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Roots of resilience: exploring community-focused mental health through place

Edited by
Salim Al-Huseini, Melanie Rees-Roberts and Nagina Khan

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Roots of resilience: exploring community-focused mental health through place

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Editorial: Roots of resilience: exploring community-focused mental health through place

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Editorial on the Research Topic
Roots of resilience: exploring community-focused mental health through place

1 Introduction

Mental health represents one of the most significant public health challenges globally. Recent information from the World Health Organization (1) has estimated that more than 1 billion people will live with a mental disorder in 2025, with anxiety and depressive disorders among the most common conditions (2). Poor mental health also has devastating consequences, with suicide affecting people in all countries and contexts and as a particularly concerning cause of death among young people (1).

The economic impact of poor mental health is significant, with mental disorders accounting for the second leading cause of years lived with disability globally (3). Importantly, this burden is not distributed equally. Depressive, anxiety and eating disorders are more prevalent among females and differ with age (2). The burden among adolescents and young adults is particularly concerning in some countries, with recent global estimates that 279 million people aged 10–24 years were living with a mental disorder in 2021, with females aged 15–24 experiencing particularly high levels of disability (2, 4).

Compounding these worrying prevalence rates globally, mental health systems across the world are marked by large gaps and imbalances in resources, services, information and research, as well as governance, especially in low-income countries (1, 3). Alongside the fact that most people living with a mental health condition do not receive formal care (1), there is a need to think differently for better prevention, diagnosis, care and recovery.

1.1 Moving beyond the medical model: mental wellbeing, community and place

As Editors of this Research Topic, we believe the increasing prevalence of mental health problems and ongoing inequities in access to care necessitate a broader conceptualization

and approach to mental health. While diagnosis and evidence-based treatment are crucial for individuals with mental disorders, they should not be the exclusive framework for population mental health. Mental health is also shaped throughout life by social relationships, living conditions, cultural context, and opportunities for participation and inclusion. This expanded perspective aligns with the World Health Organization's call for mental health systems that integrate treatment with promotion, prevention, action on social and environmental determinants, and community-based care (3, 5).

This vision holds relevance for populations experiencing social and structural vulnerability. Factors such as poverty, unemployment, insecure housing, discrimination, violence, and social isolation can adversely affect mental health while simultaneously creating barriers to appropriate support (6, 7). Addressing these challenges therefore requires coordinated action across health, social care, education, employment, housing, and community sectors. Fundamentally, community should be understood as more than a setting for service delivery. Communities can provide social connection, belonging, practical support, and opportunities for inclusion and meaningful participation, which are important components of recovery and wellbeing (8, 9). A place- and context-sensitive approach can therefore enable mental health services to respond more effectively to local needs, cultural realities, and existing community strengths.

The articles within this Research Topic exemplify this broader vision by showcasing innovative approaches that move beyond conventional clinical treatment. They focus instead on prevention, social support, community participation, and context-responsive care. Collectively, these articles demonstrate a shift from solely asking how mental disorders can be treated more effectively to considering how systems and communities can foster conditions that promote wellbeing, support recovery, reduce inequalities, and enable meaningful societal participation.

2 How the articles in this topic demonstrate innovation in this wider vision for mental health care across prevention, social support and context, as well as treatment

2.1 Novel approaches to community-based care

The contributions to this Research Topic illustrate how community mental health can move beyond conventional service models by bringing care closer to people's everyday lives and connecting clinical support with social participation and recovery. In Spain, Besoaín-Cornejo et al., Exploring lived experiences in home-based psychiatric care, examined crisis resolution and home treatment from the perspectives of service users, families and professionals, illustrating how intensive multidisciplinary psychiatric care can be delivered within people's homes while maintaining a person-centered approach. Similarly, Adam et al.'s 3for1 intervention program, short-term psychotherapy, job coaching, and peer support, demonstrates an explicitly cross-sectoral model in which psychotherapy, employment support and peer support are integrated for unemployed people experiencing psychological distress. Rather than treating mental health independently of social circumstances, the model addresses psychological wellbeing alongside employment and social participation. The Research Topic also extends community care beyond clinical services through Simpson et al., Going beyond: recovery and homelessness supported housing provision, highlighting supported housing as an environment in which recovery can be experienced through stability, autonomy and everyday community life. Likewise, Boumans et al., Recovery through creativity, demonstrates how arts-based initiatives can provide meaningful spaces for recovery and social connection beyond conventional treatment settings. Finally, Madkour et al., Community-based mental health centers in Ukraine, illustrate the importance of developing and evaluating community mental health centers within real-world contexts. Collectively, these contributions suggest that innovation lies not simply in delivering psychiatric interventions outside hospitals, but in integrating treatment with home, work, housing, creativity and community life.

2.2 Wider determinants of health—the roots of resilience

A key message emerging across this Research Topic is that mental health and wellbeing are inseparable from the wider social, economic, physical and environmental conditions and pressures in which people live. A substantial body of evidence demonstrates that factors including personal characteristics alongside experiences (including poverty, unemployment, insecure or inadequate housing, discrimination, social exclusion and adverse environments/experiences) shape and influence both mental health and opportunities for recovery (6, 7). Addressing wider determinants does not mean replacing clinical care; rather, it means recognizing that clinical interventions operate within social and wider contexts that can either enable or constrain their effectiveness. Hamilton et al. highlight this through the experiences of families and carers within community-based psychiatric services, reminding us that the effects of mental ill-health and the resources required for recovery extend beyond the individual service user. The contributing articles in this Research Topic reflect the need for a diverse and comprehensive understanding of support across clinical and wider determinants of health, as demonstrated by Adam et al. through an integrated model combining psychotherapy, employment support and peer support. The impact of wider determinants often extends beyond simple basic needs, as highlighted by Simpson et al. who showed how housing is more than a physical environment for people experiencing homelessness or recovering from substance use, who frequently experience mental health challenges. They describe the importance of safety, autonomy, relationships, activities and community in creating conditions that support recovery.

Wider determinants of health are often linked to "place" across human and natural environments and how we interact with these, with physical health, safety, and social connection being

important for mental wellbeing. Chandra Mouli et al. explore neighborhood greenspace using mobility data across nine US metropolitan areas, highlighting the potential importance of how people actually interact with local environments rather than simply whether greenspace is geographically available. Place-based mental health approaches therefore offer an opportunity to connect clinical provision with action on the wider determinants that generate vulnerability, often drawing in existing community assets and sources of resilience to support wellbeing and recovery. Mogaji et al. illustrated how community-based participatory approaches can bring local knowledge and priorities into the identification and development of interventions, while Boumans et al., show how participation in asset-based arts recovery initiatives can create connection, meaning and social participation to support wellbeing. These findings also reinforce the importance of prevention as part of a community-focused approach to mental health. Promoting social connection, participation, resilience and supportive environments may help build protective factors before mental health difficulties become more severe, alongside ensuring timely access to effective treatment when it is needed.

3 Future needs to support change

3.1 Capacity for change in the system

Sustainable transformation depends not only on expanding community services but also on strengthening mental health systems to effectively integrate, evaluate, and scale community-based approaches. This requires multidisciplinary teams, strong leadership, comprehensive workforce training and supervision, sustainable financing, and clear pathways connecting specialist, primary, social, and community care (6). The changing nature of community mental health also has implications for the workforce. Effective community-focused care requires professionals to work alongside people with lived experience, peer workers, families, community organizations and services beyond the health sector. This means developing skills in collaboration, co-production and community engagement alongside conventional clinical competencies. The examples within this Research Topic, including the 3for1 model described by Adam et al. and the Veteran Voices and Visions groups, demonstrate the value of bringing different forms of expertise and support together. Workforce development therefore needs to create the skills, roles and organizational conditions that allow these partnerships to develop.

These systems must be adaptable, able to incorporate community insights and respond dynamically to local needs. The meaningful involvement of individuals with lived experience and community stakeholders in planning, implementing, and evaluating services is crucial for enhancing the relevance and responsiveness of care. Innovation also demands appropriate governance frameworks, rigorous outcome measurement, and established mechanisms for identifying and scaling effective approaches, all while maintaining local contextual relevance (7). Importantly, system performance assessment should go beyond metrics like hospital utilization and symptom reduction. It should include broader indicators such as recovery, functional capacity, quality of life, autonomy, and social participation. Such outcomes provide a more holistic appraisal of whether mental health services genuinely empower individuals to lead meaningful and socially integrated lives (10).

The inherent challenge lies in building systems that operate collaboratively with communities and are embedded within specific localities. This establishes community-based, person-centered care as a foundational organizing principle rather than merely a supplementary service layer.

3.2 Equity considerations within change

If mental health systems are to become community-focused, equity must be central to how services and interventions are modified, designed, delivered and evaluated to reduce health inequalities that exist. The unequal distribution of mental health problems is shaped by individual circumstances, inequalities in access to appropriate, acceptable and timely support as well as the wider conditions in which people live (6, 7). A community-based service is not necessarily an equitable service; therefore, system change will need to be aware and proactive to combat inequality. Bringing care closer to communities will have limited impact if the people most affected by disadvantage remain unable to access, trust or benefit from it. An equity-focused approach should move beyond measuring whether services are available to asking who benefits, who does not, and why.

4 Conclusion

The articles in this Research Topic collectively demonstrate that innovation in mental healthcare extends beyond new treatments to encompass how care is organized, delivered, and connected to people's social and community contexts. We believe sustainable progress necessitates systems that integrate prevention, treatment, social support, recovery, and community participation, whilst also responding to local needs. Place, social determinants, lived experience, and equity also need to shape what is provided, for whom, and how success is judged. The challenge ahead lies in translating promising approaches into sustainable practice by strengthening system capacity, fostering meaningful community engagement, and enhancing cross-sector collaboration. Centring mental health systems around people, communities, and context offers a more inclusive and sustainable pathway toward mental health and wellbeing.

Author contributions

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Exploring lived experiences in home-based psychiatric care: a qualitative study of service users, families, and professionals in Spain

Ana María Besoaín-Cornejo[1,2,3], Montserrat Gil-Girbau[1,2,4], Mariam Alouali-Moussakhkhar[4], Luisa Baladón Higueras[2,4], Josefina Sáez[5] and Maria Rubio-Valera[1,4,6,7]*

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Introduction: Psychiatric home care provides a wide range of multidisciplinary, user-centered, high-intensity psychiatric interventions to manage mental health crises. Previous studies have found high satisfaction with care, but only assessed user and nurse perspectives. This study aimed to understand the experience of a psychiatric home hospitalization program in Spain from the perspective of all involved (users, families and healthcare professionals).

Materials and methods: A qualitative study with a phenomenological approach was conducted to assess "Crisis Resolution and Home Treatment" (CRHT), a psychiatric home care program. Semi-structured individual and group interviews were held between 2021 and 2022. The final sample size was determined by saturation and data were analyzed thematically. Analyses were performed by a multidisciplinary team and externally reviewed by a mental health user and an experienced CRHT manager.

Results: Four main themes summarizing CRHT experiences emerged: (1) Organizing and operating CRHT programs; (2) Receiving care at home; (3) Caregiver and family involvement and (4) Consequences of the home-based care model. CRHT allows individualized and contextualized treatment. Users and families valued home care and felt safe, although unprepared for the post-discharge situation, especially as care intensity decreases. While home care strengthens family bonds, some caregivers may need additional support to manage a crisis. Along with personalized care, CRHT allows for the

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development of a comprehensive lifelong treatment plan, although the care burden (for oneself and others) must be considered.

Conclusion: CRHT was rated positively as a flexible intervention, facilitating person-centered care and strengthening trust between users, their families, and the CRHT team. It offers personalized treatment and connects individuals to further support, enabling better treatment experiences and strengthening family relationships.

KEYWORDS

crisis management, health services research, mental health, patient-centered care, qualitative research

1 Introduction

Psychiatric home-based hospitalization or psychiatric home care typically involves a multidisciplinary team that delivers a range of high-intensity psychiatric interventions. It provides an alternative to inpatient hospitalization for individuals experiencing acute psychiatric decompensation (1–3). This model was proposed as a consequence of the deinstitutionalization movement in the 1950s, which represented a structural shift in mental health care aimed at replacing long-term psychiatric hospitals with community-based services to support recovery and promote social integration (4, 5). Psychiatric rehabilitation comprises a person-centered and contextual framework aimed at helping individuals develop stress management skills and improve interactions with their environment (6, 7). Following rehabilitation principles, the community-based, multidisciplinary, and tailored approach of psychiatric home care is a valuable initiative, aiming to improve treatment outcomes, enhance functioning, and support recovery through an individualized therapeutic plan and shared decision-making (8).

Mental health care in Spain is coordinated by the National Health System (NHS). It operates through a decentralized model, working in collaboration with primary care, community mental health centers, day hospitals, rehabilitation services, and a network of inpatient units for acute, subacute, and long-term care (9, 10). Currently, the NHS's mental health priorities focus on strengthening the primary care network and developing a national mental health strategy based on an integrated community model that incorporates a gender perspective. Its goals include addressing the social determinants of mental health, combating stigma associated with mental illness, promoting community-based care and shared decision-making, and supporting the role of informal caregivers (9). The mental health strategy was developed in response to increasing awareness of national mental health trends and the evolving needs of the population. In 2022, 17% of the Spanish population experienced mental health issues, with a notable gender gap: 22.1% were women compared to 12.1% men. Depression and anxiety were the most common diagnoses in 2021, and Spain ranked as the second-highest consumer of prescribed anxiolytics in the European Union that year (9, 11).

The community-based model has supported the development of various services, including psychiatric home care. These approaches were initially introduced gradually across Spain (12–14). In 2017, the Department of Health of the Government of Catalonia took steps to improve mental health care within community settings (15). A key initiative was the launch of the Primary Support Program (PSP), which places mental health professionals in primary care settings to encourage integrated and collaborative treatment (16). At the same time, the department promoted the expansion of home-based mental health care services, helping to extend the reach of the home care model throughout the region (17–19). In Europe, psychiatric home care has been implemented and evaluated in diverse ways and contexts, with some of the most extensive and well-established developments observed in Northern Europe (20–22), and the United Kingdom (UK) (2, 23–25). In Southern Europe, Spain is the only country to have documented both its experience and preliminary evaluations in this area (17, 18, 26).

A central aspect of psychiatric home care is effective crisis management and person-centered care that is tailored to the individual's context. Results from previous evaluations suggest that this approach strengthens users' social networks and fosters a bond of trust among all involved parties, thereby reducing stress and stigma (3, 27). It also helps preserve daily routines, is well accepted by both users and the community (27, 28), and facilitates the identification of risk factors associated with potential readmission to standard inpatient hospitalization (29). Users value respect, recognition of the urgency of their situation, and individualized support (30). Flexibility and reliability are also appreciated, along with the inclusion of family members in the recovery process. Establishing a supportive relationship is often viewed by professionals as requiring strong alignment between care teams, support services, and service users (31).

As in studies conducted in the UK and other European countries, qualitative research in Spain has shown high levels of

user satisfaction, attributed to staff professionalism, accessibility and provision of personalized, high quality nursing care (17). However, only user and nurse perceptions were assessed (17, 32), and neither multidisciplinary professional team perceptions nor the impact on service users and their relatives were explored. This study aimed to understand the experience of a psychiatric home care program in Catalonia from the perspective of all those involved.

2 Materials and methods

2.1 Setting

The Parc Sanitari Sant Joan de Déu (PSSJD) healthcare network has three components: a regional referral hospital offering inpatient/outpatient pediatric and adult care, an intermediate care center for geriatric care, and a Mental Health Network. This Network integrates acute, sub-acute and long-term psychiatric hospitalization and community care, and includes nine Community Mental Health Centers (CMHC) and seven Psychosocial Rehabilitation Centers providing outpatient care for adults with mental health diagnoses. These CMHCs collectively serve a reference population of more than 700,000 individuals in southern Barcelona, Spain (33).

2.2 Crisis Resolution and Home Treatment

The Crisis Resolution and Home Treatment (CRHT) team, a psychiatric home care program, was created at PSSJD in 2019 as an alternative to traditional acute inpatient hospitalization. Home-based medical care for people experiencing acute clinical decompensation is provided by a multidisciplinary team including nurses, psychiatrists, psychologists, and social workers with experience in high-intensity psychiatric interventions. The team ensures round-the-clock care (7 days a week, 24 hours a day) for up to 21 days with daily visits. During non-working hours, between 6 p.m. and 8 a.m., users and caregivers have direct telephone access to an emergency psychiatrist. There are two CRHT teams, one serving the Garraf CMHC population and another serving the Cornellà and Esplugues CMHC populations, all in the Barcelona area.

CRHT referrals come from PSSJD emergency or acute care departments, CMHCs, and day hospitals. Eligibility criteria include specific psychiatric diagnosis (e.g. depressive disorders, mania/hypomania, early psychosis, and psychotic disorders without significant secondary behavioral symptoms), linkage to local mental health resources, residing in the catchment area, and presence of an informal caregiver. Exclusion criteria include lack of family support, serious somatic conditions or behavioral disturbances, imminent suicide risk, eating disorders, and substance dependence as a primary diagnosis. Upon discharge from the CRHT, individuals may be referred for outpatient follow-up, day hospital or acute inpatient hospitalization, if needed.

2.3 Research team

The research team comprised of six female researchers: MRV (PhD, pharmacist), MGG (PhD, pharmacist), AMB (MSc, pharmacist), MAM (MSc, nurse), LBH (MSc, psychiatrist) and JS (person with lived experience of mental health services). MGG and AMB are full-time researchers; MRV combines research with managing the Quality and Patient Safety Unit at PSSJD. MAM works full-time in a CRHT team, and LBH is deputy director in mental health with extensive clinical experience. JS has led community recovery groups. MGG and MRV, experts in qualitative research, mentored AMB, a predoctoral researcher. MAM and LBH had prior qualitative research experience; JS did not. The research team had no prior relationship with the study participants, except for MAM, who may have interacted with some of the users and caregivers through her work with the CRHT team. MAM was also interviewed as a member of the CRHT team.

2.4 Study design and participants

We conducted a qualitative study using a phenomenological approach to explore experiences with the CRHT program, in light of the limited literature available in Catalan and Spanish contexts. Theoretical and convenience sampling were used to recruit participants. Participants consisted of three groups: (1) CRHT service users, with the inclusion criterion that they had been discharged prior to study participation, (2) family members and/or caregivers of CRHT users, and (3) health professionals from CRHT teams. No exclusion criteria were applied. The historical user list was obtained by the person responsible for CRHT administrative tasks, and one researcher contacted participants by phone or email, aiming to achieve the greatest possible diversity in gender, age, education level, and diagnosis.

Following an early interview, a treating psychiatrist suggested that the study interview may have interfered with the user's recovery. Thus, for subsequent interviews, the user's health status and suitability for participation was first confirmed with the treating psychiatrist prior to study invitation. From this point onwards, it was considered an inclusion criterion for the study. Four users declined to participate due to lack of interest. Caregivers were contacted with users' permission, and later invited to participate directly by CRHT staff. All CRHT professionals participated in the study, and team coordinators were responsible for organizing interviews directly with professionals and researchers.

2.5 Data collection

Data were collected between April 2021-April 2022 in semi-structured face-to-face individual and group audio-recorded interviews. CRHT users were interviewed individually by a

researcher (AMB) at home or at a location of their choice. Caregivers were interviewed in groups rather than individually, as initially planned, given participant access and time restrictions. CRHT team members were interviewed collectively, with individual interviews scheduled for those who could not attend. Group interviews were conducted at the CMHC with one researcher (AMB) facilitating and another (MGG) observing.

CRHT-user interviews followed a thematic guide exploring accessibility, information, shared decision-making, expectations, family involvement, and relationships with professionals. Caregiver interviews also examined the experience of caring for a loved one in a mental health crisis and CRHT support. Interviews with professionals also covered CRHT organization and functioning, including inter-professional collaboration and team dynamics. The interview guide was developed based on CRHT admission stages, and findings from qualitative studies in psychiatric home-based care. It was reviewed by clinicians with experience in psychiatric home hospitalization. No modifications were deemed necessary following initial interviews. A field journal was kept throughout the study, in which the interviewer (and, for group interviews, the observer) documented field notes along with additional insights that aided case contextualization. Following each interview, the information collected was summarized and participant feedback was sought to validate interpretation and allow participants to correct and add to the information as needed. None of the interviews had to be repeated. Recruitment and data collection continued until data saturation was reached (defined as the point at which additional data no longer generated new themes or information relevant to the research question) (34).

2.6 Data analysis

A thematic analysis of collected data was performed in accordance with Braun and Clarke's recommendations (35): become familiar with the data, generate initial codes, search for themes, review themes, define and name themes and produce the final report. Researchers manually transcribed, pseudonymized, and reviewed the audio-recorded interviews. The transcripts were then read and reread, individually coded, and triangulated between AMB, MGG, and MAM. The team inductively identified themes through a reflective process, comparing and agreeing on meanings and creating initial categories. The results were reviewed by two members of the research team: JS, a mental health service user from PSSJD who was not interviewed, and LBH, an experienced CRHT psychiatrist. Atlas.ti 22 software was used to support data management.

2.7 Ethical considerations

As this study was part of a quality improvement project by the PSSJD Quality and Patient Safety Unit, it did not require evaluation by the research ethics committee. Nevertheless, following institution internal protocols, important ethical aspects were considered at all stages using a checklist: project scope; involvement of the individual, family/caregivers and healthcare personnel; informed consent; access to information of individuals and family/caregivers; and potential harms. The authors assert that all procedures contributing to this work comply with the ethical standards of the relevant national and institutional committees on human experimentation and with the Helsinki Declaration of 1975, as revised in 2013.

Given the sensitive nature of the personal data collected in this project, we ensured compliance with the European Union General Data Protection Regulation (GDPR) through the following measures: (1) Obtaining explicit informed consent. Participants received verbal and written details on the study, its aims, and what their involvement entailed, including details on the type of data collected (audio recording of the interview), how it would be stored and protected, who would have access to it, how long it would be retained, and their rights to access, correct, or delete their personal data. All participants signed an informed consent form, confirming their voluntary participation. (2) Ensuring confidentiality. Interviews were pseudonymized at the time of transcription, and each participant was assigned a unique code. (3) Securing data. All data were stored on encrypted devices, with access restricted to authorized personnel only, and potential risks of participant identification (e.g., in the case of a potential data breach) were minimized through early pseudonymization and removal of identifying information from the processed data.

2.8 Techniques to enhance trustworthiness

This study used Guba and Lincoln's trustworthiness criteria, which include credibility, transferability, dependability, and confirmability (36). Credibility was supported by the researcher's in-depth understanding of the organizational and structural aspects of CRHT programs. This knowledge was passed onto the research team members in a comprehensive briefing. Furthermore, triangulation of findings was conducted by researchers from different disciplines and experiences, and feedback from interviewees provided on interview completion made it possible to corroborate the interpretation of the information.

Transferability was ensured by the theoretical selection of the sample and the detailed description of the data set and how it was obtained. Dependability was achieved through a review of the project by a team of external researchers, experts in qualitative research, in the Committee for Qualitative Health Research, coordinated by the "Consorci de Salut i Social de Catalunya" (CSC) and the "Institut Universitari d'Investigació en Atenció Primària" (IDIAPJGol). The study objectives and methodology were presented to this committee, which provided an opportunity for reflection and support for methodological validity. Confirmability was achieved by reflecting on individual researchers' subjective viewpoints in relation to the study, and by presenting an update on preliminary results and methodological modifications made to the project to the "Committee for Qualitative Health Research", for discussion. The Consolidated Criteria for

Reporting Qualitative Research checklist was used (37) (Supplementary File).

3 Results

Thirty-five people participated in the study, including 11 users, 10 caregivers and 14 CRHT team professionals. The gender, age, and educational level of the CRHT users varied widely, and most caregivers were parents of users and in employment. There was a high proportion of very experienced nurses and professionals (between 11-20 years of experience) and most identified as female (Tables 1, 2). We conducted 14 individual interviews (11 with users and three with professionals; average duration=38 minutes) and four group interviews (two with caregivers and two with professionals; average duration=84 minutes).

Four main themes summarized CRHT-program experiences: (1) Organizing and operating CRHT programs; (2) Receiving care at home; (3) Caregiver and family involvement and (4) Consequences of the home-based care model. The themes are described below, with narrative quotes to support the data. Service user data are indicated by SU1-11, family caregiver data by FC1–10 and healthcare professional data by HP1-14. Figure 1 summarizes the relationship between major themes and study participants. Table 3 presents the list of themes and sub-themes, identifying the profile of participants that expressed views on them.

3.1 Organizing and operating CRHT programs

Before working in a CRHT team, crisis management in a nontraditional hospital setting was a source of uncertainty for professionals. Treating a person in crisis without 24-hour observation was hard for them to imagine; *"At first, right? Can we deal with this type of patient at home? And the fears they produce in the professionals, not having the patient monitored for 24 hours, when they are in a crisis"* (HP3).

They also noted that CRHT allows for truly multidisciplinary work, which is not always achieved in other work settings. It strengthens team bonds, transforms the workplace into a shared and trusted space, and allows professionals to learn from other perspectives and disciplines, broadening their skills through cross-functional collaboration; *"I've never made visits with a social worker and a psychologist and I'm learning a lot from other disciplines. And this gives me far more resources, doesn't it? I mean, for the patients"* (HP2). However, professionals felt unaccompanied at weekends as visits are one-to-one.

3.1.1 Access to CRHT

For some users, recalling referral and admission was difficult, although most felt the process was quick; *"They processed it and I had a physician at home in two days. I mean, it was super-fast"* (SU7). They stated that CRHT information and communication around it was very reassuring to them and their caregivers, especially for users with dependents (e.g., children) or those unfamiliar with the program; *"When they noticed I was so nervous, they explained in a very natural way that it wasn't anything bad, that I was in a program, that I would have my baby with me (…) They make you feel calmer"* (SU2). Professionals felt that using visual materials and spending more time on the initial interview would improve information provision; *"Probably a leaflet or something that you, the family, could, from here, say "Listen, what happens if I can't be here all day?" or "How do we manage, if I have a question?"* (HP14).

Upon referral, the CRHT team conducted an initial eligibility-confirmation assessment. Program inclusion criteria were sometimes relaxed, for example, when referral services were saturated, or when formal caregivers were unavailable but professionals considered users to be fully capable of self-care; *"Our unwritten internal algorithm would be: we accept that there is no caregiver if it is very clear that there aren't any other social issues"* (HP9). Even though it was an exclusion criterion, professionals and users were concerned about the risk of self-harm. After a suicide during a CRHT admission, the team was worried about future incidents and had a heightened sense of insecurity; *"For instance: suicide risk. It's very difficult to assess. Very difficult to foresee. We had a completed suicide [of a user] in the team, which also made us worry about the issue"* (HP9).

3.1.2 Home hospitalization and continuity of care

Being punctual and warning of late arrival was appreciated. Visiting hours were flexible and could be tailored to individual needs, but in some cases there was no schedule, disrupting individuals' appointments; *"(…) you can come to the Rehabilitation Service and then do the CRHT, lots of people do that". So, of course, I said: "Yes, but they don't tell me when they're coming, so I have to wait at home"* (SU6). According to professionals, the frequency and intensity of visits and calls are adapted to each person's needs, with greater intensity initially; *"… we try to adapt to the patient's needs. The assessments, the initial visits, we always dedicate more time"* (HP1). In general, users and caregivers considered visit frequency and duration adequate, except for a few who preferred longer visits and one who wanted less frequent or remote visits; *"Well, with more time. With videoconference, videocalls, I mean, do the follow-up in other ways that are more comfortable. For them and for me"* (SU5).

Users and caregivers would prefer longer CRHT stays and felt unprepared for discharge; *"But perhaps, the duration, a little longer, well yes, because … Because I felt I wasn't back to myself, you know?"* (SU9). This could be due to the high intensity of care provided by CRHT compared to post-discharge community services, which may leave users feeling helpless; *"…suddenly it stops. It stops on Monday and on Tuesday you don't have anyone (…) so it creates a bit of a vacuum effect"* (SU8).

3.2 Receiving care at home

Users saw their home as a safe, comfortable, protected environment. It gives them peace of mind and allows them to

TABLE 1 Sociodemographic characteristics of CRHT service users and caregivers.

Sociodemographic characteristics		Service users *N=11*	Caregivers *N=10*
Gender		*N* (%)	*N* (%)
	Female	6 (54.5)	6 (60.0)
	Male	5 (45.5)	4 (40.0)
Age		*N* (%)	*N* (%)
	18 – 30	3 (27.3)	0 (0.0)
	31 – 40	2 (18.2)	0 (0.0)
	41 – 50	3 (27.3)	3 (30.0)
	51 – 60	2 (18.2)	2 (20.0)
	61 +	1 (9.0)	5 (50.0)
Education		*N* (%)	*N* (%)
	None	2 (18.2)	0 (0.0)
	Primary school	1 (9.0)	2 (20.0)
	Secondary school	5 (45.5)	7 (70.0)
	Higher education	3 (27.3)	1 (10.0)
Employment		*N* (%)	*N* (%)
	Student	1 (9.0)	0 (0.0)
	Working	2 (18.2)	8 (80.0)
	Work leave	1 (9.0)	0 (0.0)
	Pensioner	7 (63.8)	1 (10.0)
	Retired	0 (0.0)	1 (10.0)
Nationality		*N* (%)	*N* (%)
	Spanish	9 (81.8)	9 (90.0)
	Other	2 (18.2)	1 (10.0)
Cohabitation		*N* (%)	*N* (%)
	Alone	4 (36.4)	0 (0.0)
	Mother and/or father	4 (36.4)	0 (0.0)
	Partner	1 (9.0)	3 (30.0)
	Partner and children	2 (18.2)	4 (40.0)
	Children	0 (0.0)	2 (20.0)
	Other relatives	0 (0.0)	1 (10.0)
Relationship to service user		*N* (%)	*N* (%)
	Mother/ father	N/A	6 (60.0)
	Partner	N/A	1 (10.0)
	Ex-partner	N/A	1 (10.0)
	Sister	N/A	1 (10.0)
	Son	N/A	1 (10.0)

CRHT, Crisis Resolution and Home Treatment; N/A: Not applicable..

continue their daily routines and freely determine their schedules and dynamics; *"…the well-being I felt when I did CRHT or now, in my free time, I can, I don't know, shower in half an hour, eat in an hour and a half, whatever … lie down on the couch and watch a movie"* (SU4). Having the entire CRHT team at home could be overwhelming for some people, especially at the beginning. However, the home provides structural comforts not available in hospitals, and users reported feeling safer at home during crises, especially because they avoid exposure to others with symptoms that may interfere with their recovery; *"You're not somewhere with other patients who have other illnesses that you can catch. In the sense that you see yourself so you start to think and then start to say: "Hang on! This could happen to me!"* (SU6). While most users preferred to manage a mental health crisis at home, some with a history of hospitalization or inadequate support networks valued the traditional inpatient setting for socialization and peer support, even seeing it as a home away from home; *"Admitted or at home, more or less, for me, it's nothing really. Even more pleasant there because I spoke with more people, with the sick and so on"* (SU3).

In the user's home, professionals can evaluate the case comprehensively, observing the individual's family and daily environment, with longer visits than in traditional hospitalization. It objectifies the user's reality in a more global way, facilitating treatment plan design; *"…the approach is more individualized at home, I have more time to give them. I can see what their environment is like, I can see what the family is like, how he/she functions at home. Things I can't see in the hospital"* (HP12). Additionally, since space and beds are not physically limited, teams can be organized to increase the number of beds as needed; *"If we are at our maximum and if we have to add an extra bed one day, two days … If you find yourself in that situation, it can be done"* (HP3).

All participants agreed that working in the user's context fosters a close, trusting, non-hierarchical relationship between professionals, users and family members, creating a strong bond. In some cases, this bond is maintained and even continues beyond the CRHT admission; *"It's very important, with mental illnesses, that an emotional bond grows, a wonderful bond, a warm bond, between the therapists, any of them, and the patient (…) And with CRHT a truly delightful bond is established"* (SU4). However, despite the benefits of being at home

TABLE 2 Sociodemographic characteristics of CRHT team professionals.

Sociodemographic characteristics		Team professionals *N=14*
Gender		*N* (%)
	Female	12 (85.7)
	Male	2 (14.3)
Age		*N* (%)
	18 – 30	4 (28.6)
	31 – 40	6 (42.8)
	41 – 50	4 (28.6)
Credentials		*N* (%)
	Nurse	7 (50.0)
	Psychiatrist	3 (21.4)
	Psychologist	2 (14.3)
	Social worker	1 (7.1)
	Administrative tasks	1 (7.1)
Years of experience		*N* (%)
	0 – 5	4 (28.6)
	6 – 10	3 (21.4)
	11 – 15	4 (28.6)
	16 – 20	2 (14.3)
	20 +	1 (7.1)

CRHT, Crisis Resolution and Home Treatment.

during a crisis, all participants recognized that home hospitalization is not appropriate for all users and depends on each person's clinical condition and situation; *"It depends on the patient (…) Some are more well-disposed to it than others, right? And the context too"* (HP3).

3.3 Caregiver and family involvement

The caregiver role can be played by any trusted person capable of taking responsibility for home care, and the choice of caregiver is agreed between the team and the user according to their preferences; *"In fact, the user decides. Who do they want to be their go-to person, based on trust, who they feel most comfortable with?"* (HP5). In this study, all caregivers were family members.

To help caregivers feel confident and at ease, the team is responsible for providing them with necessary information about the user's health and treatment. In addition, caregivers felt that active participation in their family member's treatment increased their awareness of their role and responsibility in the recovery process compared to their experiences before CRHT; *"…this team is not alone, this team works because the family is around. If not, it wouldn't work."* (FC8). By being a part of the experience, family members can better understand the process and empathize with their loved one. Furthermore, CRHT fosters a close bond between users and their families, strengthening ties and mutual understanding; *"When you have him at home, on the other hand, it's a relief because you see how they're improving every day, how they're improving. Of course, you get closer to them and they get closer to you"* (FC2). For users, feeling accompanied and supported by their family and loved ones while recovering created a strong sense of gratitude; *"Very lucky. Very grateful. Because they were there for me and I felt that love and support"* (SU9).

Caregiver involvement was personalized to meet user and caregiver preferences and interests. In some cases, they liaised with the team, providing information that the user preferred not to comment on directly; *"Because the girl spoke to her about things I didn't tell them. So, she went, I talked to her, my wife, about things, well, that I, worried about, what made me feel bad, or whatever"* (SU11). In other cases, caregivers were excluded from visits if they were felt to be barriers to recovery or if the user preferred to keep their symptoms or health status confidential; *"When they asked me about my symptoms and so on, my mother wasn't there. Because, I think … They are a little grim. So I didn't want her to worry"* (SU10).

Professionals attempted to provide caregivers with tools that would be helpful in managing the user's crisis episodes, especially in cases where the family was involved for the first time. Still, it could be shocking for users' families to experience the acute phase of the illness firsthand, and in some cases they may need additional resources to bear and manage the crisis. This was especially true of relatives with chronic mental health problems and families with young children; *"And me? I am here too. I also suffer it. And not for myself, for my daughter who is seventeen years old and has been suffering with it since she was born"* (FC6).

3.4 Consequences of the home-based care model

The CRHT team provides comprehensive care, addressing the crisis in a holistic manner, considering employment, housing, socialization, and family relationships to promote person-centered care. The team always adapts care to each individual's needs and preferences, which is perceived as more sensitive and humane than traditional hospitalization; *"Then the psychologist would always want to go for a walk (…) she always wanted us to get some sun. Of course, I never left home, with depression you're on the couch all day and she made me get dressed and … let's go!. let's get a coffee or go for a walk!"* (SU4). According to CRHT professionals, a comprehensive crisis approach allows for the development of long-term treatment plans coordinated with community resources more easily than traditional inpatient treatment; *"And the interventions are much more long-term, at the time you're doing them, in your normal surroundings, aren't they? An intervention that you can do in the hospital, it has no continuity"* (HP3).

Whenever possible, the team promotes shared decision-making based on individual preferences, including agreement on medications, visitation frequency and family involvement; *"Both, I think it was by mutual agreement. But it started with them, because*

the psychiatrist too, I suppose he realized I was getting better and I didn't have to take the medication for so long" (SU2). They also prepare users and their families to manage their care after discharge by providing information about health issues and treatments, which promotes empowerment; *"…fostering the patient's autonomy and that they understand their therapeutic process, know what it entails, know about the illness, know all about their disorder. Both them, and the family"* (HP10).

Participants appreciated having professionals available during CRHT (a team member or psychiatrist was always reachable), either at home or on the phone after-hours. This uninterrupted access was seen by professionals and users as continuous care, reassuring and comforting users, even providing a sense of well-being; *"…I felt that I wasn't alone. Because sometimes I feel, due to my illness, very alone and I felt more accompanied. Whether you want it or not, it helps you"* (SU10).

Providing care at home is more complicated for professionals as they have to travel. However, barriers to access for both the user and the family are reduced by bringing care closer to the community; *"…there's no queueing, you don't have to make appointments, I mean, they come to you and there they are, and there they are"* (SU4). Users and caregivers also perceive good health and functional recovery and improved awareness of their condition and its severity; *"He now accepts that he is sick. There was even a moment when he said "I want them to admit me, I'm not well". And before, no"* (FC5). CRHT was also associated with improved treatment adherence, although practitioners noted that family involvement could occasionally be a barrier to adherence if not aligned with clinical goals; *"Of course, sometimes we have encountered uncooperative families, right? I would say"* (HP14). Professionals also commented that self-stigma is reduced because users cannot compare themselves to others, although this can result in skewed perceptions of their illness severity. In addition, they have the opportunity to work together on strategies to reduce it; *"…you can work a bit on stigma. You eliminate false beliefs or learned beliefs that, with psychiatry, it's easier to break down barriers like this"* (HP13).

Professionals noted that for some, particularly women, home care responsibilities and caring for other family members can interfere with recovery and even privacy during visits; *"A mother will always have the kids and if they are small … then it means respecting* spaces *a little. Sure, if she were at the hospital, it would be just her during the visit. She would have her privacy"* (HP13). It can also place an additional burden on caregivers, who often try to juggle the demands of work, home, and routines on top of caring responsibilities; *"…because we were in lockdown. If not, I could not have been the caregiver (…) the only income is from my job, so, I have to work"* (FC1).

The important role of CRHT as an alternative to inpatient mental health crisis care, avoiding or reducing hospital admissions, was seen by all participants; *"Positive. Yes. You see it as a ray of light, don't you? Because, of course, between going to the emergency room and being admitted, it's an intermediate point"* (SU3). Professionals also reported satisfaction with therapeutic/professional

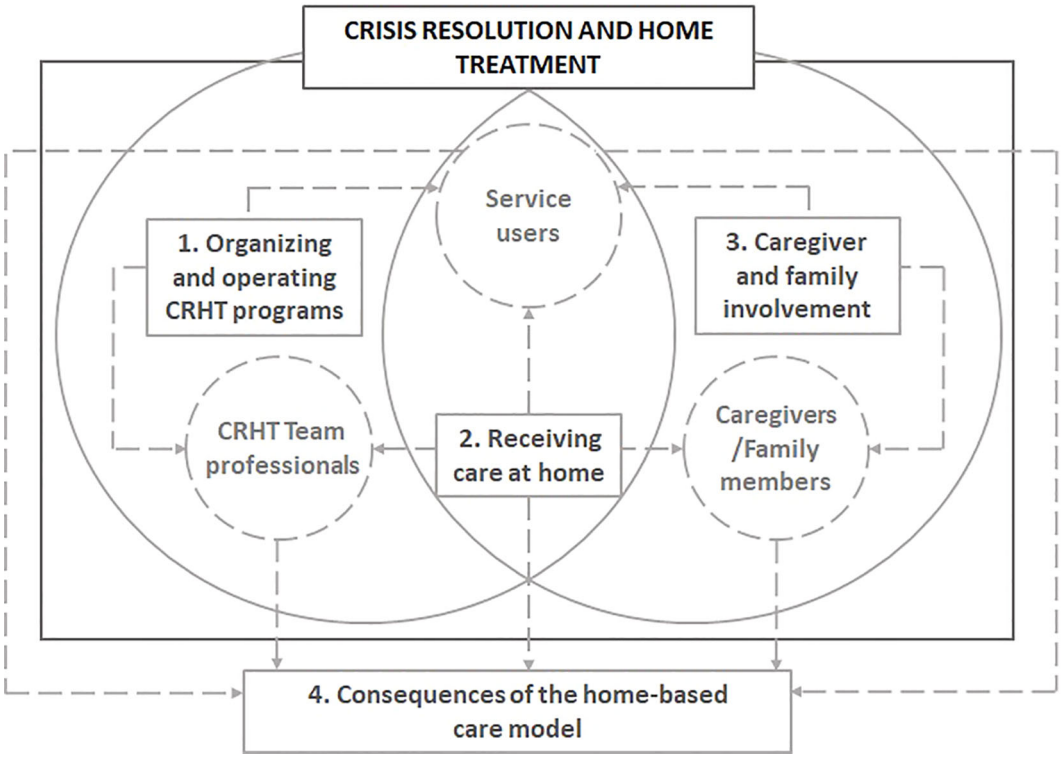


FIGURE 1
Relationship between major themes and study participants.

TABLE 3 Main themes and sub-themes emerged from the interviews, according to participants.

Themes (sub-themes)	Participant
Organizing and operating CRHT programs[a]	
Previous expectations	HP
Multidisciplinary work	SU, FC, HP
Access to CRHT	SU, FC, HP
Initial information	SU, FC, HP
Assessment	HP
Intensity and timeliness of visits	SU, FC, HP
Continued care after discharge	SU, FC
Receiving care at home[b]	
Safe environment	SU, FC
Socialization and mutual support	SU, HP
Personalized treatment	FC, HP
Bed flexibility	HP
Therapeutic bond	SU, FC, HP
Suitability	SU, FC, HP
Caregiver and family involvement[c]	
Caregiver selection	SU, HP
Caregiver's awareness	FC, HP
Family bonding	FC
Gratitude	SU
Caregiver involvement	SU, FC, HP
Support for family members	FC, HP
Consequences of the home-based care model[d]	
Person-centered care	SU, FC, HP
Long-term intervention	HP
Shared decision-making	SU, HP
Empowerment	SU, FC, HP
Accompanying	SU, HP
Reducing geographic barriers	SU, FC, HP
Insight and health improvement	SU, FC, HP
Adherence	FC, HP
Self-stigma	HP
Burden of care and self-care	SU, FC, HP
Role of CRHT	SU, FC, HP
Professional satisfaction	HP

[a]Experience in organizing and running the CRHT programs to date; [b]Effect of the care model at the user's home; [c]How the presence of the caregiver and/or family may affect admission; [d]Impact of home-based care on all those involved.
CRHT, Crisis Resolution and Home Treatment; FC, Family caregiver; HP, Healthcare professional; SU, Service user.

relationships, more time for care, and greater user improvement and recovery; *"You see the whole improvement process, don't you? And I think this is very satisfying at the professional level"* (HP8).

4 Discussion

Our qualitative findings suggest that CRHT promotes multidisciplinary work, is helpful for adapting processes and treatment to each individual, strengthens interprofessional relationships, and creates stronger bonds between professionals, users, and families. Participants rated home care highly and their perception of safety was good, although some still preferred conventional psychiatric admission. Post-discharge, users and caregivers felt unprepared to cope due to the significant reduction in care intensity. Caregivers were aware of their responsibilities, and users appreciated their family member's care, and although experiencing a loved one's recovery strengthens family bonds, some caregivers may need additional support to manage crises. Along with personalized care, CRHT allows for the development of a comprehensive, lifelong treatment plan, although the burden of care and self-care must be considered, especially when caring for other family members.

To date, this study is the first to explore service user, caregiver and professional experiences of CRHT teams in Spain. Descriptive studies and nurse/service user experiences have been reported independently, but not as a shared experience of all stakeholders (12, 13, 17, 18, 26, 32). Consistent with other studies, referral to the CRHT was perceived as a positive experience, especially in terms of admission criteria flexibility, detailed information on processes and reassurance of users and families (17, 31). Professionals should consider user/family expectations at referral and the team's capacity to meet them (38). Regarding exclusion criteria, suicide risk remains difficult to detect in initial assessments. Witnessing medical safety events, especially self-harm or suicide during psychiatric home care, has a major impact on staff as well as on subsequent assessments of the service user. Staff are at a high risk of experiencing the second victim phenomenon, leading to negative emotions, lack of trust, guilt, and frustration (39, 40). These effects may directly impact quality of life and working conditions.

Despite professionals' global perspective and coordination with other services, transition to a mental health resource after CRHT is frequently a difficult experience for users and families due to care fragmentation among the various services. Reducing end-of-care visits and promoting inter-service coordination is critical to ensuring continuity of care and preventing users from feeling abandoned (31, 41). Although these strategies are being implemented, users still perceive discontinuation of care as a major problem.

According to Winnes (42), for some, psychiatric ward hospitalization may be preferable as it separates the person from the crisis context (i.e., home) and promotes social interaction with peers. However, for most users, home is perceived as a comfortable, safe place to recover, and research suggests that the provider-user

relationship is less hierarchical in the home setting (17, 31, 43). Individuals and families are more horizontally and equitably connected to professionals, which also increases sensitivity and awareness of the therapeutic relationship. Furthermore, the home environment favors understanding of users' rights and needs, shared decision-making regarding treatment, and users' and family members' satisfaction with daily visits (31, 44).

Caregiver burden must be carefully assessed. Home care has not been shown to reduce overall caregiver burden, and although initiatives exist regarding daily household tasks and emotional support, they are not generally perceived as adequate by family members (31, 42, 45). The same holds for female users with dependents, especially those with young children, where the home visit may interfere with daily tasks, or prove intrusive and overwhelming (25). In this study, and in previous experiences evaluated in similar settings (31, 46), CRHT teams were found to play a fundamental role in liaison between hospital and community mental health services, and comprehensive care provision, although this aspect of CRHT should be further explored.

This study has some limitations. While the qualitative approach and reflexive thematic analysis methodology allowed for an in-depth approach and data-familiarity (35), it is likely that the sample does not reflect the experiences of service users who are less engaged with mental health services. It is common, especially in service evaluation studies, for users (and in this case, also caregivers) who are more satisfied with the service provided to be more motivated to participate. In this study, we did interview individuals who were dissatisfied with the service provided by the CRHT teams; however, they represented a minority compared to those who expressed satisfaction. Another limitation of the study concerns the process of accessing the sample. For caregivers, direct recruitment by CRHT professionals may have influenced participation, as they may have felt a sense of obligation out of gratitude for the service provided. However, the range of responses collected suggests that caregivers nevertheless felt able to express both positive and critical views. The group interviews conducted with professionals included the entire CRHT team. This means that team coordinators were also interviewed as part of the group. This situation may have influenced participants' responses, as they might have moderated their answers due to the hierarchical relationship with other members of the interview group. Despite potential power dynamics influencing group discussions with professionals, rich discussions were generated and subsequent conversations with individual staff members to corroborate findings did not raise any concerns about this. Finally, the setting in which the evaluation was conducted corresponds to a specific and unique context, characteristic of the geographical area covered by the CRHT teams. Even though the evaluation focused on this very particular setting and therefore the results are not generalizable, our aim was in fact not generalizability, but rather, to explore this specific context and situation.

CRHT appears to be a valuable initiative, showing consistent stakeholder satisfaction and contributing to more efficient use of healthcare resources (19). Its integration within the community-based mental health care system not only facilitates access to services but also strengthens trust in healthcare professionals. These observed benefits suggest that the model could be a promising option for implementation in other regions of the country, where it could help improve both service delivery and user experience. Exploring and understanding the lived experience of everyone involved with CRHT teams has proven to be an opportunity for learning and professional growth for its members and a comfortable, safe and accompanied way for users and their families to overcome a mental health crisis. It also presents an opportunity to design and implement future strategies to improve patient care, always considering a collaborative approach that takes into account the opinions and experiences of all stakeholders. In this case, opportunities could be directly aimed at improving the continuity of care between CRHTs and community resources, as well as the creation of a support plan that considers the real and particular needs of users and their families, whether practical, relational, or emotional. It remains crucial to further study the referral processes to and from the CRHT programs in depth and to propose, from a participatory approach, the establishment of common processes that improve communication, information and mutual understanding between the different mental health resources and all the people involved.

5 Conclusions

This CRHT program was positively valued by participants as a flexible intervention that facilitates person-centered care and strengthens therapeutic bonds. Home-based care enables professionals to tailor treatment to individual needs, foster non-hierarchical relationships with users and their families, and enhance clinical insight. In addition, family caregiving in the perceived safety of the home strengthens the bond with the service user, although additional support needs should always be assessed. Care and self-care burden on the user and family must also be taken into account, especially as home hospitalization may not be appropriate for all.

As the first known study in Spain to explore CRHT from a multi-stakeholder perspective, our findings can be used to develop quality improvement tools for CRHT in other contexts and populations (particularly regarding continuity of care, and service coordination) to promote a community-based model of mental health care across the lifespan.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

As this study was part of a quality improvement project by the PSSJD Quality and Patient Safety Unit, it was not evaluated by the research ethics committee. Nevertheless, following institution internal protocols, important ethical aspects were considered at all stages using a checklist: project scope; involvement of the person,

family/caregivers and healthcare personnel; informed consent; access to information of persons and family/caregivers; and potential harms. The authors assert that all procedures contributing to this work comply with the ethical standards of the relevant national and institutional committees on human experimentation and with the Helsinki Declaration of 1975, as revised in 2013. The studies were conducted in accordance with the local legislation and institutional requirements. The participants provided their written informed consent to participate in this study.

Author contributions

AB-C: Conceptualization, Data curation, Formal Analysis, Investigation, Methodology, Software, Visualization, Writing – original draft, Writing – review & editing, Funding acquisition. MG-G: Conceptualization, Formal Analysis, Methodology, Resources, Supervision, Validation, Writing – review & editing. MA-M: Formal Analysis, Resources, Writing – review & editing. LB: Conceptualization, Resources, Validation, Writing – review & editing. JS: Validation, Writing – review & editing. MR-V: Conceptualization, Formal Analysis, Methodology, Project administration, Resources, Supervision, Validation, Writing – review & editing.

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The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Correction: Exploring lived experiences in home-based psychiatric care: a qualitative study of service users, families, and professionals in Spain

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"You're never going to get a second chance if someone doesn't give you a second chance" perspectives and experiences of landlords and advocates on implementing HOME among youth experiencing homelessness

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Introduction: Youth experiencing homelessness (YEH), particularly those with prior legal system involvement, face significant barriers to securing stable housing, including stigma, limited income, and criminal background screenings. While supportive housing programs have improved outcomes for adults, few programs have been evaluated for youth. The Housing, Opportunities, Motivation and Engagement (HOME) trial is the first randomized controlled trial to evaluate a six-month supportive housing intervention for YEH using private-market rental assistance. This qualitative sub-study explored landlord and supportive housing advocate perspectives and experiences with implementing HOME for YEH including those with legal system involvement.

Methods: We conducted semi-structured video interviews with 12 participants: 8 landlords (4 HOME participants, 4 non-participants) and 4 housing advocates. Participants were either directly involved in HOME or had prior experience with supportive housing for YEH. Interview guides were informed by the Consolidated Framework for Implementation Research (CFIR) and piloted before being finalized. Interviews were transcribed verbatim and analyzed using template analysis, guided by CFIR's five domains. Three researchers independently double coded each transcript, met regularly to resolve discrepancies, and refined codes through focused coding. ATLAS.ti software supported data analysis.

Results: Five themes emerged: (1) *Program Features and Benefits*, including guaranteed rent and youth stabilization; (2) *Landlord and Advocate Profiles*, highlighting landlord motivations, rental practices, and experience with youth

facing homelessness and legal system involvement; (3) *Internal System Factors*, such as financial incentives and the pivotal role of advocates in bridging communication; (4) *External Influences*, including rental market constraints and stigma; and (5) *Program Enhancement Strategies*, with suggestions for longer-term leases, clearer communication, and expanded support resources.

Conclusion: Implementation of supportive housing for YEH with legal system involvement is shaped by financial, relational, and place-based factors. While guaranteed rent and advocate support facilitated landlord participation, stigma, rigid lease structures, and short program duration posed persistent barriers. Findings highlight the need for tailored, multi-level strategies that address structural inequities and promote long-term housing stability.

KEYWORDS

supportive housing, youth, homelessness, justice-involved, landlord, program implementation, place-based intervention

Introduction

Each year, 3.5 million youth (ages 18–25) experience homelessness in the United States (1, 2). Youth experiencing homelessness (YEH) are a marginalized population (3) and often have prior legal system involvement (LSI) (4–6). Legal system involvement—also referred to as being justice-involved—includes individuals who have been arrested, incarcerated (in jail or prison), placed on parole (either as an alternative to incarceration or as post-release supervision), or on probation (as an alternative to jail, with or without pre-sentencing detention) (7, 8). Although youth represent only 9.5% of the US population, they account for 23% of all arrests nationwide (9, 10). For YEH, the risk is even higher. Nearly 62% of YEH report being arrested *at least once* in their life (11, 12), and 44% report detainment in a jail, prison, or juvenile detention center (13). During periods of homelessness, YEH with LSI often face ongoing exposure to violence and victimization (14), poor mental health, and elevated mortality risk (14–16), all of which hinder their ability to secure housing and exit homelessness (17–20).

Supportive housing programs are evidence-based interventions, which aim to improve housing stability for adults experiencing homelessness, but remain under-evaluated for YEH (21, 22). Among unhoused adults, supportive housing programs have improved housing stability without worsening participant psychiatric or substance use symptoms (22–24). Compared to standard care, participants who received supportive housing had 30% fewer hospitalizations and 24% fewer emergency department visits 18 months post-intervention (25). While these studies link the intervention to housing stability and other health outcomes, other studies show inconsistent results (26), and evidence on the effectiveness for housing stability in YEH remains limited (27).

Supportive housing programs must be adapted to meet the developmental needs and unique challenges of YEH, particularly those with LSI. A major barrier to implementing these programs is recruiting landlords from the private rental market to participate (20, 28, 29). YEH face significant obstacles in securing housing (30), including lack of rental history, poor or no credit, denials related to prior legal system involvement, or lack of consistent employment (31–33). These challenges make it difficult to provide income or rental verification for housing applications. Structural barriers, such as inconsistent tenant screening practices, criminal record background screening, stigma (34), and discrimination (35), further compound the issue. Although the US Department of Housing and Urban Development (36, 37) issued guidance in 2016 discouraging the use of criminal history in tenant screening, adherence to these guidelines vary widely by city and state (38). Landlords often hesitate to rent to individuals with prior LSI due to stigma, concerns about property damage, or liability for criminal activity (28, 39–41). Conversely, some landlords are motivated by pro-social beliefs, seeking to help people transition out of homelessness (28) and reintegrate into the community after incarceration (28).

Few studies have examined the contextual factors, including barriers and facilitators that influence landlord participation in housing programs for YEH, especially those with LSI. This gap is critical, as YEH with LSI often face even greater mental and physical health challenges than their peers without LSI (6, 42). The Housing, Opportunities, Motivation and Engagement (HOME) trial is the first large-scale randomized controlled trial specifically designed to evaluate the effectiveness of a six-month supportive housing program for YEH. The program provided rental assistance through private landlords and operated as a place-based, rapid rehousing intervention grounded in a housing first philosophy (43). This qualitative study used semi-structured interviews to explore landlord and supportive housing advocate perspectives and experiences with implementing HOME for YEH, including those with prior LSI.

Materials and methods

Study setting

The HOME trial, described previously (43), was a randomized controlled trial testing the effectiveness of a supportive housing program on opioid and other substance use as well as other indicators of health and well-being. Eligible participants were youth (ages 18–24) experiencing homelessness who did not meet diagnostic criteria for Opioid Use Disorder at enrollment, based on a clinical interview (43).

Abbreviations: HOME, The Housing, Opportunities, Motivation, and Engagement trial; CFIR, Consolidated Framework for Implementation Science; YEH, Youth experiencing homelessness; LSI, Legal system involvement; COREQ, Consolidated Criteria for Reporting Qualitative Research.

Youth randomized to the housing intervention arm received 6 months of rental assistance (covering rent and utilities) and risk prevention services, while those in the comparator group received risk prevention services but not program-paid housing. The risk prevention services included Strengths-Based Outreach and Advocacy (SBOA), HIV prevention, Motivational Interviewing (MI), and suicide prevention screening; detailed descriptions are provided elsewhere [43]. Both groups had access to an advocate for 6 months to support housing navigation (with or without project rental assistance) and to deliver risk prevention services (43). The present study was a qualitative sub-study of HOME and approved by the institutional review board at the Ohio State University. This manuscript followed the COREQ (Consolidated Criteria for Reporting Qualitative Research) checklist (44).

Interview guides

Interview guides were developed based on existing supportive housing literature (20, 28, 45, 46) and the Consolidated Framework for Implementation Research (CFIR) Interview Guide Tool (47–49). CFIR, a widely used and validated framework for identifying factors that influence implementation, informed both the design of the interview guides and the analytic approach. This framework ensured a consistent and comprehensive examination of multilevel implementation factors (47–49). Interview questions focused on landlords' and advocates' perspectives and experiences implementing the HOME program for YEH, particularly those with prior LSI. Questions were organized according to the five CFIR domains, addressing the constructs relevant to understanding the factors that could influence the successful implementation of the HOME program: characteristics of HOME; characteristics of landlords and advocates; inner setting; outer setting; and implementation process. Interview guides were pilot tested with experts in the field who were not subjects in the study (e.g., landlord, advocate, and health services and health disparity researchers) and refined accordingly.

Landlord and advocate recruitment

We contacted 30 landlords, including 15 who had participated in HOME and 15 who had chosen not to participate in HOME but had experience with a similar housing program for YEH including youth with LSI. A total of 11 landlords expressed interest, and eight completed the interviews, including four HOME participants and four non-participants. Including landlords who declined HOME participation helped reduce bias, identify barriers, and diversify perspectives (50). We also recruited four advocates with direct experience securing housing for YEH with LSI.

Interview process

Interested participants were scheduled for virtual interviews, with up to three follow-up attempts made if initial contact was unsuccessful. In total, we interviewed eight landlords and four invited advocates ($n = 12$) before we achieved saturation. All semi-structured interviews were conducted via video conference by a trained researcher (DMR) who was not involved in HOME. Verbal consent was obtained before the interview. All interviews (45–60 min each) were audio-recorded and transcribed verbatim by a commercial transcription service that provides a secure platform for paid audio and video transcription. Pseudonyms were assigned to protect participant identities.

Data analysis

We conducted a template analysis of the interview transcripts to identify themes describing barriers and facilitators to implement HOME for YEH including those with prior LSI, guided by CFIR constructs. Template analysis, a structured yet flexible form of thematic analysis, uses hierarchical coding to organize data (51, 52). We used CFIR's five domains and relevant constructs as *a priori* codes to develop an initial codebook. Before starting coding, the research team agreed on the coding definitions, and inclusion/exclusion criteria. Three coders (DMR, LJ, JHS) independently coded the transcripts, with each transcript double coded. The team met regularly to review coding, discuss emergent themes, and resolve discrepancies by consensus (53). Once open coding was complete, we conducted focused coding to synthesize and group data into meaningful themes and subthemes, using ATLAS.ti (version 24) for analysis (54). At the conclusion of the qualitative analysis, we identified themes and subthemes reflecting landlord and advocate perspectives and experience with key implementation barriers and facilitators.

Results

Participant demographics

Of the 12 interviewees, five landlords (63%) and one (25%) advocate were male. Three landlords (38%) were property managers, and five (63%) were private property owners (Table 1). All landlords and advocates had experience serving YEH who had LSI.

Major themes

Five distinct themes and associated subthemes were identified and informed by CFIR's domains (Table 2).

Theme 1: Program Features and Benefits (CFIR Domain: Intervention Characteristics), which captured the core attributes and value proposition of the HOME program, included two subthemes:

(1) *Relative advantage of HOME* referred to how the program compares to alternative housing solutions. Landlords and advocates emphasized one of HOME's key advantages: it offers landlords guaranteed rent payments for YEH with LSI, while also ensuring stable housing for these youth over a 6-month period. One landlord shared, *"It was great. HOME was easy to work with and having guaranteed rent payments was a relief compared to chasing people for rent"* (L5). Another landlord appreciated the HOME model, stating, *"I like the concept of providing housing where it is otherwise difficult to do so"* (NP6). Advocates also highlighted the program's benefits for youth, with one advocate noting, *"Beyond just housing, it helped them reframe their situation and see that their current challenges do not have to define their future"* (A4).

TABLE 1 Participant characteristics.

Participant ID	Role	Gender	Participation in HOME	Reason for non-participation
NP1	Landlord	Male	No participation	Financial support fell short of expectations
L2	Landlord's property manager	Male	Yes	N/A
L3	Landlord's property manager	Female	Yes	N/A
L4	Landlord's property manager	Female	Yes	N/A
L5	Landlord	Female	Yes	N/A
NP6	Landlord	Male	No participation	Financial support fell short of expectations
NP7	Landlord	Male	No participation	Tenant's suitability for the property was limited
NP9	Landlord	Male	No participation	Housing unavailable
A1	Advocate—homes project manager	Male	Employee of housing first program	N/A
A2	Advocate—homes case manager	Female	Employee of housing first program	N/A
A3	Advocate—homes case manager	Female	Employee of housing first program	N/A
A4	Advocate—homes case manager	Female	Employee of housing first program	N/A

L, Landlord; NP, No participation in HOME program; A, Advocate.

(2) *Perceived impact on YEH* was defined as stakeholder views on the program's effectiveness for youth outcomes. Landlords and advocates discussed how HOME helped YEH, especially those with LSI, by providing stable housing and rental history, which supported their employment prospects. One advocate noted, *"These youth were motivated to find jobs and maintain reliable commutes. Once they received Housing First, they quickly found jobs and enrolled in training programs, driving their stabilization."* (A2). Landlords emphasized the importance of stable housing for youth facing challenges to self-sufficiency. One landlord stated, *"Stabilized housing is key. Your program provides that, helping them start careers they might not otherwise pursue."* (NP1). Another added, *"It gives them independence and the ability to thrive on their own, which was a great thing to do."* (L4).

Advocates agreed, noting that stable housing eased anxiety and boosted motivation. One shared, *"Having your own place, not worrying about where to sleep, and experiencing less anxiety is huge. The freedom to come and go makes a big difference."* (A1). Another remarked, *"Stable housing motivates youth to address other needs, especially mental health. It boosts their sense of self and reduces hopelessness."* (A2).

Theme 2: Landlord and Advocate Profiles (CFIR Domain: Characteristics of Individuals), which outlined key traits of landlords and advocates involved in HOME, included three subthemes:

(1) *Experience with YEH with LSI* referred to prior work or interactions with YEH with LSI. Landlords shared their experience working with YEH, particularly those with LSI, and discussed the challenges. They noted that these tenants often faced issues such as legal involvement or lack of rental history. As one landlord shared, *"I worked with over 60 youth in the program. Obviously, very different situations with every single one of them. A lot of it was just sad situations. Many were just looking for a break."* (L4). Another noted, *"The experience was not bad. After the payment period ended, like most tenants, they paid late, but there were no major issues."* (L5).

Advocates described supporting YEH with LSI through the rental process. One advocate mentioned working with 30 to 40 youth during the program, saying, *"Some had warrants, missed court dates, or outstanding charges, but not frequent jail time."* (A3). Another emphasized helping youth beyond their caseloads: *"I had 30 assigned clients, but I worked with more. If I saw others, I would offer help and refer them to their advocate."* (A2).

(2) *Motivation for participation* referred to drivers for joining HOME (e.g., altruism, financial incentives). Landlords described HOME as a meaningful opportunity to give YEH a second chance, especially those with LSI. Many believed their participation could have a positive impact. As one landlord shared, *"You're never going to get a second chance if someone does not give you a second chance. For anybody that shows promise, I will try to work with them."* (NP6). Another echoed this sentiment, saying, *"…being able to have a second chance I think is really valuable."* (L5).

Advocates expressed similar motivations, emphasizing their commitment to supporting YEH. One advocate explained, *"It was a great opportunity to work directly with youth and actually provide some hands-on assistance… helping them follow through with getting connected to different resources and jobs."* (A3). Another noted the significance of overcoming housing barriers, stating, *"Being able to work with the housing [HOME] and getting over that barrier is huge because there were clients who were stuck in a cycle of applying for places and had basically given up hope."* (A4).

(3) *Rental practices* referred to procedures for tenant screening, lease agreements, or conflict resolution. Landlords outlined their tenant eligibility criteria, which generally followed standard rental procedures. Most emphasized that tenants must be able to afford the rent, with a common guideline of earning at least three times the monthly rent (e.g., $2,700 for a $900 unit). This practice helps prevent evictions, based on their past experience. One landlord explained, *"We provide housing to those who can afford it, requiring tenants to make three times the rent. Sometimes we lower it to 2.5 or 2, depending on local wages. We also require proof of income to ensure stability for both parties."* (L2).

While landlords maintained standard criteria, many expressed flexibilities for unique circumstances. One landlord stated, *"We do not have a strict policy. For example, I work with a program that helps women coming out of incarceration… We choose tenants who are a good fit, considering how well they will get along with neighbors."* (NP1).

TABLE 2 Themes and subthemes with quotes.

Theme/ Subtheme	Quotations
Theme (1) program features and benefits (CFIR domain: intervention characteristics)	
Subtheme (1) relative advantage of HOME	
Landlord	"It was exciting to start this process and work with a new demographic. It felt more rewarding than what we were doing before. I thought it was a great program." (L4)
	"I think I was renting the properties for slightly less than the market rate, but the benefit was getting guaranteed payments." (L5)
Advocate	"The advantage is having an advocate who continues to work alongside the youth, following up with the rental agency to ensure they meet all the documentation requirements. For unhoused youth, everything is a challenge—transportation, jobs, and keeping things organized." (A3)
Subtheme (2) perceived impact on YEH	
Landlord	"I said, six tenants that moved in with the program, we still have one of them as a tenant, so that means—that is up to you guys if you consider a success that they learned to be self-sufficient." (L2)
	"The program had positive effects on the area. Some of the homeless camps cleared up, and some of the individuals became residents and contributing members of society. It was about showing them the positivity of the process." (L4)
Advocate	"It was also about giving them a sense of independence. Not only did they get housing they qualified for, but they also received assistance in securing that housing and they got to live independently." (A2)
	"I felt like we made an impact with the youth in the program. We provided housing for them, but more importantly, we also offered counseling, I felt like that was really impactful because then it created hope after that." (A4)
Theme (2) landlord and advocate profiles (CFIR domain: characteristics of individuals)	
Subtheme (1) experience with YEH with LSI	
Landlord	There were times when [staff] were quite frustrated. You will say "tenants" at the corporate level, you will have people saying, "Hey, no, never again." It's the honest truth. There is a rent incentive program in place, and we do have good management, which I believe is difficult to have, more management-intensive tenants without having a good team in place to manage that." (L2)
Advocate	"As far as being housed is concerned…I worked with a 100-ish [youth] I was the main person doing the liaison work. I was involved with them, but I was not necessarily their advocate doing the life skills stuff and doing outreach and advocacy." (A1)
Subtheme (2) motivation for participation	
Landlord	"My primary role as a landlord is to rent apartments and maintain occupancy—that is my business. If there is a need and we can work together, I am happy to house people who can pay rent. That is ultimately my goal." (L3)
	"My motivation is about changing the statistics and helping youth move forward—to show them they can do better, be better, live better. I will never forget watching one girl walk into her first apartment after years on the streets and in awful foster care. That smile at the end of it—that is what motivates me." (L4)
Advocate	"My motivation comes from knowing these kids personally and working with them regularly. It frustrates me that they have fewer options due to circumstances that should not limit them. The system is broken, not the kids, and they should not be denied opportunities because of it." (A2)
	"Many of these youth often interact with adults who aren't affirming or supportive. Having just one positive adult can make a huge difference. That is what motivated me—knowing I could be that person. I would say, 'Let us figure this out together. I'll keep encouraging you, reminding you of important things, and be here if you face challenges and need support.'" (A3)
Subtheme (3) rental practices	
Landlord	"Typically, we use a 3-to-1 income rule—tenants should earn three times the rent. That way, they are more likely to afford other essentials like groceries and living expenses." (NP9)
	"We do not have income-based rent, but we do have set rent standards. For certain units, we lower the rent requirements to make housing available to people who might fall below the typical income limits." (L4).
Advocate	"If the state could tell landlords, 'We will offer a larger security deposit for this tenant, and if eviction becomes necessary, we will cover your court fees and legal costs,' that could help. But I know that is unlikely to happen because it could be abused." (A1)
	"For individuals with criminal justice histories, it limited the pool of landlords we could work with. Some landlords were more open to renting to them, but others were not. I think if we had access to more landlords offering higher-quality housing, those with criminal records—especially felonies—might have had better options. However, the landlords we worked with often had more maintenance issues, which made the housing quality lower." (A2)
Theme (3) internal system factors (CFIR domain: inner setting)	
Subtheme (1) landlord financial incentives	
Landlord	"From talking to my colleagues, the main concern is usually money—making sure the rent is paid and managing damages. For me, it is a bit more than that. I appreciate the city's involvement, as we, as small landlords, do not have the manpower to handle all of these issues ourselves." (NP7)
	"At the end of the day, landlords are primarily concerned with ensuring that their rent is paid." (L4)
Advocate	"Some people do not believe in the Housing First model, but landlords generally support it because they are usually getting paid fairly through the rent." (A2)

(Continued)

TABLE 2 (Continued)

Subtheme (2) advocate involvement	
Landlord	"Being able to communicate with somebody in the program and not calling and being on hold, having a direct contact with someone in the program, would be valuable. That would be more valuable than anything." (L3)
Advocate	"Having agreements with landlords ahead of time, having those agreements in writing, having those processes be clear…" (A2)
Theme (4) external influences (CFIR domain: outer setting)	
Subtheme (1) housing demands	
Landlord	"If they struggle to maintain a job, need mental health support, or have been living on the streets or in shelters, it takes time for them to adjust. They need to learn things like setting up utilities in their name and adapting to a stable living situation. Some might even invite a group of friends to move in, which can create problems." (NP9)
Advocate	"With housing, we'd help them get settled into their apartment and provide furniture. We would also help gather essential documents, like IDs and birth certificates, and advocate for them if they faced challenges." (A3)
Subtheme (2) prevailing stigmas	
Landlord	"They need to know that my decisions are made with their neighbors' safety in mind. If a tenant has a criminal history, there is a concern it could pose a risk to others. We have had an incident before, and I have seen both sides—the person who is trying their best and the person who did the unthinkable thing. That is what landlords fear will happen." (L3)
Advocate	"Many landlords assume that clients with criminal records will be violent, even if their offenses were nonviolent. They worry it will make the apartment complex unsafe and could harm their reputation for providing a safe living environment." (A4)
Theme (5) program enhancement strategies (CFIR domain: implementation process)	
Subtheme (1) communication practice	
Landlord	"Communication is key for us. Even if you cannot pay your rent, let us know. If you are moving out, tell us when and provide an explanation. Just do not leave without informing us and handing over the keys." (NP2)
Advocate	"If there were maintenance issues during the initial phase, I would communicate with the landlord about what still needed to be fixed after the walkthrough. Then, I would assist with signing the lease, helping facilitate the down payment, and making sure the client received the keys." (A2)
Subtheme (2) program duration	
Landlord	"Honestly, the best setup for us would be a yearly lease, since that is our standard business model. Six-month leases are not ideal and make things harder for us. If we could be assured of a year of rent, it would make it easier to accept these tenants." (L2)
Advocate	"I believe if housing were provided for a year, along with support, it would be more realistic for helping someone adjust. A Housing First model with 1 year of housing and support may be the ideal amount of time." (A1)
Subtheme (3) resource allocation	
Landlord	"Just the resources and the educational process. As much information that you can offer us to work through that process and make your process easier. Just that hand-in-hand working combination." (L4)
	"If you guys are covering the application fee and background check, and are covering the rent, all you need to do is have some kind of insurance policy or, mitigation for damages… That way, if a tenant does not work out and there is a vacancy that landlords not losing based on giving that person a chance." (NP9)
Advocate	"I think we could benefit from more training when new people are hired into the HOME program, especially regarding the housing systems and how they work. Before the project, I had little experience with the housing market. Practical training on how to help someone secure an apartment would be helpful." (A4)

L, Landlord; NP, No participation in HOME program; A, Advocate.

Both landlords and advocates noted that individuals with unique backgrounds, such as YEH with LSI, often needed to provide additional context or documentation. One advocate clarified that criminal history was typically only a concern if it involved more serious legal charges such as a felony: *"Criminal history was not a major issue unless it was a felony, which could prevent someone from renting in certain buildings. I would communicate relevant information to the landlord."* (A2).

Theme 3: Internal System Factors (CFIR Domain: Inner Setting), which reflected elements within the program's operational environment that influenced implementation, included two subthemes:

(1) *Landlord financial incentives* referred to monetary benefits (e.g., guaranteed payments) designed to encourage participation. Landlords and advocates discussed the financial incentives for landlord participation in HOME, particularly the assurance of consistent rent payments. One advocate noted, *"At the end of the day, it was a great deal for them [landlords]. They were making good money from it [HOME], and it was consistent. They knew they was going to get paid because it was coming from us, not private citizens."* (A2). Similarly, a landlord stated, *"I honestly feel like at the end of the day the landlords are just most worried about ensuring that their rent is paid."* (L4). Another added, *"From talking to the other colleagues I have, mainly it is just money. Money and then the damages. That is their thing."* (NP7).

However, several landlords indicated that guaranteed rent alone may not be enough to encourage broader participation. One explained, "*When we assumed a higher risk of people leaving with damages—people who are not used to living like that or who might overstay their lease and not pay—having a higher deposit [provided by*

the intervention] secured us with additional rent or damages [to the property]." (L2).

(2) *Advocate involvement* referred to the impact of advocates in bridging gaps between landlords and program requirements. A key facilitator of the HOME program was the inclusion of advocates, who served as a bridge between the landlords, youth, and program requirements. Both landlords and advocates emphasized the importance of this role in fostering communication and support. Landlords especially valued having a direct line to HOME staff. As one explained, "*When a tenant is having trouble understanding something or needs help…I can reach out to their case worker or case manager to see what can be done. It is helpful to have that support* (L3). Another alluded to this point and mentioned, *"I would be willing to participate with this program again. The area that would be helpful was, like I said, just the support from caseworkers [advocates]…"* (L2).

Advocates agreed, highlighting that clear, initiative-taking communication with landlords about the program requirements was critical to the program's success. One noted, *"The landlord would contact us when payments were not made. We acted as the point of contact for both the client and the landlord. Because of that, when we reached out on behalf of the client, the landlord took it more seriously."* (A2).

Theme 4: External Influences (CFIR Domain: Outer Setting), which encompassed broader societal and contextual factors affecting implementation, included two subthemes:

(1) *Housing demands* referred to the unique accommodation needs of YEH with LSI. Landlords and advocates emphasized the housing barriers faced by YEH with LSI. One landlord explained, *"Everything seems to be against them—no credit history or bad credit, criminal convictions, and no stable work history"* (NP6). Additionally, many YEH with LSI lack support from their families. As one advocate noted, *"Some youth are cut off from their families because of their criminal history or simply because time has passed"* (A2).

HOME addressed this gap by incentivizing landlords to rent to YEH with LSI and mediating between landlords' requirements and youth needs. Participants noted that HOME's impact extends beyond housing—it provides critical stability, helping youth transition toward independence. As one advocate explained, *"Getting housed is huge. Even with a job, many youth would not be able to secure an apartment. Housing is much more than just a roof over their heads"* (A1). Another advocate added, *"I helped with food assistance, birth certificates, and social security cards because you need those to get a job."* (A4).

(2) *Prevailing stigmas* referred to negative perceptions or biases that hindered landlord engagement with YEH with LSI. Landlords and advocates discussed how societal stigma toward YEH with LSI often created hesitation among landlords to rent to them, underscoring the importance of landlord engagement in implementing HOME. They noted that some landlords held negative assumptions about these youth, viewing them as unreliable or high-risk tenants. One landlord explained, *"People might think they are unreliable or have a drug problem, which keeps them from getting employment and being a reliable tenant."* (L5). Another linked these stigmas to specific landlord demographics, stating, *"It is usually middle-aged, older, rich white guys. They think, 'Pull yourself up by your bootstraps. You put yourself in this predicament, and now you have to live with the consequences.'"* (NP6). Advocates shared similar concerns. One observed, *"There is an assumption they [YEH with LSI] will bring criminal activity into the building or that they will not be able to pay rent after 6 months or that they'll remain like this forever."* (A3). Another advocate added, *"I do not agree with how society is structured. Not everyone gets the same opportunity, and there is not a lot of equity."* (A1).

Theme 5: Program Enhancement Strategies (CFIR Domain: Implementation Process), which identified participant-proposed recommendations to strengthen HOME's implementation, included three subthemes:

(1) *Communication practice* was defined as suggestions to improve stakeholder coordination (e.g., clear communication). Both landlords and advocates stressed the importance of improving landlord and advocate coordination for the success of the HOME program, including clear communication about the program requirements and well-defined expectations for renter responsibilities. As one advocate stated, *"If expectations aren't clear or well communicated, it will not work and will make it harder."* (A2). Landlords also highlighted the need for more supportive communication, particularly with YEH with LSI. In addition to improved communication, they also emphasized the importance of teamwork and access to detailed tenant information, stating, *"The teamwork, support, and more details about tenants—what they are dealing with, what their history is—are crucial."* (L7).

(2) *Program duration* referred to perceived optimal length of housing support for YEH with LSI. Landlords and advocates agreed that the 6-month duration of housing payments posed a barrier to landlord participation in HOME. They argued that 6 months was often "too short" for YEH with LSI to stabilize and created significant challenges for landlords. One advocate shared, *"I wish [HOME] would have been a little longer, like nine months instead of six, just because that way there's more time for transition and independent living."* (A1).

Landlords echoed this concern, particularly regarding the program's non-traditional lease terms. One landlord remarked, *"Honestly, the biggest and best way for us would be a yearly lease. We would go for that because it is our standard business. Six-month leases are not conventional in our setup, which makes it harder. If we knew the rent was secured for a year, we would have a much easier time accepting such tenants."* (L2).

(3) *Resource allocation* was defined as needed supports (e.g., staff training). Landlords emphasized the need for additional resources to support housing for YEH with LSI. One landlord stated, *"The more resources and information you can provide to make the process easier, the better. A hand-in-hand approach with resources for them and education for us."* (L4). Another added, "*When issues arise, there should be someone we can call to resolve it and assess damages afterward."* (NP7).

Advocates also discussed the need for resources to navigate the housing market and build connections with landlords. One advocate noted, *"More training on housing systems would be helpful. I lacked experience with the housing market before this project, so practical training on securing apartments would be valuable."* (A4). Another stressed, *"Secured housing and relationships with landlords who are flexible with young adults who have a record are key."* (A3).

TABLE 3 Key similarities and differences in perspectives on HOME implementation between landlords and advocates.

Comparison	Landlords	Advocates
Similarities		
	• HOME provided stability for YEH, especially those with LSI	Same as landlords
	• Guaranteed rent was a major benefit	
	• Advocates were essential communication bridges	
	• Six-month leases were too short; preferred 9–12 months	
Differences		
Motivation	Primarily financial security (guaranteed rent, damage mitigation); some emphasized altruism (giving youth a "second chance")	Driven by youth empowerment and equity; focused on reducing systemic barriers and supporting relationships
Concerns	Property risks (damage, unpaid rent post-program) and nontraditional six-month leases disrupting business norms	Systemic barriers for YEH with LSI: stigma, lack of documentation, inequitable housing access
Screening practices	Relied on traditional income/background checks, though occasionally flexible	Criticized screening as exclusionary; noted it pushed youth with criminal records into lower-quality housing
Stigma	Viewed stigma as a business/risk issue (safety, liability, tenant reliability)	Saw stigma as a structural inequity that unfairly excluded youth and reinforced cycles of disadvantage

Key similarities and differences in perspectives between landlords and advocates

Table 3 summarizes the key similarities and differences in perspectives on HOME implementation between landlords and advocates. Landlords and advocates agreed that HOME was valuable, offering landlords financial security through guaranteed rent and providing youth with housing stability. Both also highlighted the essential role of advocates. However, their perspectives also diverged in key areas: landlords viewed HOME primarily through a risk–benefit business lens, while advocates emphasized youth equity concerns and the need for systemic change.

Discussion

Stable housing is critical for emerging adults ages 18–24 experiencing homelessness, yet few studies have examined programs for those with LSI or the contextual factors shaping implementation (27, 55). This qualitative study of the implementation of the HOME program, which included supportive housing for YEH with LSI, identified key barriers (e.g., rental screening criteria, stigma) and facilitators (e.g., guaranteed rent, advocate support) to landlord engagement. YEH with LSI face significantly greater housing challenges than those without LSI, compounded by limited credit history, unemployment, and stigma (17, 20, 40, 56). These challenges are often amplified by the dynamics of place—the housing environments and neighborhoods to which youth are granted or denied access. By documenting landlord and advocate experiences, this study contributes to existing literature, offering actionable insights to improve housing access for YEH, especially those with LSI.

Consistent with supportive housing principles (21, 22, 57, 58), participants emphasized that the HOME program's advantage lies in its dual approach: financial incentives for landlords paired with wraparound supports offered to youth. For landlords, guaranteed rental payments reduced financial risk while also allowing them the opportunity to "give back" to their community (28, 39). For YEH, especially those with LSI, these supports were critical to achieving housing stability, developing life skills, and improving employment opportunities, ultimately enhancing overall well-being (20, 25, 33). Advocates further highlighted the program's dual benefits, not only did it provide stable housing, but it also helped improve psychosocial outcomes of participating youth, such as reduced anxiety and increased motivation. Together, these findings underscore the importance of expanding accessible, comprehensive housing solutions for YEH, with particular attention to those with LSI (39, 41, 59).

Participants also provide nuanced insights into how landlord and advocate characteristics, including their motivations and prior experience with this marginalized populations, shape program participation. Some landlords demonstrated altruism, recognizing youth needed "second chances" and acknowledging their struggles. Landlords embracing this prosocial mindset were more willing to rent to youth with LSI, aligning with existing literature on landlord motivations for participating in supportive housing (28, 31, 40). However, traditional barriers like income thresholds and credit checks persisted. Flexibility in these standards (e.g., adjusting rent-to-income ratios from one-third to one-half of income), particularly when combined with advocate mediation, facilitated more inclusive rental decisions (40, 41).

Our findings underscore how internal system factors, such as financial incentives and advocate support, interact to influence program implementation. While guaranteed rent payments mitigated landlords' economic concerns, persistent worries about property damage and lease structures revealed the limits of financial solutions alone. This aligns with existing evidence that financial supports work best when paired with relational mediators (25, 28), as demonstrated by advocates' critical role in maintaining landlord communication and assisting youth. Yet, these internal supports often operate within a broader spatial context, where housing markets, tenant screening policies, and neighborhood perceptions serve as gatekeepers to opportunity. External barriers, including stigma against youth with LSI (e.g., stereotypes about criminality) and structural inequities

(e.g., lack of rental history) mirrored long-standing challenges faced by legal system-involved populations (6, 32, 40). In this context, housing functions as more than a material asset; it provides a foundation for resilience by supporting related needs such as employment and mental health. This perspective reinforces ongoing calls for integrated service models in youth homelessness interventions (22, 57).

Participants identified several areas for improving future program implementation, including extending rental support, strengthening communication structures, and increasing resources for both landlords and advocates. These implementation challenges suggest critical opportunities to strengthen supportive housing models for marginalized youth, such as those YEH with LSI. The consensus from those interviewed around the need for extended rental assistance beyond 6 months and adopting conventional 12-month leases, aligns with existing evidence that longer-term interventions better promote housing stability (21, 25). This reveals a tension between program design flexibility and landlords' need for predictable leasing structures, a balance future interventions may negotiate (40). The call for expanded resources (e.g., tenant training, damage mitigation protocols, and role clarification) underscores a fundamental implementation lesson that financial supports alone cannot overcome the spatial and systemic barriers to housing that many YEH with LSI face. Findings highlight the importance of concurrent investments in relational infrastructure such as youth advocate facilitation. These participant-derived recommendations mirror emerging best practices in trauma-informed housing interventions (60), particularly for legal system-involved populations who often face compounded vulnerabilities (31, 39).

Implications.

This study identifies three key implications for supportive housing programs serving YEH with LSI.

(1). *Implementation requires coordinated, multi-level strategies.* Successful implementation of supportive housing programs must address barriers across landlord, organizational, and policy levels. Encouraging landlords to adopt flexible screening can help reduce reluctance to rent to justice-involved youth. At the organizational level, involving advocates strengthens communication, mediate conflicts, and guide youth through the rental process. At the policy-level, enforcement of HUD guidance on criminal record screening is essential to reducing systemic exclusion (61).

(2). *Landlord participation depends on risk mitigation and advocate support.* Guaranteed rent alleviated some financial concerns but was not sufficient on its own. Landlords emphasized the need for damage coverage, longer leases, and alignment with standard rental practices. Programs in Seattle and Portland that reimburse landlords for tenant damages provide strong models (62, 63). Extending HOME's support period from 6 to 12 months could improve stability, while continued investment in advocates, central to the Pathways Housing First model (64, 65), is vital for maintaining communication, engaging landlords, and helping youth navigate restrictive housing markets.

(3). *Challenging societal stigma is essential to expanding housing access.* Landlords often perceived youth with LSI as business risks, while advocates emphasized stigma as a structural inequity. Programs can counter these perceptions by highlighting youth success stories and positive landlord partnerships. Initiatives such as storytelling campaigns (e.g., Barcelona's Housing First program) (56), and peer mentorship models (e.g., Canadian adaptations) (66) demonstrated how reframe YEH with LSI as resilient, capable tenants can foster inclusion, promote stability and support long-term housing success.

Limitations

This study has several limitations. First, the small sample (8 participating landlords) from one geographic region may limit generalizability and introduces potential selection bias, as those who agreed to participate may have held more favorable views of the HOME program. Additionally, social desirability bias may have influenced responses, with participants potentially downplaying negative experiences or perceptions of the program and youth. Second, the absence of direct input from youth limits our understanding of how housing environments and advocate-landlord relationships were experienced from their perspective. Third, given the distinct housing market dynamics and service infrastructure in central Ohio, findings may not translate directly to other regions. Finally, the findings of this qualitative study are context-specific and may not be directly transferable to other settings or populations. They reflect the experiences and perspectives of landlords and advocates within the context of the HOME program in Ohio, United States, which may differ from those in other regions or service systems. Nonetheless, this study provides contextually grounded insights that can inform the implementation and scaling of supportive housing programs for YEH with LSI in similar settings.

Conclusion

To our knowledge, this is the first study to explore landlord and advocate experiences in implementing a supportive housing program for YEH, including those with prior LSI. Findings highlight key program benefits including reduced financial risk for landlords, stable housing for youth, and improved psychosocial and employment outcomes, particularly for those with LSI. Crucially, housing emerged not just as a material resource but as a place-based facilitator for resilience, offering youth a foundation for independence and opportunities. At the same time, exclusionary rental practices and stigma continued to reinforce systemic barriers (42). To ensure program success, implementation strategies must consider financial and relational incentives for landlords, provide consistent advocate support, and actively address both societal and spatial stigma in housing access. Future research should examine the long-term impacts of place-based housing interventions to inform policies that support not only housing access, but the ability for youth to thrive within those spaces.

Data availability statement

The datasets presented in this article are not readily available because the raw transcripts could potentially identify individual participants. Requests to access the datasets should be directed to Jingzhen Yang, ginger.yang@nationwidechildrens.org.

Ethics statement

The studies involving humans were approved by the Institutional Review Board (IRB) of the Ohio State University. The studies were conducted in accordance with the local legislation and institutional requirements. Written informed consent for participation was not required from the participants or the participants' legal guardians/next of kin because the study posed no more than minimal risk. Before participating, all individuals provided verbal informed consent, and confirmed their understanding of the study procedures, potential risks and benefits, and their right to withdraw at any time without penalty. Written informed consent was not obtained from the individual(s) for the publication of any potentially identifiable images or data included in this article because only de-identified data were included.

Author contributions

DR: Data curation, Formal analysis, Investigation, Methodology, Writing – original draft, Writing – review & editing. JY: Conceptualization, Formal analysis, Funding acquisition, Investigation, Methodology, Project administration, Supervision, Validation, Writing – original draft, Writing – review & editing. LC: Conceptualization, Formal analysis, Funding acquisition, Investigation, Methodology, Validation, Writing – review & editing. LJ: Data curation, Formal analysis, Investigation, Methodology, Validation, Writing – review & editing. JS: Data curation, Formal analysis, Investigation, Validation, Writing – review & editing. KD: Conceptualization, Funding acquisition, Investigation, Methodology, Validation, Writing – review & editing. SB: Investigation, Methodology, Validation, Writing – review & editing. TY: Investigation, Methodology, Resources, Validation, Writing – review & editing. NS: Conceptualization, Funding acquisition, Investigation, Resources, Validation, Writing – review & editing. KK: Conceptualization, Funding acquisition, Investigation, Methodology, Resources, Validation, Writing – review & editing.

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Conflict of interest

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Mental health among farmers in Germany: a scoping review

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Background: Farmers are exposed to various stressors, including economic uncertainty, climate variability, and regulatory burdens, all of which can negatively impact their mental health. While international research has documented elevated rates of mental illness among farmers, little is known about the mental health status of farmers in Germany. This scoping review aims to synthesize current scientific knowledge on mental health outcomes among farmers in Germany.

Methods: A scoping review was conducted according to PRISMA guidelines for Scoping Reviews and following the Population Concept Context (PCC) framework. Inclusion criteria were: (a) language: English or German, (b) publication between 2014 and 2024, (c) original study, (d) population: farmers (at least 50% within the study population), (e) concept: mental health and (f) context: Germany. Web of Science and Google Scholar were chosen as databases, complemented by expert input and reference checking of relevant studies.

Results: Eleven studies met the inclusion criteria: six cross-sectional studies, three randomized controlled trials, and two qualitative studies. The outcomes reported were: depressive symptoms, anxiety and burnout symptoms, sleep disorders and perceived stress. Identified stressors linked to the outcomes included economic difficulties, bureaucratic pressure, climate-related challenges, and family conflict. However, most studies showed methodological limitations and heterogeneity regarding definitions and instruments. No data were found on suicide among German farmers.

Discussion: Compared to international research, evidence on mental health of farmers in Germany remains limited. The few mental health findings among German farmers align with those from international studies. Further epidemiological studies and context-specific interventions are needed to address mental health of farmers in Germany.

Systematic review registration: https://osf.io/yagbp/?view_only=

KEYWORDS

agriculture, farmers, mental health, depression, stress, burnout, Germany

Introduction

Agriculture is an occupational sector with a number of unique working conditions and challenges. The most common health risk factors for farmers in developed countries described in the literature include pesticide exposure, financial problems, bureaucratic pressure, unpredictable climate (extreme weather conditions, e.g., droughts), injuries, poor physical condition, animal diseases, machinery failure, time pressure, long working hours and

government regulations and inspections (1, 2). In particular, the use of pesticides, financial problems, climate change and physical condition or injuries are associated with poor outcomes for farmers' mental health or mental illness (2–4). Generational conflicts have also been identified as stressors, with evidence suggesting that the stress experienced by parents frequently extends to their adolescents (5).

Agriculture is therefore regarded as a particularly stressful profession (6), and for several years now, there have been global concerns about the rising rates of mental health problems in this occupational sector (1). A number of global studies - predominantly from developed countries in North America, Australia and England - show that farmers have poorer mental health than the general population (1–5). Prevalence rates are particularly high for mental disorders such as anxiety and depression (5). Poor mental health among farmers is not only stressful for the individuals, but also has an impact on their families, who often find it difficult to cope with the symptoms. It also affects the productivity and ultimately the existence of the farm business and the welfare of the animals, which may be neglected as a consequence (1, 3). The results of an American cross-sectional study, for example, showed a strong correlation between depressive symptoms of farming parents and depressive symptoms of their adolescent children (5). Due to the fact that also the children live on the farm, they are ultimately often already exposed to the same health risk factors as their parents. Further, they often support the work of their parents and are constantly confronted with the farm's problems (financial, government regulations) (5). The same conditions may apply for the older generation, i.e., the parents of the farming parents, which can also contribute to work- and private-related conflicts.

When it comes to recording and reporting prevalences, difficulties arise as different distinctions are made between main occupation farmers and part-time farmers. Further, the associated data is recorded by different authorities. In addition, different terminology at international and national level makes it difficult to precisely describe and identify prevalences. Internationally, the term farming is often used to summarize all areas of agriculture (e.g., crop farming, forestry, fishing, all animal farming, organic and conventional farming, green sector) (7).

Agriculture is a male-dominated sector (20–40% women worldwide) (8). Due to the fact that men often have the leading position on farms and own the farmland (8), they are faced with considerable work-related stress due to the complex interaction of social, environmental and economic factors (2, 6). Occupational stress and the resulting strain can arise when work demands are high and are not accompanied by an appropriate level of control to cope with these demands (9). Control and self-efficacy, including control over their own health, are important to male farmers, which is why they prefer to manage mental disorders themselves and only reluctantly accept outside help (6). However, this often leads to attempts to cope with depressive symptoms through social isolation and substance use (6). In addition, suicidal behaviour is also described as a way of coping or giving up to cope with symptoms of mental disorders (4, 6). Studies around the world show that farmers commit suicide more frequently (also when considering work-related stress) than the general population (2, 4). For example, the suicide rate among French farmers is at least 20% higher than in the general population (10) and in Switzerland the suicide risk among farmers is 37% higher than among other men from a rural community (11). One possible explanation for the high suicide rates among farmers discussed in the literature is the easy access to toxic substances and weapons in the broader sense (e.g., machinery) (4).

With around a third of the world's population working in agriculture (12), poor mental health among this group can have a hugely negative impact on society's economic productivity, food security and therefore global health. Therefore, it is of utmost importance that evidence on the risks for developing (mental) health related disorders is investigated internationally and nationally. By doing so, it will be possible to protect farmers health and safety at work as well as to improve it, if necessary. Ultimately, the health of farmers will affect not only the individual farmers and their families but also the societies, which benefit from their food production. For example, Germany is one of the biggest agricultural producing country in the European Union (13, 14) and around 1.2% of the population in Germany worked in agriculture in 2023 (15). Due to modern agricultural possibilities, these farmers cultivate half of Germany's total area (16). As a result of structural change in agriculture, the number of farms with large farmland is increasing and smaller farms are disappearing, so that today one farmer feeds 147 individuals in Germany (17). However, it seems that evidence on German farmers is absent from international reviews investigating their mental health (1–4). Due to different occupational definitions worldwide regarding who belongs to the agricultural sector, as well as different laws, working conditions and health systems, it seems necessary and helpful to gather information and provide an overview on evidence on farmers mental health in Germany.

For example, the German Classification of Occupations 2010 classifies the occupational groups for agriculture, forestry, animal husbandry and horticulture separately (18). However, information on farmers is often summarized into the so-called "*green professions*" (19). For our work at hand, farming entails: agriculture that involves crop and livestock (dairy, egg, and meat producing) farming, excluding garden and landscaping contractors, gardeners, equine professionals and forestry workers to focus on food production to be able to depict potential similar working conditions (15). The above mentioned international evidence on farmers mental health and the associated risk factors for the farmers themselves and society at large make clear that obtaining such evidence for the German context is of utmost relevance from a Public Health perspective. Such knowledge is required to take targeted measures to prevent mental health problems and provide assistance. Given that unpredictable natural events will increase due to climate change, the risks to farmers' mental health are expected to increase further (4, 20). In regard of this fact, it is striking that no studies from Germany are considered or mentioned in international reviews (see: 1–4). In addition, it seems that there is a lack of precise values on the prevalence of mental disorders among farmers in Germany.

Thus, to systematically identify and provide an overview of the scientific findings to date on mental health among farmers in Germany and to highlight the resulting research implications we conducted a scoping review. To achieve these aims, the following research questions were addressed:

(1) Which mental health outcomes are reported among farmers in Germany, and how prevalent are they?
(2) What potential research implications result from the findings?

Due to the possible methodological simplification, scoping reviews represent a practicable and resource-efficient approach to

gain an overview of the current literature and evidence base for a topic which seems to show relevant research gaps (21, 22). For conceptualization, the Population Concept Context (PCC) framework (Population: farmers, Concept of interest: mental health, Context: Germany) was used (23).

Methods

To conduct this scoping review, we followed recommendations from Peters et al. (23) according to the guidelines for conducting systematic scoping reviews and have based our review mainly on the PRISMA Checklist for scoping reviews (PRISMA-ScR) (24) and will clarify within the method section where our approach has differed (24, 25). The PRISMA-ScR Checklist is provided in the Supplementary material, Data Sheet 1. Following recommendations, we developed a study protocol prior to conducting this review and registered it in the Open Science Framework (https://osf.io/yagbp/?view_only=) (23). The protocol is provided in the Supplementary material, Data Sheet 2. During the review process, amendments were made to the protocol (see Supplementary material, Data Sheet 3); details and rationale for these changes are reported in the section 'Protocol amendments'.

Eligibility criteria

To be included in the scoping review, articles had to be published either in English or in German, the articles had to be published within 2014 and 2024 and had to be original studies. The time frame was chosen on the basis of previously published reviews (2, 3, 26), which show that there was a significant increase in publications on the topic of mental health among farmers, particularly around 2014, and that since then the number of publications has remained at a consistently high level or has increased. The period was also chosen in order to capture the most recent evidence and reflect the current state of mental health among farmers. Further, farmers had to be included as the study population (comprising at least 50%) via data collection and the concept of mental health had to be investigated/considered. Thus, also green professions could be included in the scoping review, if farmers comprised at least 50% of the study population. Green professions can account for farmers, garden and landscaping contractors, gardeners, equine professionals, forestry worker, livestock farmers or agricultural service technicians, for example (27). In addition, we included women working or living on farms, as they are known to be involved in all farm activities and contribute significantly to the economic success of the farm (28, 29). We thereby decided on broad terms for the search strings to be able to include a large number of potential studies (details under search strategy). Thus, we were interested in outcomes such as depression, stress, anxiety, burnout or suicide. At last, main data collection had to be conducted in Germany to ensure that the concepts assessed are relevant for the context of farmers in Germany.

We have accordingly applied the following exclusion criteria: Other language than English or German, publication outside of the specified time period, article is not an original study, farmers are not included as the study population, the concept mental health is not investigated and/or data was not collected in Germany.

Information sources

We have chosen Web of Science (last search September, 20th 2024) and Google Scholar (last search September, 20th 2024). Web of Science was used because it provides comprehensive, high-quality coverage of peer-reviewed studies across social sciences, health, and environmental disciplines, making it well-suited to identify research especially for mental health among particular occupational groups. Google Scholar was chosen to further identify German sources and because it is recommended in the literature for identifying grey literature, in particular (30). For additional sources, experts were consulted one time on September, 20th 2024 to retrieve information for additional studies or grey literature. These experts worked at the German Social Insurance for Agriculture, Forestry and Horticulture and provided additional potential articles. Further, for all screened full-texts, we conducted reference checking to identify additional studies that may have been missed by our search strategy.

Search strategy

The search string was developed according to the PCC framework: farmers were chosen as the population, mental health was the chosen concept and the context was Germany. To not miss any potentially relevant articles, we tried to create sensitive search strings which would cover a broad range regarding our concept of mental health.

In Web of Science, the following search strategy was applied for topic search (TS; including title, abstract, author keywords and keywords plus): ((TS = (farm*)) OR TS = (agriculture)) AND (((((TS = (mental health)) OR TS = (depress*)) OR TS = (suicid*)) OR TS = (burnout)) OR TS = (stress)) OR TS = (anxiety) AND TS = (german*). This search was filtered for the publication date being within 2014-09-20 and 2024-09-20 and language English OR German.

In Google Scholar, the search was conducted in German only and restricted toward the first 200 references (31). The search strategy was the following: farmer AND mental health AND Germany. This search was filtered for the publication year being within 2014 and 2024 and the language was set to German. The review protocol (available on https://osf.io/fc8aq) illustrates the search strategy and filters used in Google Scholar in German language. By conducting the search in Google Scholar, it was aimed to also receive reports from German organizations, insurances or universities (e.g., theses). Google Scholar was included with the specific aim of capturing grey literature which could behighly relevant to the German agricultural context but may not be indexed in traditional academic databases. As preliminary searches indicated that these types of publications were mainly written in German, we believe this language choice therefore increased the precision and contextual appropriateness of the Google Scholar results.

Selection process

Retrieved records were exported from the two databases into an online management tool for systematic reviews (rayyan.ai). The software automatically detected duplicates, which were then manually checked by MH, KSS and LS and removed from the management tool. To pilot the title and abstract screening process, 50 records were screened in parallel by KSS and LS (21, 22), disagreements were

discussed with MH. The remaining 381 records (title and abstract) were screened by LS. In case of doubt, LS consulted MH and KSS to discuss and decide upon inclusion or exclusion. The 24 records selected for the full-text screening were all screened by LS, MH and KSS. In case of discrepancies, the full-texts were discussed in a team of two reviewers, and a third reviewer was consulted, when two reviewers did not come to an agreement until consensus was reached. If more than one exclusion criteria applied, only one criterion was documented in the management tool according to the following order: wrong language, wrong study period, no original study, wrong population, wrong concept and data collection not in Germany. After full-text screening, reference checking was done individually by the three reviewers to find additional records.

Data collection process and data extraction

In order to collect data from the retrieved records, a data extraction sheet was developed by KSS based on recommendations for a scoping review (23). The sheet documented key information of the studies relevant to the research aim (23). Reviewers were colour-coded and the following information was documented by all three reviewers independently: Date when reviewed, authors, year of publication, country origin, aims of the study, defining characteristics of the study participants and sample size (if applicable), type of study, specific methodology, setting and context related information, concepts used to measure mental health (if applicable), measurement of outcome, key findings, author's conclusion and at last reviewer's comments. After documentation of all relevant findings, MH and LS discussed and compared the key information, checked accuracy and excluded further studies, if during the review process exclusion criteria became evident. If LS and MH came to a disagreement, KSS was consulted and cases were discussed together until agreement. The data sheet built the foundation for the following working steps and supported the development of a further table for description of assessed measurements.

Synthesis methods

For quantitative studies we report assessed outcomes as presented in the studies, focusing on mean values and standard deviations, or prevalence, depending on which data the authors of the studies reported. Otherwise, we report results of quantitative, qualitative or mixed-methods studies narratively. We mention which mental health outcomes are reported, including related concepts such as potential stressors causing the mental health burden (if reported), to synthesize the most relevant information. The categorization of results was derived from the analysed data and findings. To facilitate readability, we show results in a table format summarising the assessed outcomes from the more detailed data extraction sheet into overall topics (Table 1). Results are also presented narratively according to the study design. Due to the heterogeneity of studies and the reported data, a common classical quantitative synthesis was not possible and was not the aim of this scoping review.

We tried to consider and limit potential reporting bias by including studies in German and English and grey literature by conducting the search in Google Scholar and by consulting experts in the field. However, as the purpose of this scoping review was to provide an overview of the existing literature on the topic, we have not used other measures to assess potential reporting bias. As it was aimed to achieve a first overview of mental health among famers, it was decided to not perform a risk of bias assessment. We report all relevant study characteristics regarding design, context and population sample, if this information is mentioned in the assessed studies and otherwise report when this is not the case.

Protocol amendments

The review protocol was amended after the initial literature exploration (Supplementary material, Data Sheet 3). Originally planned as a rapid review, the methodology was adapted to a scoping review. The literature on mental health among farmers in Germany turned out to be broader and more heterogeneous than anticipated, with considerable variability in study designs, populations, and quality. This heterogeneity limited the feasibility of synthesizing findings within a rapid review framework. Adopting a scoping review approach allowed us to comprehensively map the available evidence and identify research gaps, ensuring that the review remained methodologically appropriate and maximally relevant for future research and practice.

Results

Included studies

The search conducted in September 2024 yielded a total of 440 records/hits: 240 results were found in Web of Science and from the search in Google Scholar we used only the first 200 hits, as recommended (30, 31). Additional consultation with experts of the German Social Insurance for Agriculture, Forestry and Horticulture yielded a further nine records. The title and abstract screening resulted in a total of 24 articles that were eligible for full-text screening. From the references of these 24 records, a citation search yielded a further 12 articles, of which only one record was eligible for full-text screening. Thus, 25 records were included in the full review, of which 11 records were included in the data extraction (see: Flow Chart, Figure 1). Out of the 11 included studies, 45% ($n = 5$) were from databases, 45% ($n = 5$) from expert recommendations and 10% ($n = 1$) from citation searching. In total, 73% ($n = 8$) of the studies are in German.

Study characteristics

Three studies are randomized controlled trials (RCT), six studies are of cross-sectional design and two studies are qualitative studies. Among the included studies, five were published via peer-reviewed journals and four are scientific theses, both at bachelor's and master's level. The years of publication range from 2016 to 2024. According to our inclusion criteria of a population of at least 50% farmers within green professions, farmers represent the main study population of the included studies. One study included only farmers as their study population (32). Another study investigated trainees of green professions (33). Six studies assessed farmers together with

TABLE 1 Overview of the included studies (2014–2024).

Reference nr.	Author(s)	Publication year	Language	Type of publication (Study design)	Study population (*n*)	Recruitment process/inclusion criteria	Stressors mentioned alongside mental health	Mental health outcomes
(32)	Roth	2021	German	Published article based on master's thesis (cross-sectional stuagriculturaldy)	Farmers (n = 2,788)	Recruitment: by flyer (via social media and personal contacts) and via newspaper "Bayerisches Landwirtschaftliches Wochenblatt "(a Bavarian farmers' newspaper). Inclusion criteria: not reported.	Not reported	• Depression • Anxiety • Burnout
(33)	Betz, Engemann and Vu	2022	German	Original published article (cross-sectional study)	Trainees of green professions (n = 2.662)	Not reported	• Bureaucratic and regulatory stress factors (time pressure) • Social and family challenges (conflicts with colleagues or superiors, work climate) • Working conditions (heavy lifting, work climate)	• Depression • Sleep disorders • General health status
(34)	Knoop and Theuvsen	2020	German	Original published article (cross-sectional study)	managers and owners of agricultural and horticultural enterprises (n = 288)	Recruitment: by survey link that was spread via farmer's newspaper, social media, e-mail lists of farmers (working groups and agricultural chambers and offices (convenience sample) Inclusion criteria: not reported.	• Bureaucratic and regulatory stress factors • Societal challenges (social environment) • Working conditions (work intensity, physical effort)	Not reported

(Continued)

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TABLE 1 (Continued)

Reference nr.	Author(s)	Publication year	Language	Type of publication (Study design)	Study population (*n*)	Recruitment process/inclusion criteria	Stressors mentioned alongside mental health	Mental health outcomes
(35)	Braun et al.	2021	English	Original published article (randomized controlled trial)	Green professions ($n = 360$)	Recruitment: pragmatic (simultaneously to Braun et al. (36), see below) • Recruited almost nationwide (not in Bavaria and Schleswig-Holstein); January 2018 to April 2019 • Policyholders were invited by postal letter and e-mail (N = 80.000) send by insurance, or self-selection recruitment channels via farmers´ articles, newsletter postings, online-information or several websites Inclusion criteria: • Policyholders from SVLFG (German Social Insurance for Agriculture, Forestry and Horticulture) • Perceived Health Questionnaire (PHQ-9) ≥ 5 • ≥ 18 years • No psychotherapy treatment • Working/ Employed, family member or pensioner with adequate insurance status • Web access available • Ability to step back from suicidal ideation • Preferred this trial over parallel chronic pain study (if applicable)	Not reported	• Depressive symptoms • Anxiety • Burnout/ Emotional exhaustion • Life satisfaction • Sleep disorders • General health status (mental health care service use) • Perceived stress

(Continued)

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TABLE 1 (Continued)

Reference nr.	Author(s)	Publication year	Language	Type of publication (Study design)	Study population (*n*)	Recruitment process/inclusion criteria	Stressors mentioned alongside mental health	Mental health outcomes
(36)	Braun et al.	2022	English	Original published article (randomized controlled trial)	Green professions ($n = 81$)	Recruitment: pragmatic (simultaneously to Braun et al. (35), see above). • Recruited almost nationwide (not in Bavaria and Schleswig-Holstein); starting in February 2018 • Policyholders were invited by postal letter and e-mail (N = 80.000) send by insurance, or self-selection recruitment channels via farmers´ articles, newsletter postings, online-information or several websites. Inclusion criteria: • Policyholders from SVLFG (German Social Insurance for Agriculture, Forestry and Horticulture) • Pain duration at least 6 months • Considerable pain intensity: at least grade II according to the Chronic Pain Grade questionnaire (CPG) • ≥ 18 years • E-mail address available • Web access available • Willing to consent	–	• Depressive symptoms • Anxiety • Life satisfaction • Sleep disorders • General health status (mental health care service use) • Perceived stress
(37)	Schöllhorn	2020	German	Published article based on bachelor's thesis (cross-sectional study)	Green professions ($n = 634$)	Recruitment: not reported Inclusion criteria: not reported	• Environmental and climate-related stressors • Bureaucratic and regulatory stress factors (mental and time-related) • Social and family challenges • Personal stressors (for male: high requirements and restrictions; for female: family conflicts, peaks in workload, liquidity problems) • Working conditions (lack of sleep, working with animals)	• Perceived stress

(Continued)

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TABLE 1 (Continued)

Reference nr.	Author(s)	Publication year	Language	Type of publication (Study design)	Study population (*n*)	Recruitment process/inclusion criteria	Stressors mentioned alongside mental health	Mental health outcomes
(38)	Stier-Jarmer et al.	2020	English	Original published article (randomized controlled trial)	Green professions ($n = 108$)	Recruitment: convenience sample Inclusion criteria: • Increased stress and increased risk for physical and/or mental health impairments (assessed by physician) • SVLFG (German Social Insurance for Agriculture, Forestry and Horticulture)-membership • ≥ 18 years • Working/ Employed • Physically and mentally stable, moderately resilient	Not reported	• Depression/ Well-being • Anxiety • Perceived stress • Burnout symptoms • Sleep disorders • Health status
(39)	Hetzel et al.	2016	German	Original published article (cross-sectional study)	Green professions ($n = 3.176$)	Recruitment: a three-stage random sample, stratified by regional population, was taken from the SVLFG (German Social Insurance for Agriculture, Forestry and Horticulture) address database Inclusion criteria: • ≥ 55 years • Employed or working in the Bavarian agriculture	Social and family challenges (generational conflicts)	• Life satisfaction • General health status (psychological complaints)
(40)	Buhne	2019	German	Published article based on master's thesis (qualitative interview study)	Farmers ($n = 6$), wife of a farmer who committed suicide ($n = 1$, treated as farmer in analyses)	Recruitment: not reported Inclusion criteria: Burnout treatment received	• Economic stressors (pressure, competition among farmers) • Bureaucratic and regulatory stress factors • Societal challenges (poor social support among colleagues, social and political pressure) • Social and family challenges (work-life conflicts, conflicts regarding farm transfer) • Personal stressors (rejection of mental health problems of older generations)	• Burnout • Sleep disorders • General health status (physical symptoms, performance capability)

(Continued)

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TABLE 1 (Continued)

Reference nr.	Author(s)	Publication year	Language	Type of publication (Study design)	Study population (*n*)	Recruitment process/inclusion criteria	Stressors mentioned alongside mental health	Mental health outcomes
(41)	Greiner	2024	German	Published article based on master thesis (qualitative interview study)	Individuals from the agricultural sector ($n = 4$) and consultants ($n = 4$)	Not reported	• Economic stressors • Bureaucratic and regulatory stress factors • Social and family challenges (poor communication, intergenerational conflicts, role conflicts, conflicts between couples, missing or unwilling heirs) • Personal stressors (role transition)	Not reported
(42)	Von Davier	2024	German	Original published article (cross-sectional study)	Women who live and/or work on farms ($n = 5.488$)	Recruitment: not reported, nationwide survey Inclusion criteria: • Women living and/or working on farms • Women who have a connection to the farm either through: family member, existing employment or apprenticeship	• Economic stressors • Societal challenges • Social and family challenges • Work conditions	Burnout

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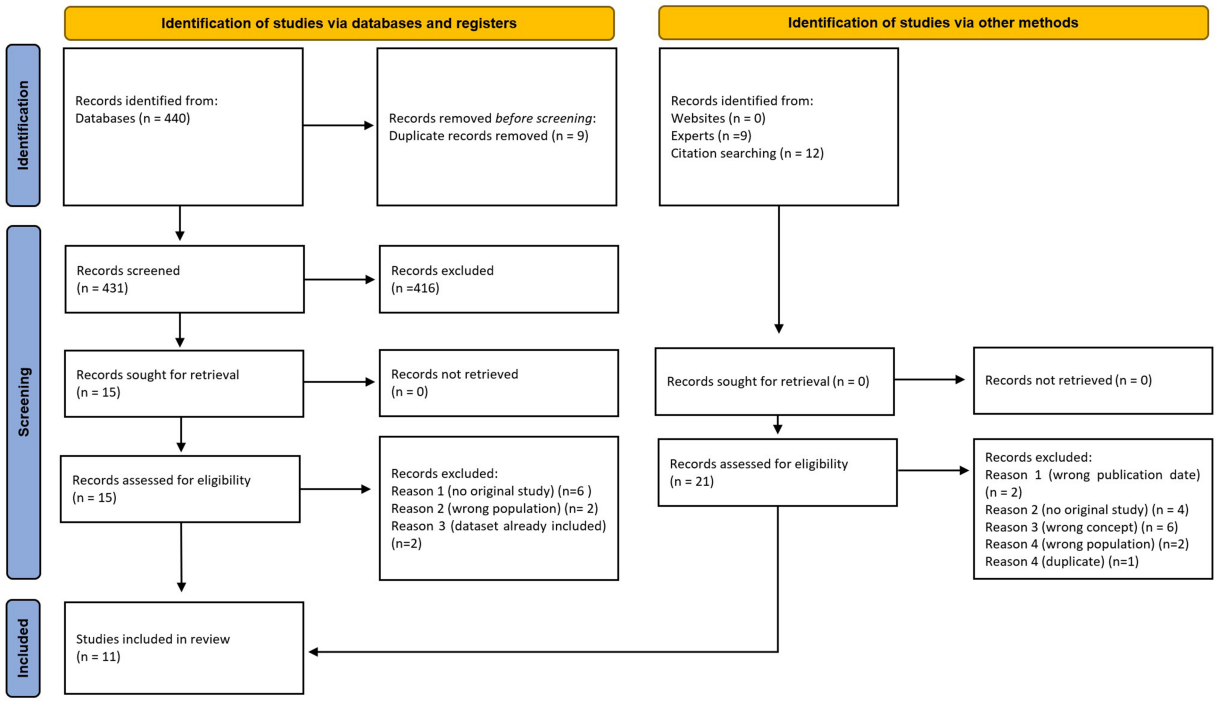


FIGURE 1
Flowchart of excluded and included studies.
Source: Page MJ, et al. BMJ 2021;372:n71. doi: 10.1136/bmj.n71. This work is licensed under CC BY 4.0. To view a copy of this license, visit https://creativecommons.org/licenses/by/4.0/.

horticulturists (34) or farmers together with horticulturists and foresters, i.e., green professions (35–39). The two qualitative studies interviewed farmers and, additionally, the wife of a farmer (40) as well as consultants being involved in farm successions (41).

The two qualitative studies investigated seven and eight individuals and the broad range of individuals included within the quantitative studies goes from n = 81 to 5,488. Only seven out of the 11 included studies reported the mean age of the study participants, but not all of them also reported the age range or standard deviation. The reported mean values were between 20.13 and 56.98 years. One study gave no indication about the age of study participants (41) and the remaining studies provided some limited details such as only reporting the age range. A similar pattern is presented regarding gender of the included participants. Two studies do not mention the distribution of gender of their study participants (37, 41). One study included only women (42). There are only two studies where less men participated than women (35, 36). Furthermore, in one study, data collection was also done among farmers living in Austria (corresponding to 15% of the study sample) (32).

Results of studies

Nine out of the eleven included studies report outcomes related to mental health (32, 33, 35–40, 42). Although the remaining studies dealt with the concept of mental health, they did not report any direct outcomes, instead they described stressors. Six of the eleven included studies analyse these stressors in agriculture in connection with mental health (34, 37, 39–42).

Table 1 gives an overview of the key information for the included studies, covering study sample information (especially, if there is a selective study sample) and (if possible) the recruitment strategies with eligibility criteria. The result section only states values, which were reported by the authors of the original studies. If values such as frequencies, mean or standard deviation are not reported within the result section, this is due to a lack of presentation in the included studies. The results of the individual studies are also reported using the terminology used by the authors of the original studies (green professions or farmers). In Table 2, there is a more detailed presentation of assessed measurements. The missing details in Tables 1, 2 also reflect the overall heterogeneity and limited methodological transparency observed across the included studies, which should be considered when interpreting the findings.

Mental health outcomes

The nine studies reporting mental health outcomes have used different instruments, making comparisons possible only to a limited extent. To give an overview on the instruments used, we provide a detailed description in Table 2 where we report the used questionnaires and, if specified, their scale calculations and description. For the following overview of results, we have categorized the observed findings into subheadings and show similar concepts together. We report findings transparently, but need to mention that almost all of the included studies lack relevant information for evaluating the results.

TABLE 2 Overview of the measurements related to mental health outcomes in the included studies.

Reference nr.	Author(s)	Publication year	Measurement	Source of measuring instrument	Number of items	Scale description (Information mentioned in the included studies)
(32)	Roth	2021	Hospital Anxiety and Depression Scale (HADS-D)	Herrmann-Lingen, C., Buss, U. and Snaith, R. P. (2011). Hospital Anxiety and Depression Scale – Deutsche Version (HADS-D). Bern: Hans Huber.	14 (7 Anxiety and 7 Depression)	0–21 range; 0–42 total value no symptoms (0–7) mild symptoms (8–10) severe symptoms (11–14) very severe symptoms (15–21) score of >11 (severe & very severe)
(32)	Roth	2021	Copenhagen Burnout Inventory (CBI)	Nübling, M., Stößel, U., Hasselhorn, H. M., Michaelis, M. and Hofmann, F. (2005). Methoden zur Erfassung psychischer Belastungen – Erprobung eines Messinstrumentes (COPSOQ). Bremerhaven: Wirtschaftsverlag NW (Schriftenreihe der Bundesanstalt für Arbeitsschutz und Arbeitsmedizin Fb 1,058). Kristensen, T., Borritz, M., Villadsen, E. and Christensen, K. (2005). The Copenhagen Burnout Inventory: A new tool for the assessment of burnout. Work & Stress 19(3), 192–207. doi:10.1080/02678370500297720	6	Personal Burnout; 0-100 range; burnout cut-off: four of six items must be over 75
(33)	Betz, Engemann and Vu	2022	Pittsburgh Sleep Quality Index (PSQI)	No information provided	No information provided	No information provided
(33)	Betz, Engemann and Vu	2022	Epworth Sleepiness Scale (ESS)	No information provided	No information provided	No information provided
(33)	Betz, Engemann and Vu	2022	WHO-5 Well-Being Index (WHO-5)	No information provided	No information provided	No information provided
(33)	Betz, Engemann and Vu	2022	Azubi-Gesundheitsfragebogen (AGF)	No information provided	No information provided	No information provided
(35)	Braun et al.	2021	Quick Inventory of Depressive Symptomology (QIDS-SR16)	Rush, A. J., Trivedi, M. H., Ibrahim, H. M., Carmody, T. J., Arnow, B., Klein, D. N., Markowitz, J. C., Ninan, P. T., Kornstein, S., Manber, R., Thase, M. E., Kocsis, J. H., Keller, M. B., 2003. The 16-Item Quick Inventory of Depressive Symptomatology (QIDS), Clinician Rating (QIDS-C), and Self-Report (QIDS-SR): a Psychometric Evaluation in Patients with Chronic Major Depression. Biol Psychiatry 54, 573–583. https://doi.org/10.1016/S0006-3223(03)01866-8.	16	0-27 total score range; Each item: 4-point scale, rated from 0 to 3 with a higher score indicating a more severe depressive symptomology Classified symptoms: normal (0–5) mild (6–10) moderate (11–15) severe (16–20) very severe (20–27)

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TABLE 2 (Continued)

Reference nr.	Author(s)	Publication year	Measurement	Source of measuring instrument	Number of items	Scale description (Information mentioned in the included studies)
(35)	Braun et al.	2021	The Perceived Stress Scale (PSS)	Cohen, S., Kamarck, T., Mermelstein, R., 1983. A Global Measure of Perceived Stress. J. Health Soc. Behav. 24, 385–396. https://doi.org/10.2307/2136404.	10	0-40 total score range
(35)	Braun et al.	2021	Insomnia Severity Index (ISI)	Bastien, C. H., Vallières, A., Morin, C. M., 2001. Validation of the Insomnia Severity Index as an outcome measure for insomnia research. Sleep Med 2, 297–307. https://doi.org/10.1016/S1389-9457(00)00065-4.	7	0-28 total score range
(35)	Braun et al.	2021	Generalized Anxiety Disorder (GAD-7)	Spitzer, R. L., Kroenke, K., Williams, J. B. W., Löwe, B., 2006. A Brief Measure for Assessing Generalized Anxiety Disorder: the GAD-7. Arch. Intern. Med. 166, 1,092–1,097. https://doi.org/10.1001/archinte.166.10.1092.	7	0-21 total score range
(35)	Braun et al.	2021	Composite International Diagnosis Interview (CIDI)	Auerbach, R. P.; Mortier, P.; Bruffaerts, R.; Alonso, J.; Benjet, C.; Cuijpers, P.; Demyttenaere, K.; Ebert, D. D.; Green, J. G.; Hasking, P.; et al. WHO World Mental Health Surveys International College Student Project: Prevalence and Distribution of Mental Disorders. J. Abnorm. Psychol. 2018, 127, 623–638.	No information provided	Self-report version
(35)	Braun et al.	2021	Panic and Agoraphobia Scale (PAS)	Bandelow, B., 1995. Assessing the efficacy of treatments for panic disorder and agoraphobia. II. The Panic and Agoraphobia Scale. Int. Clin. Psychopharmacol. 10, 73–81 https://doi.org/10.1097/00004850-199506000-00003. Bandelow, B., Hajak, G., Holzrichter, S., Kunert, H. J., Rüther, E., 1995. Assessing the efficacy of treatments for panic disorder and agoraphobia. I. Methodological problems. Int. Clin. Psychopharmacol. 10, 83–93. https://doi.org/10.1097/00004850-199506000-00004.	13	0-52 total score range
(35)	Braun et al.	2021	Maslach-Burnout Inventory General Survey (MBI-GS)	Maslach, C., Jackson, S. E., Leiter, M. P., 1997. Maslach Burnout Inventory. In: Zalaquett, C. P., Wood, R. J. (Eds.), Evaluating Stress: A Book of Resources. The Scarecrow Press, pp. 191–218.	5	Emotional exhaustion - 7-point Likert scale (no range description); mean value and standard deviation (M (SD))
(35)	Braun et al.	2021	Assessment of Quality of Life (AQoL-8D)	Richardson, J., Iezzi, A., Khan, M. A., Maxwell, A., 2014. Validity and Reliability of the Assessment of Quality of Life (AQoL)-8D Multi-Attribute Utility Instrument. Patient 7, 85–96. https://doi.org/10.1007/s40271-013-0036-x.	35	No information provided
(36)	Braun et al.	2022	Quick Inventory of Depressive Symptomology (QIDS-SR16)	Rush, A. J., Trivedi, M. H., Ibrahim, H. M., Carmody, T. J., Arnow, B., Klein, D. N., Markowitz, J. C., Ninan, P. T., Kornstein, S., Manber, R., Thase, M. E., Kocsis, J. H., Keller, M. B., 2003. The 16-Item Quick Inventory of Depressive Symptomatology (QIDS), Clinician Rating (QIDS-C), and Self-Report (QIDS-SR): a Psychometric Evaluation in Patients with Chronic Major Depression. Biol Psychiatry 54, 573–583. https://doi.org/10.1016/S0006-3223(03)01866-8.	16	No information provided
(36)	Braun et al.	2022	Composite International Diagnosis Interview (CIDI)	Auerbach, R. P.; Mortier, P.; Bruffaerts, R.; Alonso, J.; Benjet, C.; Cuijpers, P.; Demyttenaere, K.; Ebert, D. D.; Green, J. G.; Hasking, P.; et al. WHO World Mental Health Surveys International College Student Project: Prevalence and Distribution of Mental Disorders. J. Abnorm. Psychol. 2018, 127, 623–638.	No information provided	Self-report version

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TABLE 2 (Continued)

Reference nr.	Author(s)	Publication year	Measurement	Source of measuring instrument	Number of items	Scale description (Information mentioned in the included studies)
(36)	Braun et al.	2022	Generalized Anxiety Disorder (GAD-7)	Spitzer, R. L., Kroenke, K., Williams, J. B. W., Löwe, B., 2006. A Brief Measure for Assessing Generalized Anxiety Disorder: the GAD-7. Arch. Intern. Med. 166, 1,092–1,097. https://doi.org/10.1001/archinte.166.10.1092.	7	No information provided
(36)	Braun et al.	2022	The Perceived Stress Scale (PSS)	Cohen, S., Kamarck, T., Mermelstein, R., 1983. A Global Measure of Perceived Stress. J. Health Soc. Behav. 24, 385–396. https://doi.org/10.2307/2136404.	10	No information provided
(36)	Braun et al.	2022	Insomnia Severity Index (ISI)	Bastien, C. H., Vallières, A., Morin, C. M., 2001. Validation of the Insomnia Severity Index as an outcome measure for insomnia research. Sleep Med 2, 297–307. https://doi.org/10.1016/S1389-9457(00)00065-4.	7	No information provided
(36)	Braun et al.	2022	Assessment of Quality of Life (AQoL-8D)	Richardson, J., Iezzi, A., Khan, M. A., Maxwell, A., 2014. Validity and Reliability of the Assessment of Quality of Life (AQoL)-8D Multi-Attribute Utility Instrument. Patient 7, 85–96. https://doi.org/10.1007/s40271-013-0036-x.	No information provided	No information provided
(37)	Schöllhorn	2020	Perceived stress was assessed with eight items (original scale unknown)	Blankenstein, Gassner, Hilken und Milz (year unknown)	8	1–5 range; higher values indicate higher perceived stress
(37)	Schöllhorn	2020	Standardised questionnaire for stressors (original scale unknown)	Unknown	38	Not provided
(38)	Stier-Jarmer et al.	2020	Perceived Stress Questionnaire (PSQ)	Fliege, H.; Rose, M.; Arck, P.; Levenstein, S.; Klapp, B. F. Validierung des "Perceived Stress Questionnaire" (PSQ) an einer deutschen Stichprobe. Diagnostica 2001, 47, 142–152. Fliege, H.; Rose, M.; Arck, P.; Walter, O. B.; Kocalevent, R.-D.; Weber, C.; Klapp, B. F. The Perceived Stress Questionnaire (PSQ) Reconsidered: Validation and Reference Values From Di_erent Clinical and Healthy Adult Samples. Psychosom. Med. 2005, 67, 78–88.	No information provided	Subscales M (mean) and standard deviation (SD): Worries, Tension, Joy, Demands; sum score; n (%): Stress level normal (≤45) Stress level increased (46–59) Stress level high (≥60)
(38)	Stier-Jarmer et al.	2020	Burnout symptoms, assessed with Maslach Burnout Inventory General Survey (MBI-GS-D)	Büssing, A.; Glaser, J. Managerial Stress und Burnout, A Collaborative International Study (CISMS), Die Deutsche Untersuchung; Technische Universität, Lehrstuhl für Psychologie: München, Germany, 1998.	No information provided	Emotional Exhaustion: mean value and standard deviation (M (SD)); n (%): No burnout (<3.6 points) Risk of burnout (3.6–5.0 points) Symptoms of burnout (>5.0 points)

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TABLE 2 (Continued)

Reference nr.	Author(s)	Publication year	Measurement	Source of measuring instrument	Number of items	Scale description (Information mentioned in the included studies)
(38)	Stier-Jarmer et al.	2020	Sleep disorders, assessed with Insomnia Severity Index (ISI)	Gerber, M.; Lang, C.; Lemola, S.; Colledge, F.; Kalak, N.; Holsboer-Trachsler, E.; Pühse, U.; Brand, S. Validation of the German version of the insomnia severity index in adolescents, young adults and adult workers: Results from three cross-sectional studies. BMC Psychiatry 2016, 16, 1–14.	No information provided	n (%): Absence of insomnia (<8 points) Sub-threshold insomnia (8–14 points) Moderate insomnia (15–21 points) Severe insomnia (>21 points)
(38)	Stier-Jarmer et al.	2020	Depression, assessed with Patient Health Questionnaire (PHQ-2)	Löwe, B.; Kroenke, K.; Grafe, K. Detecting and monitoring depression with a two-item questionnaire (PHQ-2). J. Psychosom. Res. 2005, 58, 163–171.	2	Sum score; 0–6 range, 3 as cut-off
(38)	Stier-Jarmer et al.	2020	Anxiety, assessed with Generalized Anxiety Disorder (GAD-2)	Kroenke, K.; Spitzer, R. L.; Williams, J. B.; Monahan, P. O.; Lowe, B. Anxiety disorders in primary care: Prevalence, impairment, comorbidity, and detection. Ann. Intern. Med. 2007, 146, 317–325.	2	Sum score; 3 as cut-off
(38)	Stier-Jarmer et al.	2020	Well-being, assed with the World Health Organization 5-item Well-Being Index (WHO-5)	Bech, P. Measuring the Dimension of Psychological General Well-Being by the WHO-5. Qual. Life Newsl. 2004, 32, 15–16. Bech, P.; Olsen, L. R.; Kjoller, M.; Rasmussen, N. K. Measuring well-being rather than the absence of distress symptoms: A comparison of the SF-36 Mental Health subscale and the WHO-Five well-being scale. Int. J. Methods Psychiatr. Res. 2003, 12, 85–91.	5	No specific information provided
(38)	Stier-Jarmer et al.	2020	Health status, EuroQol (EQ-5D-5L)	Rabin, R.; de Charro, F. EQ-5D: A measure of health status from the EuroQol Group. Ann. Med. 2001, 33, 337–343. Herdman, M.; Gudex, C.; Lloyd, A.; Janssen, M.; Kind, P.; E Parkin, D.; Bonsel, G. J.; Badia, X. Development and preliminary testing of the new five-level version of EQ-5D (EQ-5D-5L). Qual. Life Res. 2011, 20, 1727–1736.	5	Health Status M (SD); no specific information provided Reported - n (%): Mobility: no problems Self-care: no problems Usual activities: no problems Pain/discomfort: no problems Anxiety/depression: no problems

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TABLE 2 (Continued)

Reference nr.	Author(s)	Publication year	Measurement	Source of measuring instrument	Number of items	Scale description (Information mentioned in the included studies)
(39)	Hetzel et al.	2016	Life satisfaction (LEZU)	Diener E, Emmons RA, Larsen RJ et al. The Satisfaction with Life Scale. J Person Assess 1985; 49: 71–75 Glaesmer H, Grande G, Braehler E et al. The German version of the Satisfaction with Life Scale (SWLS): psychometric properties, validity, and population-based norms. European J Psych Assess 2011; 27: 127–132	5	7 response levels (no range description); High scores correspond to high values
(39)	Hetzel et al.	2016	Mental health impairments (PSYC)	Bakker AB, Demerouti E. The job demands-resources model: state of the art. J Manag Psychol 2007; 22: 309–328	5	5 response levels (no range description); High scores correspond to high values
(40)	Buhne	2019	Qualitative study; burnout and symtpoms related to burnout	No information provided	No information provided	No information provided
(42)	von Davier	2024	Copenhagen Burnout Inventory (CBI)	Kristensen, T., Borritz, M., Villadsen, E. and Christensen, K. (2005). The Copenhagen Burnout Inventory: A new tool for the assessment of burnout. Work and Stress 19(3), 192–207. doi:10.1080/02678370500297720 Stöbel-Richter Y, Daig I, Brähler E, Zenger M (2013) Prävalenz von psychischer und physischer Erschöpfung in der deutschen Bevölkerung und deren Zusammenhang mit weiteren psychischen und somatischen Beschwerden. PPmP 63(03/04): 109–114, zu finden in <https://www.thieme-connect.com/products/ejournals/abstract/10.1055/s-0032-1331704 > [zitiert am 02.4.2024]	6	Personal burnout; 0–100 range; 62.5 as cut-off for burnout risk

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Depressive symptoms

Six studies showed results for depressive symptoms and/or symptom severity (32, 35, 36, 38), well-being (33, 38) or psychological complaints (39). Two studies further assessed mental health care service use and onset or remission of major depressive disorder (35, 36).

One randomized controlled trial RCT investigated telephone coaching sessions in employees of green professions (n = 108; e.g., 65.7% had animal husbandry), who show elevated stress levels and are at risk of developing (mental) health impairments (38). According to the authors, 24.1% of participants reported symptoms of depression, which would require further professional investigation (38). Another study among farmers in Germany and Austria (15% of the study population are farmers in Austria) assessed depressive symptoms among 2,788 participants with the German version of the Hospital Anxiety and Depression Scale (HADS-D) (32). For depressive symptoms, 23.6% of participants showed values indicating a clinically relevant depression (32).

One pragmatic RCT investigated effectiveness of internet-based interventions to prevent depression in green professions (35). Several stress-related outcomes were assessed at baseline (and a certain level of symptoms were assessed as inclusion criteria, see Table 1). For example, 42.9% of the participants at baseline reported a moderate to very severe level of depressive symptom severity, assessed with the Quick Inventory of Depressive Symptomology (QIDS-SR16). On average, participants reported a mean value of 10.01 (SD = 4.42) indicating a mild level of depressive symptom severity (35). The authors further reported mental health care service use and showed that 5% of the participants were searching for a psychotherapist or were on a waitlist for psychotherapy, at baseline (35).

Another pragmatic RCT from the same group of authors investigated effectiveness of online-based acceptance and commitment therapy to improve chronic pain-associated disability in green professions (36). Baseline data are only shown separately for intervention and control group. The mean depressive symptom severity, also assessed with QIDS-SR16, was reported as 7.63 (SD = 3.80) and 7.89 (SD = 4.43) for intervention and control groups respectively, indicating mild symptoms (36). Regarding mental health care service use, 2.3% in the intervention group, and 2.6% in the control group, are treated by a psychotherapist and 4.7 and 2.6%, respectively, see a psychiatrist, neurologist, or psychosomatic medicine specialist (36). No information was provided on the comparison of the mental health care service use in the general population, so it is not possible to classify the results.

Two studies show results for (mental) well-being using the World Health Organization well-being index (WHO-5) (33, 38). Among green professions who reported increased stress levels as an inclusion criterion for study participation, the reported average value for well-being at baseline was 45.0 (SD = 19.1) (38). A cut-off of 50 is usually used when the WHO-5 is applied as a screening tool for depression, and values less than 50 indicate the possible presence of depression (43). Betz et al. (33) reported that among trainees in green professions, 23% of participants reported to have impaired well-being, which would be a better finding compared to a similar aged population.

Another study investigated the health status of older individuals working in green professions (39). Psychological complaints were assessed with five items ranging from one to five (higher numbers indicating more complaints) and a mean value of 2.43 (SD = 1.01.) was shown (39). This value also proved to be low compared to other occupational sectors such as commercial and technical fields (39).

Anxiety symptoms

Four studies assessed generalized anxiety symptoms (32, 35, 36, 38). Three of these have used the generalized anxiety disorder questionnaire in different length-version (GAD-7 and GAD-2), while Roth (32) assessed anxiety with the HADS-D.

A mean value of 2.5 (SD = 1.5) was reported for anxiety in the study by Stier-Jarmer et al. (38). According to the authors, 39.2% had symptoms of anxiety, which would require further professional examination. Similarly, Roth reported that 32.5% of participants showed values indicating a clinically relevant anxiety disorder (32). Braun et al. (35) showed average levels at baseline only separately for intervention and control group. Mean values of 7.84 (SD = 4.39) and 8.09 (SD = 3.47) were reported for intervention and control group. The same group of authors also reported only separate baseline mean values for the study participants in another RCT, showing anxiety mean values of 7.16 (SD = 4.08) and 5.87 (SD = 4.08) for intervention and control group (36). A cut-off of ten is usually applied to identify clinically relevant generalized anxiety disorders, and values greater than 5 can indicate mild levels of anxiety symptoms (44). These results indicate that both the intervention and the control group show symptoms of an anxiety disorder.

Burnout symptoms

Burnout symptoms were investigated in one qualitative study (40). Personal burnout, i.e., not addressing the work context, was assessed by two studies (32, 42). Further two studies assessed burnout via emotional exhaustion (35, 38).

The qualitative study aimed to investigate how farmers perceive the development, progression and treatment of burnout. This study assessed several symptoms regarding burnout among six farmers and the wife of a farmer who had committed suicide, who was not further differentiated in the study from other farmers (40). After receiving treatment for burnout, the return-to-work process was described as a great challenge for farmers. Compared to other occupational sectors, farmers report that they cannot go back to work with reduced working hours, but have to start fulltime again in order to prevent further economic difficulties (40). They have to learn other strategies, such as delegating their work tasks and taking time for breaks.

Two studies used the scale personal burnout out of the Copenhagen Burnout Inventory (CBI) (32, 42). It was reported that 27% of farmers in Germany and Austria are affected by burnout (32). Differentiated into women and men, it was shown that 23.2% of men and 37.2% of women are affected by burnout (32). Significant differences were found for burnout or other mental health outcomes in relation to gender or age. Women, for example, reported to have more often clinically relevant anxiety symptoms and burnout than expected (32). Further, Roth (32) investigated possible differences for different forms of farming and reported that dairy farmers were more often affected by depression, anxiety or burnout. One study investigating only women who live or work in farms also assessed

burnout with the CBI (42). Out of the participants, 21.4% were at risk of having burnout.

Two studies assessed emotional exhaustion with different versions of the Maslach Burnout Inventory General Survey (MBI-GS-D) (35, 38). Of the individuals in green professions with increased stress levels at baseline of an RCT, 72.2% had either risk of burnout (57.4%, indicating values from 3.6 to 5) or symptoms of burnout (14.8%, indicating values >5) (38). Mean values for emotional exhaustion of both studies differed and due to lack of reported data on number of items and scale range, a comparison or classification of these values is not possible (35, 38).

Sleep disorders

Five studies investigated sleep disorders (33, 35, 36, 38, 40). Three of them assessed insomnia (35, 36, 38), while one qualitative study reported sleep disorders or fatigue (40) and another study reported sleep problems and daytime sleepiness (33).

The qualitative study of Buhne (40) reported that having sleep disorders resulted in being tired at work. Betz et al. (33) questioned trainees of green professions and reported that 28% of participants have a poor sleep quality. This was assessed with the Pittsburgh Sleep Quality Index (PSQI) and Epworth Sleepiness Scale (ESS). One third of the participants reported to have experienced micro sleep while driving, resulting in an accident for 6% of these participants (33).

Three studies assessed insomnia with the Insomnia Severity Index (ISI) (35, 36, 38). Stier-Jarmer et al. (38) reported that 35% of the participants had moderate or severe insomnia. Braun et al. (35) reported separate mean values of 9.96 (SD = 5.19) and 11.22 (SD = 5.21) for intervention and control group at baseline. Braun et al. (36) reported mean values at baseline of 8.63 (SD = 4.91) and 9.08 (SD = 6.16) for intervention and control group for insomnia. Values 8–14 for example indicate subthreshold insomnia and values greater than 14 indicate clinically relevant insomnia (45).

General health status

Two studies have assessed the general health status (33, 38). For example, in a study among trainees of green professions, 78% of the participants reported to have a good or very good general health status (33). The most common health complaints were back pain and headaches (33).

Perceived stress

Perceived stress was assessed by four studies (35–38).

In one study with 634 participants belonging to green professions, perceived stress was assessed with eight items of a questionnaire not identified (37). It was reported that participants aged between 50 and 65 reported the highest stress levels. Women reported higher stress levels than men and the lowest stress levels were observed for farmers without a formal agricultural qualification (37).

In the RCT among stressed individuals in green professions, participants reported to have an average value of 55.3 (SD = 14.6) for the Perceived Stress Questionnaire (PSQ) at baseline, showing an increased level of stress (38). The authors also stated that nearly 74% of the participants had either increased (values from 46 to 59) or high (values ≥60) stress levels, according to the PSQ (38).

In the two pragmatic RCTs, perceived stress was assessed with the perceived stress scale (35, 36). An average value of 20.61 (SD = 6.80) was shown in the intervention group and a mean value of 22.21 (SD = 5.93) was shown in the control group at baseline in the RCT about effectiveness of an internet-based intervention to prevent depression, which corresponds to an intermediate perception of stress (35). In the other pragmatic RCT about effectiveness of an online-based therapy to improve chronic pain-associated disability, the participants also started at baseline with mean values of 18.26 (SD = 6.60) and 17.76 (SD = 6.94), corresponding to an intermediate perceived stress level (36).

Stressors mentioned alongside mental health

Based on the six studies which dealt with stressors related to mental health, seven overarching categories of psychological stressors were identified: (1) environmental and climate-related stressors, (2) economic stressors, (3) bureaucratic and regulatory stress factors, (4) societal challenges, (5) social and family challenges, (6) personal stressors and (7) working conditions (34, 37, 39–42). In addition to these identified categories, Schöllhorn (37) also points out that the perception and rating of the various stress factors differs between women and men in agriculture. Women tend to feel more stressed by conflicts within the family and financial problems of the farm, whereas men are mainly overwhelmed by bureaucracy and high requirements and restrictions (37).

Environmental and climate-related stressors

Among the six studies that analysed stressors in agriculture, one cross-sectional study surveyed farmers on climatic stressors (37). It found that farmers over the age of 65 in particular but also part-time farmers and farmers who practise organic farming, perceive fears of storms as stressful. Fears of animal diseases tend to play a minor role and working with animals in general does not appear to be a stressor for farmers.

Economic stressors

Economic pressure, liquidity problems and the associated fears for the future are investigated by four studies as economic stressors (37, 40–42). Difficulties to calculate investment costs, high investment costs as well as the often generally high economic value of farms put farmers under pressure (37, 40, 41) and lead to fears for the future (37). The qualitative results of Greiner (41) emphasize these aspects as a burden for young farmers in particular. Buhne (40) states that business farming is leading to increased competition among farmers, with a loss of collegiality (40). The study by von Davier (42) on mental health of women in agriculture showed that women who see the existence of the farm threatened are significantly more at risk of burnout than women in agriculture who assume a better future for the farm. Uncertainty regarding organization of large financial investments and a poor personal income situation are also described by the women as

stressful (42). Schöllhorn (37) also points out that farmers only feel stressed by low profitability and high interest rates (borrowing costs) when liquidity problems arise.

Bureaucratic and regulatory stress factors

Four studies describe the burden of bureaucracy as an important stress factor in agriculture (34, 37, 40, 41). The study by Schöllhorn (37) identifies bureaucracy as the greatest mental stress factor in agriculture. The legal frameworks to which agriculture is subjected to makes farmers feel externally determined and dependent (34, 40). This is because the sensibility and practicability of policies is not questioned by the political side (according to the farmers' perception) and makes profitable farm management almost impossible (40). Further, Knoop and Theuvsen (34) emphasizes that compliance is monitored, which also places a mental burden on farmers. Schöllhorn (37) found that the mental burden of bureaucracy is a key cause of sleep deprivation, especially on livestock farms. In addition, attempts to keep the farm profitable, such as direct marketing, are in turn associated with a high mental burden for farmers (37). Schöllhorn (37) also finds that individuals aged from 35 to 65 in particular, for whom farming is their main occupation, feel burdened by bureaucracy. Women, on the other hand, hardly reported any burden from bureaucracy (42).

Societal challenges

Two of the six studies that report results on psychological stressors in agriculture (40, 42) show that farmers feel stressed by a perceived negative social image of agriculture. According to von Davier (42), women who are burdened by the social image of agriculture are more at risk of burnout than other women in the agricultural sector. Women from organic farms are less stressed by the social image of agriculture than women from conventional farms. Women from conventional farms are most affected by the poor social image of agriculture (42). Farmers in the qualitative study by Buhne (40) name society's unobjective and emotionally driven debate about agriculture as well as society's desire for cheap food without realising the production effort behind it as reasons for this poor image.

Social and family challenges

All six studies describe stressors regarding the social or family environment in agriculture (34, 37, 39–42). Hetzel (39) and Greiner (41) describe the generational change on farms as a decisive challenge and emotional burden, which always leads to conflicts and considerable disputes, for example when the older generation is unable to let go, is not in favour of modernisation driven by the younger generation or holds different values. Greiner (41) found that formal aspects, such as contracts or arrangements for caring for the older generation, also play an important role in the increased perception of stress when handing over a farm. Ultimately, this can also lead to emotionally stressful conflicts between couples and personal roles (41). Therefore, it is not surprising that most of the stress in the age group of 20 to 34 years is felt through conflicts within the family (34, 37). However, according to Hetzel (39), Schöllhorn (37) and von Davier (42), generational conflicts are less stressful for men than for women. One possible reason described by Buhne (40) is the unpaid work on the farm by family members, which exacerbates family conflicts.

Personal stressors

Various personal factors appear to increase the perception of stress in agriculture. The number of children seems to have an impact on the stress perception of women in agriculture, as women without children or with one child have a lower risk of burnout than women with more than one child under the age of six (42). Another stressor mentioned by women is the remaining high workload around childbirth, resulting in perception of tension between work and childcare as a consequence of this double burden (42). According to Buhne (40), farmers do not prefer to work with employees not being family members because it is emotionally difficult to engage with them. Next to the (poor) rating of their own health, the own role on the farm, e.g., being the wife of the farm owner, also leads to a higher risk of burnout among women in agriculture (42). This detailed information in connection with the life situation and overall health status is not described in the included studies for men or rather in connection with economic and bureaucratic stressors.

Working conditions

Four of the six studies that analyse stressors in agriculture describe stressors that result from the specific working conditions in the sector (34, 37, 40, 42). Two studies describe the dissolution of boundaries between private and work life as stressful due to the fact that both aspects are happening in the same place (34, 40). Personal needs, hobbies, time with the family and holidays are less prioritized than the farm (34, 40) and are a particular burden for farmers with an average age of 40 (34). Other stressful working conditions identified by Knoop and Theuvsen (34), Schöllhorn (37) and Buhne (40) are the long working days, the time pressure and the intensity of work and variety of tasks (37).

Discussion

This scoping review aimed to explore which mental-health outcomes are reported among farmers in Germany and which potential implications are resulting from the findings. Our knowledge synthesis of the literature revealed that only few studies assessed mental health of farmers in Germany with, in some cases, poor descriptions, e.g., of the study population or the measuring instruments used, resulting in a total of only eleven included studies, out of which five were found through additional expert sources. Outcomes examined in the studies were depressive symptoms, anxiety symptoms, burnout symptoms, sleep disorders, general health status or perceived stress. About half of the included studies reported stressors alongside mental health outcomes, such as social and family challenges (i.e., generational conflicts) or difficult working conditions (e.g., time pressure, long working hours, dissolution).

Internationally, several studies show high rates of mental health problems in the agricultural sector (3). Many of these studies focus on depression, stress or suicide, while anxiety or burnout are less frequently investigated, worldwide (3). The studies examined in the present review have also considered anxiety (four studies) and burnout symptoms (five studies) in the German context. Compared to the 12-month prevalence of anxiety disorders (15.3%) in an average German population (46), percentages of anxiety symptoms indicating clinically relevant anxiety disorders were considerably higher among individuals working in agriculture in two of the reviewed studies (32,

38). However, as one of the two studies evaluated a telephone coaching to reduce perceived stress, there is likely a selection bias present, as a higher amount of farmers perceiving stress were included (38). This is likely to be also true for two other randomized controlled trials examining interventions for reduction of depression and chronic pain, which indicated higher symptoms of anxiety in their study populations (35, 36). Although the data is not sufficient to estimate the prevalence for anxiety disorders among German farmers, the high proportion of farmers with anxiety disorders warrant to further study this mental health problem regardless of whether it is more prevalent than in the general population.

Among the studies investigating burnout, one qualitative study reported that farmers who had received treatment for burnout described experiencing great difficulties when returning to work, as a stepwise return-to-work procedure was not feasible and stressors such as financial pressure were perceived as particularly high (40). Another quantitative study showed that 27% of the farmers (living in Germany or Austria) are affected by burnout (32). For example, a 12-month prevalence of a diagnosed burnout-syndrome for a general German population was reported to be 1.5% (47). However, there is need for more studies using similar measurements to be able to compare these prevalences. A similarly high estimation of 21.4% of women being affected by burnout was found for women in the agricultural sector (42). One study among women in agriculture in Switzerland reported a slightly higher prevalence of 15% (48). Therefore, these values should raise concern and underscore the need for more sound and precise investigation of burnout prevalence for this particular occupational sector, especially, as the international evidence is also scarce: A scoping review on the mental health of farmers worldwide identified only two studies (from Canada and Finland each) investigating burnout (3, 49, 50). One study among Irish farmers reported a prevalence rate of 23.6% of burnout (51), pointing in the same direction as the findings for German farmers (32, 42).

For Germany, we found no study exploring outcomes related to suicide among farmers. As several European studies mention increased risks for suicide in the agricultural sector compared to other occupational sectors or general population samples, further research is warranted to generate evidence for Germany (10, 11). For example, in their trend analysis of suicides in France, Bossard et al. (10) describe that the risks of dying from suicides were 28% higher among male farmers, than in the general population in 2008 and in 2009 (22% higher). Factors such as long working hours, high physical demands or high stress due to unforeseen natural events may especially contribute to increased risks for suicides among farmers (4). From the included studies, financial burdens (high investment costs), high bureaucratic requirements, and a lack of work-life balance in particular are identified as burdens for farmers in Germany (34, 37). These are some of the risk factors for suicide that have been already identified in the international literature (4) and indicate a potential risk for German farmers. The particular conditions for farmers need to be considered in future research to detect potential farmers at risk for suicidal ideations.

The most assessed mental health outcome in the included studies was depressive symptoms. Six studies reported findings on depressive symptoms using various measurements. However, many of these studies did not report prevalence rates of symptoms, but were mostly randomized controlled trials. The only study investigating prevalence of depression indicated that 23.6% of participants (farmers either living in Germany or Austria) reported clinically relevant depression symptoms (32). However, the results have to be interpreted carefully, as eligibility criteria were not reported. These numbers would need to be confirmed by studies using representative samples. Internationally, studies reveal a similar pattern of high rates for depression among farmers: One systematic review on mental health among farmers worldwide found 111 studies examining depression (3). Half of these studies were conducted in the US, while Australia, UK and Norway were other countries that investigated mental health among farmers more frequently (3). For example, a study from England and Wales reported that 31% of the surveyed farmers have problems with anxiety/depression (1). Another systematic review and meta-analysis of the same author group included 45 studies on the prevalence of depression among farmers, of which 42 were conducted in the US (26). The meta-analysis was conducted on the centre for epidemiologic studies – depression scale (CES-D), and revealed an overall prevalence of depression of 20% with high heterogeneity, when considering depression as a binary outcome (26). Other reviews also mention that further research is needed due to limited evidence and that more sound science is required with a focus on assessment of depression or other mental health outcomes (52). Due to the reported large heterogeneity, there seem to be relevant methodological or contextual factors contributing to the between-study variance (26). These factors may for example be geographic locations, the type of farming, gender, political changes or factors such as willingness to talk about mental health (26). Half of the included studies within the meta-analysis used convenience sampling, contributing to a risk of selection bias, for example (26). Also, as response rates were often not reported, this may lead to the underestimation of reported prevalence rates as those with depression may be less likely to respond to surveys (26). One study compared farmers with non-farmers or their siblings and showed that farmers had the highest odds of having high depression symptoms (53). For example, farmers had the highest odds of reporting depressive symptoms (Odds Ratio = 1.99, confidence interval 1.55–2.55) compared to higher grade professionals (53). A longitudinal study in Australia among farmers and non-farming workers showed that farmers in rural areas report poorer mental health compared to non-farming workers in rural areas (54). In general, farmers were also less likely to seek health services, such as a general practitioner or a mental health professional than non-farm workers (54). For example, one study among green professions in Germany included in our review reported that only 5% of participants of an internet-based intervention to prevent depression were searching for a psychotherapist or were on a waitlist for psychotherapy at baseline, although almost 43% of participants reported moderate to severe levels of depression symptom severity (35). This may also indicate a mismatch between seeking access and the need for treatment among the group of working farmers. Further, it is possible that existing services are not known among farmers or that they are not accessible or even lacking in rural areas (55).

One of our included studies reported the mean value of the WHO-5 questionnaire, assessing mental depressive symptoms (38). Values below 50 can indicate a depression. For a representative sample of the general population in Germany, there is normative mean data on the WHO-5 questionnaire available for different age groups ranging from 66.80 (SD = 20.52) for individuals being 61 or older to 73.44 (SD = 19.19) for individuals being 40 or younger (56). Similar values are available for the Danish general population, where a

population mean score is 70 (43). In the included study among green professions with increased stress levels at baseline, the reported mean value was 45.0 (SD= 19.1) (38) (38). However, that study aimed at reaching farmers who perceive increased stress levels and is thus not reflecting the general farmer population in Germany (38), which is why the results should be interpreted carefully. Another study on Norwegian farmers showed that almost 35% of participants would need further screening for major depression, also assessed with WHO-5 (57), highlighting the need for increased efforts to improve the use of mental health systems and identification of farmers at risks. Almost all of the mentioned studies find notable gender differences, where females show poorer mental health than males, indicating the need for considering gender as relevant determinants in research. This is also shown in the description of the perceived work-related stressors by von Davier (42).

Next, to the depressive symptoms, sleep disorders were another common outcome examined in the studies included in this review ($n = 5$). Sleeping disorders or poor sleep quality may be especially concerning among farmers, as farm work often entails operating heavy machinery or dealing with livestock or pesticides (51). Experiencing sleep problems is associated with poorer mental health (58) and may increase the risk for work stress (51). One study among farmers reported that half of the participants reported poor sleep (51). Among trainees of green professions, a study included in this review, reported that almost one third had poor sleep quality (33). Among adult farmers, insomnia was reported among 35% of participants in one included study, for example (38). Thus, sleeping problems seem to occur frequently among farmers, and should receive more emphasis in national and international research, as their consequences can be harmful for farmer's health and mental health. One recently published study reported differences for the cold and warm season among farmers and their partners in Switzerland and showed that sleep quality was perceived as better during the cold season (59). This may be related to the fact that harvest time, and thus the peak working period for farmers, takes place in the summer. However, in contrast to the above-mentioned studies, findings of that new cohort study generally reported good sleep quality in both seasons (59). So, there is still a need for research about the sleep quality of farmers, including in relation to their seasonal workload.

One study, included in this review, reported that among trainees of green professions, the general health status was perceived as good or very good for 78% of the participants (33). Something similar was observed among farmers and their partners in Switzerland, where younger farmers report overall better physical health than older farmers (59). Not only for farmers, but also in general, there is a trend observable that physical health is decreasing with age, while mental health is more concerning at lower ages (59–61). In light of our results, this highlights the need for further research to investigate the sources for potentially increased mental health problems among younger farmers. There may be increased economic or digital stressors, for example. However, older farmers may have different views or values on mental health and their subjective well-being compared to younger farmers, indicating potential discrepancies between the generations.

In our review, four studies reported results on perceived stress. Similar to mental health research (see above), females did more often report higher stress levels than males. Mean levels of the perceived stress scale in two studies of this review (35, 36) were reported as intermediate and similar to perceived stress levels, reported in a study among Canadian farmers (62). These findings may show similarity of perceived stress levels among farmers in different countries; however, more research would be needed to confirm this suggestion.

Next to the mental health outcomes that were assessed in this review, many of the included studies also assessed stressors in relation to mental health. In our review, these were mainly climate-related stressors, bureaucratic or regulatory stressors, economic stressors, social or family challenges, personal stressors or working conditions. Some of these are frequently examined in the international literature. For example, financial difficulties, government policies or regulations, climate variabilities, role conflicts within the family or time pressure were named in a systematic review on key risk factors for affecting mental health of farmers, globally (2). Further, the farmers mentioned poor physical health as important factors as well as pesticide exposure (2). Other stressors frequently mentioned among farmers in Eastern North Carolina were weather, taxes, being concerned about the future of the farm or problems with machinery (63).

We found that a wide range of topics covered in the international literature were also addressed or touched upon in the studies included in this scoping review. When comparing the findings on the mental health of German farmers with the international literature, cultural and political differences between countries should be taken into account when interpreting the results. This also includes differences in the structure of agricultural businesses, gender roles and social security or insurance systems, which can influence the perception of stress and access to psychological services (7, 26, 42).

Limitations

This study has some limitations that we would like to address. Due to the nature of this scoping review, we did not conduct a quality assessment for the included studies. However, we believe it is important to mention that many of the studies had methodological shortcomings that came to our attention while screening the articles and we tried to transparently show some of these in our detailed Table 2 of assessed scales for mental health. Due to the inclusion of RCTs or other interventional studies a selection bias is likely present where participants with poorer mental health are included than in a general farming population. Further, there were two studies where it was not clearly reported if the underlying study samples were different from each other (35, 36). Our findings can only give a first overview on mental health among farmers in Germany and cannot be generalized onto other countries or population groups. Nevertheless, compared to other countries worldwide, there are initial indications that mental health problems among German farmers appear to be similarly important. We have only included original studies that were published between 2014 and 2024 (based on the realisation that around 2014 publications have increased (2, 3, 26)), indicating that we may have missed findings that were published before 2014. However, these may be less representative for the current mental health status of German farmers. When conducting this scoping review, we used two large and established databases where we assumed to find the most relevant hits for the topic at hand, and we asked experts in the field for further relevant literature (21, 22). However, with this approach, there is a risk of missing relevant studies not identified by the selected databases and the languages used. Further, in Germany farmers are often

considered together with other occupations in the green professions. Some of the studies did not provide sufficient information on participant data, which makes it difficult to interpret the results. Therefore, future studies should try to be very specific in their definition of study samples among farmers.

Implications

There is still a wide research gap when it comes to mental health among farmers. Although many studies nowadays try to develop interventions targeting mental health of farmers, many of these lack an adequate methodological approach. In some of the included studies, the study population, study design, measurement instruments used and analysis methods are not described with the necessary methodological rigour, which is why studies that describe their methodological approach transparently are particularly necessary for a better understanding of farmers mental health. One systematic review on farmer mental health interventions assessed 92 studies with different study designs of which only one considered a control condition during their investigation (64). The results of this scoping review also show that there is currently a lack of concrete epidemiological data on the prevalence of mental illness in Germany, which would be essential for the targeted development and implementation of preventive measures to promote the mental health of farmers. The investigation of work-related stressors in Germany appears to be still in its early stages. However, knowledge in this area is essential for improving working conditions, also in view of the upcoming changes due to climate change, which will transform work in agriculture in particular (20). Thus, more sound evidence is needed when it comes to farmers and their mental health. As international research suggests, farmers are one of the occupational groups with the highest risk for poor mental health (2, 6, 26). Farmers represent a special working population with unique working conditions and contextual factors, which are often not comparable to other working populations (55, 65). In addition, there are cultural and political differences for farmers worldwide in terms of insurance systems, farm sizes and structures, and gender roles (7, 26, 42). Therefore, it is of utmost importance to increase fundamental research as well as applied research on the mental health among farmers in Germany to enable the development of tailored prevention programs and the implementation of policy measures to combat structural stress factors such as economic pressure and administrative burdens.

Conclusion

Our review has demonstrated that research on mental health of farmers in Germany is scarce. We could not identify studies that assess suicide risks and only a few reported findings on burnout. There is an indication that poor mental health outcomes among farmers in Germany may occur at a similar rate to that found in international studies, but more frequently than in the general population. However, there is a need for epidemiological studies to gain reliable evidence on the prevalence. The stressors identified can provide a basis for targeted preventive interventions.

Author contributions

MH: Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Software, Validation, Writing – original draft, Writing – review & editing. LS: Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Software, Validation, Writing – original draft, Writing – review & editing. KS-S: Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Software, Validation, Writing – review & editing. PA: Conceptualization, Supervision, Validation, Writing – review & editing.

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Supplementary material

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Mapping compassion in the general adult population: religious and secular compassionate acts in social relationships and organizational culture

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Background: Compassion, defined as recognizing suffering and acting to alleviate it, is increasingly acknowledged as a public health asset that enhances resilience, trust, and cooperation. Shown through interpersonal care, ethical leadership, and institutional backing, compassion influences social relationships and organizational culture, although interpretations differ across religious, secular, and cultural contexts. Clarifying how compassion is understood is crucial for fostering inclusive, supportive communities and workplaces, with existing literature linking it to mental health and community-rooted resilience.
Objectives: This study examined how religious and secular ethics shape individuals' perceptions of compassion received from others, and how these experiences inform social relationships and collective activities. It further explored how compassionate behaviors in workplace settings contribute to organizational climate, an area of growing relevance in public health. Rather than measuring health outcomes directly, the study focused on identifying mechanisms and ingredients for cultivating compassion as a key enabler of public health, with its broader link to well-being supported by existing literature.
Methods: Three rounds of online surveys were conducted with 877 working-age adults in the United States between January and April 2025. Participants represented diverse religious backgrounds, including Christianity, Islam, Buddhism, Hinduism, Judaism, and others. To preserve the conceptual breadth of "organization," no specific profession was defined, ensuring generalizability across public health contexts. Quantitative analyses employed frequency distributions, chi-square tests, and ANOVA, supplemented by path analysis to aggregate results. Qualitative data were examined through thematic narrative analysis and integrated with set theory models to theorize compassion's broader role.
Results: Participants reported that compassion was rarely visible in public discourse, particularly in media ($\chi^2 = 75.30$, $p < 0.001$), despite its perceived importance in healthcare ($\chi^2 = 27.11$, $p < 0.001$), education, and family life. Receiving compassion in workplaces was strongly linked to improved team cohesion, ethical leadership, and support during personal crises ($\chi^2 = 364.32$; $\chi^2 = 138.29$, both $p < 0.001$). Qualitative narratives revealed that compassion was interpreted as empathic acknowledgment, shaped by both religious

traditions and secular experiences, and embedded in the social fabric of public and professional life.

Conclusion: This study identifies receiving compassion as a valuable social and organizational resource, positioning it as a potential public health asset. Compassion strengthens social bonds within communities and workplaces, contributing to trust, cooperation, and resilience. Religious frameworks often interpreted compassion as sacred obligation, while secular frameworks emphasized fairness and civic responsibility, together illuminating compassion's versatility as both spiritual and civic resource. Limitations include reliance on self-reported data, broad framing of "organization," and a U.S.-based sample. Future research should employ longitudinal and observational designs to validate findings and explore how cultural contexts and intersecting identities shape interpretations of compassion.

KEYWORDS

compassion, compassion from others, organizational culture, religion, secularism, society & culture, well-being

Introduction

Background/rationale

Compassion, etymologically, is a term originating from the 14th-century "compassioun" meaning "to suffer with another", or from the Latin "compassionem", which is formed by the words "com + pati" (pati = "to experience a sense of pity") and "com" ("together") (1). Compassion, the ability to recognize suffering and take steps to alleviate it, goes beyond empathy by inspiring supportive actions (2). In public health, it is increasingly regarded as a foundation for resilience, trust, and cooperation, reducing stress and isolation while enhancing mental well-being (3, 4). Scholars define compassion as recognizing suffering, understanding its universality, tolerating discomfort, and being motivated to help. The definition of compassion is also shaped by cultural, ethical, and spiritual traditions, and it is seen as both a moral duty and a practical form of wisdom (5). Most studies focus on how compassion is cultivated—through self-compassion, training, or institutional practices (6), yet little is known about how individuals interpret compassion when received from others. This gap is critical in pluralistic societies, where diverse religious and secular frameworks shape experiences of compassion (7). While existing evidence highlights these factors, little research examines how compassion is perceived when received. This study addresses that gap by positioning compassion within community-rooted resilience and place-based support, which are vital for mental health (8). This study addresses a crucial gap by focusing on how compassion is received and interpreted, rather than just how it is enacted. By placing compassion within community-rooted resilience and public health, it highlights its practical significance for enhancing mental well-being and organizational culture (9). Asano conceptualizes compassion as a multidimensional, culturally embedded process involving three core elements: the recognition of suffering, emotional engagement, and a motivation to alleviate distress (10). His work highlights that compassion is not merely a personal trait but a relational dynamic shaped by cultural norms and interpersonal contexts (10). Through his research on fears of compassion, Asano emphasizes how individuals may struggle with receiving or expressing compassion due to vulnerability, shame, or social expectations, especially in cultures that value emotional restraint (10). As a relational and scientifically relevant concept, compassion promotes well-being, ethical leadership, and collaborative public health efforts (5). Furthermore, compassion intersects with science and spiritual care through shared principles of connectedness, healing, and ethical responsiveness (5). Religious traditions regard compassion as a moral obligation, while psychology considers it a biologically rooted caregiving behavior (5). In this context, compassion from others refers to the experience of being supported by individuals who are both emotionally attuned to one's distress and motivated to alleviate it through meaningful action (5). For the person receiving compassion, this involves being noticed, understood, and accepted without judgment, while others remain present and responsive to their suffering. Accepting compassion from others is characterized by a sense of emotional safety, where the distress is met with care, tolerance, and practical support, reinforcing the feeling of being valued and connected (5).

A vital distinction exists between compassion from others and the act of receiving compassion. Compassion from others refers to the visible expression of care—acts of kindness, protective support, or empathic presence offered by someone else (11, 12). It is relational and externally expressed, influenced by cultural norms, perceived sincerity, and interpersonal trust (11, 12). This type of compassion can be provided by loved ones, professionals, or strangers, and is usually measured through behavioral indicators or reports from third parties (11, 12). In contrast, receiving compassion pertains to the internal, subjective experience of being cared for; it entails perceiving and emotionally processing another's compassionate actions, marked by feelings of warmth, safety, and connection during moments of distress (13). This process activates neural systems linked to social bonding and threat reduction and supports psychological resilience, emotion regulation, and attachment wellbeing (14–16).

However, despite extensive research on compassion, there remains limited information on whether people choose secular ethics, common sense, or religion to interpret compassion or to guide their own actions accordingly. To study compassion in detail, we adopted several frameworks. The first theoretical framework is a biopsychosocial-spiritual model in which personal well-being

encompasses one's emotional, physical, mental, spiritual, and social health (17). The second conceptual framework relates to compassion within organizations. Patients, healthcare professionals, and organizations may all gain from compassionate leadership and teamwork, as proposed by the Schwartz Centre for Compassionate Healthcare Framework (18). For example, a compassionate healthcare system can be achieved through seven pledges: compassionate leadership, compassionate education, compassionate valuation and rewards, carer support, patient and family partnerships, compassionate integration into healthcare delivery, and compassionate research and understanding (12). There is a two-way link between compassion and involvement: some clinicians and staff prefer a compassionate work environment because it provides them with a sense of fulfilment (12). Furthermore, compassion is fundamental in helping professions, as spirituality, compassion, religion, and forgiveness impact both the personal well-being of healthcare workers and their empathetic approach to patients (19). The third conceptual framework connects compassion and religion. Compassion is a core, multicultural value that is universally endorsed by all the world's major faiths. It has been suggested that religion might positively influence health by fostering people's compassionate attitudes and behaviors towards others (20).

In a study conducted in Japan, compassion from others was measured using a standardised scale. This scale included the following concepts endorsed by a person or respondent: (1) others generating helpful strategies for someone to cope with distress; (2) others focusing their attention on what is likely to benefit a person; (3) others taking actions and doing things that will be advantageous for someone; (4) others treating a person with feelings of support, helpfulness, and encouragement; (5) others reflecting on and understanding a person's feelings of distress; (6) other people actively motivated to engage and work with a person's distress when it arises; (7) others noticing and being sensitive to a person's feelings of distress when they occur; (8) others being accepting, non-critical, and non-judgemental of a person's feelings of distress; and (9) others being emotionally affected by a person's feelings of distress (21). Preliminary studies of ours suggest that the cement for collateral sustenance in interprofessional (healthcare) teams is reciprocal empathy and compassion (22). A systematic review of 3,387 trials shows that compassion, through self-compassion, enhances job satisfaction, optimism, and self-care while decreasing burnout and compassion barriers (17). This study also emphasised that self-compassion closely aligns with mindfulness and Buddhist practices, reinforcing its importance in emotional regulation (23). Compassion is also essential in the healthcare profession. For instance, a study examined COVID-19's mental health impact on Japanese medical workers, emphasizing loneliness, hope, and self-compassion as key factors (24). Another study involving 129 Irish social work students explored compassion and self-compassion in relation to resilience, engagement, and motivation (25). Findings revealed that self-compassion is influenced by personal factors such as age and gender, with resilience and intrinsic motivation serving as key predictors (12). This research highlights the importance of fostering compassion within professional education, suggesting that educators can enhance students' resilience and motivation to support their well-being (12). Another study found that among United Kingdom education students, compassion, and specifically self-compassion, emerged as the most significant predictor of mental health problems, highlighting its potential role in improving emotional well-being (26). Compassion is widely recognized as a multidimensional construct encompassing emotional, cognitive, and behavioral components that underpin human connection and caregiving roles (27). In the helping professions, such as healthcare, education, and social work, it is considered both a moral imperative and a professional competency (28). While numerous studies have explored how compassion can be taught and cultivated in clinical and educational settings (29, 30), there remains a gap in understanding how individuals receive and interpret compassion from others, particularly within organizational and societal contexts (31, 32).

This interpretive gap is especially relevant when considering the frameworks people use to make sense of compassionate acts. Religious traditions often provide structured moral narratives that frame compassion as a spiritual duty (33), while secular reasoning, rooted in empathy, reciprocity, or human rights, offers alternative, intuitive pathways for compassionate behavior (34). However, empirical research on how individuals draw upon either religious or secular frameworks to guide their interpersonal compassion remains limited, particularly in pluralistic and multicultural societies.

The decision to start this wave of research with a sample of 877 working-age adults from the United States was based on both methodological and contextual reasons. The United States presents a uniquely pluralistic religious and secular environment, making it an ideal location for examining received compassion across different belief systems. Its healthcare system widely incorporates Clinical Pastoral Education (CPE) and spiritual health practitioners, whose roles are specifically focused on compassionate care for patients, families, and staff (35, 36). This institutional embedding of compassion supports our study's aim to examine compassion as a public health resource. While foundational literature from the United Kingdom and Japan was used to establish theoretical grounding—particularly Gilbert's evolutionary model and Asano's cross-cultural insights—these frameworks were chosen for their conceptual relevance rather than geographic alignment. Subsequent waves will expand to other regions, enabling comparative analysis and cultural adaptation of the model. We utilized the STROBE (Strengthening the Reporting of Observational Studies in Epidemiology) checklist to structure the manuscript sections (see Appendix) (37).

Objectives and hypotheses

The study aimed to fill a key gap in compassion research by exploring how compassion is understood when received, rather than how it is developed or expressed. Specifically, the objectives follow (see Figure 1).

1. Interpretive frameworks: Assess whether individuals rely on religious teachings, secular ethics, or intuitive reasoning when perceiving compassion.
2. Contextual reception: Examines how compassionate behavior is recognised and understood across family, workplace, healthcare, and community settings.
3. Pluralistic relevance: Examines how various belief systems in modern societies influence the experience and significance of compassion.
4. Mapping compassion: Recognizes and interprets compassionate acts within social, organizational, and

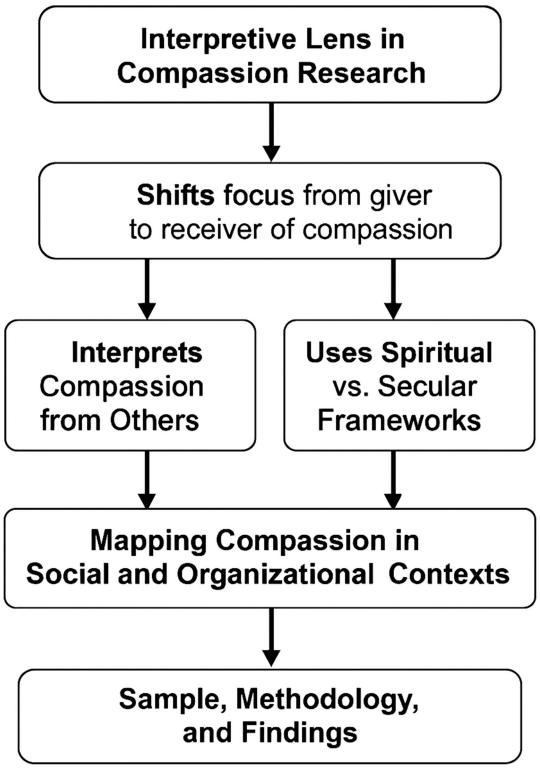


FIGURE 1
This study shifts focus from giving to receiving compassion, exploring how individuals interpret compassionate acts through religious, secular, or intuitive frameworks. It maps compassion in social and organizational contexts, revealing implications for public health, ethics, and institutional culture.

community settings as relational mechanisms that promote resilience and place-based support essential for personal well-being.

5. Public health and institutional implications: Examine how compassion, as perceived and understood, indirectly influences well-being, organizational culture, and the embedding of compassionate practices.

Hypotheses:

- H1: Individuals interpret compassion through different frameworks (religious, secular, or intuitive), with measurable differences across demographic groups.
- H2: Recognition and understanding of compassionate behavior vary notably across family, workplace, healthcare, religious, secular, and community settings.
- H3: Diverse belief systems in contemporary societies influence how compassion is perceived in terms of meaning and relevance.
- H4: Compassionate acts serve as relational mechanisms that strengthen resilience and place-based support, especially within organizational and community contexts.
- H5: Interpreting compassion indirectly enhances individual well-being, boosts community resilience, and promotes the embedding of compassionate practices within public health and organizational culture.

Methodology

This study employed a mixed-methods explanatory design, combining quantitative surveys with qualitative responses to explore how religious and secular ethics influence perceptions of compassion. Quantitative data revealed broad trends, while qualitative insights provided clarification and depth, following Creswell's explanatory sequential model. Based on pragmatism, the approach focused on real-world problem-solving by merging statistical analysis with thematic exploration (38). Ontologically, compassion was regarded as both a personal experience and a socially constructed phenomenon influenced by cultural and ethical contexts. Epistemologically, the study employed a pluralistic approach, utilizing various methods to identify both general patterns and individual meanings. Axiologically, the research was guided by principles of relational ethics and inclusivity, prioritizing transparency, reciprocity, and fairness (39). Compassion itself functioned as both the focus of the inquiry and a methodological guideline, ensuring the study was conducted in a respectful and culturally sensitive manner (40–43).

Research question

How do individuals interpret compassion received from others, whether through religious or secular frameworks—, and in what ways can these interpretations shape the development of individual and community-based resilience, organizational culture, and place-specific practices that frame compassion as a public health resource?

Methods

Study design and setting

This is a mixed-method explanatory research study conducted between January and April 2025. We used three anonymous online surveys in three separate phases, gathering data from an electronic and public platform: SurveyMonkey. Data included both numerical and qualitative information. Quantitative analysis involved Chi-square $\chi 2$ (Goodness of Fit Index = GFI), t-test statistics, one-way ANOVA F, and cross-correlations. Since the direction of the effect was unknown, we employed two-tailed p-values. Data were collected using close-ended questions on Likert scales. Qualitative analysis was conducted through thematic analysis, identifying themes and subthemes from open-ended responses. Medcalc and NVIVO facilitated the quantitative and qualitative analyses, respectively. Quantitative results were deemed statistically significant when rejecting the null hypothesis at an alpha level of $p < 0.05$. Effect sizes were measured using Cohen's w or d coefficients. Data were initially gathered and elaborated for frequency distribution via an online survey engine. The survey distribution was anonymous and outsourced to a third-party specialized in collecting customer surveys, to address ethical and practical issues such as biases, locality, religious beliefs, geographical location, and personal matters related to faith, spirituality, and experiences in the subject. We employed three different surveys as assessment tools, each refined across three successive waves. This iterative process allowed us to enhance clarity, validity, and contextual relevance at each stage, ensuring that the final

instruments captured nuanced interpretations of compassion across religious, secular, interpersonal, and organizational settings. By progressively refining the surveys, we improved both methodological robustness and the reliability of the findings, aligning the tools with the study's goal of exploring how compassion is perceived and understood, rather than merely enacted.

Participants

The surveys used in this study were designed and conducted by the authors as part of original data collection, rather than relying on secondary datasets or pre-existing SurveyMonkey databases. Administered online to a United States sample of 877 working-age adults through random and opportunistic recruitment, the survey instrument focused on how individuals perceive and interpret compassion received from others, examining religious and secular frameworks, interpersonal relationships, and organizational contexts. The primary aim was to investigate the mechanisms and interpretive lenses through which compassion is understood, not to measure direct health or well-being outcomes. To address the potential disconnect with public health, the study has been reframed to emphasize compassion as a social and organizational resource and a potential public health asset, with its link to health and well-being supported by existing literature rather than direct measurement. We selected working-age Americans because the United States offers a pluralistic context where diverse religious, secular, and cultural frameworks shape how compassion is interpreted. This group is embedded in families, workplaces, and communities, making their perspectives highly relevant to public health, organizational practice, and resilience. Their diversity and accessibility through online recruitment provided a robust sample to explore how compassion is received and understood in everyday social and professional settings. The study took place from January to April 2025.

Sampling

We used an opportunistic and anonymous sample of the general population in the USA, voluntarily participating in an anonymous online survey on key aspects of religion, compassion, well-being, and social relationships.

Variables

In organizing the study, the following elements were identified to ensure clarity and logical sequence.

(1) Outcomes (dependent variables): the primary outcomes included perceptions of compassion across individual, organizational, and religious domains, alongside well-being indicators such as psychological distress, resilience, belonging, and social cohesion. Secondary outcomes encompassed organizational performance measures, including team cohesion, morale, job satisfaction, and prosocial behaviors. These were assessed through survey responses, validated compassion scales, and thematic coding of qualitative data.
(2) Exposures (independent variables): key exposures included workplace and societal dynamics such as supportive relationships and collaborative practices, religious principles like the Golden Rule, charity, patience, and forgiveness, media exposure and educational promotion of compassion, and healthcare organizational structures, particularly staffing levels and administrative burdens.
(3) Predictors: demographic factors such as age, gender, religious affiliation, and education were considered, alongside ethical orientation and relational context (team-based practices and moral reasoning). The public health setting of practice (SoP), including community, workplace, and healthcare institutions, was also regarded as a predictor.
(4) Potential confounders: socioeconomic status, cultural background, prior mental health conditions, organizational size and resources, and media exposure unrelated to compassion were identified as potential confounders and accounted for in analysis.
(5) Effect modifiers (interaction variables): age was examined as a moderator of the relationship between compassion and workplace cohesion, religious affiliation as a modifier of compassion's impact on ethical leadership, and organizational context as a factor influencing the effect of compassion on well-being outcomes.

Bias

Bias was addressed by identifying and mitigating potential sources at each stage of the study. Selection bias was minimized through clear inclusion and exclusion criteria and transparent recruitment procedures. Measurement bias was reduced by triangulating survey data with qualitative coding. Confounding bias was managed by adjusting for demographic and contextual variables such as age, religious affiliation, socioeconomic status, and organizational size. Analytical bias was limited through sensitivity analyses and the use of interaction terms to test effect modification.

Descriptive quantitative analysis

In the quantitative strand, data were analyzed using the chi-square goodness-of-fit test (GFI) to identify differences in response percentages and assess their statistical significance. An alpha threshold of $p = 0.05$ was applied to determine meaningful variation across categories. Additionally, cross-correlational analysis was conducted to explore associations between variables, providing further insight into how different factors influenced interpretations of compassion. Quantitative data comprised answers to closed-ended questions.

Path analysis

Path analysis explored how multiple variables could be combined to form a cohesive framework for understanding perceived compassion in society and organizations, as well as its attribution to religious or secular frameworks. Participants (adults aged 18 and above) responded to structured items and open-ended prompts concerning compassion in workplace or social contexts. Thematic coding was applied to qualitative responses, while standardised path coefficients were calculated using structural equation modelling (SEM) for quantitative variables to evaluate directional relationships between variables such

as age, gender, religious orientation, and compassion-related outcomes. Path analysis adhered to guidelines from Kline, ensuring model fit and clarity (44). Path analyses were conducted using AMOS v.26 (45). RMSEA (Root Mean Square Error of Approximation) is a commonly used index to evaluate the goodness-of-fit in structural equation modelling, including path analysis. It measures how well the proposed model fits the population covariance matrix, accounting for model complexity (46). For our path analysis, RMSEA was utilized to assess the structural validity of the model connecting demographic factors, media perception, educational attitudes, and experiential frequency to moral reasoning. A value below 0.06 indicated a good fit, suggesting that the model effectively captured the observed relationships and supported the robustness of compassion as a teachable and psychologically significant construct.

Statistical power and effect size justification

To evaluate associations between categorical and continuous variables, the study employed statistical procedures guided by the Power*G framework (47, 48). All analyses were configured to achieve 80% power ($1 - \beta = 0.80$) at a conventional alpha level of 0.05, ensuring robust detection of meaningful effects while minimizing the risk of Type I error. The chi-square goodness-of-fit (GFI) test was used to examine whether the observed distributions of Likert-type responses deviated from theoretical expectations. A medium effect size (w = 0.5), aligned with Cohen's (49) recommendations, guided the selection of critical chi-square values, which were $\chi^2 = 5.9$ for 2-point and 3-point scales, and $\chi^2 = 7.8$ for 4-point scales. The analysis incorporated data from three surveys ($N = 318$, 244, and 285, respectively), each exceeding the minimum required sample size to reliably detect medium effects. In accordance with Psychometrica conventions, effect sizes for chi-square analyses were interpreted using Cohen's w, with small effects ranging from 0.1 to 0.4, intermediate from 0.5 to 0.7, and large effects defined as >0.8 (50). To investigate differences in group means across continuous outcomes, one-way ANOVA was employed. A medium effect size ($f = 0.39$) was specified following Cohen's guidelines. Sample size requirements were determined based on the number of predictors: $n = 66$ for two predictors, $n = 75$ for three predictors, and $n = 83$ for four predictors, while maintaining the desired statistical power threshold. Effect sizes from ANOVA tests were calculated and interpreted using Cohen's *d*, as recommended by Psychometrica (51). Small effects ranged from 0.1 to 0.4, medium effects from 0.5 to 0.7, and large effects exceeded 0.8. By applying these calibrated thresholds and analytic conventions, the statistical design was sensitive to practical implications and consistent with best practices in psychological and social research.

Descriptive qualitative analysis

Thematic analysis

In the qualitative strand of this study, we analyzed participants' open-ended survey responses using Braun and Clarke's six-phase framework for thematic analysis. This process began with familiarization, where responses were read and re-read to capture initial impressions, followed by systematic coding in which meaningful segments of text were labeled to reflect their content. Codes were then organized into broader themes, such as compassion as understanding, supportive relationships, and collective response, with subthemes identified to capture finer distinctions. Each theme was reviewed against the dataset to ensure coherence and then clearly defined to represent its boundaries. This iterative approach balanced flexibility with rigor, enabling us to identify patterned meanings while remaining attentive to contextual nuance. The resulting themes provided insight into how compassion was interpreted across diverse settings, including religious, secular, interpersonal, and organizational domains (52).

Set theory analysis

To complement this thematic approach, we applied set theory as a formal lens to represent relationships among themes (53). Each thematic domain was treated as a set—for example, C_1 (understanding), C_2 (supportive relationships), and C_3 (collective response). The union ($C_1 \cup C_2 \cup C_3$) represented the full conceptual space of compassion, while the intersection ($C_1 \cap C_2 \cap C_3$) highlighted shared attributes such as empathy, trust, and care. This framework allowed us to model overlaps and distinctions across contexts with clarity and reproducibility. Religious (R) and secular (S) orientations were considered conditioning sets that influenced how compassion was expressed, shaping the thematic landscape without altering its core traits. Set Theory Analysis extended this representation by modeling directional relationships between latent constructs, expressed as functions ($f: L_i \rightarrow L$), to illustrate how one dimension of compassion influenced another. The symbol L denotes a latent construct, or latent variable. Latent constructs are abstract dimensions that cannot be directly observed but are inferred from patterns in the data. In this study, such constructs included compassion as understanding, supportive relationships, and collective response—each distilled from the thematic analysis of participants' responses. The subscripts i and j simply distinguish between different constructs, with (L_i) representing the source construct (for example, compassion as understanding) and (L_j) representing the target construct (such as supportive relationships). The function (*f*) expresses a path or directional relationship between constructs, showing how variation in one latent dimension influences another. In plain terms, L refers to an abstract theme identified in the analysis, and the mapping ($f: L_i \rightarrow L$) models how one construct affects or predicts another. These operations formally represent how constructs relate across contexts and enable reproducible conceptual mapping (51, 54). Set theory modelling provides a structured framework for qualitative research, moving beyond description to systematic explanation of complex phenomena. By treating attributes and outcomes as sets, researchers can analyse how conditions combine and interact, especially in contexts of conjunctural causality. Its main application is Qualitative Comparative Analysis (QCA), which uses Boolean logic to identify necessary and sufficient conditions, explore equifinality, and build rigorous models. This enables outcomes such as policy success or organizational change to be understood as configurations of factors rather than isolated variables (51, 55–57).

Statistical software

We used Medcalc (83) for general statistical analysis. G*Power (47, 48) calculator for sample size and statistical power. Psychometrica

(50) was used for the calculation of the effect size. Chi-square GFI was obtained using the Statology program (58). The Chi-Square power calculator was accessed via the Statistic Kingdom (59). Qualitative analysis was conducted with NVIVO (60). Path analysis was conducted with AMOS (61). Set theory and writing was helped by Wolfram Alpha (62).

Triangulation methods

We employed a convergent mixed methods triangulation design to integrate quantitative and qualitative strands. Quantitative analyses (chi-square, correlations, path analysis) and qualitative thematic analysis (Braun and Clarke) were conducted in parallel. Results were then mapped comparatively, aligning statistical patterns with thematic domains to identify convergence, divergence, and complementarity. Using set theory integration, thematic overlaps and distinctions were systematically cross-referenced with quantitative associations. Religious and secular conditioning frameworks were examined across both strands to assess belief-system influences on compassion. Finally, meta-inference synthesized findings into a unified interpretation, where statistical significance reinforced thematic salience and qualitative nuance explained quantitative variation (38, 63).

Ethical considerations

This study did not require formal ethical approval due to its design and data-handling procedures. The data collection was conducted by an independent international research company using opportunistic sampling, with responses fully anonymous and no personally identifiable information collected. In line with guidance from the UK Health Research Authority, the University of Aberdeen's SERB, and the University of Nottingham's ethics flowchart, anonymous surveys that do not involve sensitive data or vulnerable populations are usually exempt from formal review. The survey focused on attitudinal and perceptual variables related to compassion, without probing health, trauma, or protected characteristics. Data collection complied with GDPR and institutional privacy protocols, and the research adhered to the Declaration of Helsinki (2013), ensuring respect for autonomy, confidentiality, and beneficence. Participants were informed of the study's purpose, voluntary participation, and the anonymity of responses, with no deception, coercion, or follow-up contact. This approach aligns with best practices for low-risk behavioral research (64–67).

Surveys methods

PICOS (Population, Intervention, Comparison, Outcome, and Settings/Study Design) frameworks were used to organize the survey data.

Survey no. 1 – compassion, common sense, and religion

This survey investigated how adults aged 18 and above (population) perceive compassion when it is represented in media, education, and broader social systems (intervention). Responses were compared across religious and secular frameworks (comparison) to understand how belief systems influence attitudes toward compassion. The outcomes (outcome) examined whether compassion is viewed as rooted in religion, secular ethics, sufficiently represented in media, necessary in areas such as healthcare, education, and politics, and whether it should be explicitly taught. Conducted within societal contexts including media, education, and public discourse (Settings), the study indicates that compassion is a socially constructed and ethically guided principle. The two aspects of survey no. 1—working population and religious affiliations—demonstrate how compassion is interpreted both in daily life and across cultural traditions. Although not explicitly framed as public health research, the findings imply that compassion plays a role in public and mental health, resilience, and social cohesion, offering valuable insights into the ethical foundations that underpin well-being and healthier communities.

Survey no. 2 – compassion in organizations

This survey examined how adults aged 18 and over working in team-based environments (population) perceive compassion in organizational relationships and workplace culture (intervention). It compared responses across demographics, professional backgrounds, and crisis scenarios (comparison) to identify patterns in valuing and practising compassion. Outcomes (outcome) highlighted its influence on team satisfaction, engagement, and performance, demonstrating how relational empathy enhances workplace effectiveness. Conducted within organizational contexts such as teams and companies (settings), the study suggests that compassion is a vital cultural element. Beyond workplace success, findings indicate compassion supports mental well-being, resilience, and social cohesion, linking organizational ethics with public health.

Survey no. 3: perceived compassion in organizations and role of religion or common sense

This study explored how adults aged 18 years and older working in various types of organizations (population) perceive and interpret compassion within organizational settings (intervention). It examined differences in responses based on demographic characteristics, religious orientation, and workplace experiences (comparison), enabling a detailed understanding of how personal and contextual factors influence attitudes towards compassion. The study aimed to provide insights into the role of compassion in team dynamics and the impact of religious versus secular guidance on workplace behavior (outcome), positioning compassion as both a relational and ethical concept. Carried out across unspecified workplace organizations of any kind (settings), the research contributes to a broader understanding of how compassion operates within diverse professional environments, informing leadership practices, team cohesion, and organizational culture (Figure 2).

Results

Results from survey no. 1: compassion, common sense, and religion

The research hypothesis was that people's views on compassion vary depending on their background and professional setting, with broad support for making compassion more visible and integrating it into key

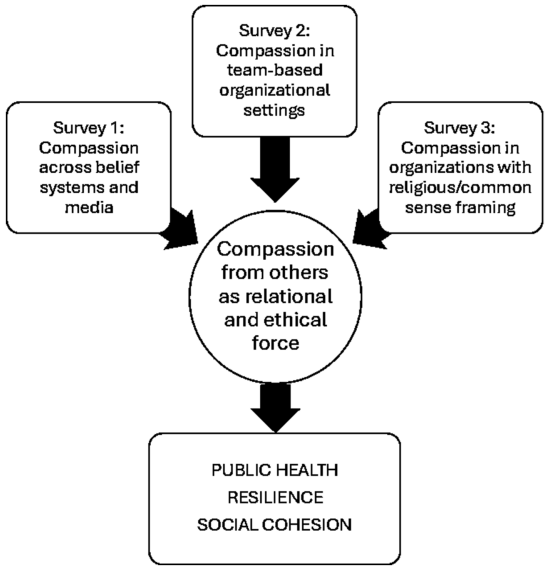


FIGURE 2
Survey no. 1 examined compassion across belief systems and social contexts; survey no. 2 explored compassion in organizational culture; survey no. 3 investigated compassion in workplace settings shaped by religion or common sense. Together, they converge on the role of belief and context in valuing compassion, leading to shared perceptions in social and organizational environments and ultimately linking compassion to public health outcomes such as resilience, well-being, and social cohesion.

social areas, such as the media and education. The survey (population: $N = 318$) of the adult population, regardless of religion, examined perceptions of compassion across gender, age, and professional contexts, revealing statistically significant trends. The gender distribution was balanced (male: 45.91%, female: 54.09%, p = n.s.), indicating no significant difference. However, age-related differences were notable ($\chi^2 = 73.37$, $p < 0.001$, w = 1.09), with the largest group aged 30–44 (37.42%), while religious affiliation also showed significant variation ($\chi^2 = 223.81$; $p < 0.001$; w = 0.6). A majority (50.63%) believed that compassion is underrepresented in modern media ($\chi^2 = 75.30$, $p < 0.001$, w = 1.11), highlighting concerns about public awareness. Healthcare was seen as the field most needing compassion (73.90%), followed by education (66.98%), family (56.92%), community services (50.00%), and politics (47.48%) ($\chi^2 = 27.11$, $p < 0.001$, w = 0.34). Notably, 71.38% supported explicit compassion education ($\chi^2 = 370.57$, $p < 0.001$, w > 1.0), indicating strong consensus. Daily experiences of compassion varied: 44.65% reported occasional exposure, while 34.28% reported frequent exposure ($\chi^2 = 108.54$, $p < 0.001$, w = 1.4). Views on the origin of compassion were evenly divided: 28.93% linked it to religious teachings, 28.62% to common sense, and 36.79% to both equally ($\chi^2 = 131.86$, $p < 0.001$, w = 1.6) (Table 1).

Path analysis

Our path analysis revealed a clear pathway linking demographic identity to attitudes about compassion, with age and religious affiliation identified as key predictors. Older respondents were more likely to see compassion as underrepresented in media (β = 0.42) and rooted in religious teachings (β = 0.33), while media perception served as a central mediator, predicting support for incorporating compassion into curricula (β = 0.51) and influencing perceptions of its societal importance (β = 0.36). Support for compassion education correlated with increased recognition of compassionate acts in daily life (β = 0.48), which in turn promoted balanced views that integrated religious and common-sense origins (β = 0.55). Religious affiliation significantly impacted multiple domains, including media representation (β = 0.42), perceived societal need (β = 0.38), support for curricula (β = 0.49), daily interactions (β = 0.44), and conceptual origins (β = 0.51), affirming its role in shaping the meaning and value of compassion. Gender was excluded due to non-significance. Survey no. 1 (N = 318) reinforced these findings, showing that age and religious background consistently shape perceptions of compassion. Model fit was strong (RMSEA ≈ 0.05), supporting the structural validity of the proposed compassion pathway.

Qualitative text analysis in survey no. 1 (open-ended questions)

In Survey No. 1, participants were asked directly: "How do you define compassion in your own words?" Their responses revealed three distinct but interconnected themes. The first theme, compassion as empathic understanding during disagreement, emphasized the ability to remain empathetic even when perspectives diverge, exemplified by the statement "empathic understanding even if you don't agree." The second theme, compassion as empathic understanding without judgment, highlighted openness and acceptance, where understanding is offered without criticism, illustrated by the response "to show understanding to another without judgment." The third theme, compassion by prioritizing neighbors' needs, reflected a more action-oriented dimension, portraying compassion as selflessness and care for others, expressed in the phrase "putting the needs of someone else before your own." Taken together, these themes demonstrate that compassion is understood both as an inner disposition—marked by empathy and non-judgment—and as an outward practice of prioritizing others' well-being, bridging differences, fostering acceptance, and motivating altruistic action (Figure 3).

Set theory model from the qualitative survey no. 1

In this study, the Universe of Discourse (U) included all participant definitions of compassion across media, education, belief, and society. Three sets were established: A = empathic understanding during disagreement, B = empathic understanding without judgment, and C = prioritizing others' needs. Their intersections highlighted key relational dimensions: $A \cap B$ reflected emotional regulation in disagreement versus judgment; $B \cap C$ emphasized non-self-centeredness and moral regard; $A \cap C$ revealed ethical tensions between personal beliefs and altruism. The union $A \cup B \cup C$ represented a combined definition of compassion as empathic understanding + non-judgment + altruistic prioritisation. A cyclic path ($A \rightarrow B \rightarrow C \rightarrow A$) illustrated how empathy in disagreement promotes non-judgment, which enables altruism, which then reinforces empathy. Formally, f:{A, B, C} → {B, C, A} with $f(A) = B$, $f(B) = C$, and $f(C) = A$. This set-theoretic model demonstrated that received compassion forms a dynamic relational

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TABLE 1 Survey no. 1 – compassion, common sense, and religion (multiple-choice questions).

Survey no. 1 (N = 318)	Answer choice	Responses (%)	N	χ^2 (GFI) (significance p)	Effect size Cohen's w
Gender	Male	45.91%	146	n.s.	0.00
	Female	54.09%	172		
Age	18–29	10.06%	32	73.37 (<0.001)	1.09
	30–44	37.42%	119		
	45–60	36.16%	115		
	>60	16.35%	52		
Religious affiliation	Christianity	39.85%	127	131.13 (p < 0.001)	0.6
	Islam	12.43%	40		
	Buddhism	16.45%	52		
	Hinduism	10.96%	35		
	Judaism	12.25%	39		
	Other	8.5%	25		
Do you believe that compassion is adequately represented in modern media?	Yes, it is well represented	37.74%	120	75.30 (<0.001)	1.11
	No, it needs more representation	50.63%	161		
	Unsure	11.64%	37		
Select all that apply: In which of the following areas do you think compassion is most needed today?	Healthcare	73.90%	235	27.11 (<0.001)	0.34
	Education	66.98%	213		
	Politics	47.48%	151		
	Community services	50.00%	159		
	Family	56.92%	181		
Do you think compassion should be taught explicitly as part of educational curricula?	Yes	71.38%	227	370.57 (<0.001)	>1.0
	No	12.58%	40		
	Only as part of religious studies	4.09%	13		
	Only as part of ethics or philosophy classes	11.95%	38		
How often do you encounter acts of compassion in your daily life?	Very often	34.28%	109	108.54 (<0.001)	1.4
	Occasionally	44.65%	142		
	Never	1.57%	5		
In your opinion, does compassion derive more from religious teachings or from common sense?	Mostly from religious teachings	28.93%	92	131.86 (<0.001)	1.6
	Mostly from common sense	28.62%	91		
	Both equally	36.79%	117		
	Neither	5.66%	18		

loop, strengthening social relationships and organizational culture. While health outcomes were not directly measured, existing literature positions compassion as a public health asset, suggesting that A ∪ B ∪ C enhances emotional safety, supports mental health, and fosters inclusive environments.

Details of survey no. 1 and cross-sectional study (compassion, common sense, and religion)

The survey explored the connection between compassion and religious teachings across major world religions. Among participants, 40.83% believed compassion arises equally from religious teachings and common sense, while 34.86% attributed it mainly to religious teachings. The variation in responses was statistically significant (ANOVA F = 6.43, p = 0.012, d = 0.20). Views on how modern media portrays compassion varied; 51.38% felt it required more visibility, with Buddhism (65.56%), Hinduism (68.33%), and Judaism (61.19%) showing strong agreement (ANOVA F = 4.29, p = 0.033, d = 0.16). Healthcare was identified as the area where compassion is most needed (74.31%), followed closely by education (66.06%) and family (61.93%). Differences between religious groups were not statistically significant (ANOVA F = 0.68, p = 0.41, d = 0.06), indicating consensus. A large majority (76.23%) supported explicitly teaching compassion in educational curricula, especially within Islam (85.29%) and Hinduism (80%). However, only 5.50% felt

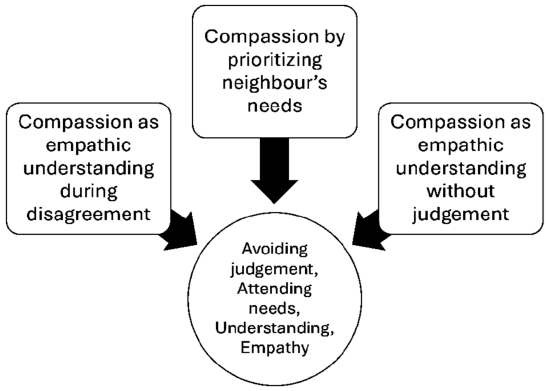


FIGURE 3
Mapping themes of the qualitative analysis.

it should be limited to religious studies, while 10.09% preferred ethics or philosophy courses (ANOVA F = 0.77, p = n.s., d = 0.07; Table 2).

Path analysis

The model revealed a structured pathway linking religious affiliation to the conceptual, perceptual, and pedagogical aspects of compassion. Religious affiliation significantly predicted attributing compassion to religious teachings over common sense (β = 0.20, ANOVA F = 6.43, p = 0.012, d = 0.20), and perceptions of its underrepresentation in modern media (β = 0.16, ANOVA F = 4.29, p = 0.033, d = 0.16), with Buddhism, Hinduism, and Judaism showing the strongest agreement. Support for including compassion in curricula was modestly predicted (β = 0.07), with Islam (85.29%) and Hinduism (80%) showing the highest endorsement. Conversely, prioritization of compassion across societal domains (healthcare, education, family) was consistent across groups and not significantly predicted (ANOVA F = 0.68, p = 0.41, d = 0.06), while preferences for teaching methods showed no variation (ANOVA F = 0.77, n.s., d = 0.07). Overall, religious affiliation influenced conceptual framing and media critique but had a limited impact on domain prioritisation or pedagogical preferences, reinforcing compassion's shared societal importance. Model fit was strong, with RMSEA ≈ 0.05 (values < 0.06 indicating good fit), supporting the structural validity of the pathway.

Result from survey no. 2: compassion in organizations

The research hypothesis was that compassion is viewed as a crucial factor in effective organizational relationships, especially in team dynamics and crisis management among mid-career professionals across various sectors. The survey (population: N = 274) investigated perceptions of compassion within organizational relationships, uncovering statistically significant trends. Gender distribution was balanced (male: 48.91%, female: 51.09%, p = n.s.), with the largest age group being 30–44 (41.61%), closely followed by 45–60 (40.51%), indicating an even distribution among mid-career professionals (χ^2 = 113.18, p < 0.001, w = 1.67). Religious affiliations were varied, with Christianity accounting for the largest share (40.88%), then Buddhism (15.33%), Islam (13.14%), Hinduism (10.22%), Judaism (11.68%), and Other (8.76%) (χ^2 = 119.90, p < 0.001, w = 0.66). Compassion was regarded as highly important in team relationships, with 59.85% rating it as "very important" and 32.12% as "important" (χ^2 = 364.32, p < 0.001, w > 3.0). Regarding organizational compassion during crises, 41.24% felt their organization "always" displayed compassion, while 23.72% reported "often" and 26.28% "sometimes" (χ^2 = 138.29, p < 0.001, w = 2.01). Compassion was widely recognised as a key skill in team building, with 53.65% strongly agreeing and 35.40% agreeing (χ^2 = 306.40, p < 0.001, w > 3.0). Essential components of compassionate teamwork included active listening (80.66%), empathy (65.69%), and supportive communication (62.41%) (χ^2 = 85.31, p < 0.001, w = 1.34). Team compassion satisfaction was high, with 42.34% "very satisfied" and 35.77% "satisfied" (χ^2 = 190.48, p < 0.001, w = 3.021). Notably, 59.49% strongly agreed that compassion enhances team performance (χ^2 = 363.44, p < 0.001, w > 3.0), underlining its vital role in workplace effectiveness (Table 3).

Path analysis

Based on survey no. 2 (N = 274), the path analysis revealed a coherent and statistically robust model linking demographic variables, attitudinal beliefs, behavioral recognition, experiential satisfaction, and perceived team outcomes. Gender was excluded due to non-significance, while age emerged as a fundamental predictor: older respondents were more likely to rate compassion as important in team relationships (β = 0.41) and report higher satisfaction with compassion shown by team members (β = 0.36). Perceived importance of compassion acted as a central mediator, predicting endorsement of compassion as a key team-building skill (β = 0.52), which was associated with satisfaction with team compassion (β = 0.48). Satisfaction strongly predicted belief in compassion's impact on team performance (β = 0.55), reinforcing the experiential-performance linkage. Attitudinal endorsement also shaped behavioral awareness, predicting recognition of compassionate behaviors such as empathy and active listening (β = 0.39). Organizational compassion, defined as being treated compassionately during crises, was predicted by perceived importance (β = 0.44) and contributed to satisfaction (β = 0.50). Religious affiliation significantly influenced workplace attitudes, with moderate to strong effects across domains: team compassion importance (β = 0.52), organizational compassion (β = 0.45), team-building endorsement (β = 0.48), behavioral recognition (β = 0.39), satisfaction (β = 0.46), and performance belief (β = 0.51). Overall, the model delineates a structured pathway from demographic identity through attitudinal beliefs and behavioral recognition to experiential satisfaction and team performance, supported by large effect sizes (Cohen's w = 1.34–3.0) and highly significant chi-square values (all p < 0.001). Model fit was strong (RMSEA ≈ 0.05), confirming the structural validity of compassion as a relational and performance-enhancing construct in team environments.

Qualitative text analysis in study no. 2: compassion in organizations (open-ended questions)

In study no. 2, participants were asked: "Can you provide an example of a time when your organization treated you with compassion

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TABLE 2 Survey no. 1 – cross-sectional study (N = 318) (multiple-choice questions).

		Which world religion do you think emphasizes compassion as a core tenet?							
Question	Answer	Christianity	Islam	Buddhism	Hinduism	Judaism	Other	ANOVA F (p)	Effect size d
In your opinion, does compassion derive more from religious teaching or common sense?	Mostly from religious teachings	76 (34.86%)	23 (33.82%)	16 (17.78%)	10 (16.67%)	21 (31.34%)	8 (6.82%)	6.43 (0.012)	0.20
	Mostly from common sense	48 (22.02%)	17 (25%)	27 (30%)	21 (35%)	15 (22.39%)	27 (61.36%)		
	Both equally	89 (40.83%)	24 (35.29%)	38 (42.22%)	24 (40%)	24 (35.82%)	10 (22.73%)		
	Neither	5 (2.29%)	4 (5.88%)	9 (10%)	5 (8.33%)	7 (10.45%)	4 (9.09%)		
Do you believe that compassion is adequately represented in modern media?	Yes, it is well represented	83 (30.07%)	35 (51.47%)	19 (21.11%)	13 (26.87%)	18 (26.87%)	5 (11.36%)	4.29 (0.033)	0.16
	No, it needs more representation	112 (51.38%)	27 (39.71%)	59 (65.56%)	41 (68.33%)	41 (61.19%)	32 (72.73%)		
	Unsure	23 (10.55%)	6 (8.82%)	12 (13.33%)	6 (10%)	8 (11.94%)	7 (15.81%)		
In which of the following areas do you think compassion is most needed today?	Healthcare	162 (74.31%)	51 (75%)	74 (8.22%)	49 (81.67%)	57 (85.07%)	36 (81.82%)	0.68 (n.s.)	0.06
	Education	144 (66.06%)	57 (83.82%)	67 (74.44%)	45 (75%)	55 (82.09%)	30 (61.18%)		
	Politics	103 (47.25%)	44 (64.71%)	48 (53.33%)	30 (63.33%)	41 (61.19%)	25 (56.82%)		
	Business	77 (35.32%)	31 (45.59%)	42 (46.67%)	29 (48.33%)	32 (47.67%)	22 (50%)		
	Community services	115 (52.75%)	42 (60.29%)	67 (74.44%)	43 (71.76%)	47 (70.15%)	23 (52.27%)		
	Family	135 (61.93%)	39 (57.35%)	62 (68.89%)	44 (73.33%)	45 (67.16%)	29 (65.91%)		
Do you think compassion should be taught explicitly as part of educational curricula?	Yes	164 (76.23%)	58 (85.29%)	61 (67.78%)	48 (80%)	50 (74.63%)	24 (54.55%)	0.77 (n.s.)	0.07
	No	20 (9.17%)	6 (8.82%)	8 (8.89%)	3 (5%)	6 (8.96%)	10 (22.73%)		
	Only as part of religious studies	12 (5.50%)	2 (2.94%)	5 (5.56%)	3 (5%)	3 (4.48%)	1 (2.27%)		
	Only as part of ethics or philosophy classes	22 (10.09%)	2 (2.94%)	16 (17.78%)	6 (10%)	8 (11.94%)	9 (24.95%)		

during a crisis or complex situation?" The objective of this survey was to examine the role of compassion in team dynamics, crisis response, workplace satisfaction, and organizational performance. Their responses revealed three interconnected themes. The first theme, organizational compassion as understanding, reflected the importance of empathy and recognition of individual circumstances, illustrated by the account "when I had an illness and they were very understanding." The second theme, organizational compassion as supportive relationship, emphasized tangible assistance and care, captured in the response "helped with accident expenses." The third theme, organizational compassion as collective response, highlighted coordinated action at the group level, exemplified by the statement "we had a co-worker die during her shift. Management pulled staff from other departments to allow our staff to leave." Taken together, these themes demonstrate that organizational compassion is expressed through understanding, practical support, and collective action, each contributing to resilience, trust, and well-being in the workplace (Figure 4).

Set theory model from survey no. 2

We identified three sets of Organizational Compassion (OC): OC_1 = Compassion as Understanding {empathy, patience, emotional recognition}, OC_2 = Compassion as Supportive Relationship {financial

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TABLE 3 Survey no. 2 – compassion in organizations (multiple-choice questions).

Survey no. 3 (N = 274)	Answer choice	Responses (%)	N	χ^2 (GFI) (significance p)	Effect size Cohen's w
Gender:	Male	48.91%	134	n.s.	
	Female	51.09%	140		
Age	18–29	8.39%	23	113.18 (<0.001)	1.67
	30–44	41.61%	114		
	45–60	40.51%	111		
	>60	9.49%	26		
Religious affiliation	Christianity	40.88%	112	119.90 ($p < 0.001$)	0.66
	Islam	13.14%	36		
	Buddhism	15.33%	42		
	Hinduism	10.22%	28		
	Judaism	11.68%	32		
	Other	8.76%	24		
How important do you believe compassion is in team relationships?	Very important	59.85%	164	364.32 (<0.001)	>3.0
	Important	32.12%	88		
	Moderately Important	6.57%	18		
	Slightly Important	1.46%	4		
	Not important	0.00%	0		
In moments of crisis or complex situations, do you feel that your organization treats you with compassion?	Always	41.24%	113	138.29 (<0.001)	2.01
	Often	23.72%	65		
	Sometimes	26.28%	72		
	Rarely	7.30%	20		
	Never	1.146%	4		
Do you think compassion should be considered a key skill in team building?	Strongly agree	53.65%	147	306.40 (<0.001)	>3.0
	Agree	35.40%	97		
	Neutral	10.22%	28		
	Disagree	0.73%	2		
	Strongly Disagree	0.00%	0		
Which of the following aspects do you believe are part of demonstrating compassion in a team? Select all that apply	Active Listening	80.66%	221	85.31 (<0.001)	1.34
	Empathy	65.69%	180		
	Supportive Communication	62.41%	171		
	Understanding Personal Circumstances	50.36%	138		
	Providing Assistance	48.54%	133		
	Offering Encouragement	41.97%	115		
How satisfied are you with the level of compassion shown by your team members?	Very satisfied	42.34%	116	190.48 (<0.001)	3.021
	Satisfied	35.77%	98		
	Neutral	17.52%	48		
	Dissatisfied	3.28%	9		
	Very Dissatisfied	1.09%	3		
Do you believe that showing compassion in team relationships leads to better team performance?	Strongly agree	59.49%	163	363.44 (<0.001)	>3.0
	Agree	32.48%	89		
	Neutral	7.66%	21		
	Disagree	0.36%	1		
	Strongly Disagree	0.00%	0		

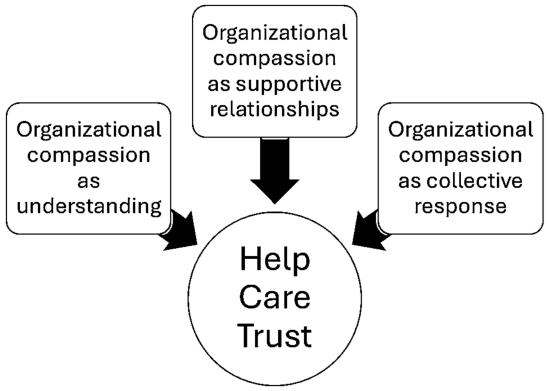


FIGURE 4
Themes in organizational compassion.

assistance, personal support, relational care}, and OC_3 = Compassion as Collective Response {team coordination, crisis adaptation, structural flexibility}. Their intersection, $OC_1 \cap OC_2 \cap OC_3$ = {help, care, trust}, signifies the shared ethical foundation of organizational compassion, while the union $OC_1 \cup OC_2 \cup OC_3$ captures the complete scope of compassionate practice. The synthesis function Compassion = $f(OC_1, OC_2, OC_3)$ combines emotional sensitivity, practical support, and coordinated action, resulting in multidimensional organizational behavior. Survey 2 confirmed that this model improves well-being and public health: the intersection fosters emotional safety and cohesion, while the union reflects the range of compassionate responses in crises. Overall, Compassion = $f(OC_1, OC_2, OC_3)$ encourages resilience, ethical conduct, and relational stability, reinforcing compassion's role as a public health asset within organizational settings.

Result from survey no. 3: perceived compassion in organizations and role of religion or common sense

The research hypothesis was that employees who perceive high levels of compassion within organizational teams, especially during crises, are more likely to report enhanced job satisfaction, well-being, and team performance. The survey (population: $N = 285$) explored perceptions of compassion within workplace relationships, focusing on its connection to religion, common sense, and personal experiences. Gender distribution was balanced (male: 48.08%, female: 51.15%, other/prefer not to answer: 0.76%), with a significant $\chi^2 = 232.59$ ($p < 0.001$, w = 4.21), suggesting notable variation in gender-related responses. Age distribution showed a concentration in mid-career professionals, with 35–44 years (33.09%) and 45–54 years (31.27%) forming the majority, while younger (18–24: 2.91%) and older (65+: 1.82%) groups were less represented ($\chi^2 = 207.06$, $p < 0.001$, w = 3.25). Religious affiliation was distributed within Christianity (40.35%), Islam (12.98%), Buddhism (16.14%), Hinduism (10.53%), Judaism (11.58%), and Other (8.24%) ($\chi^2 = 97.79\%$; $p < 0.001$, w = 0.5). Regarding the basis for understanding compassion within organizations, respondents primarily relied on common sense (34.39%), followed closely by religious interpretation (30.18%) and personal experiences (24.56%), while company culture played a minor role (10.18%) ($\chi^2 = 114.03$, $p < 0.001$, w = 1.63). A majority (58.95%) felt their religion or faith could guide their application of compassion in the workplace, whereas 28.77% disagreed, and 12.28% found the question not applicable ($\chi^2 = 95.76$, $p < 0.001$, w = 1.42) (Table 4).

Path analysis

Based on survey no. 3 ($N = 285$), the path analysis revealed a statistically significant model linking demographic identity, interpretive focus, and religious applicability of compassion in workplace settings. Gender was statistically significant ($\chi^2 = 232.59$, $p < 0.001$, Cohen's w = 4.21) but excluded as a non-predictive factor. Religious affiliation showed a moderate positive association with prioritizing religious interpretation or personal experience as compassion anchors ($\beta = 0.41$). Age emerged as a strong predictor ($\chi^2 = 207.06$, $p < 0.001$, w = 3.25), with older respondents more likely to emphasize religious interpretation or common sense over personal experience or company culture ($\beta = 0.44$). Interpretive preferences mediated belief in religion as workplace guidance ($\beta = 0.52$), supported by strong reciprocal effects (Cohen's w = 1.63 and 1.42). Overall, the model delineates a pathway from age → interpretive focus → religious applicability, highlighting demographic maturity and moral orientation in shaping compassion. Religious affiliation further predicted compassion's perceived importance in team building, recognition of supportive behaviors, satisfaction with team compassion, and belief in its impact on performance. Compassionate attitudes were closely tied to organizational care during crises, highlighting compassion's role in effective team dynamics. Model fit was strong (RMSEA ≈ 0.05, values < 0.06 indicating good fit), confirming the structural validity of the pathway.

Qualitative text analysis in survey no. 3: compassion, religion, and organizations (open-ended questions)

In survey no. 3, participants were asked: "When you consider compassion within your team and organization, what aspect do you primarily focus on?" The objective of this survey was to explore how compassion shapes leadership, team relationships, workplace satisfaction, and collaborative performance across groups. Responses revealed two main themes. The first, reciprocity, highlighted mutual respect and fairness, illustrated by the statement "treating others as you would want to be treated." The second, understanding, emphasised the importance of empathy and recognizing others' perspectives, simply expressed as "understanding." Participants were also asked: "Do you think that your religion or faith could offer guidance on interpreting or applying compassion in your workplace?" Those who answered affirmatively described a variety of influences. The theme of religious guidance included charity, kindness, patience, forgiveness, and love, with references to key teachings such as the Golden Rule and the Ten Commandments. Some responses included "love one another," "love your neighbor as yourself," and "religion can help you handle situations better." Others stressed values like charity, empathy, and active listening, noting that faith traditions encourage approaching challenges with compassion and supporting one another. As one participant explained, "share the same love Jesus Christ showed us and compassion with each other," while another highlighted that "our work

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TABLE 4 Survey no. 3 – perceived compassion in organizations and role of religion or common sense (multiple-choice questions).

Survey no. 3 (N = 285)	Answer choice	Responses (%)	N	χ^2 (GFI) (significance p)	Effect size Cohen's w
Gender	Male	48.08%	134	232.59 (<0.001)	4.21
	Female	51.15%	133		
	Other	0.38%	1		
	Prefer not to answer	0.38%	1		
Age	Under 18	0.73%	2	207.06 (<0.001)	3.25
	18–24	2.91%	8		
	25–34	15.64%	43		
	35–44	33.09%	91		
	45–54	31.27%	86		
	55–64	14.55%	40		
	65+	1.82%	5		
Religious affiliation	Christianity	40.35%	115	97.79 ($p < 0.001$)	0.5
	Islam	12.98%	37		
	Buddhism	16.14%	46		
	Hinduism	10.53%	30		
	Judaism	11.58%	33		
	Other	8.42%	24		
When you consider compassion within your team and organization, what aspects do you primarily focus on?	Religious interpretation	30.18%	86	114.03 (<0.001)	1.63
	Common sense	34.39%	98		
	Personal experiences	24.56%	70		
	Company culture	10.18%	29		
	Other	0.7%	2		
Do you think your religion or faith could offer guidance on interpreting or applying compassion in your workplace?	Yes	58.95%	168	95.76 (<0.001)	1.42
	No	28.77%	82		
	Not applicable	12.28%	35		

value emphasis on empathy, kindness, and understanding" and fosters a compassionate workplace culture. Overall, these themes show that compassion in organizational settings is understood both as a relational practice of reciprocity and understanding and as a value system enriched by religious or faith-based guidance, which offers moral charity and promotes kindness, patience, and collective support (Figure 5).

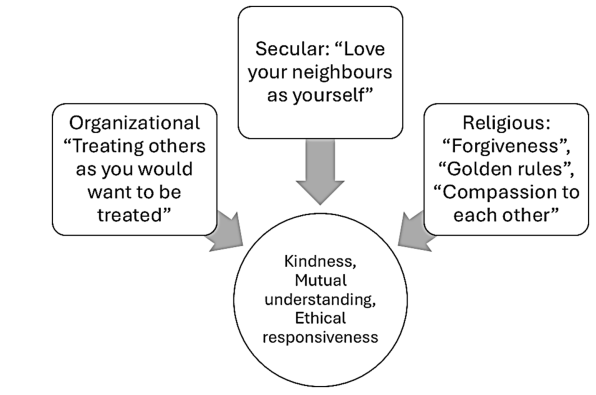


FIGURE 5
Compassion, organization and religion.

Set theory model from survey no. 3

This model used set theory to formalize compassion in organizational contexts shaped by ethical and religious principles. Three domains were defined: organizational (= reciprocity, empathy, active listening), religious (= charity, forgiveness, Golden Rule), and secular ethics (= universal moral principles such as fairness and treating others well). Their intersection, = ∩ ∩ , represented the shared core of compassion—kindness, mutual understanding, and ethical responsiveness—essential for leadership and team cohesion. The union, ∪ ∪ , captured the full landscape of compassion, including organizational practices, religious directives, and ethical imperatives. Religious teachings influenced organizational behavior (→), while ethical principles guided team functioning (→). Jointly, R ∪ E → O

illustrated how integrated moral and spiritual foundations shape compassionate leadership. The synthesis function, Compassion = *f*(, ,), expressed how these domains interact to produce environments of charity, empathy, and ethical responsiveness. Survey 3 confirmed that received compassion—through O, R, and E—emerges from their intersection as a unified framework that enhances psychological safety, moral charity, and relational well-being, affirming compassion's role in public health and organizational resilience.

Aggregated results

Across all three surveys, the integrated path and set-theory analyses uncovered a clear, statistically significant progression linking demographic factors to compassion-related beliefs, behaviors, and workplace experiences. Age consistently emerged as the most influential predictor, with older respondents more likely to value compassion, recognize its underrepresentation in media, and prioritize religious or commonsense interpretations. Religious affiliation provided a distinct moral and interpretive perspective, influencing how compassion was understood, endorsed in education, and perceived in media, team dynamics, and crisis response. Notably, receiving compassion from others was not viewed uniformly: within religious frameworks, compassion was often understood as divine grace, moral duty, or communal solidarity, whereas within secular frameworks, it was framed as ethical care, humanistic responsibility, or fairness. These dual interpretive pathways highlight compassion's versatility as both a spiritual and civic resource. Attitudinal beliefs—including the importance of compassion, its teachability, and moral foundation—served as mediators, linking demographic maturity and moral orientation with lived organizational and societal experiences. Respondents who regarded compassion as teachable and morally grounded were more likely to recognise compassionate behaviors, report satisfaction with team interactions, and affirm its influence on performance and social life. Gender showed some statistical variation but played a minor role overall and was therefore excluded from the final models. At organizational level, compassion translated into tangible outcomes. Recognition of compassionate behaviors, satisfaction with team dynamics, and confidence in compassion's impact on performance were consistently reported. Receiving compassion within workplace settings was associated with reduced stress, increased resilience, and higher satisfaction, reinforcing its restorative function in professional environments.

Beyond the workplace, compassion emerged as a relational ethic defined by empathy, non-judgment, altruism, supportive relationships, and collective response. Experiencing compassion from others validated identity, strengthened psychological well-being, and reinforced trust and cohesion within communities. Religious frameworks often reinforced compassion as a sacred obligation, while secular frameworks emphasized its role in sustaining fairness, cooperation, and civic responsibility. Together, these perspectives enriched compassion's meaning and broadened its impact. Finally, the integrated models demonstrated compassion's reach across multiple domains of influence. At the personal level, receiving compassion enhanced emotional regulation, resilience, and satisfaction, with religious interpretations deepening its spiritual resonance and secular interpretations reinforcing its ethical charity. Institutionally, compassion embedded in organizational settings, education, and organizational practice improved outcomes and equity, while also legitimizing compassion as a professional standard. At the societal level, compassion strengthened public health, media representation, and community cohesion, positioning it as a shared moral and operational construct that sustains healthier individuals, stronger institutions, and more cohesive communities (Table 5).

Discussion and conclusion

All objectives and hypotheses were confirmed, illustrating compassion's indirect yet significant role in enhancing personal well-being and public health. Participants consistently interpreted compassion through religious, secular, and intuitive frameworks, highlighting its pluralistic relevance. Compassionate acts were recognized across family, workplace, healthcare, and community settings, functioning as relational mechanisms that foster resilience and social support. These interpretations indirectly support the current trend in considering receiving compassion as a factor contributing to personal well-being and broader public health outcomes, by reinforcing resilience, fostering social cohesion, and

TABLE 5 Summative results.

Section	Variables	Impact on personal and societal well-being
Demographic predictors	Age drives compassion values; religion shapes interpretation; gender is excluded.	Age adds moral charity; religion frames received compassion as grace, duty, or solidarity, strengthening resilience and identity.
Attitudinal beliefs (mediators)	Beliefs in compassion's importance, teachability, and moral grounding bridge demographics with outcomes.	Seeing compassion as teachable enhances emotional regulation; societal embedding normalizes compassion in education and discourse.
Organizational outcomes	Compassion attitudes translate into recognition, team satisfaction, and performance impact.	Receiving compassion at workplace reduces stress and builds resilience; compassionate workplaces foster healthier institutions.
Relational ethic	Compassion is defined by empathy, non-judgment, altruism, supportive ties, and collective response.	In the individual, compassion from others validates identity and well-being; in social relationships it builds trust, cohesion, and resilience in communities.
Domains of influence	Compassion spans personal, institutional, and societal domains.	Receiving compassion boosts emotional balance and satisfaction; institutions and societies gain equity, cohesion, and public health benefits.

shaping organizational cultures that embed compassionate practices. At the broader level, compassion indirectly shaped organizational culture and community resilience, supporting the institutionalization of compassionate practices. Collectively, findings demonstrate compassion's power to advance public health outcomes through its relational and interpretive impact. Therefore, the results confirm previous research and extend understanding of compassion's global impact, demonstrating its influence both at the micro level in interpersonal relationships and at the macro level as a sustaining force within organizations and societies (68–78).

Scholarship on compassion underlines its dual function as both an interpersonal virtue and a systemic resource. Research on bidirectional compassion indicates that giving and receiving support are mutually reinforcing, fostering trust, resilience, and psychological safety (79). Receiving compassion specifically alleviates stress, reduces isolation, and aids recovery, thereby enhancing individual well-being and collective health (79). Crawford and colleagues expand this perspective by analyzing compassionate language in acute mental health care, demonstrating how discourse influences therapeutic relationships and creates environments where patients feel heard, valued, and supported (79). Collectively, these insights emphasize compassion's vital role in fostering resilience and health across personal and institutional settings (79). Brown and colleagues highlight practical compassion, where everyday gestures operationalise care and affirm dignity (80). These micro-level acts, when received, strengthen emotional resilience and improve adherence to treatment, with downstream effects on public health indicators such as reduced hospital readmissions and improved community trust in healthcare systems. The notion of compassionate environments further emphasises organizational culture, team cohesion, and institutional support as critical to sustaining compassion (81, 82). When healthcare professionals themselves experience compassion, burnout is reduced, staff retention improves, and the quality of care increases (78). Compassionate design incorporates compassion into social environments, systems, and procedures, normalizing it as a collective resource that boosts resilience and promotes equitable, sustainable health outcomes (78).

Limitations

This study offers valuable insights into how receiving compassion influences mental well-being and organizational climate, but several limitations should be recognized. The sample was limited to working-age adults in the United States, limiting its applicability across cultures, generations, and institutional settings. Although the mixed-method design enhanced interpretation, reliance on self-reported data introduces biases such as social desirability and retrospective distortion. The absence of longitudinal data hindered the evaluation of long-term effects on well-being and collaboration, while the exploration of religious and secular ethical frameworks did not fully disentangle their individual impacts or consider intersectional factors like race, gender, religion, and socioeconomic status. Furthermore, the lack of observational or behavioral data limits the validation of reported experiences. Future research should adopt cross-cultural and longitudinal designs, incorporate behavioral methods to triangulate self-reports, and investigate how intersectional identities and ethical frameworks influence reception.

Several types of generalizability strengthen the contribution of this study. Statistical generalizability is supported by findings from a large U.S. working-age sample, providing a foundation for future cross-national or multi-site research. Ecological generalizability highlights compassion's adaptability across workplaces, schools, and community organizations, underscoring its role as relational infrastructure. Cross-cultural transferability points to the potential for replication in diverse contexts to test whether predictors such as age and religious affiliation are universal or vary by culture. Intersectional transferability emphasizes relevance across overlapping identities, including race, gender, socioeconomic status, and religion. Temporal generalizability establishes a basis for examining whether compassion's impact on well-being and organizational performance persists across life stages and changing social conditions. Finally, conceptual or theoretical transferability ensures that the relational framework of compassion can inform public health, ethics, and community resilience, positioning the study as a versatile and impactful contribution.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

Ethical approval was not required for the studies involving humans because an anonymous online survey is accessible to persons who cannot be identified by researchers or others. Third party data collection. The studies were conducted in accordance with the local legislation and institutional requirements. Written informed consent for participation was not required from the participants or the participants' legal guardians/next of kin in accordance with the national legislation and institutional requirements because Anonymous online survey of unknown responders.

Author contributions

CL: Conceptualization, Data curation, Formal analysis, Funding acquisition, Investigation, Methodology, Project administration, Resources, Software, Supervision, Validation, Visualization, Writing – original draft, Writing – review & editing. PC: Conceptualization, Data curation, Formal analysis, Funding acquisition, Investigation, Methodology, Project administration, Resources, Software, Supervision, Validation, Visualization, Writing – review & editing. YK: Conceptualization, Data curation, Formal analysis, Funding acquisition, Investigation, Methodology, Project administration, Resources, Software, Supervision, Validation, Visualization, Writing – review & editing.

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Supplementary material

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Impact of social alienation on self-care ability in rural older adults through psychological resilience and subjective wellbeing

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Background: The present study is intended to examine the multiple mediating roles of psychological resilience and subjective well-being in the relationship between social alienation and self-care ability in old age among rural empty-nest older adults.

Methods: From February 17, 2021, to April 20, 2023, a questionnaire survey conducted using a multistage stratifed sampling method among 425 rural empty-nest older adults (60 years and over). These participants were recruited from a rural areas of Liaoning Province, China. The questionnaire included the Social Alienation Scale, the Psychological Resilience Scale, the Subjective Well-being Scale, the Self-care Ability In Old Age Scale. A descriptive analysis was performed to characterize the sample. Linear regression was utilized to evaluate the relationship between social alienation and self-care ability in old age. PROCESS macro (Model 6) was used to analyze the multiple mediated effects of psychological resilience and subjective well-being.

Results: Social alienation exerted a remarkable direct effect on the self-care ability in old age among rural empty-nest older adults (β = −0.678, 95% CI = −0.750− −0.607), which represented 56.45% of the total effect. Through three significantly mediated pathways indirectly affect the self-care ability in old age: (1) through the psychological resilience pathway (β = −0.431, 95% CI = −0.515− −0.350), which represented 35.89% of the total effect; (2) through the subjective well-being pathway (β = −0. 044, 95% CI = −0.089− −0.010), which represented 3.67% of the total effect; and (3) through both the psychological resilience and subjective well-being pathway (β = −0.048, 95% CI = −0.073− −0.029), which represented 3.99% of the total effect. The total mediating effect was 43.55%.

Conclusion: Psychological resilience and subjective well-being mediate the relationship between social alienation and self-care ability in old age among rural empty-nest older adults. Therefore, healthcare professionals and stakeholders should be concerned about the psychological resilience status and mental health of rural empty-nest older adults, strengthen their attention to subjective well-being, and adopt necessary targeted intervention measures to enhance the psychological resilience and subjective well-being of rural empty-nest older adults.

KEYWORDS

psychological resilience, rural empty-nest older adults, self-care ability in old age, social alienation, subjective well-being

Background

China currently holds the distinction of having the world's largest population of older adults citizens, coupled with the fastest rate of aging (1). According to the data from the seventh census in 2020, the proportion of rural residents aged 60 and above and 65 and above are 23.81 percentage points and 17.72 percentage points, respectively, which is significantly higher than in urban areas (2).

With rapid urbanization, many rural young and middle-aged laborers migrate to cities, seeking better opportunities. The white paper "The Youth of China in the New Era" released by China's State Council Information Office in 2022 indicates that there were nearly 170 million migrant workers in 2020, most of whom are young people (3, 4).

As a result, the degree of "empty nest" is serious, and "hollow villages" are increasingly common. Rural empty-nest older adults refers to the older adults who live without their children nearby, including those without children and those living separately from their children (5–7).

This scenario presents a heavy burden for older adults care in rural China. Fully tapping the advantages and potential of rural empty nesters and improving their self-care ability in old age is of great significance for relieving the pressure of older adults care and promoting positive aging. Self-care ability in old age includes economic independence, self-care, and health maintenance (8).

Rural empty nesters often face challenges of loneliness and social alienation due to the independence of their children. Social alienation refers to a state where an individual is unable to establish positive interactions with others or the surrounding environment, leading to negative emotions (9). Social alienation can be considered a source of stress, causing psychological stress in empty nesters, and is a predictive factor for various diseases and adverse health outcomes. Recent studies have shown that social alienation is an important factor leading to loneliness and depression, which may affect the psychological health and quality of life of the older adults, thereby reducing the self-care ability of rural empty nesters (10, 11).

Recent research suggests that social alienation significantly impacts psychological resilience, defined as an individual's ability to recover from stress, challenges, or adversity (12). Psychological resilience is a key factor in coping with life's difficulties and is considered a vital protective factor among the older adults, helping to alleviate negative emotions and psychological stress (13, 14). For instance, prolonged social isolation can lead to persistent feelings of loneliness and emotional distress, which in turn erodes psychological resilience (15). This decline in resilience makes it more difficult for older adults individuals to recover from the stresses and challenges posed by social alienation (16).

The erosion of psychological resilience due to social alienation has a direct impact on the self-care ability of the older adults. Self-care ability involves managing one's daily life and health, including maintaining physical health, handling finances, and performing household activities (17, 18). When older adults possess higher levels of psychological resilience, they are more likely to actively face health challenges, adapt to physical changes, and effectively manage various tasks and responsibilities in daily life. Conversely, older adults individuals with lower psychological resilience may feel more overwhelmed when facing life's challenges, thereby impacting their self-care ability (19, 20).

Recent studies suggest a strong correlation between psychological resilience, social alienation, and self-care capabilities in older adults individuals living alone in rural areas (21). Therefore, it is possible to hypothesize that social alienation lowers the older adults's psychological resilience, which in turn reduces self-care ability in old age. Stated differently, the association between social alienation and self-care ability in old age may be mediated by psychological resilience.

Research findings indicate that social alienation can reduce an individual's subjective well-being, which in turn significantly impacts the self-care ability of the older adults (4). Prolonged social alienation can lead to feelings of loneliness and emotional distress, thereby decreasing individuals' life satisfaction and happiness (22). Subjective well-being, which encompasses overall life satisfaction and emotional balance, is a crucial indicator of psychological health and quality of life (4). Higher levels of subjective well-being can enhance the confidence and positivity of older adults individuals, making them more motivated and capable of handling various challenges and tasks in life (4). Studies have shown that older adults individuals with higher subjective well-being are more proactive in dealing with health issues and daily tasks, exhibiting greater self-care abilities (23). Therefore, it can be hypothesized that social alienation affects self-care ability in old age by reducing their subjective well-being. In other words, subjective well-being may mediate the relationship between social alienation and self-care ability in old age.

Cornwell and Waite (24) pointed out that prolonged social isolation can lead to feelings of loneliness and emotional distress, which may weaken an individual's ability to cope with life challenges, thereby reducing their level of psychological resilience. Bonanno (25) found that decreased psychological resilience makes older adults individuals more prone to negative emotions, which in turn reduces their subjective well-being.

Research findings demonstrated that older adults individuals with high psychological resilience can more effectively cope with the negative emotions brought about by social alienation, maintaining higher levels of subjective well-being (23). Ryff and Singer (26, 27) emphasized that subjective well-being is crucial for self-care ability in old age. Individuals with higher subjective well-being are more likely to proactively address health issues and daily challenges, exhibiting stronger self-care ability in old age.

This study is grounded in the Social Ecological Model (SEM) and Psychological Resilience Theory. The SEM provides a comprehensive multi-level framework, positing that individual health behaviors—such as self-care—are not merely personal choices but are shaped by a complex interplay between individual, interpersonal, and environmental factors. For rural empty-nest older adults, the SEM allows for an exploration of how distal social factors (e.g., social alienation) interact with proximal psychological resources (e.g., resilience and well-being) to determine self-care outcomes. Complementing this, Psychological Resilience Theory emphasizes the internal capacity of individuals to adapt to stressors. In the context of the "empty-nest" transition, resilience serves as a critical psychological buffer; however, chronic social alienation may erode this capacity, subsequently diminishing an individual's motivation and ability to maintain self-care practices.

The primary objective of this study is to elucidate the mechanisms through which social alienation influences self-care ability among rural

Abbreviations: SAS, Social Alienation Scale; PRS`, Psychological Resilience Scale; SWS, Subjective Well-being Scale; SAIOAS, Self-care Ability In Old Age Scale; SD, Standard Deviation; SE, Standard Error; B, Unstandardized; CI, Confidence interval; ANOVA, Analysis of Variance; ΔR, Amount of R2 change.

empty-nest older adults. Specifically, this research aims to: (1) quantify the direct impact of social alienation on self-care capacity; (2) examine the independent mediating roles of psychological resilience and subjective well-being; and (3) determine whether these two factors operate sequentially as a chain mediation. By identifying these pathways, the study seeks to provide a theoretical basis for targeted interventions to improve the health outcomes of this vulnerable population.

Based on the literature review, we propose the following hypotheses (This study's conceptual framework see Figure 1):

> *H1*: Social alienation negatively impacts self-care ability in old age through psychological resilience.
>
> *H2*: Social alienation negatively impacts self-care ability in old age through subjective well-being.
>
> *H3*: Psychological resilience and subjective well-being jointly mediate the effect of social alienation on self-care ability in old age.
>
> *H4*: Subjective well-being acts as a dependent variable in the relationship between social alienation and self-care ability in old age.
>
> *H5*: A serial mediator model is more appropriate than a parallel mediator model for these relationships.

We anticipate that psychological resilience and subjective well-being can act as buffering factors, reducing the negative impact of alienation and enhancing the self-care capabilities of the older adults. Through this study, we aim to provide a theoretical basis for the formulation of targeted intervention measures to improve the quality of life for older adults people living alone, and to offer valuable information for policymakers to better support this unique group. Moreover, our research will also contribute new perspectives and data for future studies in mental health.

Materials and methods

Participants

Between February 17, 2021, and April 20, 2023, a multistage stratified sampling approach was employed for data collection across ten townships in Chaoyang County, Chaoyang City, located in Liaoning Province, China. A random digit table was used for all necessary calculations to select rural empty-nest older adults in Chaoyang City, Liaoning Province (a total of 8 counties) as the research population. First, the 8 counties were numbered, and 3 counties were randomly selected using a random number table (the study included Chaoyang County, Beipiao County, and Jianping County). Next, the townships in these counties were numbered as follows: Chaoyang County (25 townships), Beipiao County (27 townships), and Jianping County (24 townships). Another random number table was used to select 3 townships from each county.

For the study, older adults living alone in each selected township were systematically selected from the civil affairs department, meeting specific inclusion criteria. These criteria included willingness to participate, the ability to communicate clearly and verbally without impediments, and no documented history of neurological or psychiatric conditions.

Sample size and power calculation

Before data collection, a sample size calculation was performed using the G*Power Calculator to determine the appropriate sample size and ensure sufficient statistical power for the study. Based on the expected effect sizes and the desired power level (0.80) and alpha level (0.05), the calculation indicated that at least 400 participants would be required to detect statistically significant relationships between the variables. This sample size was chosen to minimize the risk of Type II errors (false negatives) and ensure the robustness of the results.

To avoid data saturation and ensure that the study had sufficient power, we aimed to distribute 450 questionnaires. In total, 425 valid responses were received, yielding a high response rate of 94.44%. Participants were registered as rural residents and permanent residents (continuously residing for ≥6 months), aged 60 or older, and were those whose children were not around for a long time (within a year, children visited for less than three months).

Survey process and data collection

Before conducting the survey, twenty investigators underwent standardized training to enhance their communication abilities and familiarity with the scoring system. Rural older adults living alone were approached with questionnaires. After providing informed consent, participants engaged in one-on-one interactions with the researchers and completed the surveys themselves. Throughout this process, all methods adhered to the principles outlined in the Helsinki Declaration.

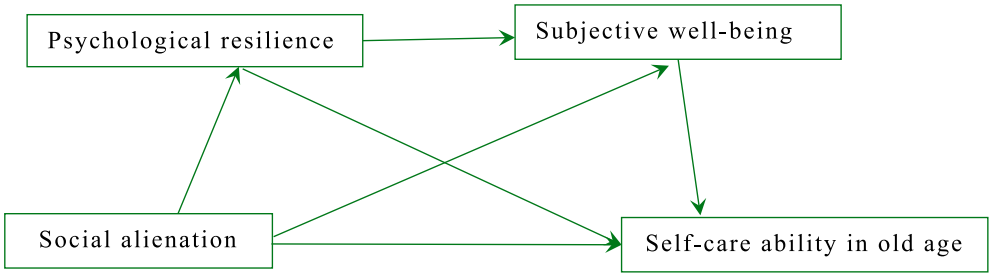


FIGURE 1
Hypothesized model.

Sample size and power calculation

To ensure statistical stringency and minimize the risk of Type II errors, an *a priori* power analysis was conducted using G*Power software (version 3.1.9.7). The calculation was based on a medium effect size (f^2 = 0.15), a significance level (α) of 0.05, and a target statistical power ($1 - \beta$) of 0.80. The analysis indicated that a minimum sample size of 400 participants was required to detect significant mediating effects within the proposed structural model. To account for a potential attrition rate or incomplete responses (estimated at approximately 10–15%), the recruitment target was set at 450. Ultimately, 425 valid questionnaires were recovered, yielding an effective response rate of 94.44%, which exceeded the requirements for robust statistical inference.

Participants and data collection

The study focused on rural empty-nest seniors. Inclusion criteria were defined as: (1) registered rural residents with permanent residency (residing in the area for > 6 months); (2) aged 60 years or older; and (3) meeting the "empty-nest" definition (children absent for the majority of the year, with total visitation time of less than three months annually).

Data collection was executed by a team of twenty investigators who underwent standardized training to ensure inter-rater reliability, communication proficiency, and mastery of the scoring instruments. Participants were recruited through face-to-face outreach. Following the provision of informed consent, researchers administered the questionnaires via one-on-one interviews to accommodate varying literacy levels among the older participants. All procedures were conducted in strict accordance with the ethical standards of the Declaration of Helsinki.

Exclusion of childless older adults

To address the fundamental differences in the nature of social support, we excluded older adults without children from the study. This ensured that the focus remained on those who have children but whose children are not currently living with them, providing a consistent basis for analyzing the impact of social alienation on self-care ability.

Measurement

Social Alienation Scale

The Social Alienation Scale (SAS), developed by Jessor and colleagues (28), serves as a tool to gauge individual feelings of alienation and hesitance in engaging with activities. In our research, we utilized the 15-item version of this scale, which is known for its robust validity and reliability, evidenced by a Cronbach's alpha of 0.77. This scale is divided into four distinct subscales (29): feelings of social alienation, self-alienation, meaninglessness, and powerlessness. Responses are recorded on a four-point Likert scale, ranging from 1 (strongly disagree) to 4 (strongly agree), allowing for a total score between 15 and 60. Higher scores on this scale indicate greater social alienation. Sample items include "Sometimes I feel that the people I know are not very friendly" for social alienation and "Most of the things I do daily are very valuable and meaningful to me" for meaninglessness. In our study, the overall Cronbach's alpha for the GSAS was 0.805, and the Cronbach's α for each subscale ranged from 0.614 for powerlessness to 0.772 for feelings of self-alienation in this study. This limitation is acknowledged and discussed in the limitation section.

Psychological Resilience Scale

The Psychological Resilience Scale, originally developed in English by Wagnild and Young (30), was later translated into Chinese by Huang Weixiao (1). This scale comprises five dimensions: equanimity, persistence, self-reliance, meaningful life experiences, and ease of being, totaling 25 items. Each item is scored on a scale from "1" indicating complete disagreement to "7" indicating complete agreement. The total score ranges from 25 to 175, with higher scores indicating higher levels of resilience. A total score below 125 indicates a low level of psychological resilience, between 125 and 145 indicates a moderate level, and above 145 indicates a high level of resilience. Sample items include "I can get through difficult times because I've experienced difficulty before" for persistence and "When I make plans, I will follow through with them" for self-reliance. The scale's Cronbach's alpha is 0.943, with subscale Cronbach's alphas ranging from 0.797 to 0.913.

Subjective Well-being Scale

The Subjective Well-being Scale, developed by Kozma et al. (31), is a tool for measuring subjective well-being, particularly in older populations. First implemented in Newfoundland in 1980, it targeted individuals aged 65–95 across urban and rural areas, as well as those in senior living facilities. The Subjective Well-being Scale is notable for its high reliability and validity (32). This scale has proven effective for assessing the subjective well-being of older adults people in China as well. Comprising 24 items, the Subjective Well-being Scale is divided into four subscales: positive affect (PA) and negative affect (NA), each with five items, and positive experience (NE) and negative experience (PE), each with seven items. The scoring system ranges from −24 to +24, with a constant of 24 added for ease of calculation, resulting in a final score range of 0–48. Higher scores indicate greater subjective well-being. According to the scale's criteria, a total score of ≥36 suggests high subjective well-being, ≤12 indicates low subjective well-being, and scores in between reflect a medium level of well-being. Sample items include "I feel very satisfied" for positive affect and "I am in a good mood" for positive experience. In this study, the Cronbach's α for the Subjective Well-being Scale's four sub-dimensions were 0.790, 0.827, 0.746, and 0.810, respectively. Additionally, a KMO coefficient of 0.936 underscores the scale's good reliability.

Self-care Ability In Old Age Scale

The Self-care Ability In Old Age Scale was developed by Pang Shuqin (33), drawing on Dorothea Orem's theory (34) of self-care deficit within her self-care theory framework, and incorporating the Active Aging Theory (35). This Chinese scale is tailored to measure self-care ability in old age. This scale mainly consists of three dimensions: economic independence, daily living skills, and health self-maintenance, with a total of 45 items. Each item is scored from 1 (Not at all applicable) to 5(Completely applicable), with the total score ranging from 45 to 225. The higher the score, the stronger the self-care ability of the rural empty-nest older adults. Sample items include "I have adapted to the current living environment (living pace, weather, etc.)" for daily living skills and "I can maintain good interpersonal relationships" for health self-maintenance. In this study, the

Cronbach's α coefficient is 0.952, the Cronbach's α for the Self-Care Ability Scale's three dimensions were 0.876, 0.922, and 0.939, respectively. Additionally, a KMO coefficient of 0.936 underscores the scale's good reliability. The distribution of sub-scale scores was checked to ensure they meet the assumptions required for regression analysis, and this information is included in the results section.

Covariates

Age, gender, education level, monthly income, the contact situation between children and parents, marital status, and types of chronic diseases, were included in our study as covariates. Gender was classified into two groups: male and female. Education level was segmented into three types: elementary school or lower, middle school or less, and high school or higher. Monthly income was divided into three categories: less than 1,000 CNY, 1000 ~ 2000 CNY, and above 2000 CNY. For the contact situation between children and parents, we recognized four levels: daily contact, weekly contact, monthly contact, above monthly contact. Marital status was categorized into two: married, widow or widower. Finally, types of chronic diseases were parsed into four categories: 0 diseases, 1 disease, 2 diseases, greater than or equal to 3 diseases.

Statistical analysis

In this study, we used IBM SPSS version 26.0 (IBM Corp, Armonk, NY) for all data analysis and processing. Initially, we performed descriptive analyses of the data, with measurement data described as means and standard deviations. Pearson correlation was then utilized to test the correlation between continuous variables. We used the PROCESS macro version 4.1 (model 6) provided by Hayes for the analysis, with the social alienation as the independent variable, Psychological resilience and subjective well-being as mediating variables, and self-care ability in old age as the dependent variable. A *p*-value of 0.05 was considered statistically significant. The study set the bootstrap confidence interval (CI) at 95% based on a bootstrap sample of 5,000. If zero was not included in the 95% confidence interval, it indicated a significant mediation effect.

Results

Characteristics of participants

Our study involved 425 participants, and Table 1 displays the demographic characteristics of this group. Additionally, it includes univariate analyses examining the factors influencing self-care abilities in the older adults, based on various participant traits. Out of the 425 rural empty-nest older adults, 194 (45.72%) were men and 231 (54.28%) were women. The rural empty-nest older adults' ages ranged from 61 to 85 years, with a mean age of 70.34 ± 8.86 years. The univariate analyses of the self-care ability in old age for different characteristics are detailed in Table 1.

Correlation analysis of key variables

According to the Pearson correlation study, social alienation was negatively related to self-care ability in old age and negatively related

TABLE 1 Univariate analysis of self-care ability in old age among rural empty-nest older adults with different characteristics (*N* = 425).

Variables	Group	*N* (%)	Self-care ability in old age (Mean ± SD)	*F*/*t*	*p*
Gender	Male	194	147.07 ± 19.73	1.664	0.097
	Female	231	143.89 ± 19.49		
Education level	Elementary school or lower	123	139.54 ± 25.39	12.502	0.000
	Middle school or less	230	149.56 ± 15.11		
	High school or higher	72	141.77 ± 18.15		
Monthly income	Less than 1,000 CNY	149	139.66 ± 23.91	10.169	0.000
	1,000 ~ 2000CNY	210	148.77 ± 16.75		
	Above 2000CNY	66	147.25 ± 14.01		
The contact situation between children and parents	Daily contact	53	155.30 ± 19.67	21.814	0.000
	Weekly contact	267	147.20 ± 16.44		
	Monthly contact	65	141.46 ± 19.76		
	Above monthly contact	40	126.07 ± 25.08		
Marital status	Married	278	149.77 ± 17.07	6.720	0.000
	Widow, widower	147	136.96 ± 21.43		
Types of chronic diseases	0	104	150.42 ± 19.53	17.007	0.000
	1	141	149.27 ± 15.84		
	2	118	143.62 ± 17.42		
	Greater than or equal to 3	62	131.16 ± 24.27		

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to psychological resilience and subjective well-being ($p < 0.01$). Psychological resilience exhibited a positive association with self-care ability in old age and a positive link with subjective well-being ($p < 0.01$); subjective well-being and self-care ability in old age had a positive correlation ($p < 0.01$). See Table 2.

Analysis of chain mediation effect

We conducted a chain mediation effect analysis using the PROCESS plugin in SPSS, selecting model 6 from the chain mediation models, with 5,000 bootstrap samples. The social alienation was used as the independent variable, self-care ability in old age as the dependent variable, and sociodemographic factors as control variables. Psychological resilience and subjective well-being were included as the first and second mediating variables, respectively, in the chain mediation path. The analysis was performed on standardized data for each variable, with results detailed in Table 3.

The data showed that in the chain mediation model, social alienation negatively affected psychological resilience ($\beta = -0.678$, $t = -12.063$, $p < 0.01$) and negatively affected subjective well-being ($\beta = -0.141$, $t = -3.288$, $p < 0.01$). Psychological resilience positively affected subjective well-being ($\beta = 0.189$, $t = 7.228$, $p < 0.01$) and positively affected self-care ability in old age ($\beta = 0.521$, $t = 22.319$, $p < 0.001$). Subjective well-being positively affected self-care ability in old age ($\beta = 0.311$, $t = 7.618$, $p < 0.01$).

Using the Bootstrap test, we assessed the significance of the mediation effects through the range of the confidence intervals. In this study, the 95% confidence intervals for the chain mediation effects did not contain zero, indicating that the mediation effects were significant, as shown in Table 4. Calculating the effect sizes of each mediation path, we found that the mediation effect accounted for 43.55% of the total effect of social alienation on self-care ability in old age in rural older adults individuals, as detailed in Table 4. The path diagram is shown in Figure 2.

TABLE 2 Descriptive statistics and correlation analysis of SAS, PRS, SWS, and SAIOAS.

Variables	Mean ± SD	1	2	3	4
SAS	40.01 ± 14.15	1			
PRS	131.33 ± 23.16	−0.506**	1		
SWS	28.38 ± 12.18	−0.347**	0.444**	1	
SAIOAS	145.34 ± 19.64	−0.734**	0.777**	0.250**	1

**Represents $p < 0.01$.

Discussion

In our study, we investigated how social alienation impacts the self-care abilities of the older adults living alone in rural areas. We found a strong negative association between social alienation and these individuals' capacity for self-care. Significantly, our analysis revealed that psychological resilience and subjective well-being play a partial mediating role in this relationship.

Based on the main findings of this study, social alienation affects the self-care ability in old age among rural empty-nest older adults through the chain mediating role of psychological resilience and subjective well-being. First, studies have shown that social relationships and support are crucial for an individual's mental health. For rural empty-nest older adults, the reduction in social support (such as children moving away and weakened community connections) leads to increased feelings of loneliness and social isolation, which may exacerbate psychological stress and, in turn, affect their mental health (36, 37). When older adults individuals lack effective contact and interaction with family, friends, and the community, their feelings of loneliness and neglect increase, leading to heightened social alienation. This prolonged social alienation not only results in mental health issues such as depression and anxiety but also affects their cognitive function and life satisfaction (38, 39), thereby reducing their self-care ability in old age.

Secondly, research has found that psychological resilience is a key factor in coping with social alienation and psychological stress. Older adults individuals with lower psychological resilience may struggle to effectively handle the emotional and behavioral issues arising from social alienation, making them more susceptible to mental health problems (40). In contrast, those with higher psychological resilience are better able to face life's challenges with a positive attitude, thus maintaining their self-care ability despite social alienation (41).

Additionally, subjective well-being, which is an individual's assessment of their life satisfaction, is closely related to psychological resilience and feelings of social alienation. Studies have shown that social alienation and low psychological resilience can lead to increased negative emotions and decreased life satisfaction, thereby reducing the

TABLE 3 Analysis of the mediation effect of social alienation on self-care ability in old age in rural older adults after controlling for demographic variables.

Regression equation		Overall fit index			Significance	
Outcome variable	Predictors	R	R^2	F	B	t
Psychological resilience	Social alienation	0.506	0.256	145.508	−0.827*	−12.063
Subjective well-being	Social alienation	0.466	0.217	58.532	−0.141*	−3.288
	Psychological resilience				0.189*	7.228
Self-care ability in old age	Social alienation	0.888	0.788	522.901	−0.678*	−18.592
	Psychological resilience				0.521*	22.319
	Subjective well-being				0.311*	7.618
Self-care ability in old age	Social alienation	0.734	0.538	492.647	−1.017*	−22.196

$p < 0.01$*, control Age, gender, education level, monthly income, the contact situation between children and parents, marital status, and types of chronic diseases.

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subjective well-being of the older adults (42, 43). Older adults individuals with higher subjective well-being typically possess a more positive outlook on life and greater vitality, enabling them to participate more actively in daily activities and self-care (44).

Finally, social alienation may weaken the older adults's experiences of autonomy, competence, and relatedness, particularly in terms of relatedness and competence, which can directly affect their self-care ability. Feeling unneeded by society or lacking opportunities for social interaction can lead to a lack of initiative and engagement in daily life, thereby impacting their self-care ability (45).

In summary, social alienation affects the self-care ability of rural empty-nest older adults by influencing their psychological resilience and subjective well-being. This chain effect underscores the importance of reducing social alienation and enhancing psychological resilience and subjective well-being. Enhancing community support and providing mental health services can effectively improve the self-care ability of this population, thereby improving their quality of life (46).

This study was dedicated to thoroughly exploring the interplay between social alienation and the capacity for self-care in older age among rural empty-nest seniors. Its aim was to provide valuable insights for the early detection and mitigation of declines in self-care abilities in this demographic, offering both theoretical and practical value. The findings highlight that addressing social isolation alone is insufficient; enhancing psychological resilience and subjective well-being is equally crucial in improving self-care capabilities.

TABLE 4 A test of mediating effects between social alienation and self-care ability in old age.

Path	Effect value	S. E	LLCI	ULCI
Direct effect				
X → Y	−0.678	0.036	−0.750	−0.607
Intermediary effect				
X → M1 → Y	−0.431	0.041	−0.515	−0.350
X → M2 → Y	−0.044	0.019	−0.089	−0.010
X → M1 → M2 → Y	−0.048	0.011	−0.073	−0.029
Total intermediation effect	−0.523	0.042	−0.544	−0.501
Total effect	−1.201	0.045	−1.207	−0.927

X is Social alienation; M1 is Psychological resilience; M2 is Subjective well-being; Y is Self-care ability in old age.

Key clinical implementations

Integrating psychological support with engaging social activities

Healthcare professionals should not only focus on addressing social isolation but also enhance psychological resilience and subjective well-being. One effective approach could be integrating psychological support with engaging social activities. Organizing regular counseling sessions led by professional therapists can help alleviate feelings of loneliness and isolation. Additionally, encouraging participation in community interest groups, craft classes, or cultural events strengthens psychological resilience and fosters a sense of belonging. This approach promotes greater life satisfaction and overall happiness among older adults.

Health promotion and daily life skills training

According to Positive Psychology, an individual's well-being is closely linked to their life skills and health status. Offering health promotion initiatives, such as basic health education and daily life skills training (e.g., healthy cooking classes, simple home care skills), can greatly enhance the self-care capabilities of rural empty-nest older adults. These interventions help boost confidence, self-sufficiency, and subjective well-being, enabling older adults to manage their health more effectively and improve their quality of life.

Tailoring interventions for individuals with lower psychological resilience and subjective well-being

Given the significant role of psychological resilience and subjective well-being in mediating self-care abilities, healthcare providers should consider tailoring interventions and treatments for individuals with lower levels of these factors. By identifying and addressing these individuals' specific needs, healthcare providers can improve the effectiveness of interventions aimed at enhancing self-care abilities in older adults.

Comprehensive strategies combining social support, mental health services, and practical skills training

A holistic approach that combines social support, mental health services, and practical skills training is essential. Implementing these strategies together can significantly improve the overall well-being and self-care capabilities of rural empty-nest older adults.

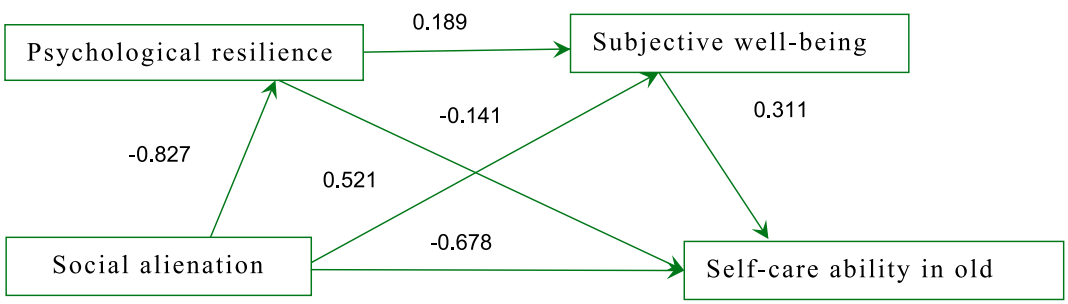


FIGURE 2
Path diagram of the impact of social alienation on self-care ability in China's rural empty-nest older adults. The values shown are the standardized coefficients.

Suggestions for further clinical practice

Develop multidisciplinary intervention programs

It is recommended to develop multidisciplinary intervention programs involving mental health professionals, social workers, and community organizers. These programs should work collaboratively to provide comprehensive care that addresses both the social and psychological needs of rural empty-nest older adults.

Monitor and evaluate the effectiveness of interventions

Ongoing monitoring and evaluation of the effectiveness of these interventions are crucial. This will help to assess improvements in self-care abilities and overall well-being, ensuring that the implemented strategies are achieving their intended outcomes.

Adapt interventions to local cultural and socio-economic contexts

Interventions should be tailored to account for the unique cultural and socio-economic contexts of the rural communities. This adaptability will ensure that the interventions are relevant, acceptable, and sustainable in the local setting, as recommended in the manuscript's limitations section.

Strengths

The main strengths of this study are as follows: first, this study was specifically designed for rural empty-nest older adults, emphasizing the important value of decreasing social alienation, improving psychological resilience and subjective well-being on the self-care ability in old age of this specific population, and providing a theoretical basis for clinicians and caregivers. Second, this study is the first to use a serial mediator model to explore the relationship between social alienation, psychological resilience, subjective well-being, and self-care ability in old age among rural empty-nest older adults. Compared with the traditional single model, this approach allowed us to consider the interactions between these factors more comprehensively.

Limitations

Sample scope and generalizability

Firstly, the geographical scope of this study was confined to specific rural regions, and the sample size was relatively modest. These factors may constrain the external validity and generalizability of the results to older populations in different geographical or urban contexts. Furthermore, significant logistical challenges were encountered during the recruitment and data collection phases. Reaching older participants in remote rural areas was hindered by poor infrastructure, the digital divide, and the physical distance between households. To overcome these hurdles, researchers relied on door-to-door visits and coordination with local village committees; however, the exclusion of those with severe mobility or cognitive impairments may have introduced a degree of selection bias. Future studies should employ broader multi-regional surveys and larger cohorts to enhance representativeness.

Methodological and design constraints

The study's reliance on self-reported questionnaire surveys may introduce subjective biases, such as social desirability bias or recall bias. Although questionnaires are efficient for quantitative analysis, they may not capture the nuanced lived experiences of the participants. Future research would benefit from a mixed-methods approach, incorporating in-depth interviews and case studies to provide a more comprehensive qualitative understanding. Additionally, as this was a cross-sectional study, it captures only a snapshot in time, precluding the ability to establish causal relationships or observe long-term psychological trajectories. We recommend that future researchers adopt a longitudinal design to track the evolution of psychological states over time.

COVID-19 context and precautions

Data collection for this study occurred continuously throughout the COVID-19 pandemic. While this provides a unique reflection of the ongoing psychological impact of a global health crisis, the results may be influenced by pandemic-specific stressors—such as social isolation, fear of infection, and disrupted healthcare access—that may not be present in a post-pandemic landscape. To ensure the safety of the participants and the research team, strict COVID-19 precautions were implemented during all face-to-face interactions. These included the mandatory use of N95 masks, maintaining a physical distance of at least two meters, conducting interviews in well-ventilated outdoor spaces when possible, and performing health screenings (temperature checks) prior to engagement. These measures, while necessary, may have subtly influenced the rapport between researchers and participants.

Measurement reliability

The reliability of the Social Alienation Scale used in this study warrants caution. The Cronbach's α coefficients for the subscales ranged from 0.614 (powerlessness) to 0.772 (self-alienation). Specifically, the relatively low reliability of the powerlessness subscale may affect the robustness of the statistical outcomes. Future studies should consider utilizing scales with higher internal consistency or adapting existing instruments to better fit the linguistic and cognitive profiles of rural older adults to ensure more accurate measurement.

Cultural context and confounding variables

This study did not fully account for certain confounding variables, such as detailed socio-economic status and deep-seated cultural backgrounds. In the rural setting of this study, traditional values of filial piety significantly influence elder care practices. There remains a strong cultural preference for home-based care provided by kin; consequently, nursing homes are often viewed with social stigma and are perceived as a "last resort" for those abandoned by their families. This cultural landscape likely exacerbates the feelings of alienation among those living alone. Future research should integrate these cultural constructs and socio-economic indicators to explore how they moderate the relationship between living arrangements and psychological well-being.

Conclusion

The primary objective of this study was to elucidate the complex mechanisms through which social alienation influences the capacity for self-care among rural empty-nest older adults, specifically examining the mediating roles of psychological resilience and subjective well-being. The

findings demonstrate that social alienation exerts a significant negative impact on self-care capacity. This relationship is not direct but is partially explained by the parallel and sequential mediation of psychological resilience and subjective well-being. Collectively, these variables form a critical pathway that determines the functional independence of the older adults in rural settings.

The results underscore the vulnerability of rural empty-nesters, whose diminished self-care abilities are exacerbated by social isolation and psychological distress. Consequently, it is imperative to implement multi-dimensional strategies that transcend basic physical care. Healthcare providers, local government agencies, and community stakeholders should prioritize interventions that bolster psychological resilience and enhance subjective well-being. By fostering social connectivity and psychological strength, it is possible to mitigate the deleterious effects of alienation on functional health.

Furthermore, this study highlights the necessity for tailored support systems. Interventions should be specifically designed for individuals identified as having low levels of resilience or poor life satisfaction. Future research should build upon these narrative findings by employing longitudinal designs to evaluate the long-term efficacy of such psychological interventions. Ultimately, addressing the psychological precursors of self-care capacity is essential for promoting healthy aging and improving the quality of life for the growing population of rural older adults living alone.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

This study was approved by the Medical Ethics Committee of Jinzhou Medical University (approval number JZMULL2022017). The studies were conducted in accordance with the local legislation and institutional requirements. The participants provided their written informed consent to participate in this study.

Author contributions

QS: Writing – original draft. SS: Writing – review & editing. SZ: Writing – review & editing. ZJ: Project administration, Writing – review & editing, Supervision.

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Conflict of interest

The author(s) declared that this work was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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The author(s) declared that Generative AI was not used in the creation of this manuscript.

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Neighborhood greenspace visits and mental health: insights from mobility data across nine U.S. metropolitan areas

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Background: Access to greenspace supports mental health, but most studies focus on the presence of greenness rather than actual use. Fewer explore how the association may vary within city boundaries and suburban areas.
Objective: We examined associations between neighborhood-level greenspace visits and poor mental health across nine U.S. metropolitan statistical areas (MSA), adjusting for Normalized Difference Vegetation Index (NDVI), demographics, and social vulnerability, and evaluated spatial heterogeneity.
Methods: We integrated greenspace visits, CDC PLACES mental health estimates (2023), Social Vulnerability Index (2018), demographics (ACS 2010–2014), and NDVI (2021). Ordinary least squares (OLS) models were conducted for each metro and overall, adjusting for NDVI, SVI themes, and demographics. Multi-scale geographically weighted regression (MGWR) assessed spatial variation.
Results: The sample included 13,152 tracts across nine MSAs (72.5 million residents). Poor mental health prevalence ranged from 12.9% (DC) to 18.7% (Houston), while visits ranged from 11.5 (Houston) to 33.2 (DC). In pooled models, more visits indicated better mental health ($\beta = -0.029$; $R^2 = 0.62$). Metro-specific models showed strongest effects in Houston ($\beta = -0.113$; $R^2 = 0.716$) and Atlanta ($\beta = -0.096$; $R^2 = 0.634$), with weaker results in Philadelphia and DC. MGWR revealed strong urban-core associations in Houston, Atlanta, and Dallas, while peripheral tracts often showed null effects.
Conclusions: Greenspace engagement, not just presence was linked to lower poor mental health across the metros, though associations varied by neighborhood. Promoting use may improve mental health, but interventions should account for local context and social vulnerability.

KEYWORDS

greenspace visits, mental health, mobility, nature, spatial heterogeneity, urban environment

1 Introduction

Exposure to natural environments has long been recognized as an important determinant of mental health and wellbeing. In 1984, Ulrich showed that natural views accelerate physiological and emotional recovery from stress (Stress reduction theory/SRT) (1–3), while Kaplan and Kaplan proposed that nature replenishes depleted

cognitive resources through Attention Restoration (ART) (4–6). These pioneering studies highlighted the psychological benefits of contact with nature in controlled settings. Building on this foundation, later epidemiological research began to document community wide and population-level benefits of greenspace, showing associations with reduced psychological distress, lower risk of depression, and improved wellbeing (7, 8). More recently, reviews and meta-analyses have consolidated this evidence, pointing to multiple pathways through which greenspace supports mental health, including stress reduction, opportunities for physical activity, social cohesion, and buffering of urban stressors. These pathways represent modifiable environmental determinants of mental wellbeing, central to public health programs, disease prevention and health promotion. Recent research has emphasized that these benefits may vary across populations and settings due to spatial and social heterogeneity in environmental exposure, reflecting differences in accessibility, quality, and local context (9, 10).

Much of the epidemiologic literature linking greenspace with mental health has thus far relied on static indicators of greenness, such as the Normalized Difference Vegetation Index (NDVI), to quantify exposure. While NDVI provides valuable information about the presence of vegetation, it does not capture whether residents engage with greenspaces (11). Because exposure opportunity does not necessarily equate to exposure behavior, actual use or engagement may better reflect realized environmental contact and potential health effects. Understanding this behavioral dimension of exposure is increasingly recognized as essential for translating environmental health evidence into equitable, actionable public health strategies. This gap has prompted calls for measures that capture actual utilization with greenspace, such as visits and usage patterns, which may be stronger predictors of realized health benefits. At the same time, studies suggest that variations in accessibility, safety, connectivity, and environmental quality influence how different populations experience greenspace (12). For instance, lower park density, limited transport connectivity, or perceived safety concerns can restrict use, while high-quality and well-connected greenspaces can promote engagement even in dense urban areas. Socio-environmental context therefore modifies the strength and direction of greenspace-health relationships observed across cities (10).

To address these gaps, this paper uses mobility-derived datasets to examine whether greenspace engagement, is associated with neighborhood-level prevalence of poor mental health across U.S. metropolitan areas. Leveraging analysis at a small geographic scale, we used estimates of mental health burden (CDC PLACES), social vulnerability index, population demographic characteristics, and NDVI to test the extent to which greenspace visits influence mental health, considering both engagement and context.

2 Methods

2.1 Study design

We conducted a cross-sectional ecological study at the census tract level across nine of the 10 largest U.S. metropolitan statistical areas (MSAs; hereafter referred to as metropolitan areas or "metros"). MSAs were defined using the U.S. Census Bureau's 2020 delineation of metropolitan and micropolitan areas. Miami was excluded due to the absence of tract-level health estimates in CDC PLACES. For each included metro, county Federal Information Processing Standards (FIPS) codes were obtained from the Census Bureau, and all constituent census tracts were selected. The number of counties per metro ranged from two (Phoenix, Los Angeles) to 22 (New York City), yielding a total of 13,152 census tracts across the nine study metros.

We compiled a comprehensive dataset by integrating information from multiple national sources that provide small area estimates or spatially continuous data (Table 1). These included health indicators, environmental exposures, social vulnerability indices, and demographic composition for each MSA at the census tract level. All data are publicly available, de-identified and contained no personally identifiable information and as such, institutional review board (IRB) approval and informed consent were not required.

2.2 Data sources and variables of interest

Publicly available census tract-level health data were obtained from the CDC PLACES Project, which provides modeled estimates of chronic disease risk factors, health behaviors, and outcomes for U.S. census tracts. PLACES estimates are derived using small-area estimation methods that combine survey data from the Behavioral Risk Factor Surveillance System (BRFSS) with population demographics from the Census Bureau. The outcome was the prevalence of adults reporting ≥14 days of poor mental health in the past month, denoted as frequent mental distress in adults, a validated indicator for poor mental health used in population-level health surveillance.

Data on greenspace visits were obtained from Advan Research mobility traces (20), monthly and aggregated to the whole years of 2021. This dataset aggregates anonymized smartphone location data from millions of devices in the U.S. and provides visit counts to points-of-interest (POIs). Greenspace POIs were defined using the U.S. Park Serve database and OpenStreetMap land-use categories, restricted to public-access parks and recreational spaces.

TABLE 1 Data sources overview.

Dataset	Source	Year of release	Variables used
Mobility data	Advan Research	2021	Greenspace visits, Devices
CDC PLACES	CDC, RWJF	2023	MHLTH Crude Prevalence
Social Vulnerability Index	CDC/ATSDR	2020	RPL_THEME1-4 (SVI Themes)
Demographics	ACS	2014	% Female, % Black, Median Age

CDC, Centers for Disease Control and Prevention; RWJF, Robert Wood Johnson Foundation; ATSDR, Agency for Toxic Substances and Disease Registry; ACS, American Community Survey (conducted by the U.S. Census Bureau).

Greenspace visitation data for a given census tract were defined as the total number of visits to greenspace locations made by mobile devices whose owners were residents of that tract, divided by the total number of resident devices in the tract, defined as:

$$\text{Greenspace visits} = \frac{\textit{Total Greenspace visits by resident devices}}{\textit{Number of Resident Devices}}$$

Device residency was determined using Advance Patterns' algorithm, which assigns a device's home census tract based on its long-term nighttime location. This normalization adjusts for variation in the density of devices observed by the mobility panel across geographic areas.

2.3 Covariates

Environmental and social covariates were selected to reflect contextual factors that may influence neighborhood mental health. Normalized Difference Vegetation Index (NDVI) was derived from 2021 VIIRS satellite imagery obtained through NASA's EarthData platform. 12 monthly raster files (8th day of each month in 2021) were downloaded, stacked, and averaged to create an annual mean index. Tract-level data was calculated using spatial overlays: census tract polygons (2010 TIGER/Line shapefiles) were used to extract mean NDVI values from the raster via zonal statistics. Values less than zero (representing water or blue spaces) were set to zero, resulting in our dataset that reflects census level vegetation presence across all our metropolitan areas. Finally, since the obtained data from 2021 primarily relied on 2020 census boundaries, we cross walked them to reassign 2020 bounded data to 2010 geographic areas.

Social vulnerability obtained from the CDC/ATSDR Social Vulnerability Index ((19) release), incorporates 15 census variables are grouped into four themes: socioeconomic status, household composition, racial/ethnic minority status and language, and housing/transportation. For this analysis, we included each of the four theme-specific indices. SVI values range from 0 to 1, with higher values indicating poorer social vulnerability.

The study also adjusted for demographics data, obtained from the American Community Survey (ACS, 2010–2014). Using tract-level data, we extracted three key variables: percentage of female residents, percentage of Black residents, and median age by census tract. These variables were queried and processed and merged into a complete dataset. All datasets were harmonized to the tract geography using 2010 U.S. Census boundaries and merged using GEOID identifiers. The final data frame, after merging all our individual datasets retained coverage for more than 95% of all tracts across the nine MSAs (Table 2). While data from Advan Research was obtained under a commercial license, all other datasets are publicly available. As all data were aggregated at the census-tract level and contained no personally identifiable information, institutional review board (IRB) approval and informed consent were not required.

2.4 Statistical analysis

All analyses were conducted at the census tract level within each of the nine metropolitan statistical areas (MSAs), relying on the official county-to-MSA crosswalk published by the Office of Management and Budget (OMB) and disseminated through the U.S. Bureau of Labor Statistics (BLS) (13). All analysis were conducted on R Studio 2025.05.0 Build 496. Prior to modeling, descriptive statistics were generated for all study variables to examine distributions and assess tract-level coverage across datasets.

For each MSA, an OLS regression model estimated the association between poor mental health prevalence and greenspace visits, adjusting for NDVI, SVI theme scores and demographic variables. Scatterplots were generated to visualize the associations.

Formally, the global OLS model can be expressed as:

$$Yi = \beta 0 + \beta 1\, GSi + \beta 2\, NDVIi + \beta 3\, SVIi + \beta 4\, Xi + \varepsilon i$$

Where Yi denotes the prevalence of poor mental health in census tract I, Gsi represents greenspace visits, NDVIi captures the tract-level vegetation presence, SVIi represents SVI themes from the CDC/ATSDR, Xi denotes the demographic covariates, and εi is the error term. Two supplementary OLS models were additionally conducted to evaluate the relative contributions of NDVI and greenspace visits by alternatively including and excluding each predictor alone and in combination while holding all other covariates constant. In addition, an overall OLS model pooling data from all nine MSAs was conducted. To explore spatial heterogeneity in these associations, we applied Multiscale geographically weighted regression (MGWR) for each MSA using the same model specification. MGWR relaxes the assumptions of traditional geographically weighted regression models (MGWR) by allowing regression coefficients to vary locally and at predictor-specific spatial scales. Adaptive bandwidths were selected for greenspace visitations automatically via cross-validation to balance local bias and variance, thereby defining the neighborhood contributing to each local estimate in a data-driven manner. Local coefficients of association (β) were estimated and visualized to examine spatial variation in the relationship between greenspace visits and poor mental health prevalence, using the formulation:

$$Yi = \beta 0(ui, vi) + k \sum \beta k\,(ui, vi) Xik + \varepsilon i$$

Together, the OLS and MGWR analyses provided a comprehensive view of both global (city-wide) and local (neighborhood-specific) relationships between greenspace engagement and mental health, supporting inference at scales relevant to urban public health and environmental planning.

3 Results

3.1 Descriptive patterns

The 10 largest U.S. metropolitan statistical areas by population were initially selected for analysis. However, Miami was excluded due to the absence of census tract-level mental health estimates in

TABLE 2 Census tract counts and data coverage across nine U.S. MSAs.

MSA/Counties	CDC Places (*n*)	Mobility (*n*)	Demographics (*n*)	SVI (*n*)	NDVI (*n*)	Coverage (%)
Atlanta (29)	948	948	882	948	948	93
Chicago (13)	2,167	2,167	2,119	2,167	2,147	97.8
DC (23)	1,264	1,264	1,209	1,264	1,254	95.6
Dallas (11)	1,309	1,309	1,223	1,309	1,309	93.4
Houston (10)	1,071	1,071	1,004	1,071	1,056	93.7
Los Angeles (2)	2,904	2,904	2,893	2,903	2,892	99.6
NYC (22)	4,138	4,138	4,097	4,138	4,138	99
Philadelphia (11)	1,464	1,464	1,434	1,464	1,464	98
Phoenix (2)	984	984	936	984	984	95.1

Values represent the number of census tracts within each metropolitan statistical area with available data from each source. "Tracts with Complete Data (%)" indicates the proportion of census tracts with non-missing data across all datasets used in the analysis (CDC PLACES, greenspace visits from Advan Research, NDVI, SVI, and ACS demographics).

CDC PLACES. The analytic sample included 13,152 census tracts across the nine MSAs, without the inclusion of Miami (Table 2). Tract counts ranged from 948 (Atlanta) to 3,951 (New York City). Figure 1 displays the distribution of poor mental health prevalence and greenspace visits across metros. Median prevalence of poor mental health ranged from 12.9% in Washington, DC to 18.7% in Houston, while median greenspace visits ranged from 11.5 in Houston to 33.2 in DC. Notably, these distributions appeared inversely patterned. Cities such as Houston showed both the highest prevalence of poor mental health and the lowest greenspace visits, whereas Washington, DC displayed the opposite trend. Other metros generally fell between these extremes, suggesting a consistent ecological association between greenspace engagement and mental health that is further explored in regression models.

3.2 OLS model results

Adjusted ordinary least squares (OLS) models revealed significant negative associations between greenspace visits and poor mental health prevalence in most metros (Table 3, Figure 2). Higher levels of greenspace visitation were consistently associated with lower prevalence of poor mental health after adjusting for NDVI, and socioeconomic context, with effect sizes and model fit varying across MSAs. Model performance was strongest in several large metros, including Dallas, Washington DC, and Houston, where adjusted R^2 values exceeded 0.70, indicating that our model captured a substantial proportion of tract-level variation in mental health outcomes.

To distinguish the effects of actual greenspace engagement (i.e., visitation) vs. greenspace availability (i.e., NDVI-derived coverage), we conducted sensitivity analyses in which models included each exposure separately and jointly (Supplementary Table S1). When modeled alone, greenspace visitation was consistently and inversely associated with poor mental health across most MSAs. In contrast, NDVI-only models showed substantial heterogeneity across metropolitan areas, with greater variability in both the magnitude and direction of associations and generally less stable model fit. When both measures were included simultaneously, model performance improved modestly in some MSAs but remained unchanged or decreased in others. Overall, these findings suggest that greenspace visitation captures much of the variation relevant to the mental health benefits of greenspace, beyond what is explained by the greenspace availability measure alone.

In pooled analyses across all nine metros, Model A (without Metro fixed effects) indicated that each additional greenspace visit was associated with a 0.037% lower prevalence of poor mental health ($\beta = -0.037$, $p < 0.001$l Supplementary Figure S1), with the model explaining just over half of the variance ($R^2 = 0.53$; Supplementary Figure S2). When Metro fixed effects were added in Model B, model fit improved substantially ($R^2 = 0.62$; Supplementary Table S2), reflecting city-level context accounted for additional variability. Relative to Atlanta (reference), Phoenix (+2.7 pp), Houston (+1.3), and Philadelphia (+1.2) exhibited higher adjusted baselines of poor mental health prevalence, while Washington, DC (−1.1) and Chicago (−0.7) were lower. In this specification, the association between greenspace visits and poor mental health remained robust though slightly attenuated ($\beta = -0.029$, $p < 0.001$). Taken together, these pooled models confirm higher greenspace engagement is consistently linked with better mental health outcomes across metropolitan areas, while also highlighting meaningful differences in baseline prevalence of both poor mental health and greenspace visits between cities (Supplementary Figures S3, S4). In our within-metro models, the strongest association were observed in Houston ($\beta = -0.113$, $p < 0.001$) and Atlanta ($\beta = -0.096$, $p < 0.001$), where each additional greenspace visit was associated with over a 0.1% lower prevalence of poor mental health. In contrast, Philadelphia ($\beta = 0.003$, $p = 0.29$) and Washington DC ($\beta = -0.07$; $p < 0.001$) showed weak or inconsistent associations. Model explanatory power varied, with R^2 values ranging from 0.55 in NYC to 0.86 in Dallas, indicating robust model fit overall.

3.3 Spatial patterns (multiscale geographic weighted regressions)

While OLS models identified metro-wide associations between greenspace visits and poor mental health prevalence, these

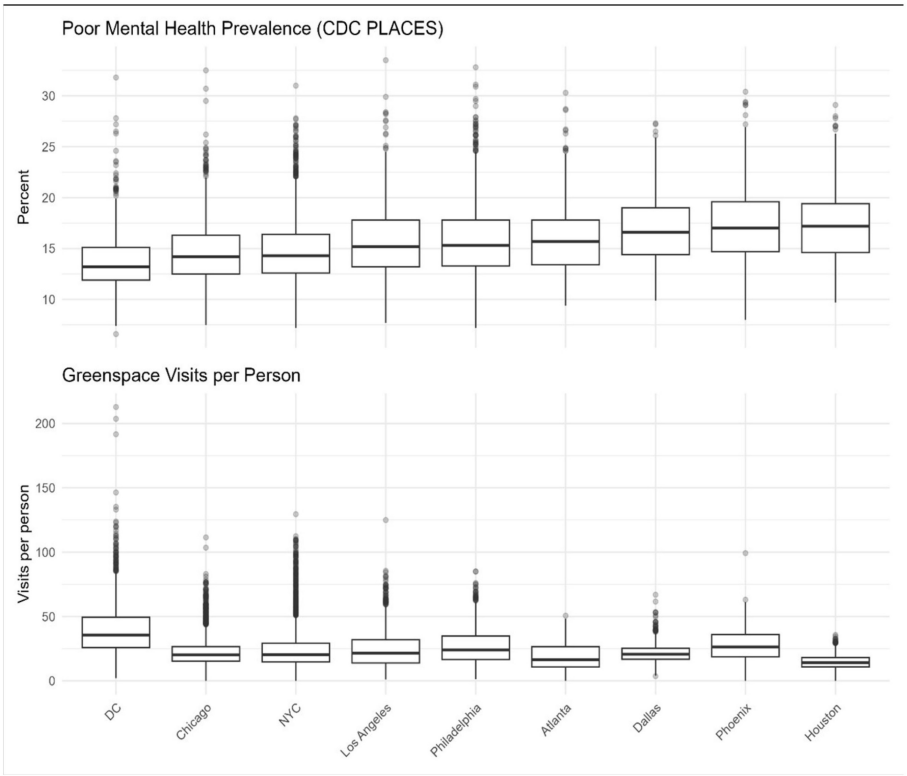


FIGURE 1
Distribution of poor mental health prevalence and greenspace visits across nine U.S. metropolitan statistical areas.

TABLE 3 Adjusted OLS associations between greenspace visits and poor mental health prevalence by metropolitan area.

MSA	Term	β (Greenspace visits)	CI levels [LL; UL]	p-Value	R^2
Atlanta	Greenspace visits	−0.096	−0.11; −0.082	<0.001	0.634
Chicago		−0.026	0.03; −0.0194	<0.001	0.665
Washington DC		−0.007	−0.01; −0.004	<0.001	0.796
Dallas		−0.024	−0.03; −0.014	<0.001	0.857
Houston		−0.113	−0.13; −0.092	<0.001	0.716
Los Angeles		−0.014	−0.02; −0.006	<0.001	0.679
New York City		−0.018	−0.02; −0.012	<0.001	0.550
Philadelphia		0.003	0.00; 0.009	0.289	0.851
Phoenix		−0.017	−0.03; −0.0071	<0.001	0.765

Values shown represent the regression coefficient (β) for greenspace visits from multivariable ordinary least squares models. All models are adjusted for normalized difference vegetation index (NDVI), four Social Vulnerability Index (SVI) theme scores, and demographic covariates (percentage female, percentage Black, and median age). Confidence intervals and p-values correspond to the greenspace visits coefficient only.

estimates assume spatial homogeneity. To capture potential neighborhood-level variation, we applied multi-scale GWRs. The results of our MGWRs allowed to visualize the multiple spatial scales within each MSA. Our results revealed that the strength and direction of the greenspace-mental health association varied substantially across neighborhoods, with distinct patterns emerging in each MSAs (Figures 3, 4).

Because our aim was to test whether greater greenspace engagement corresponds with lower prevalence of poor mental health, inverse relationships (negative coefficients) are interpreted as favorable i.e., more greenspace visits is associated with improved mental health among the population. Conversely, positive coefficients suggest the opposite pattern, which we interpret as unfavorable. Across metropolitan areas, spatial heterogeneity followed a consistent contextual pattern rather than a purely geographic one. Stronger inverse associations between greenspace visits and poor mental health were concentrated in dense, higher socially vulnerability urban neighborhoods, whereas lower-density, lower-vulnerability suburban and exurban tracts generally exhibited weaker to mild or inconsistent relationships.

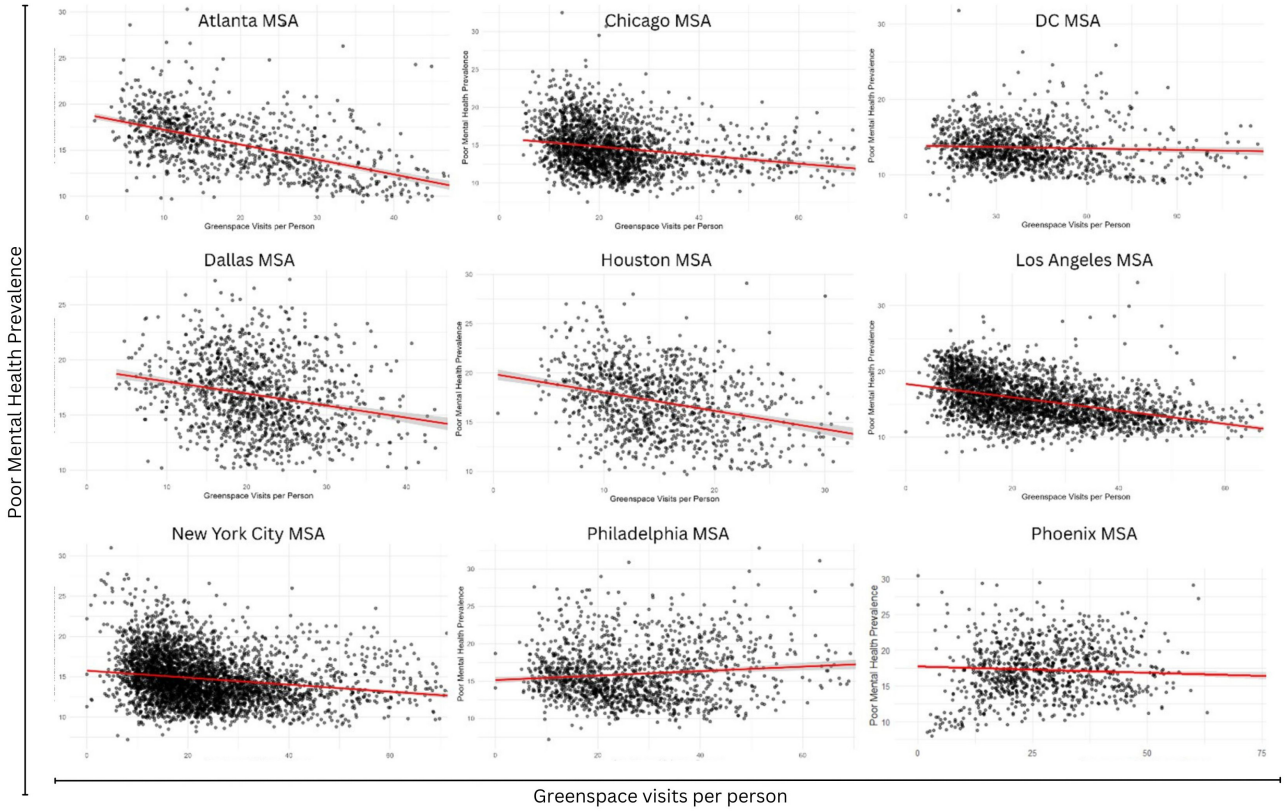


FIGURE 2
Association between greenspace visits and poor mental health prevalence by metropolitan area.

In Atlanta, the strongest beneficial relationships were seen in the southern tracts like Fulton and DeKalb Counties, areas that are characterized by historically higher social vulnerability, while northern suburban tracts with lower vulnerabilities showed weaker or no associations (14). Houston exhibited a similar vulnerability-stratified pattern with strong inverse associations concentrated in the urban core and weaker associations in outer suburban tracts (Montgomery and Fort Bend Counties). In Dallas, favorable associations were concentrated in socially vulnerable urban tracts, while outer suburban areas exhibited weaker effects. Los Angeles and Chicago showed more mixed patterns.

Patterns in Los Angeles and Chicago were more heterogeneous but followed similar contextual gradients. Tracts with greater access to large, centrally located public parks showed stronger associations, whereas lower-density coastal and valley areas showed minimal effects. In Chicago, tracts along the lakefront and in the central city In Chicago, tracts along the lakefront and in the central city.

New York City showed strong inverse associations in dense tracts surrounding major public greenspaces, particularly in parts of Manhattan, Brooklyn, and Queens, while outer borough tracts exhibited weaker or unfavorable associations. Philadelphia represented a notable exception in the overall association pattern of our analysis. Although some tracts near Fairmount Park showed favorable relationships, many surrounding neighborhoods exhibited weak or unfavorable associations, consistent with the null findings observed in metro-wide OLS models. In Washington, DC, associations were generally weak across the district, with modest localized effects near major parks like Rock Creek but minimal effect in the Eastern neighborhoods.

Local models were estimated for each census tract using an adaptive spatial kernel, such that the number of neighboring tracts contributing to each local regression varied according to tract density. The optimal bandwidth was selected automatically by minimizing the cross-validation (CV) score, balancing local bias and variance.

To complement the metro-specific models, we also conducted pooled analyses across all nine MSAs (Supplementary Table S2). In Model A, without accounting for variations between MSAs, greenspace visits were inversely associated with poor mental health ($\beta = -0.037$, $p < 0.001$; $R^2 = 0.53$). After adding Metro fixed effects in Model B, the association persisted but was modestly attenuated ($\beta = -0.029$, $p < 0.001$), while model fit improved considerably ($R^2 = 0.62$), underscoring the importance of accounting for city-level differences. These pooled results confirm the robustness of the overall relationship, even as the metro-specific models highlight substantial heterogeneity in both magnitude and direction of effects.

Across metros, a consistent urban-suburban gradient was observed. MGWR local fit surfaces were computed using a k-nearest-neighbor (kNN) approach, where local R^2 values were estimated by comparing observed and fitted outcomes within a

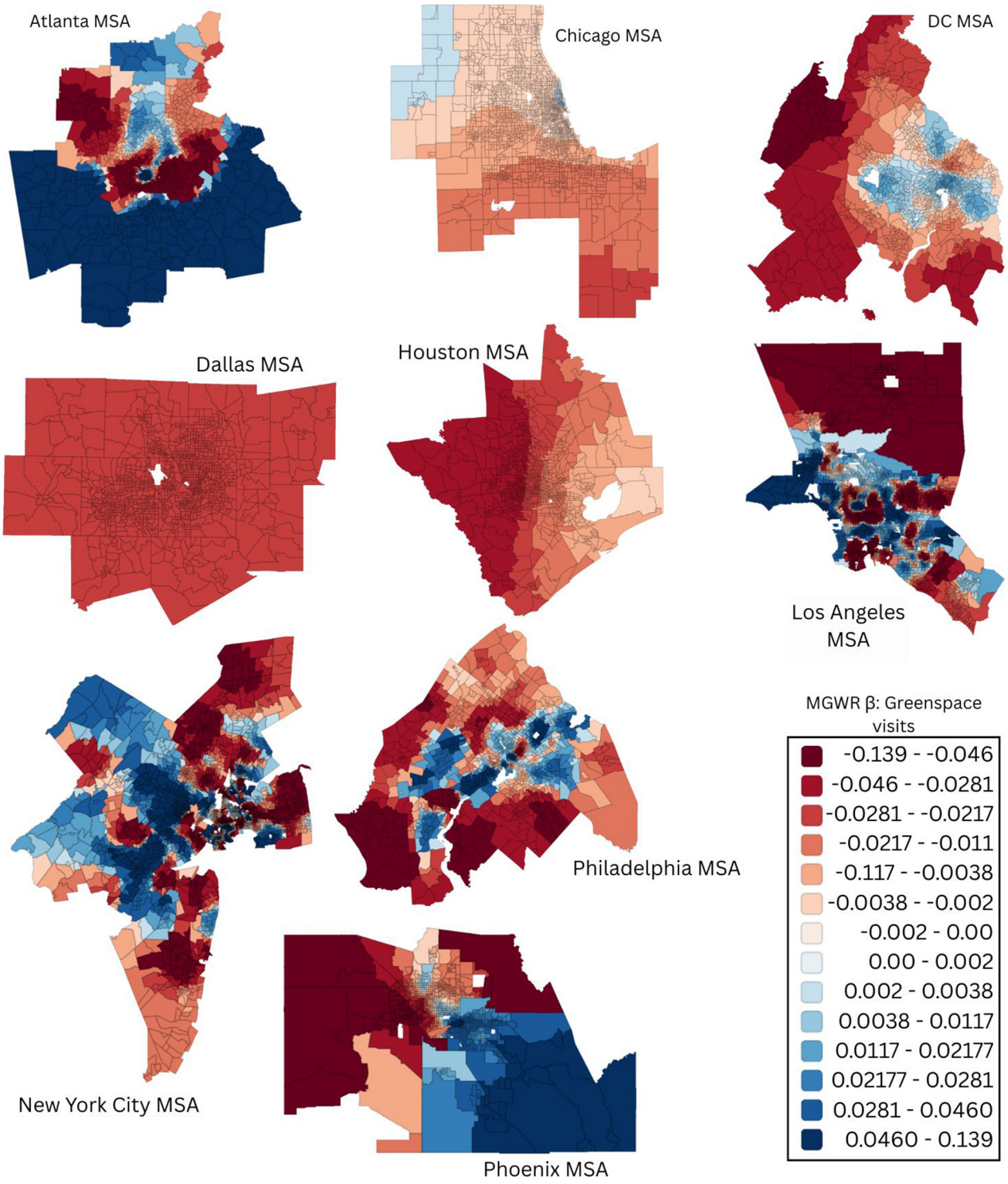


FIGURE 3
Multiscale geographically weighted regression (MGWR) coefficient surface showing the census tract-level association between greenspace visits and poor mental health across nine U.S. metropolitan areas. Blue indicates protective associations, white indicates near-null effects, and red indicates positive associations.

fixed neighborhood ($k = 200$) around each census tract. The R^2 maps showed consistently high explanatory power across all metros (local $R^2 \geq 0.80$), with stronger fit in dense urban neighborhoods and slightly lower but still robust fit in peripheral areas (Figure 4). This pattern suggests that greenspace engagement may be particularly salient for mental health in high-density areas, where exposure to stressors and social vulnerability is greater but public park access is more frequent and well

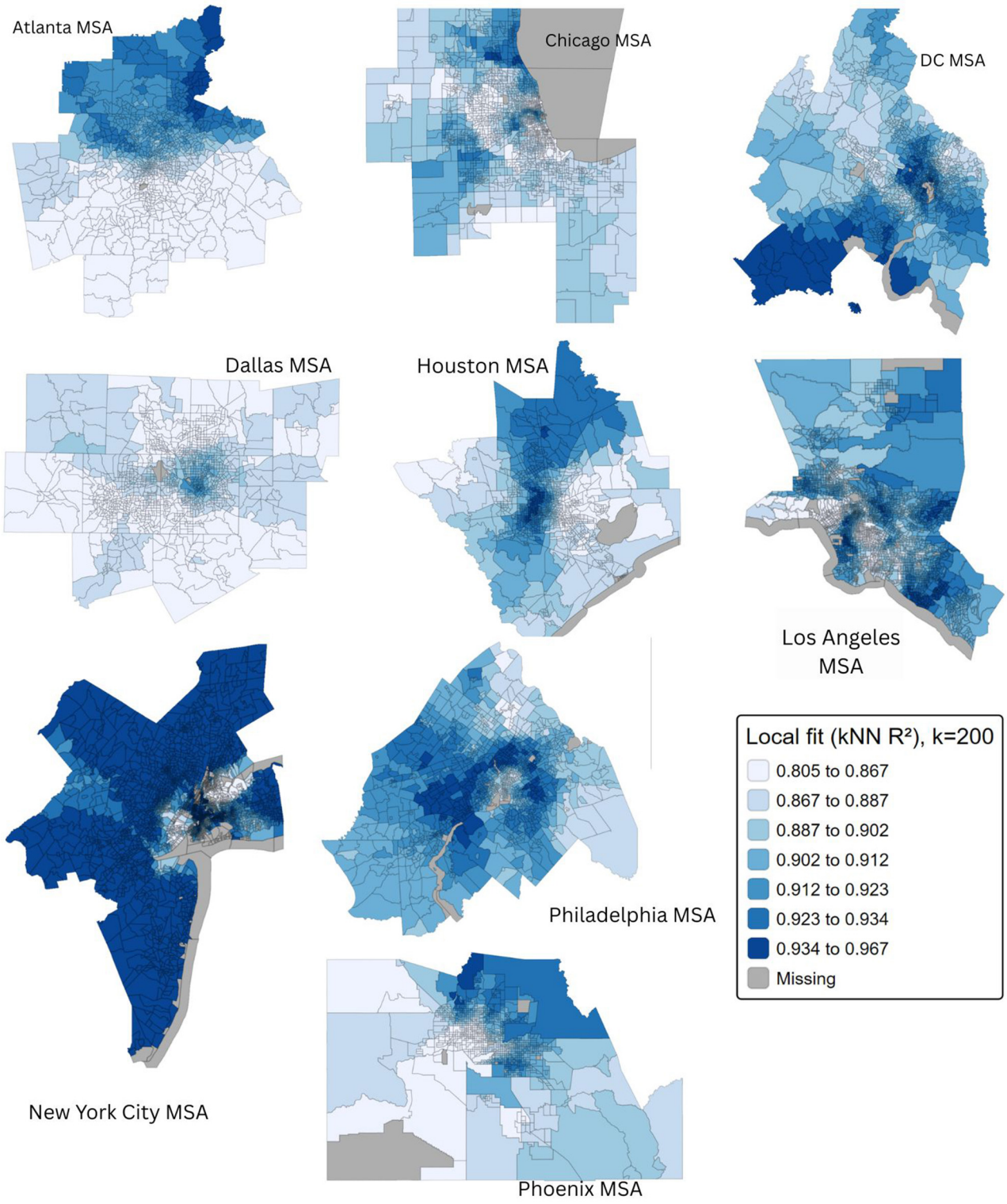


FIGURE 4
Local model fit (R^2) surfaces for MGWR models across nine U.S. metropolitan areas, computed using a k-nearest-neighbor ($k = 200$) approach. Darker blue indicates higher local explanatory power of the MGWR model, while lighter shades indicate comparatively lower fit.

connected. In contrast, suburban and exurban contexts may have larger quantities of greenspace, but less public transit, more fragmented accessibility, and a reliance on private yards, which may limit the degree to which greenspace engagement translates into measurable mental health benefit. Taken together, these findings indicate that the mental health benefits associated

with greenspace engagement are highly context-dependent, with the strongest associations occurring in dense, socially vulnerable urban neighborhoods patterns that are obscured in city-wide average estimates.

4 Discussion

This study examined the relationship between greenspace engagement and poor mental health prevalence across nine major U.S. metropolitan areas. Using mobility-derived visits as a measure of greenspace usage, we found that greater greenspace engagement was generally associated with lower prevalence of poor mental health at the census-tract level. Our findings are consistent with prior research emphasizing the benefits of greenspace on mental health (7, 8). More importantly, our research extends prior work by demonstrating that these benefits are contingent not merely on the presence of greenspace but also on actual engagement with it. Notably, the association remained significant in most cities after adjusting for NDVI, demographic characteristics, and social vulnerability, with particularly strong effects in Houston and Atlanta. Sensitivity analyses comparing alternative greenspace specifications (visitation-only and NDVI-only models) yielded directionally results that varied from our fully adjusted models, with some cases showing staggeringly extreme estimates, highlighting the importance of jointly accounting for both greenspace presence and use. The improved model fit following these adjustments suggests that the mental health benefits of greenspace engagement are shaped by underlying social and environmental vulnerability, aligning with prior literature (10, 12).

The MGWR analysis demonstrates that associations between greenspace engagement and poor mental health are not only spatially heterogeneous, but also operate at multiple spatial scales, bringing out the importance of neighborhood context in shaping healthy environments. By allowing the influence of greenspace visits to vary locally while accounting for spatial autocorrelation, our MGWR provides a more granular representation of how behavioral exposure to greenspace relates to mental health than global or single-scale local models. This multiscale framework clarifies how global citywide estimates (average associations) may conceal substantial neighborhood-level heterogeneity, particularly in socially diverse metropolitan regions.

Stronger inverse associations were consistently observed in dense, socially vulnerable urban neighborhoods, while suburban and peripheral areas exhibited weaker or null relationships. For instance, in Houston, poor mental health prevalence was highest in Harris County's urban core, overlapping with tracts where greenspace visits were relatively low, while wealthier outer suburbs such as Fort Bend and Montgomery Counties exhibited weaker associations. In Washington DC, the strongest relationships clustered around Rock Creek Park, whereas peripheral counties like Culpeper and Fauquier had generally lower prevalence of poorer mental health and fewer visits, which may help explain why associations there were weaker or null. Areas close to major urban greenspaces (UGS), such as downtown Los Angeles near Griffith Park, and neighborhoods around Central Park in New York City, exhibit stronger relationships. This pattern suggests that greenspace engagement may be most beneficial where psychosocial stressors are higher and public greenspaces are more accessible and routinely used. In contrast, suburban and exurban areas often contain more abundant but less publicly accessible or less frequently used greenspace (e.g., private yards or fragmented parks), which may limit the extent to which greenspace engagement translates into measurable mental health benefits. The unexpected patterns observed in Philadelphia further indicate that unmeasured contextual factors such as greenspace quality, safety, or cultural relevance may modify these associations, reinforcing the need for context-sensitive interpretations of greenspace- mental health relationships.

In contrast to dense urban neighborhoods where greenspace use appears most strongly associated with better mental health, peripheral areas often contain greenspaces that is either less accessible or less conducive to regular public use, despite being more abundant such as private yards or isolated parks. In these contexts, lower visitation may partly explain weaker associations. For example, Rieves et al. (18) found that perceived greenspace can differ from objective vegetation measures like NDVI, and both are linked to mental health in distinct ways (15). In some contexts, perceived safety or poor quality of the greenspace may reduce use altogether, resulting in weak or null associations. In others, greenspaces may still be used due to proximity, or routine travel patterns but may not confer mental health benefits if the experience is stressful, unsafe, or culturally misaligned. This distinction may explain why some tracts exhibited weak or unfavorable associations despite measurable visitation, but fails to translate into better mental health outcomes, as suggested in prior literature (16). In communities where greenspace is scarce, increasing both the supply and activation of greenspaces may directly improve mental health outcomes. These findings suggest that investments in greenspace infrastructure should be paired with interventions that promote and sustain consistent usage across communities, with a focus on residential access. Urban planning analyses may benefit from considering both vegetation and behavioral exposure metrics, a shift that aligns with emerging "smart city" approaches leveraging big data, mobility traces, to better understand how residents interact with urban environments (17). At the same time, simply increasing the presence of greenspace is insufficient, particularly if communities cannot/does not use them due to safety, irrelevance to their needs. Context-sensitive engagement strategies that integrates usage to needs may be necessary to ensure that mental health benefits of greenspace are realized broadly. Prior conceptual reviews also highlight the benefits of greenspace engagement for vulnerable populations, explaining the differences in accessibility or utilization (12). Integrating greenspace strategies into broader health equity frameworks, including neighborhood audits and participatory design approaches represents a critical step toward improving social and environmental determinants of health. By linking behavioral mobility data with neighborhood health and vulnerability indicators, this study bridges environmental epidemiology and public health practice, informing prevention-oriented urban design and community-level health promotion efforts that advance broader goals of health and resilience and adaptive wellbeing.

4.1 Strengths and limitations

This study offers several strengths that advance understanding of greenspace and mental health. By analyzing nine of the largest U.S. metropolitan areas, we provide one of the few multi-city perspectives on neighborhood-level associations, capturing both commonalities and differences across diverse urban-suburban contexts. The use of mobility traces to measure greenspace visits represents an important innovation, moving beyond static measures of greenness toward actual engagement, more closely tied to realized health benefits. Finally, the application of MGWR revealed spatial heterogeneity within each city, that global models cannot detect, offering insight into the highly localized nature of greenspace-health relationships. Together, these strengths provide a robust and scalable framework for future research at the intersection of urban design, behavioral data, and population health.

A few limitations must be noted. First, the cross-sectional design precludes causal inference, and results should be interpreted as associations rather than effects. Second, analyses were conducted at the census-tract level, raising the possibility of ecological fallacy when inferring individual outcomes; moreover, survey-based health estimates may themselves be biased if participation or reporting varies across neighborhoods, which may help explain unfavorable associations in some areas. Third, mobility data are subject to smoothing and potential underrepresentation of certain populations, which could bias estimates of greenspace use. Additionally, our dataset consists of cumulative annual exposures and outcomes, based on CDC estimates and Advan research, which may not be perfectly aligned. Future work should examine multi-year mobility trends. Finally, measures of greenspace quality, amenities, and safety were not included, factors that as previously mentioned could account for some of the spatial heterogeneity observed.

Future research should adopt longitudinal designs to assess temporal dynamics in greenspace use and mental health. For example, seasonality considering weather and post-COVID19 effects may impact the patterns of outdoor activities and social vulnerability factors. Incorporating finer measures of greenspace quality and accessibility, as well as equity-focused audits, would strengthen the evidence base for interventions. Linking mobility data with health services, such as nature-based prescription programs could further clarify how greenspace can be operationalized in public health practice.

In summary, this study provides new evidence that greenspace engagement is associated with mental health outcomes in U.S. metropolitan areas, and the strength of associations vary across space and are strongly conditioned by social vulnerability. These results highlight the importance of moving beyond measures of greenness to consider actual use, and of pairing greenspace planning that address the social and structural contexts shaping mental health.

Data availability statement

The data analyzed in this study is subject to the following licenses/restrictions: With the exception of the greenspace visits data obtained from Advan Research (formerly SafeGraph), all datasets used in this study are publicly available from their respective repositories: CDC PLACES (https://www.cdc.gov/places/), CDC/ATSDR Social Vulnerability Index (https://www.atsdr.cdc.gov/placeandhealth/svi/index.html), and NDVI from NASA EarthData VIIRS (https://earthdata.nasa.gov/). Requests to access these datasets should be directed to salkindi@houstonmethodist.org.

Author contributions

SC: Conceptualization, Writing – review & editing, Methodology, Investigation, Writing – original draft, Data curation, Visualization, Formal analysis. TZ: Methodology, Writing – review & editing, Writing – original draft. ZC: Writing – original draft, Writing – review & editing, Methodology. SR: Writing – review & editing, Methodology, Writing – original draft. JM: Writing – review & editing, Conceptualization, Methodology, Project administration, Writing – original draft. KN: Methodology, Writing – review & editing, Writing – original draft. WD: Investigation, Writing – review & editing, Resources, Validation, Writing – original draft, Methodology, Conceptualization, Formal analysis, Project administration, Supervision, Data curation. SA-K: Conceptualization, Resources, Validation, Methodology, Investigation, Writing – review & editing, Supervision, Project administration, Writing – original draft.

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Conflict of interest

The author(s) declared that this work was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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The author(s) declared that generative AI was used in the creation of this manuscript. The author(s) used Chat GPT (OpenAI) to assist in language refinement and general organization of the manuscript. All content was verified, revised, and approved by the author(s).

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Supplementary material

The Supplementary Material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/fpubh.2026.1731243/full#supplementary-material

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Development of the Social Housing of Ontario (SHO) Registry by health region: a platform for health research with the social housing population

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Introduction: Social housing plays a critical role in addressing housing inequality and promoting well-being. This paper examines the creation of a registry of social housing sites across all six Ontario Health (OH) regions.
Methods: For all 47 housing service providers in Ontario, social housing address, provider type, and building type were extracted from their website or from documents provided by the housing organization. The Registry included rent-geared-to-income housing with unique or minimally shared postal codes. Descriptive statistics were analyzed for the housing site characteristics aggregated by OH region.
Results: 2,109 social housing sites were included in the final Registry, including 472 designated as seniors only (low-income naturally occurring retirement communities, LI-NORCs). There were regional differences in the proportions of each tenant designation, postal code uniqueness, housing provider types, and building classifications. For instance, the Toronto and North West regions had higher government-owned social housing sites (61% and 57%), whereas the East region had more non-profit owned sites (55%). Apartments were the most common building type across regions (57%), with varying proportions of townhouses and single/semi-detached houses.
Discussion: A social housing registry, the SHO, has been established, serving as a valuable resource for health research, especially for marginalized populations. It can be linked to other datasets for future studies. The SHO Registry provides a robust method for the determination of LI-NORCs (low-income naturally occurring retirement communities).

KEYWORDS
administrative data, health equity, low-income naturally occurring retirement communities, registry, seniors, social housing

1 Introduction

Vulnerable individuals, such as those with low socioeconomic status, older adults, single-parent households, and individuals with a history of homelessness, frequently depend on affordable housing options for their residence (1, 2). Providing subsidized housing is a common strategy implemented to address homelessness, poverty, and housing

inequality that disproportionately impacts these vulnerable groups. In 2017, Canada introduced the National Housing Strategy, which focuses on providing affordable housing, where the rent is priced at or below market rent for low-to-moderate-income households (3, 4). Similarly, social housing is a government-assisted type of subsidized housing where the rent is typically capped at 30% of household income (5). These dwellings are usually owned by service managers, non-profit organizations, or co-operatives and managed by municipal or district service managers (6). As of 2021, Statistics Canada reports that 842,000 Canadians aged 15 years or older were being provided with subsidized housing (7). In Ontario, there are an estimated 270,000 social housing units managed by 47 municipal or district service managers, demonstrating a significant resource commitment to this housing strategy (8).

This vulnerable population of social housing residents has low health literacy and often experiences barriers to accessing primary and preventative healthcare and poor quality of life (9). In addition, approximately 28% of social housing residents are seniors, with 7% of residents being over the age of 80 compared to 4% in the general population (10). As a result, high rates of chronic health conditions, such as cardiovascular diseases (22.70%), diabetes (10.54%), hypertension (59.12%), high cholesterol (43.59%), and higher rates of mortality are reported in this population (11). The higher prevalence of chronic diseases and mortality that affect social housing residents have been associated with the housing type and location (12, 13). There is an urgent need to address these rising health issues in this population, which adversely impacts their quality of life and places excessive burden on the healthcare and emergency response systems (12).

In order to identify priority health concerns of individuals residing in social housing, and to be able to specifically target low-income seniors living in naturally occurring retirement communities, which we have termed LI-NORCs, it is necessary to create a database or registry of social housing sites. However, there remains a lack of consistency in the information available and accessibility of the information from the 47 municipal and district social housing providers in Ontario. Furthermore, the lack of variables within health administrative data to identify individuals as social housing residents makes it difficult to examine potential associations between resident health issues and social housing conditions. We propose to address this gap in available resources by developing a registry of social housing sites that currently services populations across Ontario and can be linked to administrative data. The aim of this study was to create a registry, called the Social Housing of Ontario (SHO) Registry, comprising all social housing sites in Ontario that can be identified using administrative data.

2 Methodology

2.1 Site identification

We identified the 47 municipal and district housing providers from the Government of Ontario website (14). Social housing addresses were collected either directly from each housing provider's website or from publicly available housing application materials, and housing providers were contacted if this information was not available online. Written permission from the housing providers was obtained when required by the terms and conditions of the websites.

For each municipal/district housing provider, the data collected for each available housing site included: street address, postal code (if available), number of units, specific housing program (e.g., rent-geared-to-income, supplement, other special programs), tenant eligibility (e.g., senior, family, singles), housing provider type (non-profit organization, government-owned or a cooperative), building type (e.g., detached house, apartment building), and other building characteristics (e.g., number of stories, elevator availability, common room space). Any information that was not available was entered as "not specified."

2.2 Extraction and classification of postal codes

For each housing site, its postal code or postal codes were determined using the Canada Post "Find a Postal Code" web-based tool (15). Disagreements between the postal codes provided by the housing provider and Canada Post were resolved using Google Maps and by consulting the housing provider when needed. The most common scenario was that a social housing site was large enough to have multiple postal codes, but only one was listed in the housing provider's materials. The second most common situation was a typo in the social housing provider's materials. In one instance, the housing provider listed a non-existent postal code (per Canada Post) that was nonetheless used on health cards by some residents (according to OHIP data when linked with administrative data) (16), so both postal codes were retained in the Registry. For the purposes of this Registry, social housing sites that shared a postal code were combined and considered one social housing site.

Next, all postal codes were entered into the same Canada Post tool to conduct a reverse look-up and identify all other residences or businesses sharing the same postal code. Where there were no other residences or businesses sharing the same postal code as the social housing site, the postal code was categorized as "unique" to social housing; in other words, 100% of that postal code catchment area was social housing units. This was further validated by visualizing the site on Google Maps, identifying the addresses of all adjacent buildings, and entering those addresses into the Canada Post tool.

For postal codes that *were* shared with neighboring addresses, an additional step was taken to calculate the proportion of social housing units within each postal code catchment area. For example, if a social housing apartment building with 60 units shared a postal code with 10 detached houses that were not social housing, then that postal code catchment area was 86% social housing units. Postal codes were categorized as "minimally shared" if social housing represented 50% or more of the units within its catchment area. Postal codes with less than 50% of units being social housing were categorized as "not unique or minimally shared." For data verification, this full process was repeated by a second research staff member to reduce the likelihood of data entry errors in the final Registry.

2.3 Eligibility criteria for registry inclusion

To be eligible for inclusion in the Registry, the social housing site needed to have rent-geared-to-income (RGI) units and have at least one postal code that was either "unique" (100% social housing) or "minimally shared" (≥50% social housing). Since the purpose of the Registry was to link to existing datasets (e.g., administrative health, census, built environment), sites were required to have at least 10 units and be linked to a Dissemination Area using Statistics Canada's Postal Code^{OM} Conversion File Plus (PCCF+) (17). In contrast, social housing locations were excluded if the housing provider used a rent supplement form of payment, as these are typically tied to the individual and not the specific address where they currently reside. Other special programs for specific populations (e.g., Indigenous housing programs, supportive housing) were also excluded.

2.4 Site measures

The data was collated, and a unique site ID was assigned to each social housing location. For housing locations with multiple addresses (e.g., a cluster of townhouses), the same site ID was assigned to all addresses at that location. For each site ID, the following characteristics were compiled:

- Tenant designation: Housing providers designated some housing sites for specific tenant populations, such as seniors, families, or adults only. Where this information was not provided, the site was classified as "unspecified." The sites designated for seniors are LI-NORC locations.
- Postal code type: Using the postal code classification process described in the methods above, each postal code was determined to be "unique," "minimally shared," or "not unique." Since sites could have multiple postal codes, each site was then classified as having "unique postal codes," "minimally shared postal codes," or "mixed postal codes." Sites where all postal codes were "not unique" were excluded from the Registry (see eligibility criteria).
- Provider type: Sites were identified as being owned by a private non-profit housing provider, government-owned, a co-operative, or mixed. The sites that did not provide this information were classified as unspecified.
- Building type: The building sites included in the Registry were classified as either an apartment, townhouse, single/semi-detached house, or a mix of these three types. Building type was classified as other/unspecified if the site did not provide information on building type or was of another type not included in the Registry.

2.5 Analysis

Descriptive statistics were used to describe the distributions of different characteristics of the housing sites included in the final Registry. The type of postal code, type of housing provider, and type of buildings available at every site were described for each district/regional housing provider. The descriptives were subsequently collapsed into the six Ontario Health Regions (West, East, Toronto, Central, North East, North West) to examine geographic distributions across the province and analyzed using chi-square and Cramer's V to test the statistical significance and effect size of the association, respectively. All analysis was completed using IBM SPSS Version 30.0.

3 Results

A total of 2,109 social housing sites met the eligibility criteria and were included in the final Registry. When aggregated by the Ontario Health regions (see Table 1), the region with the largest number of sites was the West region ($n = 689$), constituting 32.7% of the Registry, and the smallest was the North West region ($n = 37$) at 1.8%. All regions had LI-NORC sites designated for senior tenants only, ranging from 15.5% to 37.8% of their sites, for a total of 472 LI-NORC sites in the SHO Registry. This is a conservative count of LI-NORCs in the Registry since 478 sites (22.7%) were a mix of tenant types (e.g., a low-rise apartment building for seniors only and townhouses designated for families at the same site), and for 689 sites (32.7%), the tenant type was not specified by the housing provider.

3.1 Postal code type

Across the six Ontario Health regions, nearly 75% of sites had a unique postal code, not shared with any other addresses (see Table 2). Toronto (82.2%) had the most sites with a unique postal code, but it was the most common finding across all regions (54.1% to 82.2%). The proportion of postal codes determined to be "minimally shared" was less than 25% for all sites except for the North West region (40.5%). Lastly, less than 5% of total social housing sites were classified as having a "mixed" postal code type where the site had at least one "unique" postal code and at least one "minimally shared" postal code. A small but statistically significant association between region and postal code type was found ($\chi^2 = 74.8$, df = 10, $p < 0.00$; Cramer's V = 0.13), indicating that postal code type was not evenly distributed across regions.

3.2 Housing provider type

In the Toronto and North West Ontario Health Regions, the majority of sites managed are government-owned housing providers (61.0% and 56.8%, respectively) (see Table 3). There was a statistically significant association observed between Ontario Health regions and housing provider type ($\chi^2 = 195.0$, df = 15, $p < 0.001$) with a moderate effect size (Cramer's V = 0.22), suggesting regional differences in the types of organizations providing housing. In the East Ontario Health Region, the majority of sites were owned by non-profit organizations (54.8%). The proportion of sites that were managed by a co-operative housing provider was consistently low amongst regions, with North West

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TABLE 1 Total number of social housing sites and tenant types for the regions of Ontario.

Ontario health region	Number of sites *N* (%)	Designated tenant type				
		Seniors (LI-NORC locations) *n* (%)	Families *n* (%)	Adults *n* (%)	Other/ Mixed *n* (%)	Not specified *n* (%)
West	689 (32.7)	151 (21.9)	158 (22.9)	57 (8.3)	228 (33.1)	95 (13.8)
East	549 (26.0)	85 (15.5)	115 (20.9)	18 (3.3)	57 (10.4)	274 (49.9)
Toronto	439 (20.8)	114 (26.0)	0 (0.0)[a]	0 (0.0)[a]	9 (2.1)	316 (72.0)
Central	253 (12.0)	78 (30.8)	64 (25.3)	17 (6.7)	94 (37.2)	0 (0.0)
North East	142 (6.7)	30 (21.1)	32 (22.5)	1 (0.7)	75 (52.8)	4 (2.8)
North West	37 (1.8)	14 (37.8)	8 (21.6)	0 (0.0)	15 (40.5)	0 (0.0)
Total	2,109	472 (22.4)	377 (17.9)	93 (4.4)	478 (22.7)	689 (32.7)

[a]Toronto had a very high number of sites without a specified tenant type.

TABLE 2 Distribution of social housing sites based on type of postal code for regions of Ontario.

Ontario health region	Total number of sites *N*	Sites with unique postal codes *n* (%)	Sites with minimally shared postal codes *n* (%)	Sites with mixed postal codes *n* (%)
West	689	477 (69.2)	179 (24.7)	42 (6.1)
East	549	376 (68.5)	161 (29.3)	12 (2.2)
Toronto	439	361 (82.2)	54 (12.3)	24 (5.5)
Central	253	204 (80.6)	48 (19.0)	1 (0.4)
North East	142	105 (73.9)	30 (21.1)	7 (4.9)
North West	37	20 (54.1)	15 (40.5)	2 (5.4)
Total	2,109	1,543 (73.2)	478 (22.7)	88 (4.2)

TABLE 3 Distribution of social housing sites based on type of housing provider for regions of Ontario.

Ontario health region	Total number of sites *n*	Type of housing provider				
		Private non-profit *n* (%)	Government *n* (%)	Co-operative *n* (%)	Mixed *n* (%)	Unspecified *n* (%)
West	689	254 (36.9)	299 (43.4)	83 (12.0)	2 (0.3)	51 (7.4)
East	549	301 (54.8)	170 (31.0)	34 (6.2)	2 (0.4)	42 (7.7)
Toronto	439	98 (22.3)	268 (61.0)	73 (16.6)	0 (0.0)	0 (0.0)
Central	253	64 (25.3)	100 (39.5)	21 (8.3)	2 (0.8)	66 (26.1)
North East	142	52 (36.6)	44 (31.0)	14 (9.9)	1 (0.7)	31 (21.8)
North West	37	14 (37.8)	21 (56.8)	0 (0.0)	2 (5.4)	0 (0.0)
Total	2,109	783 (37.1)	902 (42.8)	225 (10.7)	9 (0.4)	190 (9.0)

Ontario reporting the lowest at 0% and Toronto reporting the highest at 16.6%.

3.3 Type of building

For all six Ontario Health regions, the most common building type for social housing sites was apartment buildings, followed by townhouses (see Table 4). Despite this similarity, using a Chi-square Test it was found that building type was not distributed evenly across the regions ($\chi^2 = 341.6$, df $= 20$, $p < 0.001$) and that this was a small-to-moderate association (Cramer's V $=$ 0.20). The proportion of apartment buildings ranged from 35.1–83.4%, with Toronto having the highest proportion, followed by the Central region at 66.0%. In comparison, the West and East regions reported the highest proportions of townhouses (32.2% and 28.4%, respectively). For the remaining regions, the proportion

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TABLE 4 Distribution of social housing sites based on the type of housing building for regions of Ontario.

Ontario health region	Total number of sites *n*	Building type				
		Apartment *n* (%)	Townhouse *n* (%)	Single/ semi detached *n* (%)	Mixed *n* (%)	Other/ unspecified *n* (%)
West	689	323 (46.9)	222 (32.2)	43 (6.2)	57 (8.3)	44 (6.4)
East	549	248 (45.2)	156 (28.4)	10 (1.8)	85 (15.5)	50 (9.1)
Toronto	439	366 (83.4)	62 (14.1)	3 (0.7)	8 (1.8)	0 (0.0)
Central	253	167 (66.0)	51 (20.2)	13 (5.1)	22 (8.7)	0 (0.0)
North East	142	86 (60.6)	21 (14.8)	10 (7.0)	20 (14.1)	5 (3.5)
North West	37	13 (35.1)	1 (2.7)	5 (13.5)	6 (16.2)	12 (32.4)
Total	2,109	1,203 (57.0)	513 (24.3)	84 (4.0)	198 (9.4)	111 (5.3)

of townhouses ranged from 2.7% to 20.2%. Single/Semi-detached housing was the least common building type across all regions, except for the North West (13.5%). In addition, a mixture of building types were seen for sites with more than one listed address, with all six regions reporting between 1.8% and 16.2% of sites being mixed. Finally, the proportion of sites that had building types other than the main three types or had no information on building type was the highest in the North West region at 32.4%.

4 Discussion

The SHO Registry of social housing sites across all six Ontario Health regions has been successfully established, including a valuable subset of LI-NORCs. This Registry will serve as a valuable resource for research on the social determinants of health and healthcare utilization, particularly focusing on vulnerable populations. It has been purposefully designed with the capability to be linked to other administrative datasets using postal code or census divisions (e.g., dissemination area). Importantly, the methodology employed to create this Registry is reproducible, enabling the refreshment of the Registry as the social housing landscape naturally changes and based on different reference dates as needed. In fact, since 472 social housing buildings are designated specifically as seniors' buildings, containing a high concentration of low-income seniors, we recommend that these sites be considered to be a subset of naturally occurring retirement communities (18), which we have named Low-income Naturally Occurring Retirement Communities or LI-NORCs. Due to their low income, these clusters of vulnerable seniors form specific groups of individuals for whom targeted health and social programs may be beneficial and more efficiently delivered. The SHO Registry provides a robust method for the determination of LI-NORC sites.

Moreover, the development of the SHO Registry addresses a critical gap by providing a centralized platform. Individuals seeking information about housing services in various regions and districts could collaborate with the research team and access this resource, eliminating the need for laborious searches or multiple application processes. This approach is especially beneficial for those with limited time or resources, such as housing providers with limited or no capacity for this type of analysis. Furthermore, the methodology used in creating this Registry can be extended to develop similar tools for other essential services, such as long-term care homes, food banks, and homeless shelters, which often lack comprehensive information resources.

When considering the implications of our research, it is essential to recognize how this methodology can be applied to social housing in other Canadian provinces/territories and in other countries. While there are over 350,000 social housing residents in Ontario (10), there are 842,000 across Canada (7). In the United States, public housing is priced significantly below the market rate, but it has faced challenges over time due to funding shortages and management issues (19). Similarly, council housing in the UK has historically been conducive to alleviating poverty, although recent trends indicate a decline in its availability and impact (20). The methodology used to create a registry of social housing sites in Ontario can be extended to create a centralized registry of public housing in the US and council housing in the UK. The establishment of such a registry would enable researchers to investigate the influence of housing on various health conditions, risk factors, quality of life, and social determinants of health in these countries.

Postal codes are pivotal in research, acting as markers to identify population areas, residential locations, as well as health conditions and risk factors (21–24). Researchers have employed diverse methodologies to establish comprehensive registries. A 2020 study in Ontario developed a screening method to determine the likelihood of identifying retirement home residents based solely on postal code information (25). This approach facilitates linkages to administrative databases when direct address-to-health linkage is unavailable. Our study similarly utilized postal code data and map-based technologies to identify the specific population of interest and construct a social housing registry. Both studies aim to enhance data availability for researching residents' sociodemographic profiles, healthcare needs, and health conditions over time. While Brath et al. (25) focused on algorithm development, our study utilized postal code information and geospatial tools to create a much-needed social housing registry in Ontario.

The statistically significant variations in the distribution of postal code, building types, and provider types across different regions can largely be attributed to the unique characteristics of each area (26, 27). Toronto, being the most densely populated geographical area in Ontario, has a higher proportion of sites with unique postal codes and social housing sites that consist of apartments. In contrast, the East Ontario Health region, characterized by low population density, exhibits a much higher proportion of social housing sites with unique postal codes and the second lowest proportion of apartment buildings among its building sites (28). Furthermore, Northern Ontario, covering nearly 90% of Ontario's land mass, has the lowest population density in the province. Interestingly, despite its sparse population, the North has the lowest proportion of social housing sites in the form of townhouses, along with a small number of detached or semi-detached houses. Due to elevated construction costs compared to Southern Ontario, there is limited availability of new housing (29). This can present significant challenges for new housing development, making it less financially viable to build detached or semi-detached houses compared to apartment buildings. Lastly, we recognize that there is a difference in the dominant type of housing provider between the regions. We can speculate that this stems from the decisions made by the individual municipalities regarding the allocation of funds. The diverse characteristics and unique challenges of each region in Ontario help shape the distribution and types of social housing across the province.

In our study, the primary limitation was the lack of information available on the websites and applications of some housing providers (e.g., tenant classification). This incomplete data collection process could impact the utility of the SHO Registry, as users may still need to seek out this information independently or may choose not to access housing data due to the lack of details. To address these limitations, subsequent revisions of the tool could explore alternative methods for gathering missing information (e.g., additional direct data requests to the housing providers). Another limitation was that the Dissemination Area for three sites could not be determined using Statistics Canada's Postal Code^{OM} Conversion File Plus (PCCF+) and therefore those sites needed to be excluded from the Registry; however, this was less than 0.2% of the sites.

5 Conclusion

To lay the groundwork for research on the health of social housing residents in Ontario, we have created a comprehensive social housing registry, further subdivided into a subset of LI-NORCs. This unique SHO Registry sets the stage for future research into the connections between resident health and social housing conditions across the six Ontario regions. Moving forward, developing an address-based tool could greatly enhance data collection and enable integration with other administrative databases, paving the way for more in-depth future studies.

Data availability statement

The data analyzed in this study is subject to the following licenses/restrictions: Available upon reasonable request. Requests to access these datasets should be directed to Gina Agarwal, gina.agarwal@gmail.com.

Ethics statement

Ethical approval was not required for the study involving humans in accordance with the local legislation and institutional requirements. Written informed consent to participate in this study was not required from the participants or the participants' legal guardians/next of kin in accordance with the national legislation and the institutional requirements.

Author contributions

GA: Writing – review & editing, Methodology, Supervision, Writing – original draft, Investigation, Conceptualization, Formal analysis, Data curation, Funding acquisition. MPi: Data curation, Conceptualization, Writing – review & editing, Methodology, Formal analysis, Investigation, Writing – original draft. MPl: Investigation, Conceptualization, Writing – review & editing, Data curation, Methodology, Writing – original draft, Formal analysis. KG: Methodology, Writing – original draft, Investigation, Formal analysis, Writing – review & editing, Data curation. RA: Methodology, Investigation, Data curation, Formal analysis, Writing – review & editing. JB: Writing – review & editing. CK: Writing – review & editing. GM: Writing – review & editing. FM: Writing – review & editing. MV: Writing – review & editing.

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Conflict of interest

The author(s) declared that this work was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Generative AI statement

The author(s) declared that generative AI was not used in the creation of this manuscript.

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Co-production of informal settlement health: a community based participatory research program for building healthy communities in urban informal settlements of Salvador, Brazil

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Introduction: More than 15% of Brazil's urban population lives in slums characterized by limited access to essential urban services, heightened vulnerability to infectious pathogens and environmental hazards, and deprivation of citizenship rights. These conditions exacerbate social inequality, perpetuate cycles of poverty, and fuel violence, underscoring the urgent need for sustainable interventions.

Methods: Following a social justice framework, we developed a community development program rooted in participatory research methods and popular health education to foster collaboration between university researchers and communities. The aim was to identify priorities and co-create locally driven, cost-effective, and sustainable solutions. This article describes our ongoing project in three prominent urban slums of Salvador, Brazil (Alto do Cabrito, Pau da Lima and Marechal Rondon), detailing the methodologies employed, activities initiated, and interventions developed.

Results: We conducted ethnographic, eco-epidemiological, and collaborative mapping surveys to contextualize diverse health and well-being challenges. Furthermore, we organized consultative and socialization events with dynamic community groups and identified local priorities, leading to the design of thirteen interventions targeting citizenship rights, social cohesion, environmental restoration, waste management, and unemployment.
Discussion: Here, we described how our interdisciplinary approach leveraged social capital and fostered inter-sectoral partnerships to empower marginalized urban communities towards addressing their health and environmental challenges through sustainable, locally tailored solutions. While the program has strengthened community trust, facilitated partnerships, and achieved notable environmental improvements, further evaluation is needed to assess the long-term impacts of these interventions on broader social health determinants.

KEYWORDS
Brazil, community-based participatory action research, health inequities, health justice, Popular Health Education, urban slums

Introduction

Over a billion people reside in informal settlements within urban areas (1). These settlements are characterized by socioeconomic, environmental, and infrastructural deficiencies that impact resident wellbeing, safety, social and political inclusion, and livelihood opportunities (2).

In Brazil, social and economic inequalities (3, 4) have resulted in the establishment and expansion of urban informal settlements, commonly referred to as "*favelas*" (5). More than 15% of the Brazilian urban population resides in *favelas*, where they have limited economic opportunities, insufficient access to basic urban services, including clean water and sanitation (6), often living in substandard and overcrowded domiciles, subject to seasonal flooding and erosion risks, which increases the exposure to pathogens whose transmission is favored by such poor socio-economic and environmental conditions (7–10). The socioeconomic and health disparities, and in some cases, violence in informal settlements are closely linked to feelings of deprivation of citizenship rights and privileges (11). Over the last two decades, our team has been engaged in the study of infectious disease in residents of urban informal settlements in the Brazilian city of Salvador, Bahia (7–10). We here describe a participatory program, which has evolved within our overall study to address health and wellbeing more generally and their social, demographic, and environmental determinants.

Initially the focus, led by medical scientists, was on the epidemiology of leptospirosis, a neglected but important human bacterial disease transmitted from the urine of a zoonotic reservoir host, predominantly the brown rat, *Rattus norvegicus* (9, 10, 12–14). Subsequently, our scope broadened to encompass ecological studies of leptospirosis in its *R. norvegicus* reservoir (15), and in the wider environment (16), and to other infectious diseases, including dengue (17), zika (8), and SARS-CoV2 (18). Recently, the research program broadened further to integrate social scientists and promote community engagement and participation (19, 20), and address wellbeing more broadly.

During this program, our studies have highlighted the need for investments in environmental improvements, basic urban services, and enabling residents to protect themselves and their domiciles from sources of environmental contamination (21). However, such transformations demand significant government investments, which, in practical terms, may not materialize within an expected timeframe. Instances of political neglect and disparities in the allocation of infrastructural resources to informal settlement populations are not uncommon (22), leading often to sporadic and localized interventions that lack coordination, and which are therefore unsustainable. Sustainability is further undermined by interventions often being short-term and poorly adapted to the local context, which raises issues of acceptability, appropriateness, and feasibility (23).

These considerations, and the growing complexities associated with urbanization and inequality globally, argue for the need, far more widely acknowledged in the social than in the natural sciences (24–29), for teams such as ours to adopt approaches that fully involve community residents in the creation and delivery of interventions tailored to the specific context of informal settlement areas. Our on-going program, described in this article, adapts and builds on the principles of Community-Based Participatory Research (CPBR) and Popular Health Education (27, 28), with the primary aim of driving action and facilitating social change based on local priorities (29, 30). This necessitates a recognition of professional researchers' social obligation and commitment to research processes that can drive sustainable change (24), predicated on the premise that *co-construction* enables deeper engagement, which may be key not only to health promotion, but also to social transformation and emancipation in these informal settlements (25, 26). Co-construction is defined here as the participatory and iterative process through which professionals and community members jointly design and implement activities and interventions.

We identified several key attributes for the success of this approach, including successful blurring of lines between researchers as neutral and objective observers and research participants, minimizing power imbalances, approaching health and wellbeing with a holistic and community-based perspectives, and conducting research in partnership with communities to achieve common goals: sustainable, long-lasting positive outcomes that extend

beyond the duration of the research (29). Our aim is to address the paucity of CBPR approaches necessary for improving health outcomes among informal settlement populations (22, 31).

We worked with residents and other stakeholders in three communities that are superficially similar, but have contrasting histories and social characteristics, leading to three unique CBPR experiences. These included a range of participation dynamics and community empowerment activities and outcomes, leading to cross-fertilization arising from the interaction among communities and our interdisciplinary research team. Nevertheless, a common aim in the three communities was to address simultaneously multiple problems of health and wellbeing (a range of infectious diseases, rat infestation, food security, and environmental and community wellbeing) and evaluate multiple outcomes related to the participatory and organizational processes, stakeholder satisfaction, and individual, community, animal, and environmental health.

Below, we describe the processes and interventions achieved in the initial phase of our program. In doing so, we draw an important distinction between what we describe as "activities" and "interventions." Indeed, the difference between activities and interventions is a key characteristic of the approach described here. We define an activity as an action that is initiated by the external research team (i.e., *not* by the community), which has the proximate aim of facilitating community engagement or empowerment—defined here as strengthening community capacities to identify and communicate health challenges, actively participate in the co-construction of solutions, and contribute to their evaluation. Each activity can thus be assessed primarily by its success in promoting meaningful engagement and empowerment, as well as by its ability to generate, through sustained interactions between the research team and the community, one or more context-specific interventions. An "intervention," then, is defined as an action initiated by an empowered and engaged community in collaboration with the external research team, with the aim of improving the health and/or the wellbeing of the community and can thus be assessed by its success in doing so in the short and/or the long term.

We first provide the health context of the study area and described the range of *activities* undertaken. This is "what was done" and might therefore be considered equivalent to our "Methods." We then describe the proposed *interventions* generated which may be considered as our "Results." Finally, we discuss several key lessons emerging from reflections on the process leading from activities to interventions, including how they differ from the conventional solutions health experts might have suggested, and how their success is currently being assessed, and will be documented in subsequent articles.

Methods

Study area, population, and context

Our program was implemented in Salvador, Bahia, Northeastern Brazil, a city with approximately 2.5 million inhabitants according to the 2022 Census conducted by the Brazilian Institute of Geography and Statistics (IBGE) (6). In Salvador, 45% of households live in informal settlements (6), and the city has about 7% of all urban informal settlement residents in the country (32). Most of our previous studies have been implemented in the Pau da Lima community (8, 9, 18), and more recently in four other similar marginalized peri-urban settlements including two considered here, namely Marechal Rondon and Alto Do Cabrito (10, 19). All these communities are extremely vulnerable to flooding and soil erosion due to their open sewer systems and their topographic properties, including steep valleys (Figure 1). In these communities, most residents lack legal titles to their homes, and the median household per capita income is US$2.32/day (18). Majority were either unemployed or informally employed as artisans, in domestic and construction work (18, 19, 21). During the COVID-19 pandemic, economic conditions pushed more than two-thirds of the population into hunger and close to 80% into unemployment (10, 33). The communities differ in age of establishment, yet variation in socioeconomic and environmental conditions appears to be larger within than between the communities (10, 33). Public services, including transportation, sewage systems, and primary health centers, are generally accessible to residents and are located around the slum communities within walkable distance. In Brazil, these services are typically delivered through decentralized municipal systems, with primary health care provided through local health units linked to the Unified Health System (SUS). Within each community, heterogeneous local structures exist, including neighborhood associations, cultural associations, youth groups, and religious organizations, which serve as important channels for communication and community mobilization. While neighborhood associations often engage with local government structures, cultural and youth associations were specifically engaged in this study because they have minimal political affiliation and provided neutral platforms for community participation. The study areas ranged between 0.07 and 0.09 km^2 in extent within each community, with approximately 3,000 participating residents living in over 1,000 households (see Table 1 for additional demographic and contextual information).

Program design

Our program includes the following dimensions: (i) community engagement (events and activities) to facilitate the entry and participation of community residents and other stakeholders, (ii) quantitative, eco-epidemiological research to estimate exposures of residents and domestic animals to disease reservoirs and vectors, as well as collaborative environmental and perception mapping to provide accurate geo-location of the problems identified by the communities. Additionally, the project includes (iii) qualitative research and ethnographic studies to understand the processes of participation and the perceptions of residents about the various processes of research, (iv) socialization activities for co-construction interventions, (v) dialogue and cooperation with local agencies (public and private) for the implementation and possibility of scaling up the proposed interventions, and finally (vi) co-evaluation of research processes with communities, which includes quantitative and qualitative parameters (Figure 2).

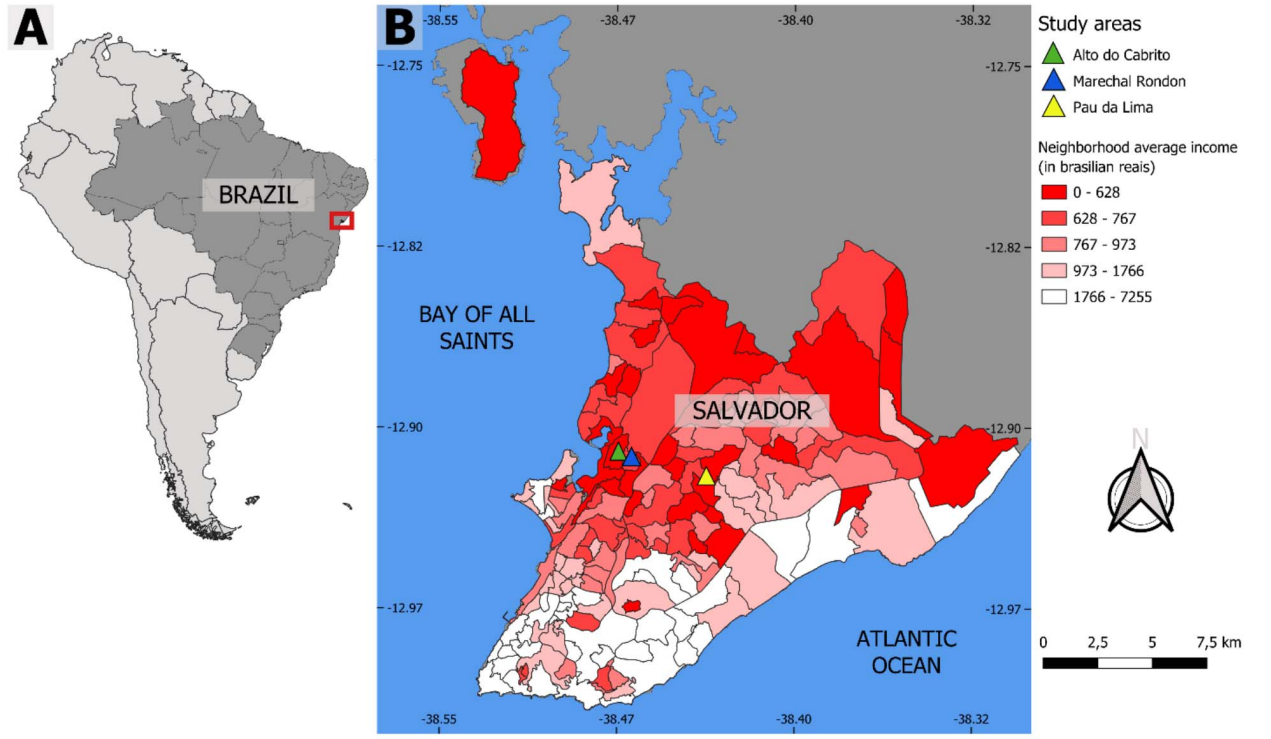


FIGURE 1
Map of Brazil **(A)** and Salvador showing the location of the three marginalized communities where we work **(B)**. The neighborhoods of Salvador are classified by the mean income of the head of the household to show the rent spatial segregation observed in the city. The maps are not copyrighted as they were created by the authors using QGIS 2.18 software [Open Source Geospatial Foundation (OSGeo), California, USA]. The boundary polygons of Brazil, Salvador and the production of the Salvador income map were downloaded from open and publicly accessible base of IBGE—Instituto Brasileiro de Geografia e Estatistica, on the Geosciences platform which can be accessed at https://www.ibge.gov.br/geociencias/downloads-geociencias.html. The WorldView-3 May 2017 satellite image was also used to digitize the study area. The image was acquired by the research project/Instituto Gonçalo de Moniz—IGM—Fiocruz Bahia from the company Satmap (Salvador, Brazil), with disclosure permitted referencing the Copyrights of DigitalGlobe images.

Team composition and role

The program had three interlinked arms: (i) social sciences, (ii) ecology and epidemiology (eco-epidemiology), and (iii) collaborative mapping and extension. Briefly, the social sciences arm was coordinated by a team of social scientists, educators and psychologists. They organized socialization activities including engagement within and between teams and residents, performed ethnographic surveys, and subsequent curation and dissemination of research findings. The eco-epidemiological arm was coordinated by a team of epidemiologists, ecologists, statisticians, database managers and laboratory technicians. They performed and supervised surveys between 01 November 2021 and November 2024 to collect demographic, socioeconomic, and environmental data as well as estimate resident and domestic animal exposure to infectious diseases. The collaborative mapping and extension arm conducted mapping activities, focusing on resident perceptions of, and attitudes regarding, their direct (peri)domestic environment and community, including areas and environmental features they prioritize for interventions. This complements the qualitative and survey-based activities of the two other project arms. Additionally, this arm led capacity-development initiatives within the community through institutional collaborations and engagement with governmental and other third-party organizations.

While each project arm took the lead on one or more of the project dimensions, the participatory dimension and the evaluation of all interventions and the process were jointly led. More importantly, even for "disciplinary" dimensions, continuous dialogue among different teams and the exchange of experiences, ideas, and mutual curiosity ensured that our project constantly evolved and interdisciplinarity increased. This was exemplified by the co-construction of novel study tools, generation of ideas, and subsequent implementation of collaborative activities among the arms.

Community engagements

The primary strategy for engaging residents across the three study areas in the design and implementation of interventions was through establishment of community working groups. The social sciences team facilitated community mobilization processes and supported the formation of these groups, which served as platforms for identifying challenges and co-designing locally appropriate interventions. Attempts were made to include representatives from local health facilities and municipal government agencies in the working groups; however, participation from these stakeholders was limited despite invitations. The meeting dynamics followed popular education methodologies and a problem-solving approach,

TABLE 1 Baseline profile of study communities included in the interdisciplinary project (November 2021).

Variables	Study communities		
	Pau da lima	Marechal Rondon	Alto Do Cabrito
Study population size	1,834	816[c]	93
Number of households	833	463[c]	51
Female population	58.1%	60.5%	61.3%
Median age (in years)	32	35.0	34.0
Predominant race-black/brown	94.3%	90.5%	90.3%
Literacy level[a]	34.5%	39.4%	46.2%
Food insecurity[b]	45.2%	67.2%	89.2%
Unemployment[c]	61.4%	53.3%	48.8%
Seroprevalence of SARS-CoV-2	75.9%	91.2%	89.1%
Seroprevalence of leptospirosis	10.2%	12%	7.6 %
Seroprevalence of Chikungunya	44.2%	40.1%	46.7%
Seroprevalence of Dengue fever[d]	61%	82.9%	81.5%
Physical health score[e]	53	48	46
Mental health score[e]	51	46	47

[a]Than 6 years of formal education.
[b]Responses were from head of households or another eligible representative.
[c]Unemployment was assessed for adult participants (18 years and above).
[d]Prevalence among residents under 20 years of age.
[e]Reference threshold for good health score is 50 (21).

allowing residents to decide on discussion topics and actions to be undertaken in their communities. This approach is grounded in the traditions of Popular Education and Community-Based Participatory Research as developed in Latin American public health scholarship (28, 34). Outputs from these discussions were documented as meeting notes or minutes and subsequently used to guide follow-up discussions and implementation activities in later meetings. Some interventions were supported through written agreements and institutional partnerships with public and private agencies. However, most interventions were implemented through informal commitments grounded in trust, shared responsibilities, and ongoing collaboration among stakeholders. Table 2 provides an overview of the community groups, including meeting location, frequency, and format, as well as key themes discussed in those meetings.

For instance, the Pau da Lima community is very heterogeneous, characterized by its diverse composition of four valleys. We decided to work in the first valley "Baixa de Santa Rita," where social vulnerability is highest and, as unpublished feedback sero-survey questionnaires revealed, residents did not perceive that they were adequately represented by neighborhood associations and leaders. Additionally, there was a notable absence of leisure activities or avenues for community participation reported by individuals in the area. Hence the team conducted door-to-door visits and discussions to contextualize needs, resulting in a greater participation of women who arrived with their young children to join group discussions. The team established an open tent called the "Freirean Tent," serving as the meeting venue every fortnight. To promote engagement and inclusive dialogue, we employed methodologies rooted in popular education and participatory research, including social cartography (28, 34–38). This approach enabled the identification of community needs, challenges, and aspirations for a better future. Interestingly, the involvement of children under 12 years old was unplanned initially, but mothers arrived with their children seeking participation in the sessions. Consequently, we adapted by organizing parallel recreational, sports, and artistic activities for the children, alongside the main discussions. These gatherings facilitated dynamic conversations on potential intervention strategies that could be prioritized to address community issues (Table 2).

In selecting the participatory group for the Alto do Cabrito community, we collaborated with the "Cia de Arte Cultural E ao Quadrado" (E^2), an artistic and cultural association. The pre-existing relationship, established during research conducted from 2017 to 2019 (10), fostered trust between the E^2 leaders and our project team, facilitating continued collaboration (Table 2).

In Marechal Rondon, like Alto do Cabrito, there existed a prominent Community Association known as "Associação Emília Machado Bahia" (AEMBA), which we had also engaged with in previous projects. AEMBA focuses primarily on youth capacity-building initiatives. To understand the community's needs, we conducted key informant interviews with local leaders and drew upon knowledge gained from our previous research in the area. Youth recruitment for group discussions took place at AEMBA, and meetings became more frequent with the initiation of the current project. The discussions led to collaborative mapping exercises and the identification of key themes by young participants from AEMBA and Colegio Germano Machado, a school in the community, which subsequently informed action plans (Table 2).

Research activities of the eco-epidemiological, and collaborative mapping arms of the project

The eco-epidemiological arm conducted surveys to estimate zoonotic and mosquito-borne pathogen burdens and associated risk factors in the study areas. For individuals above the age of 5, bi-annual serological surveys were conducted at households across study communities, involving the collection of blood, nasal swabs, and saliva (from humans). For domestic animals (e.g., dogs, cats, chickens), blood, oral/rectal swabs and feces were collected to assess health conditions and zoonotic infections. Ecological assessment involving seasonal environmental surveys using track-plates and oviposition traps were used to estimate rodent and mosquito populations, respectively (39, 40). Remote sensing techniques were also used to assess the presence and extent of open sewers, drainage, trash accumulation points, and land cover/land use. Water from open sewers and puddles, as well as soil from randomly selected points, were collected to

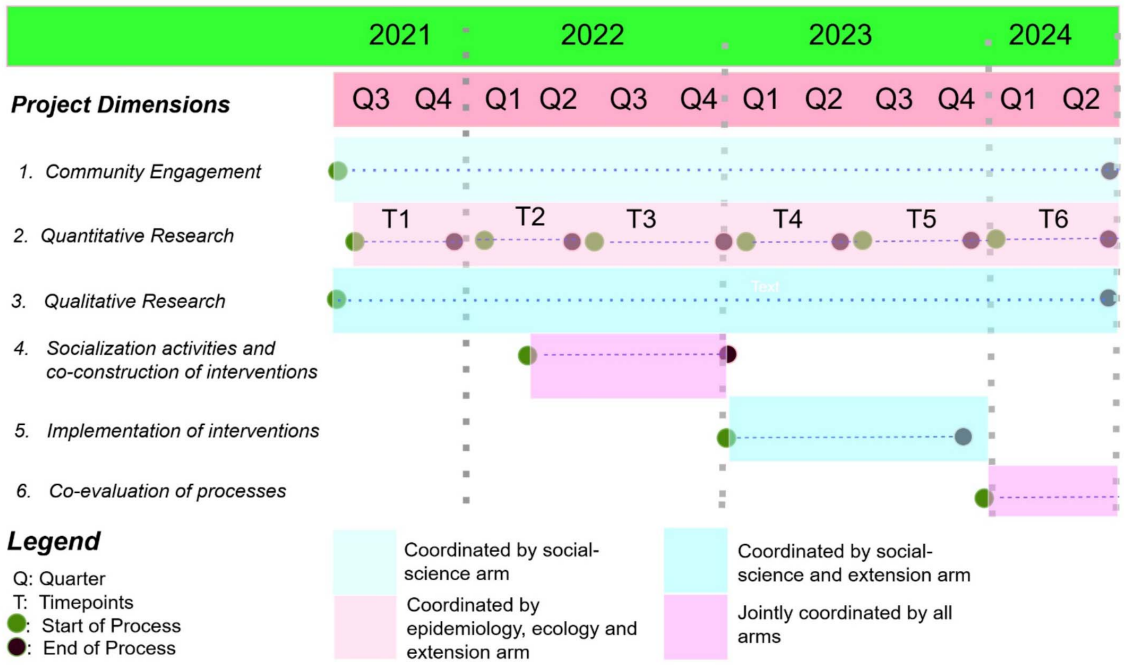


FIGURE 2
Schematic diagram of the project design.

quantify pathogen loads in the environment. These data were complimented by those provided by the mapping and extension team, which coordinated all project-related mapping activities, focusing environmental features that were identified by residents as points of strength or which needed improvement. The team also emphasized community empowerment through the establishment of cultural, artistic, and communication programs.

Socialization of results and co-construction of interventions

All socialization activities (communicating and reflecting on the current state of data-based knowledge to the broader community) happened after the first 12 months of initiating the project, which coincided with the period where results generated from established working groups, and eco-epidemiological surveys had been analyzed for dissemination at community meetings. The process of socialization was different in each community. The Alto Do Cabrito community served as the pilot site for socialization of results, which involved several workshops and engagements between the team and the residents over a period of 4 months. The workshops provided a platform for our team to share their earlier research findings, enabling interdisciplinary discussions among experts in epidemiology, ecology, extension, and social sciences. The workshops involved community debates based on a video synthesis of research results, mediated by field researchers., and focused on community feedback regarding how they perceived the implications of previous results for health interventions in the community.

In Marechal Rondon, the socialization was not limited to meetings, but also a series of engagements between researchers and youths through training activities, field tours and mapping of identified vulnerabilities. The pre-existing interest of the youths in activities related to environmental health, vector and reservoir ecology allowed the exchange of knowledge and research findings to be more fluid and constant throughout the project.

In Pau da Lima, the longer-term engagement of the broader research team with the community led to the socialization process taking on a distinct dynamic. Initially, the project teams proposed a review of published articles from research studies conducted in Pau da Lima over the last two decades. All teams, including community mobilizers, participated in this process, with the aim of synthesizing these studies and producing written or online materials. However, as the article summaries were being finalized, a sewerage improvement project commenced, disrupting our regular fortnightly meetings in the Freirean tents. During subsequent meetings, we therefore focused on those research findings related to sewerage improvements and health in discussing the design of interventions in the community.

Results

This section outlines the objectives, key activities, stakeholders, and expected outcomes of the interventions implemented in the three communities.

TABLE 2 Profile of community groups across the study communities included in the interdisciplinary project (November 2021).

Variables	Study communities		
	Pau da lima	Marechal Rondon	Alto Do Cabrito
Were there existing community groups?	Yes[a]	Yes[b]	Yes[c]
Make-up of group	Mostly women and children and researchers	Community leaders, youths and researchers	Women (community leaders, residents, youths) and researchers
Size of group	Dynamic[d]	Dynamic[d]	Dynamic[d]
How we contextualize needs	Open questions in the sero-survey (21) and discussions held in the Freirean tent	Open questions in the sero-survey (21) and conversation circles with young people and leaders based on data from previous research and other problematization	Open questions in the sero-survey (21) and conversation circles with community leaders, youths and leverages on previous research in the locality
How group members were invited	Door-to-door visits to residents. Delivery of printed invitations, and wall posters in the community	Contact with AEMBA and recruitment at the local school	Contact with E^2 and a snow-ball sampling approach among community leaders/stakeholders
Meeting venue	A newly created open tent by the team called a "Freirean Tent"	AEMBA and Community School	E^2 Theater Cultural Center
Frequency of meetings	Fortnightly	Weekly	Bi-weekly
Format of meetings	Physical	Physical and virtual	Physical and Virtual
Themes of group discussions	Community needs, problems and aspirations and definition of interventions	Community needs, problems and aspirations and definition of interventions	Community needs, problems and decision on priorities in interventions

[a]Yes, but in the serosurvey questionnaire, people indicated that they did not feel represented by them.
[b]Emília Machado Association (AEMBA).
[c]E^2 Theater Cultural Center.
[d]Participation is open, hence the groups are heterogeneous and dynamic in nature.

Alto-Do Cabrito community

A total of five interventions were developed in Alto do Cabrito (Table 3). The first intervention proposed by the community group involved creating a memorial to document the community's history. This initiative aimed to challenge the prevailing narratives about the neighborhood, which often focused on themes of violence and drug trafficking. The memorial project included capturing audiovisual narratives from residents of the neighborhood. Group members organized themselves to conduct more than 20 interviews with individuals recognized for their significant roles in the community, whether as religious figures, cultural influencers, or social leaders. Beyond sharing these videos on a dedicated website, the collaborative efforts have been showcased in a community exhibition. The memorial project has facilitated a re-examination of the neighborhoods' narratives, highlighting its identity as a peripheral area while also exploring the connection between present-day health issues and collective memory.

The second intervention involved organizing a health fair aimed at fostering collaboration among various social, health, artistic, and cultural entities. In partnership with the Federal University of Bahia (UFBA), planning meetings were held to develop dynamic organizational strategies, plan activities, and secure funding. In addition to health professionals, local artists were also involved, collaborating with residents to develop proposals aligned with the broader health perspective for inclusion in the fair. The health fair venue featured a dissemination tent where the research's most significant findings were showcased through interactive panels and discussion circles (Table 3).

The third intervention was the "Dique Verde Vivo Project" (literal translation "Living Green Dike project"). It was initiated by the community group, with the aim of restoring the Dique do Cabrito, an artificial lake that runs through the community's territory and is linked to the history of socio-cultural development of the neighborhood. The idea of restoring the lake emerged from the people interviewed for the memorial, as their narratives highlighted the importance of the Dique for the community. A number of health and socio-environmental issues linked to the Dique were also mentioned during the socialization of the results. The Living Green Dike project encompasses a range of activities including cleaning of the lake, educational campaigns aimed at raising community awareness for cleaning the lake, tree planting around the lake, a collective action to assemble a "Christmas tree" using recyclable materials, and the creation of a poetry wall. The latter is a cultural activity featuring presentations by around 130 local artists, facilitating the exchange of existing artistic potential within the neighborhood. To carry out these activities, this project has actively sought partnerships from governmental agencies responsible for (i) refuse collection i.e., LIMPURB-

TABLE 3 List of interventions developed in Alto do Cabrito community.

Intervention	Aim	Activities	Actors	Frequency	Immediate impact	Long term impact
Community memorial	Preserve the life story and narratives of residents, their memories, experiences and knowledge about life and health in the territory	Recording interviews and audiovisual production of narratives condensed into 3 documentaries and development of an open repository (i.e., webpage)	Residents (leaders and people of reference in the community)	Continuous	Encouragement and strengthening of bonds and sense of belonging within and between neighborhoods, contributing to countering stigmatizing and prejudiced hegemonic narratives about the territory.	Strengthen cohesion among community group members and improve intergenerational relationships. Contribute to the construction of health based on the perception of memory as a human experience.
Community health fair	Promote integration between communities. Promote awareness about community working groups. Promote health in an expanded way and collaboration between different social, health, artistic and cultural entities	Socialization of preliminary research results, thematic dialogues, provision of health services and carrying out integrative activities (cultural, artistic, poetic displays)	Residents and researchers	Point	Encouraging engagement and building bonds (between residents, communities and research teams); Expanding the communal conception of health	Strengthening autonomy and self-management dynamics; strengthening partnerships with other entities
Dique Verde Vivo Project	Contribute to the socio-environmental recovery of Dique do Cabrito	Providing awareness about environmental management; Assisting with claims from public authorities; Implementing environmental and artistic interventions (cleaning the surrounding area and the waters of the Dique)	Community residents and researchers, LIMPURB, SEMOP, and INEMA	Continuous	Improve the aesthetics of the neighborhood; Reducing exposure to disease vectors; Promoting care for the environment; Valuing art and local artists and strengthening articulation between residents in organizing the event; Integration between communities (Marechal Rondon and Alto do Cabrito)	Improve environmental conditions and quality of life for the population living around the Dique, as well as strengthening community cohesion
Bota Fora	Promote the removal of unusable waste materials from abandoned spaces	Removal of unusable waste from abandoned spaces with the support of residents and subsequent collection by the public waste agency.	Residents mostly youths, researchers and LIMPURB	Point	Improve the aesthetics of the neighborhood; Reducing breeding sites for rodents and vectors; Promoting better air quality and improving overall quality of life.	Improved environmental conditions as measured by reduced incidence of vectors, rodents and associated diseases; improved; Improved unity among community groups

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TABLE 3 (Continued)

Intervention	Aim	Activities	Actors	Frequency	Immediate impact	Long term impact
Artistic paintings (complementary to Bota Fora)	Redevelopment of degraded or abandoned spaces	Mapping of abandoned or degraded spaces and transformation of such places to social hubs using artistic works	Residents mostly youths	Bi-monthly	Improve the aesthetics of the neighborhood; Promoting the prevention of using renovated spaces as dumping sites	Promote interest in renovating abandoned spaces with artistic work. Improved environmental conditions as measured by reduced incidence of vectors, rodents and associated diseases. Improved unity among community groups

Empresa de Limpeza Urbana de Salvador (literal translation "Urban Cleaning Company of Salvador") (ii) SEMOP—Secretaria Municipal de Ordem Publica, (literal translation "Municipal Secretariat of Public Order") and (iii) INEMA- Instituto Do Meio Ambiente E Recursos Hidricos (literal translation "Institute of the Environment and Water Resources") to plan and execute actions (Table 3).

Fourth, the "Bota Fora" intervention (literal meaning: "to kick out") aims to improve environmental quality, repel rats and mosquitoes, and enhance aesthetics of neighborhoods by removing unusable waste materials from abandoned spaces. With the active involvement of residents, particularly youths, researchers, and the public waste agency (LIMPURB), this intervention was designed to clean up abandoned areas and dispose of waste properly. By clearing these spaces, the intervention seeks to reduce breeding sites for rodents and disease vectors, thereby improving environmental conditions and air quality. The removal of waste also contributes to a better overall quality of life for residents by creating cleaner and more pleasant surroundings. Additionally, this also aims to improve unity among community groups as they collaborate toward a common goal of enhancing the neighborhoods' cleanliness (Table 3).

Finally, the fifth intervention is complementary to "Bota Fora" and involves redevelopment of degraded or abandoned spaces within the community using artistic paintings. Through collaborative efforts primarily involving youths, these spaces are identified through mapping exercises and transformed into vibrant social hubs adorned with artistic works. The initiative aims to improve the aesthetics of the neighborhood and deter residents from using these spaces as dumping sites. Through the creation of visually appealing areas, residents are encouraged to take pride in and maintain these spaces, fostering a sense of ownership and community pride. Additionally, this initiative contributes to improved environmental conditions by reducing the incidence of vectors, rodents, and associated diseases, thereby enhancing overall public health. As the community groups work together toward revitalizing their shared spaces, this initiative will also create a more vibrant, inclusive, and collaborative community environment (Table 3).

Marechal Rondon community

In Marechal Rondon, as the group was primarily made up of young people, the first set of interventions was related to the development of community and university courses and workshops to prepare young people for the job market, considering the greater difficulty in accessing jobs for young people living in peripheries (41). These activities include courses in English and French languages, computer studies, robotics, theater, singing, guitar, dance, college entrance exam preparation classes, entrepreneurship, first-aid and graffiti. Some of the young people who participated in these courses were available to share what they learned with other young people in the community after the project ended and were recognized as teachers, bringing them satisfaction due to the feedback they have received and the difference they are making (see Table 4 for details).

TABLE 4 List of Interventions developed in Marechal Rondon community.

Intervention	Aim	Activities	Actors	Frequency	Immediate impact	Long term impact
Community-run courses	Developing skills in various areas of knowledge with teachers from the community itself	Engage youths in courses such as informatics, photography, arts, English and music.	Young teachers from the community	Bi-annually	Improved skill sets for job opportunities; Enhanced capacity and improved self-esteem for young community teachers; Improved valuation for teaching profession; strengthened association within the community	Established network of professional teachers; Increased interest of young teachers and students in advanced education; Enhanced engagements amongst youths for sustainability.
University-run courses	Developing skills in various areas of knowledge with teachers from the university (research group)	Engage youths in language classes (French, English), computer courses, graffiti and collaborative mapping exercises	Researchers from the universities and youths in the community	Bi-annually	Improved skill sets for job opportunities; improved capacity and self-esteem for youths to interact with global audiences	Established network between youths and researchers; Increased interest of youths in advanced education; Enhanced capacity and engagements amongst youths for sustainability.
Startup social CommuniTech	Empower youth from communities to take leadership in digital culture and engage in discussions about inequalities.	Creating and hosting podcasts; Offering computer and technology courses; Producing audiovisual content; Participating in conferences and seminars	Youths from community	Monthly	Facilitating communication on technology and inequality topics relevant to peripheral youth, presented in accessible language; Inspiring other young people to take initiative and become involved in social startups.	Establishing sustainable practices and fostering new interventions that benefit future generations
Periphery in Every Corner (PETOC)	Promote citizenship and guarantee the right to the city and art (access to desired and unknown spaces)	Organize visits to locations selected by the youth, such as museums, tourist attractions, universities, parks, squares, and more. Facilitate artistic performances by the youth in these spaces; Conduct discussions before and after the visits to reflect on the activities and the spaces explored.	Youths from community and researchers	Bi-monthly	Increased awareness of their surroundings within typically exclusionary spaces; Strengthened interpersonal relationships within the group; Active participation in activities connected to local associations; Encouragement of artistic expression and the use of public and university spaces.	Cultivation of critically aware individuals who challenge inequalities and exclusionary spaces; Sustained commitment to social causes and advocacy

(Continued)

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TABLE 4 (Continued)

Intervention	Aim	Activities	Actors	Frequency	Immediate impact	Long term impact
Crochet workshop	To foster social engagement and strengthen intergenerational dialogue among community members through a creative and inclusive activity.	To create a platform where women from different backgrounds can gather weekly to crochet while discussing social issues relevant to their living conditions and the challenges of their territory	Community women	Weekly	Establishment of a supportive group where participants can engage in creative activities; Increased awareness and dialogue around social issues affecting the community; Initial connections and mutual understanding between participants of different generations.	Strengthened intergenerational relationships and a more cohesive community; Empowerment of women to advocate for improvements in their living conditions; Sustainable development of a community-driven initiative addressing social issues collaboratively.
Bota Fora	Promote the removal of unusable waste materials from abandoned spaces	Removal of unusable waste from abandoned spaces with the support of residents and subsequent collection by the public waste agency.	Residents mostly youths, researchers and LIMPURB	Point	Improve the aesthetics of the neighborhood; Reducing breeding sites for rodents and vectors; Promoting better air quality and improving overall quality of life.	Improved environmental conditions as measured by reduced incidence of vectors, rodents and associated diseases; improved; Improved unity among community groups

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The second intervention was "Periferia em Todos os Cantos" (PETOC) project (literal meaning: Periphery in Every Corner), an initiative that enabled young people to occupy spaces in the city of Salvador that many of them had not previously visited and, in some cases, never considered they could access. The PETOC project promoted artistic performances in various locations in the city, such as the Federal University of Bahia and historical and touristic neighborhoods such as Barra and Pelourinho (Table 4).

The third intervention, like the memorial intervention in Alto Do Cabrito, was the creation of a podcast, by young residents, to identify and address problems in the community and those identified by the community groups. This initiative seeks to recover memories and expand the possibilities for dialogue in the community on contemporary issues, particularly those related to the environment, inequalities, social empowerment and innovations.

The fourth intervention was a crochet workshop, which aimed to bring together a different audience from those who already attended the group and to stimulate intergenerational dialogue. Through this initiative, a group of women was formed who began to meet weekly to crochet and discuss social issues related to their living conditions and the territory in which they live (Table 4).

Finally, the fifth intervention was the "Bota-for a," similar to that developed in Alto do Cabrito, with the two community groups coming together to carry out the activity in partnership. However, in Marechal Rondon, there were instances where the researchers interacted extensively with residents and shared information on how to produce homemade repellents to prevent mosquitoes that transmit dengue fever (Table 4).

Pau Da Lima community

A total of four interventions were developed in Pau da Lima. The covering of sewage outflows was implemented by the municipal project and not an outcome of our project. However, the community residents and researchers joined the agency in monitoring and improving the coverage of the intervention. The other three interventions were designed from the "Freirian tent" during our socialization activity, where residents preferred interventions aimed at strengthening community spaces and social bonds beyond the project's duration (Table 5).

The first of these interventions focused on the development of spaces that serve both ecological and social functions. This initiative aimed at improving the overall quality of life within the neighborhood and will involve the construction and management of various amenities, including parks, playgrounds, daycare centers, and family health units (Table 5).

The second group of interventions was the development of sporting, recreational and other professional activities targeting children, young people and adults, including boxing, theater, photography, crafts and makeup workshops to promote integration among the community's residents and to challenge existing social barriers, as well as courses aimed at expanding the possibilities for young people to enter the job market. The makeup course (coordinated by a resident), in addition to sharing beauty techniques, was created to be a space to discuss self-care and socially imposed beauty standards. The crafts course (also coordinated by a resident) was attended by adults and children, sharing different techniques, mainly using recyclable materials to produce art (Table 5).

The third intervention was a community garden and kitchen, which was designed for young people and adults, emphasizing alternatives for income generation while addressing food insecurity issues and improving nutrition for residents facing financial constraints. It involves the construction of the community garden and kitchen and organizing regular dialogues on food security and income generation in the community (Table 5).

Discussion

In this article, we have described our interdisciplinary program, highlighting how *co-production* can leverage social capital and inter-sectoral partnerships to enhance the capacity of marginalized urban communities to address broad health and environmental challenges through locally designed sustainable interventions (42). In the context of participatory research, particularly those in informal urban settlements, our program emphasizes several points that contribute to the research field.

Foremost, working simultaneously in three communities allowed integration of diverse knowledge, perspectives, and priorities, with a particular focus on engaging women and youth. Secondly, the communities identified priorities and targets based on their specific cultural, social, and environmental perspectives. Thirdly, the unique interventions implemented by each community to tackle similar problems demonstrated that optimal solutions are context-dependent rather than universally "best."

Furthermore, from the outset, our team prepared to evaluate changes in incidence of specific infectious diseases and environmental indicators as metrics to accompany the interventions. Interestingly, the communities primarily chose multi-purpose interventions targeting general wellbeing—choices that differed from our expectations based solely on previously collected eco-epidemiological data (10). This unexpected preference highlighted the importance of addressing broader social and collective determinants of health and will allow us to test whether the benefits of these holistic interventions extend to more specific outcomes, such as reductions in single diseases or improvements in environmental indicators (43, 44). Another innovative aspect was implementing a feedback loop connecting the *activities* organized by our team and grounded in Popular Health Education (45) with the *interventions* initiated by the community. This dynamic facilitated continuous dialogue and mutual adaptation, enabling us to refine our activities and research instruments both within and across disciplines.

Below, we describe these dimensions in more detail and provide examples from the three communities where the program was implemented. We also describe how community participation led to setting joint agendas and plans with governmental agencies, in addition to secondary and medium- and long-term benefits for the community. Finally, we identify some of the challenges that our program faced and the lessons that can be learned for adapting such a program to other contexts.

TABLE 5 List of interventions developed in Pau da Lima community.

Intervention	Aim	Activities	Actors	Frequency	Immediate impact	Long term impact
Coverage sewage channels*	Cover sewage channels that pollute the Trobogy and Coroado tributaries of the Jaguaribe River	We followed the project, encouraging dialogue between residents and those responsible for the work with the aim of maximizing its scale and benefits	Municipal government agencies.	Point	Improved health conditions and the dynamics of community coexistence.	Improved quality of life
Community spaces	Improving the neighborhoods' infrastructure and expanding access to public services	Construction, and management of parks, playing square, daycare center and family health unit (collectively regarded as eco-social hubs)	Community residents and researchers	Continuous	Improved access to basic services such as parks, playing square, daycare center and family health unit (collectively regarded as eco-social hubs),	Improved quality of life
Sports, creative and professional workshops	Promote personal and sociocultural development activities among children and adults within and between communities.	Sporting, recreational and other professional activities targeting children and young people, such as boxing classes, theater and photography workshops	Community residents and researchers	Continuous	Promote strengthening of bonds among children and adults within and between communities; Develop creative and professional capabilities of people in the community; Recognize and discuss the health problems involved in Baixa da Santa Rita	Promote integration among children (for example those with disabilities) and challenge existing social barriers
Community garden and kitchen	Promote activities to combat food insecurity and unemployment	Construction of a community garden and kitchen; Establishment of dialogues on food security and income generation	Community residents and researchers	Continuous	Improve food security and relationship with the environment; Improve employment and income conditions, based on practices that encourage solidarity and the construction of citizenship.	Improved quality of life; Improved Food security; Improved income

*Interventions were implemented by the municipal government outside the project and were only monitored by the community residents and researchers.

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Unique solutions to common challenges

Our program embraced the diverse knowledge and perspectives both within and among communities, reflecting differences in demographic, socioeconomic, and cultural characteristics of existing organizations, newly formed community groups, and participating residents. Thus, while the three communities face similar health and quality of life challenges (Table 1), their distinct profiles have shaped local priorities, resources, and methods of engagement, leading to a diversity of solutions tailored to their specific needs (28). This aligns with earlier studies emphasizing that context-specific and inclusive interventions are more effective than one-size-fits-all models (46, 47). By remaining attentive to the unique journey of each community, including their distinct histories, starting points, and processes, we aim to understand, upon evaluating the interventions in the next phase of the program, how the local context can influence priorities, interventions, and their outcomes, which will aid adapting the program to other contexts nationally and internationally (48).

For example, the active participation of women and youth introduces diverse perspectives that are more attuned to the broader needs of the community (49). Despite their important role, these groups are frequently underrepresented in participatory initiatives, leading to gaps in addressing their specific needs and perspectives (50). Previous studies have reported improved health outcomes in community health initiatives where women's participation is strengthened (51, 52). However, in this study, women's increased participation is interpreted within the context of existing structural and social gender inequalities that often position women more prominently within community and household health-related activities, rather than as an indication of an inherent or exclusive responsibility for care. The program therefore sought to recognize and support female leadership while emphasizing shared, collective, and equitable responsibility among all community members in health promotion and decision-making (51, 52).Their involvement often results in interventions that prioritize social determinants of health and strengthen community ties and capacity. These include gender-specific health needs, youth engagement strategies, child welfare, cultural preservation, and innovative approaches to community development (49). Similarly, youth engagement ensures that interventions are aligned with the needs of younger generations (53). In Pau da Lima, for example, most participants were women. They highlighted social vulnerabilities related to gender, class, and ethnicity, such as food insecurity, violence, and mental health. These themes were closely linked to the interventions proposed, which included a community garden and kitchen, sports and artistic activities, and workshops (e.g., crafts and makeup).

Evaluating broad interventions with a wide range of metrics

Rather than imposing predefined intervention targets, which often limits participation and local input in relation to what solutions are prioritized and how they are implemented (48, 54, 55), our program facilitated interventions that emerged organically from the concerns of the involved communities. The challenges identified spanned environmental, individual, and community levels, including environmental quality, infectious diseases, physical and mental wellbeing, food security, and violence, as well as less tangible elements like memory, identity, and sense of community. Interestingly, the interventions chosen in all three communities overwhelmingly targeted general wellbeing, which differed from what we might have selected as researchers relying solely on eco-epidemiological data.

From the outset, our program was prepared to continuously update existing evaluation metrics and introduce new ones. Thus, our approach to evaluating these complex interventions is to acknowledge that addressing broad, overarching wellbeing goals can have ripple effects on specific outcomes such as disease prevalence and environmental health (56). Hence, our program will define intervention success not only through individual-level outcomes (e.g., disease incidence) and at community, animal, and environmental levels, but also, more importantly, by fully appreciating community health and empowerment (54). This includes revealing whether interventions targeting individual and community wellbeing, shaped by their choices, provide specific health benefits, and challenges the assumption that the most effective interventions are those defined solely by a narrow set of predefined outcomes.

For example, in Alto do Cabrito, the decision to create a memorial to reclaim the identity and history of the community became a catalyst for further interventions, including reclaiming a dumpsite as a football field in the "Bota Fora" intervention which was also implemented in Marechal Rondon. This transformation is expected not only to enhance physical and mental health but also to reduce inadequate waste disposal, potentially decreasing rat presence and diminishing the transmission of leptospirosis—a key infectious disease in the community (10). In Pau da Lima, sports and creative workshops for children extended beyond traditional health concerns by addressing social integration and personal development. These projects spurred increased participation by youth and their mothers in broader health initiatives, leading to the creation of a community garden and kitchen that addressed food insecurity while providing environmental and economic benefits, potentially reducing disease risks (by removing resources for rats and mosquito breeding sites), and fostering community resilience.

Interdisciplinarity of focus

Throughout the program, our research teams needed to adapt to multi-target and interlinked interventions by moving beyond narrow disciplinary boundaries and engaging in processes of shared learning with community participants. This academia–community articulation reflected principles commonly associated with university extension practices, characterized by reciprocal knowledge exchange and collective problem-solving between researchers and residents. Regular meetings and workshops involving community representatives were central to synthesizing diverse disciplinary and experiential perspectives, ensuring that insights generated within one group informed

and enriched the methodologies and approaches of others. For example, when residents identified potential hotspots of disease transmission through collaborative mapping, the epidemiology and ecology teams adjusted their sampling strategies accordingly, while social scientists conducted in-depth interviews to better understand exposure risks and barriers to behavioral change. This iterative process strengthened both research design and community engagement by integrating local knowledge with scientific inquiry.

This feedback loop between *activities* and *interventions* culminated in interventions that were more creative and multi-targeted than what would have likely been proposed by a more conventional approach, driven mainly by formally trained researchers (57–60), or with an approach where both researchers and community cross-fertilized ideas but were limited within a fixed scope of intervention targets and outcomes (61, 62).

Short and long-term benefits

In the short term, our program led to the design and implementation of interventions to address health concerns as perceived by the community residents. It has promoted, within marginalized communities, participation in local planning and governance (63), and the possibility of setting joint priorities and agendas with governmental agencies, with three hearings made between 2022 and 2024 on "Bota For a," and "Living Green Dyke" interventions that required continuous collaboration with three agencies (LIMPURB, SEMOP, and INEMA). Furthermore, it has supported the establishment of common ground among different communities and the emergence of leaders from historically marginalized groups. These leaders play a crucial role in both the implementation and sustained maintenance of interventions. Our contention is that interventions in informal settlements may have significant public value (for example, through empowerment), even when their effects are not immediately measurable using conventional epidemiological or ecological metrics.

Nevertheless, in the longer term, in the next phase of the program, there will be a robust evaluation of its impacts, assessed not only through the interventions themselves, but also by evaluating their implementation (64). This distinction is vital for driving sustainable changes at local scales. When interventions fail to meet expectations, it is essential to identify whether the failure was due to the intervention being ineffective (intervention failure) or the improper execution of an otherwise effective intervention (implementation failure). Evaluating implementation effectiveness will involve assessing key factors such as acceptability, appropriateness, feasibility, uptake (adoption), reach (penetration), fidelity, cost, and sustainability (64).

Challenges

The CBPR process faced significant resource and timing constraints. At the community level, several structural challenges affected implementation. Many communities lacked pre-existing representative groups and experienced fragile social cohesion, compounded by violence and insecurity. In Pau da Lima, the absence of shared community spaces limited opportunities for social interaction and collective organization, leading to the creation of the "Freirean Tent" activities. These activities later contributed to the formation of the United Community Group, a name chosen by participants to emphasize unity as a pathway toward improved rights, living conditions, and health outcomes. Physical space limitations also affected the implementation of activities such as boxing and theater workshops, reducing children's participation. Adverse weather conditions and insecurity, including police operations, further disrupted activities and reflected broader challenges related to social invisibility and incomplete realization of established social rights.

From the research perspective, building trust among interdisciplinary teams and community members, embracing the evolving nature of CBPR, and integrating diverse disciplinary approaches presented both challenges and opportunities for learning. Conducting participatory research during the COVID-19 pandemic added additional complexity, as interactions were restricted to virtual meetings for extended periods. Defining the scope of participation and ensuring meaningful co-construction of knowledge required continuous adaptation, leading the research team to expand its conceptualization of health in alignment with local realities and to repeatedly reassess research protocols and timelines. Although the diversity of methods and engagement strategies made it difficult to maintain a linear research trajectory, it fostered sustained dialogue among stakeholders and helped avoid the imposition of a single interpretative framework.

Conclusion

This article describes a Community-Based Participatory Research (CBPR) approach, combined with principles of Popular Health Education, implemented to address health challenges in neglected urban communities in Salvador, Brazil. The approach was characterized by the active engagement of diverse community members and the incorporation of multiple perspectives shaped by gender, age, and social position. Rather than focusing exclusively on infectious diseases, the process enabled the identification of interconnected health concerns, including food security, violence, memory, and identity, reflecting broader social determinants of health. By integrating local knowledge with flexible and interdisciplinary research practices, the project supported the co-development of community-driven interventions aligned with locally identified priorities.

Despite challenges related to limited resources, insecurity, and the constraints imposed by the COVID-19 pandemic, the participatory process contributed to strengthening community dialogue, fostering collective action, and supporting the emergence of local leadership, particularly among groups historically underrepresented in decision-making spaces. The experience highlights the importance of sustained academia–community collaboration and adaptive research processes

when working in contexts marked by social vulnerability. Further research is needed to evaluate the short- and long-term impacts of these interventions and to assess their potential sustainability and transferability to similar urban settings.

Data availability statement

The datasets presented in this article are not readily available because all relevant data used in this manuscript are included in the form of tables or text descriptions. Additional datasets generated through this project can be provided upon reasonable request from the Data Manager at nivisonjr@gmail.com. Requests to access the datasets should be directed to nivisonjr@gmail.com.

Ethics statement

This study involves human participants and was approved by the National Research Ethics Committee (CONEP) linked to Brazilian Ministry of Health (approval number 35405320.0.1001.5030). All participants were informed about the study procedures and agreed to participate by signing a written informed consent form (for adults above age 17) or an assent form (for minors below age 18). Participants gave informed consent to participate in the study before taking part. The studies were conducted in accordance with the local legislation and institutional requirements. The participants provided their written informed consent to participate in this study.

Author contributions

HM: Supervision, Writing – original draft, Writing – review & editing, Project administration, Formal analysis, Methodology, Software, Investigation, Data curation, Resources, Validation, Visualization, Conceptualization. LA: Formal analysis, Project administration, Data curation, Validation, Methodology, Visualization, Funding acquisition, Software, Conceptualization, Writing – review & editing, Supervision, Writing – original draft, Investigation, Resources. LF: Resources, Visualization, Conceptualization, Writing – review & editing, Project administration, Investigation, Validation, Writing – original draft, Methodology, Formal analysis, Supervision, Software, Data curation. JA: Project administration, Supervision, Methodology, Writing – review & editing, Data curation, Conceptualization, Investigation, Validation, Writing – original draft, Formal analysis, Software, Visualization, Resources. MA: Data curation, Resources, Validation, Project administration, Visualization, Conceptualization, Writing – review & editing, Formal analysis, Methodology, Supervision, Writing – original draft, Investigation, Software. HA: Project administration, Writing – review & editing, Validation, Methodology, Supervision, Formal analysis, Investigation, Software, Visualization, Data curation, Conceptualization, Resources, Writing – original draft. IS: Supervision, Data curation, Methodology, Writing – review & editing, Software, Conceptualization, Investigation, Writing – original draft, Validation, Resources, Visualization, Formal analysis, Funding acquisition, Project administration. AP: Formal analysis, Software, Funding acquisition, Data curation, Writing – original draft, Visualization, Resources, Supervision, Conceptualization, Project administration, Investigation, Writing – review & editing, Validation, Methodology. TL: Methodology, Supervision, Validation, Conceptualization, Investigation, Data curation, Resources, Software, Writing – original draft, Writing – review & editing, Project administration, Formal analysis, Visualization. SC: Project administration, Methodology, Formal analysis, Validation, Supervision, Data curation, Writing – review & editing, Visualization, Writing – original draft, Investigation. RB: Investigation, Conceptualization, Writing – original draft, Writing – review & editing, Formal analysis, Methodology, Supervision. EC: Writing – original draft, Methodology, Conceptualization, Project administration, Writing – review & editing, Investigation, Supervision. EN: Methodology, Investigation, Supervision, Conceptualization, Project administration, Writing – review & editing. EL: Methodology, Supervision, Investigation, Writing – review & editing, Project administration. ER: Project administration, Supervision, Writing – review & editing, Methodology, Investigation. TM: Project administration, Supervision, Writing – review & editing, Methodology, Investigation. TS: Project administration, Methodology, Writing – review & editing, Supervision, Investigation. NN: Writing – original draft, Investigation, Writing – review & editing, Methodology, Project administration, Conceptualization, Supervision. JC: Investigation, Writing – review & editing, Conceptualization, Supervision, Project administration, Writing – original draft, Formal analysis, Methodology. IC: Supervision, Software, Writing – review & editing, Conceptualization, Methodology, Project administration, Formal analysis. RL: Methodology, Project administration, Supervision, Writing – original draft, Investigation, Formal analysis, Writing – review & editing. VD: Writing – original draft, Project administration, Investigation, Writing – review & editing, Supervision, Formal analysis, Methodology. MR: Formal analysis, Writing – original draft, Methodology, Investigation, Supervision, Project administration, Funding acquisition, Writing – review & editing. AK: Methodology, Project administration, Conceptualization, Supervision, Investigation, Writing – review & editing, Visualization, Writing – original draft, Resources, Funding acquisition. FC: Investigation, Conceptualization, Visualization, Validation, Funding acquisition, Methodology, Supervision, Formal analysis, Project administration, Data curation, Resources, Software, Writing – review & editing, Writing – original draft. MB: Investigation, Writing – review & editing, Validation, Software, Methodology, Supervision, Formal analysis, Resources, Funding acquisition, Data curation, Conceptualization, Writing – original draft, Visualization, Project administration. HK: Conceptualization, Writing – original draft, Resources, Investigation, Software, Visualization, Funding acquisition, Project administration, Validation, Formal analysis, Methodology, Supervision, Data curation, Writing – review & editing.

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Conflict of interest

The author(s) declared that this work was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Generative AI statement

The author(s) declared that generative AI was not used in the creation of this manuscript.

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Stakeholder perspectives on the WHO Mental Health Gap Action Programme Intervention Guide (mhGAP-IG) in humanitarian settings: a qualitative study in Lebanon and Iraq

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Background: The mental health treatment gap remains substantial in countries affected by humanitarian crises, where fragile health systems and structural instability hinder service delivery. The World Health Organization's Mental Health Gap Action Programme (mhGAP) aims to scale up evidence-based mental health care through integration into primary health care. However, its real-world implementation in humanitarian settings remains underexplored.
Methods: We conducted a qualitative study using in-depth individual interviews with 12 stakeholders, including primary care practitioners, mhGAP trainers, field supervisors and health managers involved in the implementation of WHO mhGAP training over the past five years in Lebanon and Iraq. Thematic analysis was applied to explore perceptions of training effectiveness, implementation dynamics, and contextual determinants influencing the mental health service delivery at primary health care level.
Results: The main findings of the study revolved around the following dimensions: (1) cases involving suicide risk and substance abuse are considered more challenging, requiring additional skills and coordination with specialized services; (2) the stigma surrounding mental health within communities and among healthcare providers further hinders access to care; (3) poor continuity of care restrict effective mental health care delivery; (4) the mhGAP training enhances knowledge and skills, but changing attitudes and clinical practices are directly influenced by local health systems and policies; (5) continuous supervision is crucial for changing clinical practices and ensuring care aligns with evidence-based guidelines; (6) effective monitoring mechanisms are needed to ensure the training meets its objectives and improves access to mental health care at the primary level.

Conclusions: The mhGAP training experiences have shown potential in bridging the mental health treatment gap, while a stark disparity in access to mental health services is evident within countries, which is particularly acute for populations in humanitarian settings where instability and resource scarcity compound mental health challenges. This accentuates the urgency of targeting investments in the most underserved areas, and calling for a nuanced approach that recognizes the complex interplay of social, cultural and economic factors influencing health service delivery.

KEYWORDS

humanitarian settings, implementation, mental health, mental health gap action programme intervention guide, primary health care

1 Introduction

There is a consensus among healthcare professionals and global health specialists that the integration of mental health care into primary health care levels represents a shift in the global approach to addressing the growing need for mental health services (1). This consensus is based on the principles of accessibility, cost-effectiveness, and continuity of mental health care (2, 3). Despite this agreement, the treatment gap for mental health remains a significant challenge. According to the World Health Organization (4, 51), treatment coverage for mental disorders varies substantially across countries, regions, and from one mental disorder to another. High-income countries report treating approximately 71% of individuals with psychotic disorders, whereas in low-income countries only about 12% of people with these conditions receive mental health care (5). Coverage for depression also remains particularly limited: minimum adequate treatment reaches 27% of cases in high-income countries but is considerably lower in low-and-middle-income countries (LMICs), frequently falling below 3% in parts of sub-Saharan Africa and Asia (6).

During humanitarian crises, the integration of mental health care at the primary health level is particularly challenging, but extremely necessary. Humanitarian crises, often triggered or exacerbated by armed conflict, force people to leave their homes in extremely difficult conditions and to live without access to the most essential items. In such contexts, the prevalence and burden of common mental disorders, including mild forms of depression, anxiety, and post-traumatic stress disorder, are significantly higher when compared to global estimates (7).

The prevalence of mental disorders is higher in Middle Eastern countries than in global figures (8, 9), which is commonly associated with ongoing conflicts and humanitarian crises in the region (10). Almost 60 million people across the Middle East region need humanitarian assistance at different levels, and local health systems face dramatic challenges in scaling up mental health services to deliver effective care to the most vulnerable groups (11, 20).

1.1 The mental health gap action programme (mhGAP)

As part of global efforts to address the large burden of mental health conditions, national health authorities guided by the WHO and international organizations have implemented initiatives for scaling up care for mental health and substance use disorders at the primary health level. In 2008, the WHO launched the Mental Health Gap Action Programme (mhGAP) aiming to scale up care for mental, neurological, and substance use (MNS) disorders in non-specialized health care settings, which includes the mhGAP Intervention Guide (mhGAP-IG), a guidance package on the diagnosis and management of MNS disorders (12). The revised *mhGAP-IG 2.0* and the *mhGAP Humanitarian Intervention Guide* (HIG) versions were also released in 2015 (52).

Since then, mhGAP training packages have been extensively disseminated across countries worldwide. Studies have demonstrated the benefits of the use of mhGAP-IG in training for improving the knowledge, attitudes, and confidence of health workers in relation to mental health disorders (14), particularly in enhancing the engagement of primary care practitioners with mental health.

Nevertheless, evidence shows that most of the mhGAP experiences have either never been evaluated or have not been shared as widely as they could be. Considering this reality, Spagnolo & Lal (15) conducted an extensive review of the grey literature and identified more than 90 countries in which mhGAP-IG was implemented.

While it is notable that most mhGAP initiatives are implemented in LMICs, many of which facing humanitarian crises, countries of the Eastern Mediterranean Region (16), which includes all thirteen Arabic countries of the Middle East (17), represent only 11.49% of the initiatives reported (15). During an updated systematic review of the literature on mhGAP-IG, Keynejad (18) and colleagues confirmed that despite the dramatic increase in published studies on mhGAP-IG use and evaluation, notably few studies (7%) have been conducted in the Eastern Mediterranean region.

The mhGAP-IG has been used as a key training tool in humanitarian crises; however, its effectiveness remains under-evaluated in the peer-reviewed literature. Most existing studies focus on acquired knowledge among primary health care (PHC) providers, with limited evidence linking mhGAP training to improved access to mental health care at the primary care level (19).

Lebanon faces a challenging context for integrating mental health into primary health care. According to the United Nations High Commission for Refugees, the country hosts more than 1.5 million Syrians displaced by the conflict (50), representing the highest proportion of refugees to host population worldwide. This demographic pressure has exacerbated already high and growing rates of non-communicable diseases (NCDs) and mental health conditions, affecting both the Lebanese population and the refugee

community, and underscoring the urgent need for stronger primary health care services. In addition to the Syrian crisis, Lebanon has been experiencing an unprecedented economic and financial crisis, further exacerbated by the COVID-19 pandemic and the Beirut port explosion. These compounded shocks have significantly weakened the health system, limiting state capacity to ensure equitable access to health care services for the general population (21). Within this fragile system, initiatives such as the WHO mhGAP play a central role in expanding access to mental health care (22), aligned with the efforts made by the National Mental Health Program (NMHP) in Lebanon in collaboration with humanitarian agencies (23, 24).

In Iraq, mental health has remained a highly challenging issue to address after two decades shaped by recurrent wars, protracted conflicts, and ongoing political instability (25). Modern psychiatric services in Iraq were originally established in the 1930s, marking one of the earliest institutional mental health developments in the region; however, decades of sanctions and instability have repeatedly disrupted service continuity and system development (26).

The cumulative effects of these crises have deeply scarred the population, where fear and trauma have become widespread. Despite the magnitude of these problems, research and programmatic interventions have been limited, leaving significant gaps in knowledge regarding their epidemiology (27). Moreover, the destruction of institutional archives and documentation during successive conflicts has resulted in important gaps and inconsistencies in official health data, limiting the reliability of historical service assessments (26, 28).

The mental health system remains limited, and service provision is centralized in a small number of specialized psychiatric hospitals, while community mental health centers are largely absent (29). Mental health professionals face multiple difficulties, including limited training opportunities, scarce resources, and persistent stigma surrounding mental health care (30). Epidemiological estimates suggest that nearly one in five Iraqis will experience a mental health condition over their lifetime, with anxiety disorders, post-traumatic stress disorder (PTSD), and depression being the most common (31). Recognizing these challenges, the Ministry of Health initiated efforts in the late 2000s to rebuild and decentralize mental health services, notably through integrating mental health care into primary health care (26).

1.2 Study objectives

The objective of this study is to evaluate the perceptions and understanding of key actors (primary health practitioners and health supervisors) regarding the effects of mhGAP training initiatives on improving the quality and access to mental health care at the primary level in their respective contexts. To the best of our knowledge, there are few in-depth qualitative studies on the implementation of mhGAP-IGs in countries affected by humanitarian crises. Capturing the lived experiences of primary care practitioners, mhGAP trainers, supervisors, as well as local mental health managers in Lebanon and Iraq can contribute to a better understanding of the strengths and challenges of mhGAP implementation and, overall, to a discussion of the real-world barriers and necessary measures to integrate mental health into primary health care in humanitarian settings.

2 Methods

2.1 Study design

An in-depth qualitative study was conducted using semi-structured interviews to explore the perceptions of key stakeholders regarding the effectiveness of the mhGAP training package at the primary health care level in Lebanon and Iraq.

Following the criterion of prioritizing countries in the Middle East facing humanitarian crises and with an established background of mhGAP implementation at the national level, Lebanon and Iraq were purposively selected, as local partners ensured ethical clearance and feasibility for in-depth qualitative interviewing. The initial study design also included Syria as a third country; however, access to primary care practitioners and health managers was not granted.

Interviews were conducted until thematic saturation was reached, defined as the point at which no new codes or concepts emerged in two consecutive interviews, a process verified through team discussions during the coding phase (32, 33).

The in-depth individual interviews were deemed appropriate for exploring participants' views and perceptions of training interventions, including their perspectives on the contextual challenges and dimensions of effectiveness. The interviews were conducted by a researcher with previous experience in qualitative research and a background in global mental health, including field experience in primary health care, as a trainer and mental health supervisor.

2.2 Sampling strategy

Purposive sampling was used to select and recruit interviewees. Three main criteria were considered for the selection of interviewees: (a) location: health personnel working in regions affected by humanitarian crises in Lebanon and Iraq; (b) profile: primary health care practitioners, field supervisors, and health managers at the local or national level (e.g., Ministry of Health); and (c) mhGAP training experience: stakeholders who have been involved in the implementation of *WHO* mhGAP-IG over the past five years. Stakeholders were contacted via email. An information leaflet clarifying the scope of the study, including its objectives, methodology, and information on data analysis and ethical implications, was sent by email. Upon confirmation of participation, stakeholders were offered several time slots for the interviews at their convenience.

2.3 Data collection

A semi-structured interview guide with leading and probing questions was developed while keeping in mind the objective of the study (Annex). The interview guide focused on four thematic aspects: (1) mental health needs and service gaps encountered at the primary health level, (2) perceptions of the mhGAP training experience, (3) perceived effects of the mhGAP training, and (4) challenges and recommendations for mhGAP implementation. Specific attention was given to the main barriers and facilitators encountered by stakeholders to improve access to mental health care at the primary health level. The guide was piloted with a mental health specialist

and a general practitioner, and it was revised following their feedback. The same interview guide was used to interview all respondents, with minor linguistic adaptations to address stakeholders with different roles (practitioners, field supervisors, and health managers). The interviews were conducted from May to July 2023 and lasted from 60 to 80 min each. The interviews were conducted using *Zoom* and *Microsoft Teams*, and upon consent, the interviews were recorded. Notes were taken during the interviews.

Whenever possible, interviews were conducted in English. Four interviews in Iraq required the deployment of an Arabic-speaking assistant, a local physician with practical experience in mhGAP-IG. The transcripts were subsequently translated into English through a double translation process for analysis.

2.4 Data analysis and reporting

The interviews were transcribed verbatim using *Sonix* software. The transcripts were manually checked for completeness and quality. A code guide was developed based on the study objectives, the concepts described by the *WHO* mhGAP framework, and the dimensions of mental health training effectiveness explored by previous studies and described in the literature. The code guide was used to deductively code the transcripts, and it was flexible enough to be adapted if new codes emerged inductively from the text. The data were coded using Atlas.ti and analysed following a thematic analysis approach (34). The results were reported following the Standards for Reporting Qualitative Research- SRQR (35). A completed SRQR checklist is available in Supplementary Material 1.

2.5 Ethics declarations

Upon consent to participate, a digital copy of the informed consent form was sent to all interviewees a few days before the interviews. Interviewees were fully informed of their rights, including voluntary participation and the option to withdraw consent without consequences. The interviewees had the opportunity to ask questions and seek clarification before the interviews. The study was approved by the Ethics Committee of the A.O.U. "Maggiore della Carità" (Protocol 699/CE Study number CE 088/2023), and by the Institutional Review Board Rafik Hariri University Hospital in Lebanon (RHUH 17.2023). The data collected were anonymized, and access to the data was restricted to the coauthors of this paper only. The study included health personnel only, and it did not involve patients or vulnerable groups.

3 Results

3.1 Characteristics of the sample

In total, 12 key stakeholders were enrolled in this study (Table 1). Of the 12 participants, seven were males and five were females. Four participants were primary care practitioners, and two had less than five years of experience at the primary health level. Five participants played a role as trainer or supervisor of the *WHO* mhGap training in Lebanon and Iraq over the last five years. Two participants had managerial roles, overseeing the mental health training initiatives at the respective Ministry of Health. One participant had been working as an international researcher with experience in evaluating the effectiveness of mhGAP training[1].

TABLE 1 Characteristics of the interviewees.

Country	Role
Lebanon	Health Manager
	Primary care practitioner
	Primary care practitioner
	mhGAP trainer and supervisor
	Mental health supervisor
Iraq	Health Manager
	Primary care practitioner
	Primary care practitioner
	Mental health supervisor
	mhGAP trainer
	Primary care supervisor
External- International organization[a]	International researcher

[a]International researcher of mental health systems with previous experience in both countries.

The Figure 1 presents a synthesis of the main findings emerging from the thematic analysis, organized into four thematic domains and their corresponding subthemes The domains include: (1) mental health needs and service gaps; (2) local training experiences and perceptions towards the mhGAP model; (3) perceived mhGAP training impact; and (4) main barriers and challenges to integrating mental health into primary care.

3.2 Mental health needs and service gaps

The following thematic domains emerged when examining the most common mental needs seen in primary care, alongside the availability of local health services and the main gaps in providing stepped care for mental health: (1) clinical complexity and high-risk mental health conditions encountered in primary care; (2) social and cultural determinants of mental health; and (3) access to mental health care at primary level.

3.2.1 Clinical complexity and high-risk mental health conditions encountered in primary care

Within this theme, three interrelated subthemes emerged: (i) the prevalence of common mental disorders, (ii) the

[1]In this study, the term primary care practitioner refers to frontline health professionals (e.g., general practitioners or nurses) who provide direct clinical care at primary health care facilities and are involved in the assessment and management of patients. The term health manager refers to professionals holding administrative or coordination roles at district, regional, or national level (e.g., Ministry of Health), who are responsible for planning and overseeing mental health training initiatives and service organization, but who do not routinely provide direct patient care in primary health settings.

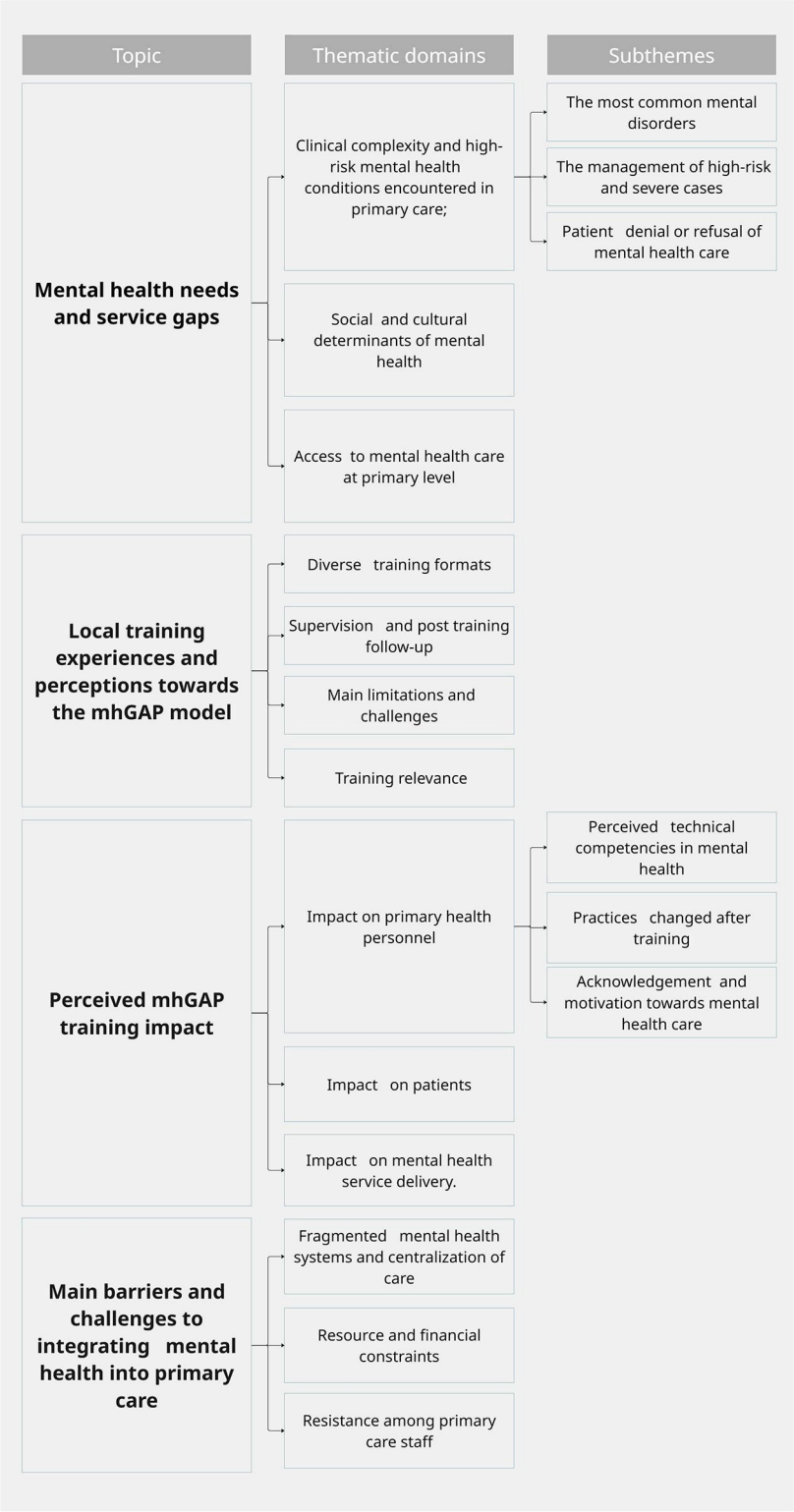


FIGURE 1
Summary of findings.

management of high-risk and severe cases, and (iii) patient denial or refusal of mental health care. The interviewees identified symptoms of depression and anxiety as the most common mental health conditions encountered in their respective primary care settings. The spectrum of symptoms reported by primary care practitioners varies widely, encompassing persistent low mood, fatigue, and changes in sleep patterns. While some patients may present with mild symptoms, others manifest acute conditions requiring immediate attention. Symptoms of posttraumatic stress disorder (PTSD) were also emphasized by primary care practitioners as a prevalent issue, especially in areas affected by armed conflicts and other emergencies: "*the*

majority of cases that I see, the mental health cases, are depression..then the anxiety, then PTSD, because since the explosion of August 4th, 2020, we are seeing many cases with PTSD" (primary care practitioner, Lebanon). The escalating cases of substance use were also highlighted by the interviewees, that emphasized the high vulnerability of those patients and the complexity of establishing proper care.

Among the most challenging conditions reported by primary care practitioners are depression coupled with suicidal ideation, especially in assessing suicide risk and defining a follow-up care plan: "*I saw many patients with suicidal ideations and recent suicidal attempts. They came and they already have tried to cut their wrists, or they took pills like a week or a month ago. So it's really risky…when see such patient, I prefer to refer them to the psychiatrist… so this is the main challenging issue to me"* (primary care practitioner, Lebanon).

Although less common, severe mental health conditions are reported by interviewees as complex cases for the primary care practitioners to address. In all the contexts covered by this study, the participants reported that primary care practitioners are not advised to manage themselves cases of severe mental disorders (i.e., schizophrenia or any psychosis) but rather to make the first assessment and refer to psychiatrists when available.

Another challenge reported by the primary health care practitioners are the patients that deny the need of mental health care or refuse to seek professional assistance despite exhibiting clear signs of mental health issues.

3.2.2 Social and cultural determinants of mental health

Interviewees pointed out the interplay of socioeconomic determinants and cultural dynamics that significantly influences the prevalence of mental health issues within individuals and communities. In Lebanon, one noteworthy factor is the economic crisis, which, according to primary care practitioners, has emerged as a major catalyst for the rise of mental health issues. The economic downturn in the country has resulted in job losses, financial instability and increased stress levels, all of which are precipitating and exacerbating mental health conditions: "*the number of people with diabetes mellitus and hypertension increase…and with the depressive disorder increase..a very bad economic situation that our people live*" (primary care practitioner, Lebanon). The economic crisis also prevents primary health care providers from managing mental health problems effectively, such as patients with difficulties attending consultations because of transportation costs.

In Iraq, the drastic economic downturn in the 1990s was also remembered by interviewees: "*In the 90s, the economic restrictions that Iraq faced led to, according to the records, I think 1 million children to permanent disability or death*" (mhGAP trainer, Iraq).

The interviewees mentioned that political instability represents another critical social determinant in the region that acts as a significant stressor for mental health. The uncertainty, fear, and upheaval associated with security issues and political instability can lead to heightened levels of stress and anxiety within communities.

Additionally, intercommunity dynamics, including social stigma towards mental health, influence individuals' willingness to seek help. The interviewees mentioned the high stigma associated with mental health, which affects both the disclosure of symptoms and the acceptance of mental health interventions*: "In humanitarian settings, especially in the Middle East, the stigma for mental health is still very high. So most of the time, if you find a person with a mental health problem and that person is known in the community, they would say the person is "majnun", it is crazy, the person is crazy..the family tries to hide the person if it has the tendency to go out and shout around in the streets*" (mental health researcher). According to the interviewees, the stigma surrounding mental health is deeply rooted in cultural, religious, and societal norms, contributing to a pervasive reluctance to openly discuss and address mental health issues. The interviewees pointed out the stigma not only from the community but also among health workers: "*you can find large percentages of health staff who are quite skeptical about mental health care because it wasn't part of their education.*" (mental health researcher).

3.2.3 Access to mental health care at primary level

Access to mental health care at the primary level is described as a combination of challenges, especially in areas affected by humanitarian crises. While primary health care and specialized mental health services are apparently accessible without financial hardship (reduced service fees), there often exists a stark disparity in access within the same country. Remote or conflict-affected areas may face limited resources, infrastructure and trained personnel, leading to a lack of mental health services offered in these regions: "*We have centers who have mental health services free of charge..but we have a lot of challenges because during the last years a lot of centers closed because of the shortage of financial funds"* (mhGAP trainer, Lebanon).

Additionally, there is a pervasive issue of mistrust among patients toward the skills of primary health workers in providing mental health care. This skepticism stems from the perception that mental health issues require specialized expertise beyond what is available in general health settings. Moreover, this perception is reinforced by a centralized psychiatric hospital-based model, which is still prevalent in many contexts in the Middle East: "*the huge, the huge problem in this context is that it's somehow centralized, it is hospital based. Sometimes the health system is quite complicated to facilitate the referral from primary health to mental health..*" (mhGAP trainer, Iraq).

Compounding the challenge is the lack of awareness about mental health and the tendency of individuals to seek care at primary health facilities for physical health only. The stigma surrounding mental health may further discourage individuals from explicitly seeking mental health care, leading to delayed or inadequate interventions. As a result, access to mental health care in both primary health settings and specialized services is far from what would be required to address mental health needs: "*I do think there's a very large amount of people who would be in need, but they do not reach the primary care level*" (mental health researcher).

3.3 Local training experiences and perceptions of the mhGAP model

The following themes emerged when examining the interviewees' perceptions of mhGAP training in their respective

contexts: (1) diverse training formats, (2) supervision and post training follow-up, (3) main limitations and challenges and (4) training relevance.

3.3.1 Diverse training format

mhGAP training has been implemented in Lebanon and Iraq since the first version was released in 2008. The implementation is normally undertaken both by local Ministries of Health (with or without specific international funding) or implemented directly by international humanitarian organizations. All the training experiences mentioned by the interviewees were adapted from the *WHO* mhGAP manuals (versions 1.0 and 2.0). The training format varied, with selected modules conducted as intensive 4–5 days training or divided into separate modules and sessions with breaks allowing participants to apply their learning between sessions.

The interviewees agreed that the training framework prioritized the modules of depression and essential care and practice: "*I usually stress a lot on the introduction part.I think this is the most important part if you want to start working in this field, talking about the communication, the general principles of care. This part, I find it really very, very interesting*" (mhGAP trainer, Lebanon). The focus on essential care aspects also allows the trainer to further understand the trainees' expectations and concerns in relation to mental health: "*sometimes they do not want to listen (the patients) because they do not know what to say or what to do..there are some specific contents that could help them to know what they could say in these difficult situations*" (mental health supervisor, Lebanon).

In some contexts, specific training modules were designed for physicians and nurses, while maintaining common content for all participants. The interviews mentioned that all training was conducted by a local psychiatrist or an international expert, depending on the context. In all the reported experiences, the strategy of training local specialists from the Ministries of Health through *training of trainers* was the key approach taken by local authorities to scale up the training initiatives and to adapt them to their local priorities.

Some interviewees mentioned that the training also included presentations about local mental health services, emphasizing guidance on screening, protocols for assessment (i.e., Lebanon), patient follow-up and referral pathways, reflecting the particularities of the local healthcare system.

3.3.2 Supervision and post training follow-up

There is a consensus among the interviewees that a crucial component of mhGAP effectiveness lies in the regular supervision and post-training follow-up of its trainees, which ensures the proper implementation and integration of mental health services into primary healthcare. The interviewees agreed that supervision plays a pivotal role in reinforcing the training content, addressing misconceptions, and providing continuous support: "*I think the supervision meetings are also as important as the trainings because trainings alone are not enough to see if the doctor already got the point or not* (primary care practitioner, Lebanon). The mhGAP trainers mentioned that supervision sessions are also important for overcoming trainees' resistance: "*The training is quite new for the primary health care physicians or nurses. And what I see in my experience is that the first few weeks they are still hesitant to practice it in their settings because they do not feel confident. So, what I was always doing is that we have weekly supervision group sessions for at least the first six weeks*" (mhGAP trainer, Iraq).

The interviewees mentioned that regular supervision in mhGAP training may involve various formats, each with its pros and cons. Regular group supervision sessions, for instance, allow trainees to share experiences, learn from peers, and receive collective guidance from a supervisor but may not address individual-specific learning needs or challenges. On the other hand, onsite one-to-one supervision provides tailored guidance, addressing specific challenges faced by individual trainees. However, this format can be time consuming and might not offer the exchange of experiences and peer technical support found in group sessions:.*we used to visit every doctor in the center where he works, sit with him and see the patients with him, all the patients that are coming and see if he's being able to screen, diagnose and manage the patients. It has a lot of advantages…the negative point of such type of supervision is the time, we used to do 4 or 5 h of driving to sit two hours, two hours and a half with the doctor. So, it takes a lot of time*" (mhGAP trainer, Lebanon).

The framework for post-training follow-up and supervision can also vary significantly among countries, depending on funding and the organization responsible for the implementation: "*Sometimes the supervision is three months, sometimes six months, and I have been doing supervision for more than two years now. So it depends a little bit about the project*" (mhGAP trainer, Lebanon). Interviewees mentioned that communication tools, such as WhatsApp, are widely used to connect trained primary care staff with supervisors, ensuring ongoing support.

There is consensus among interviewees that without regular supervision and follow-up, there is a significant risk that the mhGAP objectives will not be effectively implemented. Supervision ensures that the skills and knowledge acquired during training are correctly and consistently applied, providing a platform for addressing challenges and barriers in real time and ensuring that mental health services are integrated into primary health settings: "*without supervision, there is no implementation*" (mhGAP trainer, Iraq).

3.3.3 Main limitations and challenges

Several limitations and challenges were reported by interviewees in relation to the implementation of mhGAP training in their respective contexts. A notable concern was the short duration of training: "*there is stressed time, and we got very concentrated topics and materials. So I believe it is very useful, but it was very concentrated and very stressed. So, there is need for expanding.*(mental health supervisor, Iraq). A longer period of training is critical, particularly for trainees without prior mental health training: "*We need more people to be trained, also for a longer period..because there are many new topics that we hear for the first time* (primary care practitioner, Iraq).

The lack of continuity in training, due to various regional issues and operational constraints, was also mentioned. The interviewees mentioned that there is a significant dependency on international organizations to develop and sustain training initiatives in both financial and technical aspects. Therefore, the length and selection of training modules often depend on the operational perspectives and funding of the implementing international organizations, which may lead to discontinuity, lack of consistency, and, very often, complicated coordination among local stakeholders.

In some contexts, there is a recognized focus on the screening and referral approach and the need to improve the psychosocial and psychological interventions applicable for primary care within the training modules: "*I do not see… entering into this kind of discussion as well. How to provide psychosocial support, always focusing on identifying and treating by providing psychotropics.*(mental health supervisor, Lebanon). The lack of training continuity, including limited post-training follow-up, can also lead to the risk of potentially harmful prescriptions: "*I do think the technical knowledge is there, but because there's very few case discussions and very limited supervision, what often would happen is if you just follow these flow charts, this may lead to overmedication… 'I've seen lots of cases who were medicated from the first visit without being thoroughly assessed or diagnosed first"* (mental health researcher).

Some interviewees mentioned that on more than one occasion, the psychiatrists recruited as trainers were not familiar with the primary health care model and mhGAP concept and modules, leading to confusion among trainees: "*One of the criteria to be a trainer on mhGAP is to have mental health experience, preferably a psychiatrist. In the context where I worked, most of the psychiatrists are hospital based..this affects the quality of the training because they will keep referring mainly to the hospital management model, which will not fit in primary health care.*" (mhGAP trainer, Iraq).

Finally, some interviews raised the concern of the lack of contextualization of mhGAP tools and interventions, designed primarily in Western settings, that may not align with the cultural and societal nuances of non-Western or humanitarian settings, potentially undermining local knowledge and practices of care: "*.because these classification systems were created more in the Western world and they do not necessarily apply to these kind of settings.For example, you cannot treat people in the traditional way for PTSD when there is no "post", they are in a continuous situation. It is a continuous traumatic stress. So not only will the treatment possibly not be effective, but it's also could be a waste of resources, human resources, financial resources. But at the same time, it also undermines the person's experience and it kind of puts the blame on them*" (mental health researcher).

3.3.4 Training relevance

Despite these limitations, the interviewees agreed that *WHO* mhGAP training has been a critical step in equipping primary care professionals with essential skills: "*the assessment, the treatment plan, they gave us clues about how to give the psychoeducation.then exercise deep social relationships and sleep routines. Everything was given in detail, and in every training they repeat the same, important clinical diagnostic criteria.and the treatment plan*" (primary care practitioner, Lebanon).

The modules were considered logical and well structured, and the content was accessible and clear, catering well to primary care staff. Roleplay and practice sessions were particularly favoured because they offered hands-on experience: "*through these courses we were informed about the most common cases which might have appear or come to us. We also studied it from a theoretical point of view and practically because we did the scenarios (roleplay)"* (primary care practitioner, Iraq).

Training sessions conducted outside primary health clinics were appreciated, as they provided a dedicated learning environment. The training also fostered a sense of recognition and validation for the efforts of the primary care practitioners: "*they feel they have something to hold on to, some kind of guideline, something that not only justifies that they spend that time with mental health issues of their patients.but also that they have some ideas as what to do with them. And I think this is one of the main effects of the training*" (mental health researcher).

3.4 Perceived mhGAP training impact

When analysing the perceived impact of mhGAP training, the themes can be organized as follows: (1) impact on primary health personnel, (2) impact on patients, and (3) impact on mental health service delivery.

3.4.1 Impact on primary health personnel

When examining the impact of mhGAP training on primary health care personnel, the emerging subthemes are related to (i) perceived technical competencies in mental health, (ii) practices changed after training and (iii) acknowledgement and motivation towards mental health care. The interviewees agreed that one of the first impacts of training is the enhancement of primary care practitioners' awareness and understanding of mental health disorders. The interviewees mentioned that training has provided practitioners with guidance on early identification and management of the most common mental health issues, enabling them to recognize the physical complaints that may stem from mental health issues: "*there is a lot of benefits for them..especially on the module of the unexplained health complaints..when we conduct the training, you can see the GPs saying "I remember this case. Yeah. I have this one". They feel relieved during the training.because they have these people who keep visiting them for different unexplained conditions and they do not have the tools or the clinical expertise how to deal with them"* (mhGAP trainer).

The interviewees mentioned that training has emphasized the importance of communication skills, such as active listening and empathy, and the importance of privacy and confidentiality to build an environment where patients feel safe discussing their feelings and concerns: "*…after the training, I have developed skills in regard to how I receive the patient, how I listen to him, how I build trust, how I make him speak what is maybe difficult to speak..*(primary health practitioner, Lebanon).

Another critical area of impact mentioned is the ability to assess alarming signs, such as the risk of suicide. Practitioners

agreed that now they are more adept at identifying these signs and responding appropriately: "*We used to forget sometimes to ask the patient..So now, after this training, we are able to differentiate all these things. The red flags, everything. The imminent risk. So I do not think I can miss something or do a wrong diagnosis*" (primary health practitioner).

The ability of practitioners to assess and diagnose mental health conditions and to prescribe psychotropics, however, varies significantly across countries due to differing levels of clinical expertise and local regulations concerning the scope of primary health care. In some countries, primary care practitioners are not expected to diagnose mental conditions, and others are not allowed to prescribe psychotropics.

In addition to local specificities and limitations, the interviewees agreed that training has led to a change in attitudes and clinical practices among primary care practitioners. Some interviewees mentioned that this shift represents a move away from outdated perceptions and beliefs towards mental health towards a more inclusive and comprehensive approach to health care: "*before the mental health problem was a secondary problem. For me, the essential was diabetes.also search hypertension. But now we also put the spot over the mental health* (primary health care, Lebanon).

There is also increased motivation and readiness among health staff to better care for patients with mental illness: "*I do think it does scale up the knowledge. It gives them more self-confidence in handling mental health issues, in detecting them and understanding that mental health issues can present in different ways*" (mental health researcher).

3.4.2 Impact on patients

The interviews agreed that mhGAP training has fostered a more accessible, community-centred approach to mental health care and has had effects on patients. One of the most significant impact has been the improvement of access to mental health care for individuals unlikely to seek support from specialized services. Mental health care, which is traditionally centralized in urban and specialized settings, has been largely inaccessible to vast segments of the population, particularly those in rural or underserved areas: "*the benefits are there because otherwise most of them they would not seek mental health services. But if the doctor or the nurse are trained to identify and, at least, to do psychoeducation and treat them, then the access of mental health treatment is increasing*" (mental health supervisor).

The geographic proximity to primary health care providers plays a crucial role in reducing barriers such as distance, cost, and time that often deter people from seeking help: "*the patient will also benefit because they usually find this easier for them to go to the PHC and not to the mental health services. And for many reasons, one of them is the stigma, one of them is the accessibility.. So after the trainings, yes, if the implementation goes in the right way, the benefit for the patient is very high*"(mhGAP trainer).

The interviews emphasized that another cornerstone is the awareness-raising in mental health provided by trained primary care practitioners. Through interactions with trained primary health practitioners, patients become more informed about their conditions, leading to greater acceptance and willingness to engage in treatment: "*By increasing the number of the trainees or responsible people for mental health, we are also spreading the awareness regarding mental health services in the community*" (Health manager, Iraq).

As patients learn more about their conditions and the available treatments, they become more open to following through with recommendations, contributing to better health outcomes: "*it is very good for the patients and for their families to see the patient return to his natural life, return to sleep, return to eat naturally. The most satisfying comeback is seeing your patients getting better and going back into life again*" (primary care practitioner).

Moreover, the interviewees mentioned that mhGAP training initiatives can contribute to reducing the overall burden of mental health issues at the community level. By equipping primary care practitioners with the skills to identify and manage mental health conditions, the program may enhance early intervention and prevent the escalation of conditions that would require more intensive and specialized care.

3.4.3 Impact on mental health service delivery

The interviewees noted the impact of mhGAP initiatives on mental health service delivery at the primary health level. One of the key impacts of mhGAP training is its role in raising community awareness about mental health issues, helping to demystify mental health conditions and reduce stigma: "*more awareness after the mhgap training..also we track different sides like the community, like mosques, some community leaders. It was part of the mhGAP to increase access to primary health centers, so people are more open to discussing and treating psychological issues*" (Health manager, Iraq). This increased awareness has been pivotal in mobilizing patients, especially those who may not have recognized the mental health dimensions of their suffering to seek care: "*some of the patients when they come and they feel some improvement they bring also some people, relatives or friends. So, a kind of mobilization*" (primary care practitioner, Iraq).

The scaling up of mental health services because of mhGAP training was mentioned by the participants. Pre and post-training surveys have shown a marked increase in the number of patients receiving care for mental health issues at the primary health level, particularly among patients presenting with persistent physical complaints that often mask underlying mental health conditions: "*Some people come, they do not tell us we are depressed. They tell us I have tachycardia, I have chest discomfort, I cannot sleep at night. So when we do the PHQ-9 questionnaire, we know that this patient has depression or is anxious or he has PTSD. So it starts here. It starts with us with the primary health care physicians*" (primary care practitioner, Lebanon).

The interviewees agreed that the effectiveness of mhGAP also depends on post-training follow up and ongoing supervision for primary health practitioners: "*When we started, the doctor would not see any patients with depression. We started with, I do not know, two, three patients. Then she was diagnosing six, seven patients, then ten, twelve patients. And lately, in every supervision, she presents more than 15 patients*" (mhGAP trainer).

Despite this encouraging increase in access to mental health care, the mental health service utilization embodies a complexity that directly impacts access to care, particularly highlighting a paradox where those in dire need, such as individuals who are severely

depressed and isolated, may be the least likely to seek help. Interviews agreed on the need to scale up mental health services to a broader audience but also focused on those who are most in need and may remain unreachable due to the barriers imposed by their condition: "*if you're looking at the indicators, possibly you would say, well, we are covering the people who are seeking the support, but you have such big number of people who are not seeking the support..it is kind of paradox, you would have to truly, truly scale up the support system*" (mental health researcher).

3.5 Main barriers and challenges to integrating mental health into primary care

The interviewees agreed that integrating mental health at the primary level is a complex process that goes beyond building technical capacity among primary care practitioners and mentioned several barriers faced by primary care practitioners and health managers. Three interrelated thematic domains emerged regarding the main barriers and challenges to integrating mental health into primary care.

3.5.1 Fragmented mental health systems and centralization of care

The main barrier pointed out by the interviewees was the lack of a comprehensive mental health system and community-based services in most contexts, reinforced by a marked centralization of mental health care in psychiatric hospitals. This limitation poses challenges in coordinating a stepped care approach that impacts the continuity and comprehensiveness of care: "the challenge would be from the other side, from the specialized mental health services provider. From my experience, if they are not engaged from the beginning, before even the training, there will be quite resistance to cooperate and support…this revived frustration for the GPs when they try to communicate or to refer and they face this resistance" (mhGAP trainer).

3.5.2 Resource and financial constraints

The expansion of mental health integration into primary care, particularly mhGAP training, is clearly hindered by logistic and financial constraints. The scarcity of mental health services and trained professionals in many contexts also poses a significant challenge to providing quality mental health care and scaling up mhGAP training, especially in underserved areas: "limited resources and investment in mental health is the main barrier..just imagine in these primary health care facilities in Gaza, as I said, if they detected all the people who had a need for being referred to the psychiatric clinic, it is impossible. They have 38 beds for 2 million people" (mental health researcher).

The availability of specific psychotropics and the cost of medical fees, although reduced, still limit access to mental health care for vulnerable populations.

3.5.3 Resistance among primary care staff

One important barrier to implementation is scepticism and resistance among some primary health staff about integrating mental health into primary care: "*For many of the primary health care staff, we still need to show them that is part of their role, but also to help them to find the way and how to do it, how to make it happen. Because again, it's really a challenge, especially in a country that is facing a huge economic crisis*" (mental health supervisor). The interviewees mentioned that this scepticism is often connected to a lack of mental health training during their medical education and is sometimes related to cultural and religious background.

4 Discussion

This study examined the perceived effectiveness of the WHO Mental Health Gap Action Programme (mhGAP) from the perspective of primary care practitioners and key stakeholders operating in humanitarian settings characterized by protracted crises and health system fragility, specifically in Lebanon and Iraq. The findings highlight how mhGAP implementation in such contexts is shaped not only by training content and framework, but also by structural constraints, sociocultural determinants, and the availability of functional primary health care services.

4.1 The complexity involved in mental health care in humanitarian settings

In line with prevalence estimates of mental disorders in humanitarian contexts (7, 36), the primary care practitioners involved in the study highlighted the symptoms of depression, anxiety and trauma-related stress as the most common mental health conditions encountered in their respective settings. The complexity of care escalates with cases involving suicide risk and the management of substance abuse, which normally require supervisors' advice and additional skills in coordinating case management with other health and social services and with the patient's family.

The role of socioeconomic factors, such as income, education, and employment status, cannot be overstated. The cycles of prolonged economic crisis are highlighted as strong social determinants, leading to disparities in the availability and quality of mental health services, particularly in conflict affected areas due to the lack of investment from national authorities, alongside security and logistic constraints to enhance service provision, including the mhGAP initiatives. The interviewees agreed that this financial strain, in addition to political instability and memories of war, not only places a direct burden on individuals but also creates an environment conducive to collective heightened stress and anxiety, fomenting a breeding ground for mental health issues (37).

The stigma surrounding mental health within communities (38), and sometimes among health workers, persists as a significant barrier to accessing mental health care and exacerbating the problem. Deep-seated societal misconceptions contribute to individuals' reluctance to seek help, fearing judgement or social isolation.

Community-level studies in Baghdad have documented persistent stigmatizing attitudes toward mental illness, reinforcing barriers to help-seeking.

4.2 The importance of mhGAP and its adapted implementation

The limited scale of mental health services and lack of continuity of care remain major constraints to address the global burden of mental disorders. This is mainly attributed to restricted funding for capacity-building initiatives, the scarcity of specialized mental health services and a limited workforce, and the use of a centralized psychiatric hospital-based model, which reinforces the lack of coordination between local health services (39–41). Local health policies and regulations on the scope of primary health services can also vary significantly across contexts and sometimes impose constraints on the role of primary care practitioners in mental health assessment and case management, including the prescription of essential psychotropics (42).

In this scenario, the mhGAP training model plays an important role. Consistent with the objectives outlined in the mhGAP Intervention Guide and its humanitarian adaptation (12, 43), and supported by systematic reviews of its implementation (14, 15), participants perceived mhGAP as enhancing knowledge, diagnostic skills, and structured clinical reasoning at the primary care level. Similar findings were identified in our recent scoping review of mhGAP effectiveness in fragile settings (19).

However, translating this acquired knowledge into sustained changes in attitudes and clinical practice appears to be considerably more complex. The literature emphasizes that training alone is insufficient without supportive governance, institutional alignment, and structured implementation strategies (13, 39, 44). In our study, the application of mhGAP competencies was strongly shaped by structural determinants, including national mental health legislation and prescribing regulations (30, 42), the degree of integration between primary and specialized services (24, 41), and the availability of referral pathways within fragile health systems (22, 29).

4.3 Comparative perspective: Lebanon and Iraq

The implementation framework of mhGAPs varies significantly across the contexts covered by this study and is shaped by local health system structures and existing expertise in mental health. Different pre-training realities also frame the expected outcomes of mhGAP implementation.

In Iraq, where community-based mental health services, specialists, and clinical protocols adapted for primary care practitioners are scarce (26, 28, 29), mhGAP training tends to focus on the essential principles of mental health care. This includes basic clinical skills, early identification of mental disorders, and providing the participants with guidance to conduct awareness-raising activities at the community level. The recommendations from primary care practitioners and supervisors in these settings often emphasize the need for establishing assessment tools and protocols and improving the clinical skills and autonomy of primary care providers in mental health care.

Conversely, in Lebanon, the presence of established governance structures and policy frameworks (21, 22) drives mhGAP training to be part of a broader systemic shift. This can include the implementation of structured clinical protocols and criteria for systematically identifying and referring patients. Training in such contexts prioritizes clinical procedures, patient flow and access to essential psychotropics. Here, the feedback from primary care practitioners and supervisors often calls for greater investment in basic psychosocial support and scalable psychological interventions at the primary care level, as well as initiatives to raise awareness both within health facilities and in the broader community.

4.4 The need of a sustained and comprehensive training approach

A common consensus among all mhGAPs included in this study is the emphasis on supervision sessions and post-training monitoring. These are viewed as essential for effectively shifting primary care practitioners' attitudes and practices towards mental health care. Continuous supervision and post-training follow-up not only reinforce the acquired knowledge but also address the barriers practitioners face in changing their clinical practices. This ongoing support helps in navigating the complexities of integrating mental health care into primary care settings, especially in environments where mental health still carries a stigma, and/or the structural challenges pose challenges to the provision of comprehensive care.

The need for training contextualization is particularly highlighted by some interviewees, especially when it comes to clinical systems of classification (DSM and ICD) in which although they are reliable systems for guiding scientific communication, they may not accurately reflect the lived experiences of patients, especially in conflict-affected contexts (7, 45).

Proper planning prior to mhGAP training initiatives is crucial for their success and sustainability. This process includes a comprehensive review of local laws and regulations ensuring that the training contents align with legal frameworks and operational capabilities. The coordination mechanisms between primary care providers and specialized mental health services must be established to ensure continuity of care and effective referral systems. As a recurring lesson learned, participants emphasize the step-by-step approach of completing one training module at a time, which allows for focused learning and gradual implementation, reducing the risk of information overload and improving retention. The recruitment and training of local trainers are also essential for adapting the mhGAP modules to the cultural and linguistic context, ensuring relevance and effectiveness. A proper implementation plan and pilot training tests are considered essential for identifying potential challenges and refining the mhGAP training approach before broader implementation (13, 44).

4.5 Framework to monitor the mhGAP implementation

The development of reliable indicators for monitoring the effectiveness of the training process is indispensable for evaluating impact, guiding improvements, and ensuring that the

mhGAP initiative meets its objectives in enhancing mental health care at the primary level. This emphasis on monitoring is consistent with the implementation guidance embedded in the mhGAP intervention guide and its operational manual, which underscore the importance of supervision, service indicators, and system-level evaluation to sustain impact (12, 13). Similarly, recent reviews of mhGAP implementation highlight variability in outcomes across settings and stress the need for context-sensitive monitoring frameworks (14, 15).

A recurrent point mentioned during the study was the satisfaction of patients with the mental health care received at the primary health level. Although a positive indicator, patient satisfaction can reflect not only the quality of care but also perceptions of accessibility, respect, and understanding from healthcare providers—dimensions that are particularly salient in humanitarian contexts where trust in institutions may be fragile (36). While these aspects are very important and high satisfaction levels are encouraging, they must be critically monitored. Instances such as overmedication, while potentially leading to short-term satisfaction due to immediate symptom relief, may underscore the importance of nonpharmacological interventions and continuous monitoring to ensure that care practices are aligned with evidence-based guidelines and ethical standards (46, 47).

4.6 The paradox of the health service coverage in the mhGAP implementation

According to the participants, there are a few but promising data related to the impact of training on mental health service delivery at the primary health level. This observation aligns with broader evidence suggesting that mhGAP training can enhance primary care practitioners' capacity to recognize and manage common mental disorders and contribute to narrowing the mental health treatment gap (18, 45). By strengthening the integration of mental health within primary care, mhGAP operationalizes the principles of task-sharing and stepped care widely advocated in global mental health (12).

However, when considering the challenges raised by local health managers and training supervisors regarding the extension of training initiatives to remote and conflict-affected areas, a significant disparity becomes evident. Populations in these regions remain largely underserved despite overall improvements in trained facilities. This finding resonates with research on health systems in fragile and conflict-affected settings, which demonstrates that service expansion often occurs unevenly, favouring areas with pre-existing infrastructure and institutional stability (48, 49).

This scenario underscores a paradox within global and local efforts to expand access to mental health care: while mhGAP training effectively enhances mental health services within existing primary health care structures, it simultaneously exposes and reinforces the inequities faced by populations in greatest need —those living in areas where primary health care systems are weak, fragmented, or largely unavailable. The challenge remains to extend these training initiatives to all regions ensuring equitable access to mental health care, but also prioritize the needs of vulnerable populations, especially in settings where conflict and instability exacerbate mental health challenges.

4.7 Study strengths and limitations

The main strength of this study is the analysis of the real-life implementation of mhGAP initiatives in humanitarian settings in Lebanon and Iraq based on perceptions, beliefs, and recommendations from local actors. This study focused on understanding the effectiveness of the mhGAP-IG by assessing its perceived strength and limitations and the challenges faced by primary health staff and managers in enhancing access to and quality of mental health care at the primary care level.

This study has several limitations. The participants were recruited via purposive sampling, and while following the inclusion criteria and ensuring gender balance and diversity of functional roles, recruitment may inadvertently introduce selection bias, thereby limiting generalizability to other primary care practitioners in Lebanon and Iraq. This study could be enormously beneficial for cross-analysing qualitative approaches with existing health system data that may reflect changes in mental health system utilization patterns after mhGAP training delivery. Unfortunately, these data were not available.

5 Conclusion

This study explored stakeholder perspectives on the implementation and perceived effectiveness of mhGAP training in humanitarian contexts marked by protracted instability and fragile health systems. The findings indicate that mhGAP enhances primary care practitioners' clinical reasoning and confidence, and ability to identify common mental health conditions within routine primary care. Participants also reported improvements in early detection and increased awareness within health facilities.

Beyond training effects, the study highlights that mhGAP implementation is shaped by pre-existing health system configurations and the availability of specialized services. Supervision, structured referral pathways, monitoring mechanisms, and the adaptation of tools to local realities emerged as decisive factors influencing whether newly acquired competencies translate into sustained practice.

The analysis reveals a structural paradox: while mhGAP strengthens mental health service delivery within functioning primary health care facilities, populations in remote or conflict-affected areas—where mental health needs are often greatest—remain underserved when primary care infrastructure is weak or fragmented. Addressing this gap requires moving beyond training alone toward integrated investments in primary health care capacity and equitable access to health services.

Advancing mhGAP implementation in humanitarian settings therefore demands a dual approach: consolidating provider competencies while simultaneously strengthening the health systems that enable equitable, sustainable, and quality mental health care.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

The studies involving humans were approved by Ethics Committee of the A.O.U. "Maggiore della Carità" (Protocol 699/CE Study number CE 088/2023), and by the Institutional Review Board Rafik Hariri University Hospital in Lebanon (RHUH 17.2023). The studies were conducted in accordance with the local legislation and institutional requirements. The participants provided their written informed consent to participate in this study.

Author contributions

MR: Methodology, Writing – review & editing, Investigation, Writing – original draft, Conceptualization, Formal analysis. MV: Supervision, Writing – review & editing, Methodology. IH: Writing – review & editing, Validation, Supervision. FD: Supervision, Writing – review & editing, Validation.

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Conflict of interest

The author(s) declared that this work was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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The author(s) declared that generative AI was not used in the creation of this manuscript.

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Supplementary material

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Community-based mental health centers in Ukraine — protocol for a mixed methods evaluation study using the RE-AIM framework

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Background: Russia's full-scale invasion of Ukraine has deepened the strain on an already fragile mental health system, long shaped by Soviet institutionalized psychiatry. In response, Ukraine has started a national reform to modernize mental health services by shifting from an institutional to a community-based mental health care model. Implementation of his transition is supported by the international technical project Mental Health for Ukraine (MH4U).

Aims: To generate evidence-based evaluation of the community-based mental health centers as a basis for continued improvement and to guide national scale-up.

Methods and analysis: We will conduct a mixed-methods evaluation guided by the RE-AIM framework. First, quantitative data will be collected through (a) questionnaires administered to patient's prospective longitudinal cohort at baseline, three, and six months, (b) questionnaires from providers at the baseline and in the follow-up, and (c) administrative records. Second, qualitative data will be gathered through (a) interviews with subsample of participating patients and all the providers, and (b) focus groups with community stakeholders for each oblast (administrative region). Analyses will follow the RE-AIM framework. Adhering to a learning health systems (LHS) framework, we established continuous feedback loops and workshops to communicate study findings to MH4U implementers and stakeholders in Ukraine and Switzerland.

Conclusion: Evaluation will provide unique evidence on not only whether the community-based Mental Health Center model works, but also how and why it works in real-world conditions. Findings will also inform national policy on mental health reform and offer lessons for global mental health systems operating under crisis conditions.

Clinical trial registration: https://www.isrctn.com/ISRCTN61471084, ISRCTN61471084.

KEYWORDS
community-based care, evaluation, mental health centers, mental health service, mixed-methods, RE-AIM, real-world data, Ukraine

Background

The ongoing war in Ukraine is expected to affect the mental health of Ukrainian citizens for decades (1). Ukraine estimated population is 39 million in 2025 (2). In 2023, the World Health Organisation estimates that approximately 9.6 million people in Ukraine are at risk of, or living with, a mental health condition, and 3.9 million with moderate to severe symptoms (3). Furthermore, the Ukrainian Ministry of Health predicts that 4 million people will need psychotropic medication, and up to 15 million will need psychosocial support (4).

Ukraine inherited an institutionalized mental health care system shaped by the Soviet legacy (5). This history has contributed to enduring mistrust and strong stigma surrounding mental health care (6, 7). Nevertheless, the Ukrainian health system long struggled with the lack of clear support pathways for individuals with mental health problems, resulting in delayed access to adequate diagnosis and treatment (5, 8). Social services for people with mental disorders in the community are limited or even absent (9).

Recognizing this historic context, in 2017, the Cabinet of Ministers of Ukraine approved a key strategic document for the reform of the mental health care system: "The Concept Note on Mental Health Care Development in Ukraine". The Concept Note mandated state-sponsored and international initiatives to modernize and decentralize mental health care in Ukraine (10). A central element of this reform is the transition away from institutionalized social care facilities (internats) toward the community-based Mental Health Center (MHC) model to allow people to receive care while remaining active in their communities (11). MHCs have been shown globally to be an evidence-based model to improve access to care, health, and social inclusion while reducing stigma (12–14). Thus, the Ukrainian government commits to establishing MHCs across the country. MHC provides specialized mental health care alongside non-medicalized psychosocial support for victims of the war and the wider community (15).

International collaborative initiatives have been established to advance the transition to MHCs in Ukraine (16). One key initiative, the Mental Health for Ukraine Project (MH4U) was launched before the 2022 invasion in collaboration with the Ukrainian Catholic University's Institute of Mental Health and supported by the Swiss Agency for Development and Cooperation (DEZA) (16, 17). MH4U embodies the approaches outlined in the "Concept for the Development of Mental Health Care in Ukraine until 2030." The concept aims to create a comprehensive and effective mental health care system (8, 18). MH4U provides MHCs with financial support, infrastructure development, training, and implementation guidance in alignment with Ukraine's national mental health reform (15, 16).

MHCs serve three complementary roles. First, they provide direct mental health services in outpatient and day-clinic settings. Services are delivered by interdisciplinary teams of providers, i.e., psychiatrists, psychologists, psychotherapists, nurses, and social workers. Second, they act as a community hub for care coordination, managing referrals, and collaboration between medical and social service providers who work in alignment with the community to reduce stigma and improve mental health literacy. Third, they engage communities through public awareness, low-threshold prevention, and education initiatives (16).

Despite the potential of MHCs, no studies have evaluated how these MHCs operate in real-world conditions, their capacity to develop and expand, or their integration into communities, especially during wartime. Achieving the full potential of this model requires continuous learning, coordination, and improvement across all levels of the mental health care system.

Aims

We aim to establish an evidence-based evaluation of the MHC model to guide its refinement and national scale-up in Ukraine.

- Measure the real-world implementation and identify potential improvement variables across three levels: community, provider, and patient.
- Examine how collaboration across the multi-level system affects outcomes.
- Deliver iterative feedback to stakeholders to support continuous quality improvement and inform policy decisions for the expansion of MHCs.

Methods and analysis

Design

We employ a mixed-methods evaluation design guided by the RE-AIM (Reach, Effectiveness, Adoption, Implementation, and Maintenance) framework (19, 20). This framework allows assessment at both individual and organizational levels while capturing both internal and external validity, making it well-suited for evaluating real-world interventions and guiding scale-up efforts (19). Figure 1 shows the phases, sites, and timelines of the study. Consistent with the Learning Health System (LHS) approach, data generated through the evaluation will be continuously fed back to the MH4U team and stakeholders to inform real-time adaptation and improvement (Figure 2) (21).

Study setting and participants

MHCs

We will conduct the study across the current eight MHCs and their respective communities, including four in Lviv, two in Chernivtsi, one in Dnipropetrovsk, and one in Rivne. These oblasts may differ in the mental health impact of the war, providing important contextual variation for the evaluation. Mostly, MHCs are structural components of policlinics, i.e., outpatient services. However, in Dnipro, MHC is a part of the Primary Health Care (PHC) service. While in Rivne, MHC is a hospital department within a cluster hospital, providing a network of medical services to more than one community.

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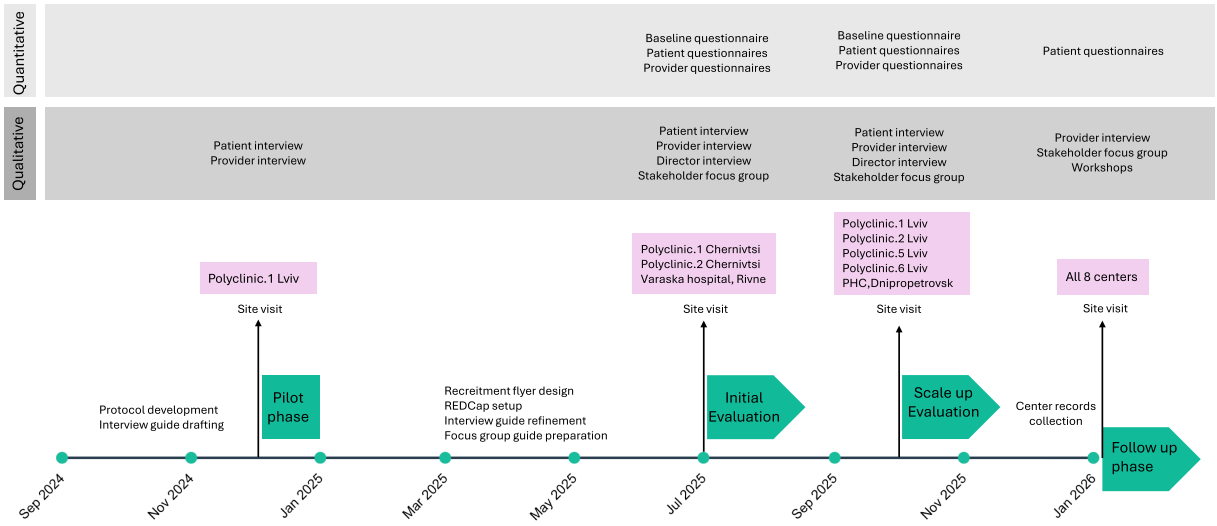


FIGURE 1
Overview of study phases, sites, and timeline. Timeline representing study phases, including participating MHCs across four oblasts, measurement and data collection.

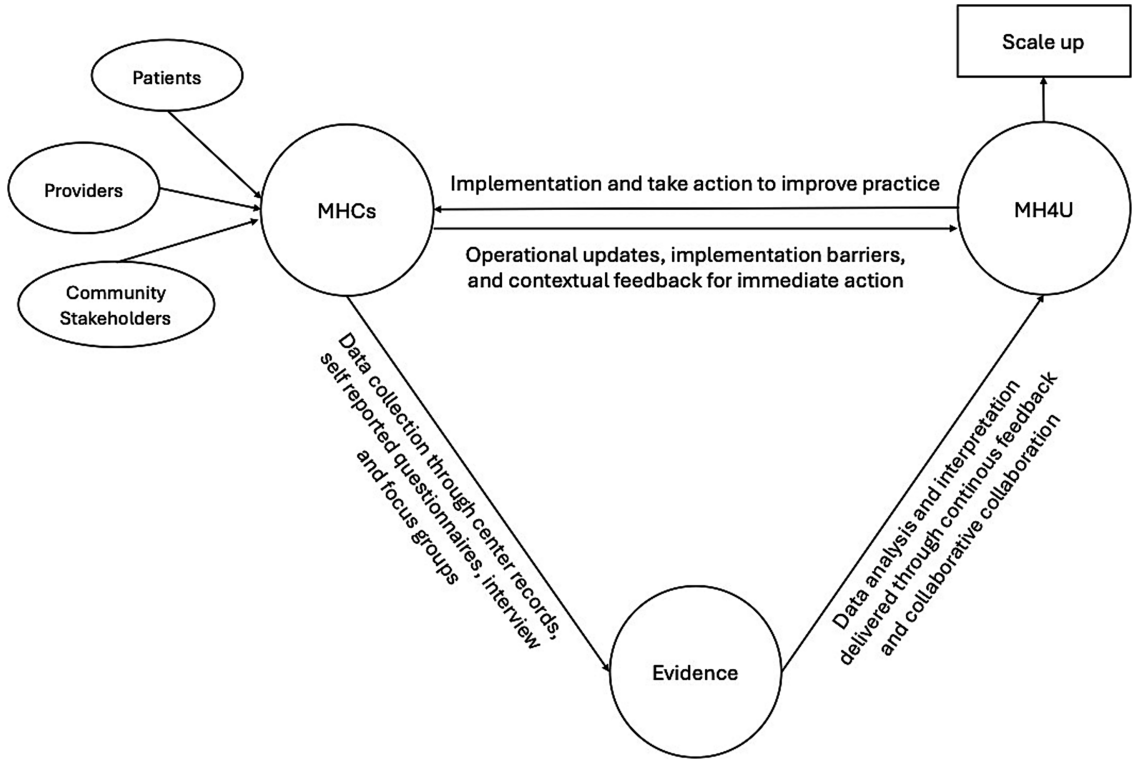


FIGURE 2
Learning health system framework for the MHCs evaluation. Figure represent the LHS applied to MHCs evaluation to produce evidence. The figure illustrate how interpreted data contributes to iterative cycles of knowledge generation, evidence synthesis, and improvement in MHC.

Participants

Patients

Intervention cohort

The inclusion criteria are: (a) Adults (≥18 years), (b) have received one to three treatment sessions at one of the participating MHCs, and (c) have provided informed consent. Patients will be excluded if they have only received an emergency session or if a treating psychiatrist determines they have severe cognitive dysfunction or an acute mental health condition that would impair their ability to participate.

Sample size calculation

We will recruit a prospective longitudinal cohort via a non-probability sampling technique. Each participating MHC representing a cluster because patient outcomes are expected to be

correlated within centers due to shared staff, resources and local community. Approximately 400 patients for the 8 MHCs (targeting ~50 per MHC) will be enrolled in the quantitative assessment. The primary outcome is the change in depressive symptoms measured by the Patient Health Questionnaire-9 (PHQ-9) scale from baseline to follow up 4 (approximately one year) (22).

We estimated the variance of the PHQ-9 change score empirically as:

$$Var\left(\Delta\right)=\acute{o}_b^2+\acute{o}_f^2-2r\sigma_b\sigma_f$$

Where $\sigma_b=5.97$ and $\sigma_f=5.50$ are the baseline and follow-up 4 standard deviations (SDs), respectively, and $r=0.546$ is the within-person correlation. Substituting these values gives $\mathrm{Var}\left(\Delta\right)\approx 30.0$, yielding $\mathrm{SD}_{\ddot{A}}\approx 5.48$.

We account for clustering between MHCs using design effect,

$$DE=1+\left(\mathrm{m}-1\right)\mathrm{ICC}$$

Where m = 50 is the average cluster size and ICC is the intraclass correlation. Under this framework (two-sided significance level 5 and 80% power), the minimum detectable difference in difference (DiD) effect in PHQ-9 points is approximately 0.94, 1.08, and 1.43 for ICC = 0.01, 0.02, and 0.05, respectively.

We will invite a subsample from the quantitative cohort of patients to interviews through a purposive sampling strategy (23). Patients will be selected with varying treatment exposure (≥1 session) to capture diverse treatment experiences and outcomes. The qualitative sample size will be guided by content saturation.

The external control cohort

The external control data will be drawn from the Mental Health Assessment of the Ukrainian Population (MAP) studies, a large-scale cohort designed to better understand the mental stress experienced by the Ukrainian population as a result of the war (24, 25). MAP participants include adults aged ≥18 years across multiple oblasts in Ukraine. They were recruited using probability-based sampling to ensure representativeness of the general population.

Providers

All providers will be recruited, given the limited and well-defined staff composition at each MHC, for both the quantitative and qualitative components.

Given the ongoing war, we will recruit a control group of providers to enhance quantitative data interpretability. This control group will include all providers from eight MHCs that are not supported by MH4U.

Community stakeholders

We will recruit six to nine community stakeholders for focus groups from two groups: (a) medical specialists (GPs, neurologists, rehabilitation specialists), (b) non-medical (local health authorities, NGOs, and social workers), who cooperate or partner with the selected MHCs.

RE-AIM operationalization

Tables 1–5 shows the RE-AIM key indicators and data sources we will use to address the RE-AIM dimensions. We will assess the five dimensions of the RE-AIM framework across three levels (patient, provider, and community) as follows:

1 Reach

- Quantitative assessment- patient level

We will capture the number, proportion, demographics, clinical characteristics, and referral sources of patients receiving care at MHCs.

- Qualitative assessment- patient level

It will complement the quantitative data to identify barriers and facilitators to accessing services.

2 Effectiveness

- Quantitative assessment - patient level

We will assess patient symptoms and severity of specific mental health conditions using standardized questionnaires previously applied in the MAP studies, covering Post-Traumatic Stress Disorder (PTSD), depression, somatic distress syndrome, anxiety, and alcohol use, in addition to health-related quality of life and mental well-being. (24, 25)

- Qualitative assessment - patient level

To understand patient perspectives on perceived benefits, harms, and contextual explanations for outcomes.

3 Adoption

- Quantitative assessment- provider level

We will capture the characteristics of all eight MHCs and their affiliated providers to quantify the extent and representativeness of adoption. We will assess factors influencing adoption. We will also measure work-and non-work-related health factors to control for external confounders in this war-affected context.

- Qualitative assessment- providers and community levels

We will examine providers' experiences and perceptions of the MHC model, alongside how mental health services integrate with primary care and the wider community.

4 Implementation

- Quantitative assessment- provider level

We will evaluate the determinants and consequences of organizational readiness for implementation.

TABLE 1 Reach key indicators, data sources, and target group.

Key indicators	Data source	Target group (level)
• % of eligible community members who received at least one MHC service vs. MAP studies	Center records	Patients
• Representatives of patients: Distribution of demographic and clinical characteristics vs. MAP studies • % of patients referred through each source (self, GP, etc.)	Baseline assessment questionnaire	Patients
• Key barriers and facilitators to access the service	Interviews	Patients

TABLE 2 Effectiveness key indicators, data sources, and target group.

Key indicators	Data source	Target group (level)
• Mean change in patients outcome over time	Posttraumatic Stress Disorder Checklist (PCL-5), Patient Health Questionnaire (PHQ-9), PHQ-15, Generalized Anxiety Disorder 7 (GAD-7), the Alcohol Use Disorders Identification Test (AUDIT), European Quality of Life 5 Dimensions (EQ-5D-5L) and the visual analogue scale (EQ-VAS), and mental wellbeing by Short Warwick-Edinburgh Mental Wellbeing Scale (SWEMWBS) (22, 35–40).	Patients
• Therapeutic alliance	Working Alliance Inventory – Short Revised (WAI-SR) (41).	Patients
• Attrition rate: % of patients lost to follow-up • Differential retention on demographics and clinical characteristics between completers and dropouts	Center records	Patients
• Themes of perceived benefit and challenge	Interviews	Patients

TABLE 3 Adoption key indicators, data sources, and target group.

Key indicators	Data source	Target group (level)
• Characteristics of participated MHCs and providers • MHC rate of diagnosis and service provision • MHC rate of referred patient's uptake of one or more sessions • Center level variability in adoption	Center records	Providers Centers
• Team functioning	Team Development Measure (TDM) (42)	Providers
• Mental health stigma among providers	Mental Illness Clinicians' Attitudes Scale (MICA-4) (43)	Providers
• Work-related wellbeing and staff health	Copenhagen Psychosocial Questionnaire (COPSOQ-III), Burnout Assessment Tool (BAT), General Health Questionnaire (GHQ-12) and Perceived stress scale (PSS-10) (44–48)	Providers
• Themes on organizational barriers and facilitators to adoption	Interviews	Providers
• Perceptions and experiences of MHC model in the community	Focus groups	Community stakeholders

- Qualitative assessment- provider and community levels

In the absence of a standardized protocol for implementation, fidelity will be explored qualitatively. We will capture operational processes, resource allocation, and center-specific barriers and enablers to implementation. In addition to that, collaboration with the community. We will share the findings with the MH4U team, providers, and community stakeholders to facilitate the translation of evidence into actionable insights.

5 Maintenance

- Quantitative and qualitative assessment- patient, provider, and community levels

It will be assessed as part of a future follow-up phase ≥ six months after the second phase. We will examine the sustained impact and institutionalization of MHCs, as well as disseminate the findings.

LHS operationalization

The LHS will be operationalized through staged feedback loops aligned with our study phases to MH4U coordination, MHC leadership and community stakeholders.

1 We will provide direct feedback following the initial and scale up phases and then again after the follow up phase.

TABLE 4 Implementation key indicators, data sources, and target group.

Key indicators	Data source	Target group (level)
• % of services delivered as planned • Consistence of referral over time per MHC	Center records	Providers Centers
• organizational readiness	Organizational Readiness for Implementing Change (ORIC) (49)	Providers
• Themes describing core implementation components of fidelity, facilitators, and barriers	Interviews	Directors
• Themes capturing real world implementation in practice	Interviews	Providers
• Quality and effectiveness of collaboration in implementation	Focus groups	Community stakeholders
• Documentation and utilization of feedback and iterative learning from workshops	Workshops	Providers, MH4U team and community stakeholders

TABLE 5 Maintenance key indicators, data sources, and target group.

Key indicators	Data source	Target group (level)
• Long-term patient mental health outcomes	PCL-5, PHQ-9, PHQ-15, GAD-7, AUDIT, EQ-5D EQ-VAS and SWEMWBS	Patients
• Robustness of long-term effects across patient subgroups • Long-term attrition and differential retention by patient characteristics or clinical condition	Center records	Patients
• Center-level adaptations post-project • Organizational-level sustainability	Interviews	Providers
	Focus groups	Community stakeholders
• Engagement in planning and implementing long-term sustainability of MHC practices	Workshops	Providers, MH4U team and community stakeholders

2 We will conduct workshops after the scale up phase to share our findings and reflect on implementation challenges and adaptation priorities in real life situation.
3 We will hold a second round of workshops following the follow up phase to present our longitudinal findings, assess sustainability and adaptation after our feedback and support national expansion of the MHC model.

Learning will be operationalized as documented adaptations linked to evaluation findings. Moreover, changes in key RE-AIM indicators between first phases and follow up phase will be examined to assess whether feedback-informed adaptations are associated with improvements in Reach, Effectiveness, Adoption, or Implementation. Workshop documentation will further explore provider and stakeholder perceptions of how feedback influenced decision-making and practice change.

Data collection methods

All study materials not originally available in Ukrainian underwent forward and backward translation to ensure linguistic and conceptual equivalence. Quantitative validated Ukrainian instruments will be used when available; otherwise, translated tools were pretested, piloted, and adapted as needed and reviewed by the study team at Sumy State University in Ukraine. In addition, we will assess internal consistency reliability and construct validity, as the range of instruments used allows. Then, we will examine indices such as Cronbach's alpha and compare expected and observed correlations. We will compare these results with published psychometric validations from other countries.

Quantitative data collection

MHCs

Annual center administrative records, collected routinely at the end of each calendar year, will be obtained retrospectively in January 2026 to capture data from 2025.

Patient

Eligible patients for the cohort will receive a flyer during their regular visit at the MHC, containing essential study information with a QR code directing them to a Research Electronic Data Capture (REDCap) registration form (26, 27). We will assess the eligibility based on the submitted registration data. Eligible participants will then be contacted via their preferred way of communication and provided with a personalized link to provide informed consent and complete the self-administered quantitative assessment instruments. Follow-up assessments will be conducted via REDCap at three- and six-month intervals after baseline.

Provider

All providers affiliated with the participating MHCs and MHCs that are not supported by MH4U will be invited to participate through a study summary along with a personalized Redcap link, through which they can provide informed consent and complete the quantitative assessment instruments. All providers will be invited again to complete the same set of instruments at the follow-up, which will be approximately one year from the baseline.

Qualitative data collection

Patient

We developed interview guides for patients structured around the concept of the "patient journey," and designed to map the individual's pathway into, through, and beyond the MHCs. We will conduct the interviews by telephone.

Provider

We developed interview guides for providers, and they will be interviewed in person during site visits by the Sumy study team.

Interview piloting and refinement

Interview guides were piloted in person at Polyclinic No. 1 in Lviv with twelve patients and three providers through in-person interviews to ensure clarity, cultural appropriateness, and alignment with the study objectives. We documented key findings and observational insights. Based on this report, the guides were iteratively refined. The interview lasted approximately 60 min for both patients and providers.

Community stakeholders

We developed the focus group guides. One focus group for medical and one for non-medical community stakeholders will be conducted in person per oblast. In Lviv, where the number of MHCs is relatively large, a total of four focus groups will be conducted to ensure representation while maintaining manageable group sizes and discussion dynamics.

Non-response and attrition management

We will employ multiple engagement strategies. If a participant does not respond within ten days, we will send a reminder. We will monitor participation patterns and initiate direct follow-up by telephone for participants who remain unresponsive. When available, reasons for non-response or dropout will be recorded.

Data analysis

Quantitative data analysis

We will analyse quantitative data with the statistical computing software R. The analytical approach will be guided by the RE-AIM framework (Tables 1–5).

Data preparation and descriptive analyses

Patient, provider, and center level characteristics will be summarized using descriptive statistics (means ± SD or medians [IQR] for continuous variables; counts and percentages for categorical variables) overall, stratified by center, and by center type. All validated instruments will be scored according to their standard scoring protocols.

Missing data, attrition, and loss to follow-up

We will quantify attrition rates and assess whether loss to follow up differ by key demographic and clinical characteristics. To reduce selection bias due to differential follow-up, we will apply inverse probability of censoring weighting (IPCW) in longitudinal analyses.

Patients

Longitudinal patient outcome data and demographics questionnaires will be analysed and compared to data from the MAP studies. MAP cohort differs at baseline from patients receiving MHCs care. Consequently, we will use inverse probability weighting (IPW) to improve comparability. The IPW model will include key covariates (e.g., age, sex, baseline symptom severity, and prior mental health service use), creating a pseudo-population in which these covariates are balanced between groups. Weighted analyses will be used for all primary MAP vs. MHC outcome comparisons. Additionally, sensitivity analyses will be carried, restricting the sample of MAP subjects to those seeking care and/or with a comparable baseline outcome levels.

We will conduct these analyses on 2 primary cohorts:

1 Retained in care cohort (per protocol style):

   This cohort includes patients who remained engaged in MHC care and completed baseline, follow up 1 and 2.

2 Care initiators cohort (intention to treat style):

   This cohort will include all enrolled participants regardless of adherence or continued engagement.

For both cohorts, we will estimate intervention effects using DiD approach, comparing pre–post changes in outcomes between MHCs and the MAP cohort, depending on outcome availability and harmonization. Regression models will include center fixed effects and time fixed effects, with the DiD estimand given by the treatment-by-post (or treatment-by-time) interaction. Where multiple follow-ups are available, we will implement an event-study specification (baseline, follow-up 1, follow-up 2). We will obtain 95% confidence intervals, and p-values via center-level wild cluster bootstrap (1,000 draws). As a robustness check for small-sample inference, we will also report results using a Kenward–Roger/Satterthwaite-style degrees-of-freedom adjustment. For retained in care cohort, we will adjust the analyses using inverse probability of censoring weighting (IPCW) to address differential loss to follow up.

Providers

Provider outcomes will first be summarized descriptively at baseline from participating MHCs and compared with outcomes from MHCs that are not supported by MH4U. For prospectively collected survey outcomes, we will evaluate changes from baseline to follow-up using a DiD framework (pre–post change in MH4U supported vs. non-supported centers), with center-clustered inference.

Integration with the LHS approach, all analytic results will be shared at each phase with the MH4U team, providers, and community stakeholders via collaborative workshops and direct feedback (21).

Qualitative data analysis

We will conduct all qualitative assessments in Ukrainian with recorded audio. Verbatim transcripts will be analysed in Ukrainian to preserve the linguistic and cultural nuances of participants' responses. All analyses will be conducted in MAXQDA (2024). Coding will combine deductive and inductive strategies. Deductive coding according to the interview and focus group guides, inductive codes will emerge during the content analyses. We aim to enhance analytic trustworthiness, reduce bias, and improve code clarity. Accordingly, two researchers at the University of Zurich and two at Sumy State University will independently analyse a subset of three transcripts. Both teams will iteratively refine the codebook, reconcile differences, and document decisions transparently. We will employ a structured content analysis approach, based on the study's research questions. Two experienced qualitative researchers from Sumy State University will lead the main analyses. We will conduct mid-term analyses after every 4th patient interview within each center to determine content saturation. Data collection will continue until content saturation is reached and no new information emerges.

Mixed methods integration

First, we will analyse quantitative and qualitative data separately. Then, we will integrate findings from both data using a convergent mixed methods design, enabling triangulation across sources. Integration will involve comparing results of both analyses to identify convergencies (agreement), complementarities (different but non-contradictory findings), divergencies (conflicting findings) and expansions (findings that overlap but still provide additional interpretation) (28, 29). This approach will deepen understanding into the MHCs model by providing validation and a holistic view of whether numerical trends match with participants lived experiences.

Data management

We will collect informed consent and quantitative data from patients and providers via the data management system redcaps (26, 27). REDCap is provided by Epidemiology, Biostatistics, and Prevention Institute (EBPI), University of Zurich (UZH), and hosted at ETH Zurich on Leonhard Med (Lamed). REDCap accounts will be created for authorized research group members.

Regarding qualitative data, we will record provider and patient interviews as well as focus groups, and the recordings will include verbal consent at the beginning of each session. We will ask participants not to share personal information (e.g., name, address, birth date). Recording will be transcribed verbatim by an external transcription provider (Transcript or application) and imported into the software MAXQDA for qualitative data analysis (30).

Monitoring and quality assurance

We will implement and maintain quality assurance and quality control with written SOPs to ensure data is generated, documented, and reported in compliance with the study protocol.

Confidentiality and coding

All project data will be accessible only to authorized personnel with a defined role in the study.

All quantitative and qualitative data will be stored on UZH servers separately in two different files: one containing identifiable information only (participant identification list) and another with pseudonymized (coded) data for analyses. Participants will be assigned a unique study identifier (ID). Data analyses will only be conducted using pseudonymized datasets.

We will create a participants' identification list, containing the personal data together with participants' IDs. This list will be saved password-protected on a secure server at the UZH for 10 years. No identifying information will appear on any of the study's written (scientific publications, conference posters) or verbal (presentations) outputs.

Ethics and dissemination

The study involving humans was approved by the Commission on Bioethics of Sumy State University, Ukraine (60–236 from 06/11/2024). The study is conducted in accordance with the local legislation and institutional requirements. Participants received modest remuneration in recognition of the time spent for completing study questionnaires.

Study findings will be disseminated through peer-reviewed publications and conference presentations. In line with the LHS approach that underpins this study, findings will also be shared with MH4U and policymakers throughout the project. Pseudonymised data will be made available on reasonable request after the main results have been published.

Discussion

Evaluation of MHCs in Ukraine will address the evidence gap on transitioning from institutionalization toward a community care model. In a war affected, post-totalitarian context, community mental health care extends beyond service delivery. Ukraine's modern mental health system remains dominated by biomedical approaches delivered primarily through inpatient psychiatric institutions and care homes (psycho-neurological internats) (18). Furthermore, despite recent efforts to raise awareness about mental health and to reduce stigma, mental health stigma remains a significant and complex challenge (31). Even before the escalation of the war, mental health resources were insufficient to meet adequate population needs (7). Together these factors have reinforced high level of institutionalization, segregation, and stigma, alongside limited availability of psychological, rehabilitative, and community-based services (18). MHCs will lower practical and symbolic barriers to care, by integrating services within communities and emphasizing psychosocial support alongside clinical care (14, 32). Consequently, MHCs have the potential to reduce stigma, strengthen trust in public health institutions, and improve continuity of care for individuals with mental health conditions (14). These dimensions are critical in Ukraine, where repeated exposure to displacement, loss, and insecurity on addition to their early life hardships (33).

Evaluating MHCs in conflict settings can generate transferable evidence for strengthening mental health systems well beyond the direct war exposure within Ukraine. Evidence from the region suggests that the psychological consequences of the conflict extend across borders. A cross-sectional study in Bosnia

and Herzegovina demonstrated that the emergence of the Ukraine war is significantly associated with the reactivation of PTSD symptoms among individuals who had lived through the Bosnian war (34). Consistent with this, a multi-country study across 11 European countries reported elevated symptoms of depression, anxiety, and PTSD in populations indirectly exposed to the war, likely due to media exposure, refugee movements, and socioeconomic uncertainty (34). MHCs are likely to operate not only as a response to recent war-related exposure, but also as a model for delivering accessible, sustainable, and community-trusted mental health care in the long run. Findings from this evaluation will provide timely evidence on scalable model capable of addressing both acute and long-term psychological needs under conditions of high demand and limited resources. However, application of this evidence in other countries will require contextual and local adaptation.

Conducting this evaluation in an active conflict setting introduces unique operational and ethical challenges. First, certain mental health topics remain highly sensitive in this context. Careful wording of instruments and flexible consent procedures are adapted to avoid causing psychological distress or re-triggering trauma. Second, ongoing conflict also affects the planned scale-up of the MHC model, introducing uncertainties that cannot be fully controlled. Third, the mixed-methods design adds further complexity. Quantitative and qualitative data must be integrated under tight timelines while providing iterative feedback. This requires sustained communication between MH4U and the research team at Sumy and Zurich universities, as well as standardized data management to ensure timely and reliable feedback.

Strengths and limitations

Strengths

This multidimensional approach, linking patient outcomes with provider and community-level factors, enables the understanding of contextual, organizational, and system-level needs. It fills a critical gap in the existing literature, which has largely focused on clinical outcomes rather than the mechanisms and conditions required for effective transition from institutionalized psychiatric services to the community-based care model. The longitudinal study design using a mixed-methods design, guided by the RE-AIM framework will generate actionable evidence to inform practice and scale up. This study also uses LHS approach with iterative feedback loops and stakeholder engagement are designed to ensure that emerging evidence informs practice and decision-making in real time.

Limitations

The variability in implementation across centers. As a result, fidelity cannot be directly measured due to the absence of standardized fidelity indicators tailored to the nature of implementation across every center. In addition, the absence of a formal economic evaluation limits conclusions regarding the cost-effectiveness and financial sustainability of the MHC model at scale.

Conclusion

The evaluation will generate evidence for MH4U and Ukrainian policymakers for quality improvement and to guide the scale-up of MHCs during ongoing war and recovery. The findings will also provide a transferable lessons for other health care systems seeking to transition from institutionalized to community-based mental health care.

Ethics statement

The study involving humans was approved by the Commission on Bioethics of Sumy State University, Ukraine (60-236 from 06/11/2024). The study is conducted in accordance with the local legislation and institutional requirements.

Author contributions

MM: Formal analysis, Project administration, Writing – original draft, Visualization, Data curation, Writing – review & editing, Validation, Conceptualization, Software, Methodology, Investigation. A-KS: Formal analysis, Software, Project administration, Methodology, Investigation, Validation, Writing – review & editing, Supervision. VY: Methodology, Software, Formal analysis, Investigation, Project administration, Conceptualization, Writing – review & editing, Validation. AF: Conceptualization, Methodology, Supervision, Writing – review & editing. MK: Investigation, Software, Validation, Writing – review & editing, Formal analysis, Supervision, Methodology, Data curation, Project administration. VP: Methodology, Writing – review & editing. MS: Supervision, Writing – review & editing, Methodology. SP: Methodology, Writing – review & editing. NK: Methodology, Writing – review & editing. ES: Writing – review & editing, Conceptualization. MB: Methodology, Writing – review & editing, Resources. OS: Writing – review & editing, Methodology, Resources. VW: Writing – review & editing. MP: Visualization, Investigation, Resources, Writing – review & editing, Validation, Methodology, Conceptualization, Project administration, Funding acquisition, Supervision. AK: Validation, Conceptualization, Project administration, Methodology, Writing – review & editing, Investigation, Formal analysis, Software.

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Conflict of interest

The author(s) declared that this work was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Generative AI statement

The author(s) declared that Generative AI was used in the creation of this manuscript. We used AI tools to assist with the translation of interview transcripts from Ukrainian to English. All translated text was reviewed and verified for accuracy by the research team.

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Recovery through creativity: a study into lived experiences of participants in Dutch arts-based recovery initiatives

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Introduction: It has been suggested that participatory arts-based activities inherently align with recovery-oriented way of working and may aid personal recovery in people with mental illness. However, underlying mechanisms need to be further clarified. The aim of this study is to contribute to more understanding on recovery through creativity by examining lived experiences in the context of arts-based recovery initiatives.
Methods: In this qualitative, interpretive study, 26 participants from Dutch arts-based recovery initiatives were purposefully selected. Unstructured interviews were conducted and transcribed. The data were analyzed using reflexive thematic analysis.
Findings: Eight themes describe participants' lived experiences of personal recovery through creativity in the context of participatory arts initiatives. We grouped these into four metathemes that represent the underlying mechanisms of recovery through creativity: "Engaging in a conscious and constructive activity," "Transforming and transcending painful experiences," "Belonging in a creative community," and "Steps toward emancipation." A fifth metatheme, "Opposing forces," describes the processes that hinder a favorable relationship between creativity and personal recovery.
Discussion: The research confirms that participatory arts initiatives align with the recovery philosophy, with both contextual and arts-related aspects playing a role in the perceived benefits of participating in such an initiative. The experience of beauty and a sense of wholeness as a counterbalance to experiences of psychological suffering offers a promising avenue for further research, as well as research leading to a better understanding of how opposing forces in the relationship between creativity and recovery can be (self-)managed.

KEYWORDS
arts, creativity, lived experiences, mental illness, qualitative research, recovery, RTA

Introduction

There is increasing interest in the potential of artistic activities in improving health and wellbeing, and a growing consensus that they should be an integral part of modern healthcare, including mental healthcare (1–6). The idea that art can contribute to positive health effects is, however, not new. For almost a century, creative and artistic practices have been used as part of treatment for people with mental illness, mainly in the context of

inpatient psychiatric care (7). This approach has traditionally been dominated by a clinical, therapeutic perspective. Recently, there has been an expanding academic interest in the effects of community-based participatory arts activities on personal recovery from mental illness (8–16), which is in line with deinstitutionalization movements and the emergence of the Recovery paradigm.

The concept of personal recovery is a response to the narrow interpretation of recovery from a clinical paradigm that pays little attention to the loss of identity, purpose and self-esteem associated with mental illness (17). Personal recovery can be described as a deeply personal, unique journey toward a satisfying, meaningful and rewarding life, characterized by discovering a new sense of identity and purpose, even with the limitations caused by illness (18, 19). A recovery-oriented approach calls for equitable and reciprocal relationships between service users, staff, and career stakeholders, and a focus on personally defined recovery (20). Participatory arts-based activities are shown to naturally complement recovery-oriented approaches, fostering key elements such as empowerment, connection, agency, and hope (21–23), which might aid recovery in other ways than, for example, regular therapies do (24).

Participatory art activities differ from more traditional forms of art therapy, which requires therapists with specialist training, in that they are focused on the process: actually "doing" and experiencing the creation of art (22, 25). In other words: art is primarily created for the sake of the art. Many benefits of participatory arts activities in people with mental illness have been described, and include improvements in empowerment, social inclusion, confidence, motivation, self-awareness, wellbeing, as well as overall quality of life and mental health (8, 10, 11, 15, 26–31). As most of these benefits have yet to be validated in controlled settings, they should be interpreted with caution, leaving room for critical reflection—or, as Clift et al. (1) suggest, "balancing optimism with assessments of uncertainty."

Much also remains unknown about the underlying mechanisms through which creativity can contribute to personal recovery. It is suggested that arts initiatives offer a safe and empowering community-based environment—one that is non-judgmental, structured but flexible, focused on potential rather than limitations, and conducive to collaboration and co-production. Such settings foster creative freedom, equality, choice and meaningful connections and provide space for sharing and telling personal stories (12, 32–35), which may facilitate the sense of connectedness and belonging and offers the opportunity to develop skills and redefine one's own identity (8, 16, 36–39). This, in turn, is assumed to promote recovery. Mechanisms inherent to the creative process itself also appear to play a role, These include, for example, the experience of artistic flow as a distraction from negative thoughts, the expression and transformation of difficult experiences and emotions in art, and the narrative potential of art to challenge current perceptions of mental illness (16, 30, 40).

Further research is needed to deepen our understanding of how creativity can contribute to recovery. Most studies addressing this question are based on small sample sizes and tend to focus on the characteristics and perceived benefits of specific arts-based programs or interventions. In the present study we are interested in the creative process itself as well as the context in which creativity unfolds. To gain deeper insight into this issue, the study explores the lived experiences of a large and diverse group of artists with lived experience of mental illness participating in Dutch arts-based recovery initiatives. This approach aims to give voice to people who have personal experience with processes of recovery and offers the opportunity to study the coherence of different aspects of recovery and creativity in the context of the person's life. The study is informed by the following research questions:

> RQ 1: How do participants in arts-based recovery initiatives experience the relationship between creativity and personal recovery?
> RQ 2: What can these experiences tell us about the potential mechanisms of action of arts-based recovery initiatives?

Methodology

Design

A qualitative design, pragmatically guided by Reflexive Thematic Analysis (RTA) (41–43). Underlying theoretical assumptions included a constructionist, experiential and inductive approach to research, which is the most appropriate theoretical stance for the purpose of the study as it gives space to personal experiences of participants. We used insights from hermeneutic-phenomenological thought (44) as an inspiration for our methodological approach. Hermeneutic-phenomenological thinking assumes that there is no "single universal truth" about phenomena. It follows a subjectivist/interpretivist ontology that focuses on the way in which individuals experience, describe, interpret and understand a particular phenomenon—in this case recovery through creativity—and is characterized by a continuous, non-linear, circular process of interpretation (45). In this paradigm, research can never be considered value-free. Instead, it assumes a value-laden axiology. The researcher is regarded as an integral part of the analysis, as a tool for understanding. Their task is not to arrive at a definitive answer, but a plausible, contextualized, and credible account of what an experience means to a particular group of participants. The researcher's active role in knowledge production and the analytical process is thus not avoided but acknowledged and embraced (46), which is also a core principle in RTA (47). The analysis in this paper is part of a larger study into lived experiences with creativity and mental illness, conducted by the first author.

Recruitment

For this study, we recruited participants of Dutch arts-oriented recovery initiatives for/by persons with experience of mental illness. The scope of different disciplines in, and approaches to, art practices in the Netherlands is broad; however, within this study we limited ourselves to visual and performance art. Two educational art/recovery centers, four arts-based daytime services, two Living Museums and three art groups/collectives of artists with experience with mental illness were involved in the

study. Of these 11 organizations, six focus on visual art-making and five on performing arts (music, theater). Characteristic of these organizations is that they eschew a therapeutic paradigm: their emphasis is not on working through personal issues to achieve psychological change, as it is in many forms of creative therapy. Instead, the organizations are art-oriented, that is, making art is the primary goal, while the potential of collaborative art-making to produce positive change in people's health and lives is secondary. Although some organizations are linked to mental health organizations and occasionally employ mental health professionals such as art therapists, leadership tends to be by professional artists. All organizations accept participants regardless of their initial level of artistic ability.

Approaching and informing potential participants

In all organizations a central contact person (often a project leader or the founder of the organization) mediated in the recruitment. After initial contact, and if the investigator determined that the person met the inclusion criteria, the potential participant received an official letter about the study, which included GDPR guidelines on confidentiality and data processing as well as a consent form, and an interview appointment was scheduled. It was emphasized that participants could withdraw from the study at any time.

In- and exclusion criteria

Inclusion criteria were as follows: over 18 years old; current or past participation experience in a Dutch arts-based recovery initiative for at least one consecutive year; self-reported mental illness with clear, long-lasting effects on everyday life; Dutch- or English- speaking and living in the Netherlands. No essential exclusion standards were used. For example, florid signs of conditions like depression or psychosis were not a criterion for exclusion. Since the aim was not to investigate the interventions/programs themselves but rather people's experiences with creativity and recovery, we did not distinguish between types of arts activities, frequency of participation, etc.

Participants and sample size

We recruited participants until theoretical saturation was reached. We are confident that the final sample size of 26 participants is sufficient to achieve a high level of completeness, comprehensiveness, and philosophical consistency (48), and made it possible to look for potential similarities (shared experiences) and differences (uniqueness).

Data collection

The first author conducted a single, unstructured, in-depth interview with each participant. The interviews lasted an average of 63 min (with a range of 40–98 min). All interviews were tape recorded, transcribed verbatim by the first author, and pseudonymized. The researcher took field notes about her impressions both during and after the interview, as well as during transcription, and actively reflected on her own assumptions and interpretations during the process of data collection. The majority of interviews were conducted remotely, by means of a video call, except for five face-to-face interviews at the location of the arts initiative, and one by phone. Although a live interview allowed more space for the researcher to see and experience the person's artistic work, there were no noticeable differences in the data gathered live vs. remotely. Both forms of conversation led to good, in-depth conversations about experiences. After the interview, a short questionnaire with general questions (both demographical and related to art discipline and mental illness experience) was administered.

The interview

The nature of the interview was "open," which means that the participant's experiences were central, and the researcher primarily listened and interfered minimally (49). The goal of this interviewing method is to gain insight into personal meanings and experiences (not guided by any theoretical or empirical frame of the researcher) related to the topics of creativity and recovery within the context of the participants' own life (story). This also meant that the topic list was kept fairly simple. It consisted of a first question (that invited participants to start talking) and a number of main topics, which were not prescriptive and left plenty of space. Each interview began with a detailed explanation from the researcher about the study's background and about her own relationship to the research topic. The participant was then invited to share something about the art discipline they are involved in, how the interest in this art discipline arose and how they came to be involved with the art initiative. These questions seemed to be a good starting point to begin discussing creativity, mental illness and recovery. Participants were in charge of narrating their experiences; follow-up questions from the researcher always matched the story of the participant. The researcher helped to make the story coherent with active and deep listening, and by picking up things that seemed to have meaning for the interviewee. Co-constitution techniques were used to validate the participants' meanings and the researcher's understanding (50).

Ethical issues

All procedures were in accordance with both the ethical standards of the Trimbos Institute and the 1964 Helsinki Declaration and its later amendments or comparable ethical standards. Written informed consent was obtained from participants. The option to withdraw was made clear. To safeguard the privacy of the participants, personal information was omitted

from the transcripts. After transcribing, audio files were deleted. This non-invasive, qualitative study was judged exempt from a review by an external review board. Specific recommendations of the ethics committee of the Trimbos Institute to optimize procedures of secure processing of personal data, the provision of full and understandable (legal) information on study participation and assessment of the burden of the interview, were adopted. (Ethical procedure Registration Number: 3028631/25-05-2020).

Data analysis

The aim of the data analysis was to gain insight into the experiences of people participating in an arts-based recovery initiative and in the meaning and meaningfulness of creativity within recovery processes. We applied Reflexive Thematic Analysis (RTA) to identify and analyze patterns and themes across the data by organizing codes around a relative core commonality, or "central organizing concept," that the researcher interprets from the data (41–43). The actual analysis included a six-phase process of familiarization, initial (latent) coding, theme generation, reviewing and revising, working toward a thematic framework, and writing up findings (51). To identify themes we applied principles from hermeneutic-phenomenological methodology such as "dwelling with the data" (45), which amounts to a circular process of reading and re-reading the parts and the whole of the transcriptions, interpretation, distilling (increasingly nuanced) themes and merging similarities into common themes and shared meanings. By adopting a constructionist epistemology, the researcher acknowledges the importance of recurrence, but appreciates meaning and meaningfulness as the central criteria in the coding process (47). The process of coding was aided by using MAXQDA software for qualitative analysis, and focused on latent meanings and underlying assumptions, ideas, or ideologies.

Reflexivity and rigor

In qualitative research—and particularly in hermeneutics—it is assumed that being situated within or connected to the phenomenon of interest can significantly enhance the researcher's ability to discover meaning (45). While her involvement cannot be seen as an insider perspective, the lead author did bring a variety of prior experiences and knowledge on the study's main topics. The lead author, who is trained in health sciences, had over a decade of experience in applied mental health research, with a particular focus on recovery and recovery-oriented practice. She conducted numerous interviews with people with mental illness, including about what recovery means outside of a medical model. The content of these conversations also touched on personal experiences surrounding (the search for) meaning and eudaimonic wellbeing. Furthermore, she had been active in the arts as an amateur musician since childhood and regularly experienced in herself and others that creativity can have something to do with mental wellbeing. All these professional and personal experiences shaped her prior understanding of the phenomena under study and led her to explore how these concepts might intersect and how their potential relationship might be understood.

However, the benefit of being connected to the research subjects rests on critically considering the influence of the researcher's own position and assumptions (46, 52). To document and explore her thoughts and preconceptions about creativity, mental illness, and recovery, the principal investigator kept a reflective journal throughout the research process. This journal proved particularly valuable during the data analysis, as it helped her explore how her own perceptions related to those of the participants, nuance her initial interpretations where possible, and approach the participants' stories with greater openness. The addition of two researchers with different academic backgrounds (medical humanities, social sciences) to the research team broadened the interpretation of the data and helped to critically question personal and societal understandings of art and recovery, thereby increasing the scientific rigor of the study.

The authors further strengthened the study's validity and reliability by providing a robust and transparent account of the research setting, participants, data collection methods, and analytic procedures, supported by rich, thick descriptions of participants' interpretations (53). They demonstrated how the findings relate to the broader literature and used verbatim quotes from participants to support the presented results and illustrate both shared and divergent experiences (54). In presenting the findings, some excerpts retain the first author's ("JB") questions or responses to clarify the flow of the dialogue for the reader.

Characteristics of study participants

Study participants (see Table 1) ranged from age 28–69 years (mean 52), and included 14 women (54%), and 12 men (46%). Of the study participants, 54% were involved in visual arts (painting, drawing, digital art, combined techniques), and 46% in performing arts (music, theater). In terms of education, 50% had completed vocational training, 35% finished higher education, while 15% had only finished high school. Before attending the art recovery initiative, 84% were already involved in their art discipline: 19% had learned the art discipline by themselves without lessons, 50% had learned their discipline in the amateur art education circuit and 15% had received some formal art or art-related training (one person started art academy but didn't finish it, one person finished a creative study on vocational level, 1 person finished a private art-related education program, and one person finished an online course to become a creative therapist). The other participants (16%) started being involved in the art discipline only when joining the art initiative. A quarter of the participants (26%) earned (some) money with art.

Self-reported main mental illness experience was psychosis-related (19%), mood- related (34%), anxiety/compulsivity-related, including PTSD (23%) and "other" mental illnesses (23%), including eating disorders, autism, dissociative disorder and ADHD. Self-reported comorbidity was high: 65% reported a second mental illness, 30% a third, 15% a fourth. At the time of the

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TABLE 1 Characteristics of study participants.

	Pseudonym	Age (years)	Gender	Art discipline	Art practice	Self reported main diagnosis
1	Ronald	66	M	Music	Art education center	Psychosis
2	Brian	33	M	Music	Art education center	Psychosis
3	Edward	51	M	Music	Art education center	Bipolar disorder
4	Jacob	67	M	Visual arts	Living museum	Anxiety/compulsive disorder
5	Victoria	54	F	Visual arts	Living museum	Depression
6	Henry	55	M	Visual arts	Art daytime services	Bipolar disorder
7	Frank	48	M	Visual arts	Art daytime services	Bipolar disorder
8	Hannah	55	F	Visual arts	Art daytime services	PTSD
9	Mark	28	M	Visual arts	Living museum	Personality disorder
10	Patricia	42	F	Visual arts	Living museum	Depression
11	James	42	M	Visual arts	Living museum	PTSD
12	Linda	52	F	Theater	Art collective	Personality disorder
13	Richard	63	M	Theater	Art collective	Depression
14	Daniel	69	M	Visual arts	Art education center	Depression
15	Elizabeth	61	F	Visual arts	Art education center	Depression
16	Olivia	33	F	Theater	Art collective	Personality disorder
17	Gary	58	M	Visual arts	Art daytime services	Psychosis
18	Christine	64	F	Visual arts	Art daytime services	Psychosis
19	Julie	28	F	Theater	Art collective	Eating disorder
20	Judy	55	F	Music	Art education center	Psychosis
21	Evelyn	32	F	Theater	Art collective	Depression
22	Margaret	63	F	Theater	Art collective	PTSD
23	Harold	52	M	Visual arts	Art collective	Anxiety/compulsive disorder
24	Virginia	63	F	Visual arts	Art education center	Depression
25	Amanda	61	F	Visual arts	Art education center	Personality disorder
26	Janet	49	F	Theater	Art collective	PTSD

interview, 76% were receiving mental health care. Another 12% had received mental health care in the past but were, at the time of the interview, supervised and treated by their general practitioner; while 12% no longer received any kind of mental health care.

Findings

The most evident, overarching pattern we identified in the interviewees' stories was that the meaning of creativity for recovery can be understood as an interplay of creativity-related and collective meanings. In order to gain a better understanding of how these different meanings take shape, we focused on the underlying lived experiences. We identified eight themes that describe these experiences and clustered them in four meta-themes, of which two relate to the beneficial aspects of the creative process itself and two relate to the collective opportunities offered by the art initiative. The four meta-themes are: "being engaged in mindful and constructive activity"; "converting and transcending painful experiences"; "belonging to a creative community"; and "steps toward emancipation." The data show, however, that tensions can emerge that hinder the beneficial potential of creativity for personal recovery. We described these tensions under a fifth meta-theme: "Opposing forces." The five (meta)themes are shown in Figure 1 and further explained below.

Being engaged in mindful and constructive activity

Distraction from the inner world: Participants, firstly, experience engaging in creative activities as a way to get into a positive flow or state of mindfulness that distracts them from compulsively wandering thoughts and worries and brings peace of mind. Characteristic of this experience in the descriptions is the sense of timelessness, the ability to focus on the here and now because "you really have no choice but to go along with the process." As Jacob explains, when he is drawing, he focusses completely on drawing, so he doesn't have to think about "all the other 258 things on his mind". Hannah similarly phrases it as a distraction;

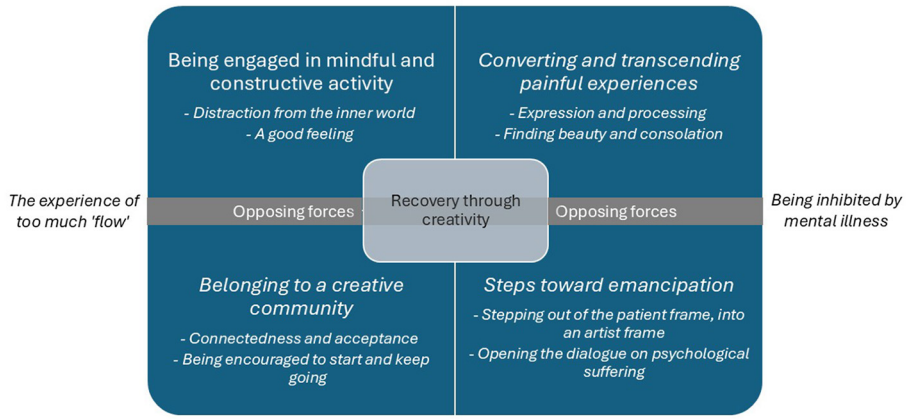


FIGURE 1
Thematic framework, inductively obtained through analysis of experiences.

from herself and from the world. Almost all participants share this experience of distraction and flow and value it for its calming and stress-reducing potential.

> Virginia: I prefer to be a little without words, and when I am making art it is also without thinking. Do you understand? It is rest for your thoughts. Because in my head it's all rattling around. Well, when I'm drawing, I'm actually waiting for what's to come. And then I sit and follow my own hand or that brush and then, "Ooh, beautiful!" Do you understand? The best thing about it is that the thoughts become silent. And then I no longer need that OCD to calm me down. It is as if art says "Let it go, let it go."

In sharing experiences about how creativity leads to distraction, all participants emphasize the intuitive nature of the creative process. Just "being" with the process of creating, and being surprised by what arises, is very important. Visual artists add to this the value of the tactile quality of the process of making art: experiencing how the material you work with *feels*, and the focus on shapes and colors, which ensures that you have nothing else on your mind. For musicians, it is the vibrations produced by sounds and melodies and the ability to sail along on the different dimensions, moods and emotions that are contained therein. For participants doing theater, the feeling of surrender when playing a scene or taking on a certain role, and the focus that is needed for this, ensures that one's own thoughts become quieter.

> Richard: I think I end up in a kind of daze, of yes in the moment, now it has to happen, and surrendering myself completely to the play and to the performance.

A good feeling: Engaging in the creative process not only quiets the mind, but also produces affective effects, which often linger beyond the creative process, and are perpetuated with more regular art practice. Participants describe how making art lifts their mood and gives them (at least when things go well) a sense of success and satisfaction, which can help build self-esteem. As Henry explains, it makes him feel good—really good. He feels competent at something; many things don't work out, but painting does. Patricia adds that the creative process has helped her feel, and accept, herself more. Her self-image has improved enormously because of it.

Participants emphasize the difference between making art, which is a constructive activity, and other, more passive, activities such as watching TV or doing household chores. Making art requires a specific effort and commitment, and also offers the opportunity to share something (positive) of yourself with others. It is precisely because of these kinds of qualities that it can gradually counterbalance deep-seated and persistent feelings of shame, self-disappointment and worry.

> Hannah: I was very disappointed in myself, I was very disappointed in life. My self-esteem was very low, I didn't know where I was going, I felt very low on energy. And then [when starting to make art] everything came up you know? So the creative process was in a way healing for me. And I think it still is, in a way it is therapy I think without noticing.

For some participants making art, through its constructive quality, has become their most important coping mechanism in dealing with symptoms of mental illness. These participants explain that when they are under-involved in creative processes, they experience an increase in symptoms, a decrease in self-confidence and they become more vulnerable to relapse. Conversely, they use creativity the moment they start to feel worse, and through the creative process they manage to return to calmer waters.

> Edward: Doing things of which you know: that makes me feel good, that makes me feel a bit better, that's what your recovery is about. So those are things I'm going to do a lot [when not doing well]. Drawing, painting, and making music are my way out of depression.

Converting and transcending painful experiences

Expression and processing: This theme revolves around the rather unique ability that art offers to put feelings, experiences and thoughts into the thing you make. Participants describe that the moment something from their inner world ends up in their art it is transformed into something else, something that is tangible and can be viewed from a distance. That makes it possible to experience

it, interact with it and move through it—but without the fear of getting lost in it.

> Olivia: Performing is sometimes difficult, especially when what you're performing is so close to your own life. But when I'm performing, I don't experience that. I'm preoccupied with where to stand, what words to say, where to look, maintaining an open posture. All those technical things come up. And then I work through that painful content, but from a distance. It contributes to the healing because it creates a kind of space for a part of myself that's difficult to accept, that I always carry with me... It's part of the processing, or something.

Participants experience the conversion of feelings, thoughts and experiences in art as liberating and redemptive as they often find it difficult to process these in other ways, especially when it concerns confusing or heavy thoughts. As Ronald shares, it feels like a liberation from a shackled existence. In the creative process, he is able to transform depressive feelings and find a 'solution' to his issues.

Participants emphasize that it is important to give meaning and space to painful experiences in their art, not because they then become less difficult, or because they are then immediately cured of them, but because they are part of their life story and should not be hidden. In the form of art, these parts are allowed to exist, albeit in a more abstract form, which helps them to come to terms with it.

> James: I'm processing what I've been through, and I think that's really important. It's a way to come to terms with it. I see it as a form of recovery. Sometimes it's difficult to talk about your problem, but you can also process it in a poem, or you can tell your story on canvas. I think it's simply a form of processing. That's how I see my art: as a form of processing.

Furthermore, many participants describe how art gives the opportunity to not only to consolidate experiences for themselves but also to transmit them to others, which leads both to a meaningful shared artistic experience and shared understanding with, for example, loved ones, of the things that are contained in the piece of art.

> Julie: It was very important to me, so others could see it too. Because i felt misunderstood during that period. That performance felt like a kind of processing. People close to me, like my mother, naturally came to see it too. And yes, I would never have said, "This is actually about me," but in the meantime, I'm showing myself, what I really want to tell them, what it's like for me. I'm showing it to them without saying it's about me. And it also led to a better connection with my mother; yes, I have a better connection with her because of it. I just wanted her to understand me.

For some participants, being able to express experiences in artistic ways also quite literally helps them to prevent more destructive ways of expressing it. As Linda explains, expressing her feelings through art, and processing and communicating her emotions that way, keeps her emotions from coming out - in her words - all "borderliny."

Incidentally, it is important to add that for most participants, processing and converting painful experiences is not the *primary* goal of making art, but rather a consequence. It can be a largely unconscious, indirect process, in which the artist only notices during the art-making process or afterwards that the artwork contains experiences that are easier to accept and transfer to others because of their new form. The process is also not limited to matters that are difficult or stressful. Other experiences, feelings and ideas can also be given a place in art, and therefore get the right to exist.

> Mark: Most of it certainly is part of my inner world. I am not much of an emotional talker at all, I also find it very difficult to talk about feelings. But in art it comes out anyway. I can put it into a kind of mold that shows how complicated I think it is. This is kind of poetic. But truth. But it is not only stressful things. Sometimes I just feel like: wow that is interesting or weird. Not that it really destroys me, but that I think: I have to represent this in a certain way. Because I find that interesting too.

Finding beauty and consolation: Yet another dimension to the process of converting experiences that contributes to the wholesome potential of art making is the fact that - making art can lead to an experience of beauty and wholeness. Participants describe that such an experience has the capability to counterbalance (some of) the crudeness and "ugliness" of experiences with mental illnesses. Some participants specifically look for experiences of beauty. Virginia, for example, who shares that, in contrast to her mental illness, she always strives for harmony or peace in her work, or as she puts it: "something sweet through form or color," "an image that radiates a kind of melody." The elicitation of an experience of beauty, however, most of the time happens unexpectedly, and may even arise when very difficult themes have been or are being consolidated in the work of art. According to participants, this is because personal, singular experiences and stories, including the "ugly," are placed in a larger, more universal context through art, and as such can contain a form of beauty.

> Victoria: Suffering in itself is only ugly, but a *story* about suffering, hidden in a work of art, can be very beautiful. Beauty can be in so many things, but it is especially in the ugly. We normally don't see that. Yes, I like that aspect of art. I like the story behind the surface, the frayed edges of existence, empty buildings. It doesn't need to be smoothed out for me.

The experience of recognizing a form of beauty within suffering, through art, is described by several participants as a form of consolation, which is more than just coming to terms with it. Rather, it is described as a very profound experience of meaning, which is confrontational and comforting at the same time, and as such forms an opportunity to be a whole person again, despite and because of suffering.

> Olivia: It was so beautiful, I sometimes really had to swallow tears because I really saw myself in it and I felt really disgusted, but at the same time it was also beautiful and a recognition and a kind of consolation that I felt. Very special.

> Edward: I think a lot depends on the experience of beauty for me in the end. This makes me emotional, but it … it makes me feel whole inside … euh … it is consolation … yes … it is comforting absolutely. I find beauty comforting. I have learned to like my emotions too. Maybe I should say that too. I'm a very emotional person and when I'm sad I can even enjoy the fact that I'm crying or something. JB: So you also experience beauty in your own suffering? Edward: Yes. Yes. Yes. Sure.

Belonging to a creative community

Connectedness and acceptance: Where the previous themes dealt with aspects related to the creative process itself, the following themes deal with aspects related to the context offered by the art-oriented recovery initiatives. For participants, the art initiatives they attend represent a physical place ánd social community where

they meet like-minded people and where people are seen and accepted for all they are and have, including their difficulties. Participating in such an initiative, for some a completely new experience, was described as very stimulating and affirming.

> Victoria: The founder said, "How about this table?" He takes a thick marker and writes my name in large letters on the wall above that table. And I really stood there crying. Then he handed me over to one of the other artists there for a tour. And it felt so much like coming home, such a relief. I felt so unconditionally at home. And from that moment on I felt it. Yes, you don't have to explain yourself here, you won't be judged. If it's not my day, that's accepted. I'm not that talkative, don't necessarily have to join the conversation, but the feeling that you are connected to each other… Connection with like-minded people, that's what I was looking for.

The sense of connection and community that arises in such art initiatives is, according to participants, strongly related to the fact that participants have similar (mental illness) experiences, which ensures a lot of mutual understanding and acceptance, without having to actually touch on the topic. Patricia's experience is illustrative for this: at the art initiative she attends, one can simply walk in with a sad face, and everyone will understand.

Even more meaningful, however, seems to be the shared passion for art. It is liberating to meet others who have the same interest. For Mark, who came from a period in which he was living in a very small bubble, entering the art initiative meant realizing for the first time that there are many other people who create art in the same way he does. Participants value the genuine interest shown in each other's work and the collective willingness to help each other grow personally and artistically, which contrasts with other environments, where pressure and expectations often play a role.

> Hannah: You can really grow here in what you do. And that happens here because the interaction is different from what you're used to; it's a different kind of interaction. JB: Yes? What's different about it then? Hannah: There are no expectations of you. In every other situation, there are expectations you have to meet. And not here. Normally, there's a lot of judgment and pressure in society. Here, there's no pressure at all. You can just be who you want to be. And when people are themselves, you can become stronger. This place is so special. The interaction between the people and the people who run this place—they're special people, you know, they give people space.

> Daniel: I did a course at a regular art school: modern art, six evenings, and then you come across a group of people where you suddenly have the feeling: there is competition, who can tell their story the best, who is the smartest. I had that feeling then and that is not the case here at all. Everyone can be themselves and you have a lot of interest in each other. Yes, that is just a very pleasant environment.

Participants emphasize that the shared passion for art and equality between participants lays the foundation for the formation of attachments, which over time can even function as a safety net and/or lead to close friendships. As a result, participating in an art initiative contributes to getting out of a situation of social isolation and loneliness and moving toward a situation of (more) connection and belonging. It is, as it were, an antidote to loneliness, and therefore an opportunity for recovery. As Jacob puts it, if a person doesn't communicate with others or doesn't have friends, they can fall into a deep chasm. In this place, they are seen and recognized by other people. That social contact is extremely important.

Being encouraged to start and keep going: Being part of a creative community not only pays social dividends but it also is very important in starting and sustaining the creative process. Many participants indicate that they found it scary and intimidating in the beginning to join the group and experienced a great resistance to actually starting to be part of a collective creative process. However, they all experienced that the moment you actually join, the community becomes an important motivator and activator to do what you actually want to do. Henry explains that the group has rekindled his enthusiasm for painting and Harold shares that he rarely manages to work on his art at home, but that the environment of the initiative encourages him to actually get things done. He notes that one does not simply sit around doing nothing there.

Facilitators often play an important role in this. They are described as very inviting people, and are often the ones who get participants in the creative mode; later on, they give suggestions on how to develop an artwork, song or scene even further.

> Elisabeth: She [the facilitator] is very intuitive and technically very strong. Then she stands behind you and says: "Ooh, that's great, that's going in the right direction." And then she gives technical advice that you can use. She has a lot of experience. And because I always go so slow and stuff, she says: "this was a huge leap forward!" So sweet.

> Christine: He [the facilitator] sometimes comes up with very surprising things. I once made a small statue, I thought of papier-mâché, and then he said, could you make it big too? I've never done that but definitely wanted to try. So then I started doing that, then I made a statue the size of a human being.

Also the others in the group take on that motivating role. Participants emphasize the importance of getting response to your work, working toward a common goal (a performance, play or exhibition) and "being in it together," which they describe as stimulating. This stems from the principle that when an activity is undertaken collectively, it is much harder for individuals to opt out or neglect their responsibilities to the group. In this way, a sense of commitment and dedication is fostered. The fact that you are all committed to the same thing ensures that you stay focused and work to overcome impediments, whether arising from the mental illness or the artistic process itself, that would be more difficult for you to go through on your own.

> Judy: Making music *together* is so important. I need that external stimulus from the group to really let myself go in the music. When I am alone it is so easy to get distracted, for example, by the television.

> Hannah: The thing is, when you come here, you can't just give up or say, "Ooh, I'll do it next week." You really have to go through the problem. You have a commitment with yourself, and also with the people who are there. Because you are not alone, you are part of the group, there is somebody who is directing you and giving you help if you need it.

Steps toward emancipation

Stepping out of the patient frame, into an artist frame: Participants find the experience of participating in an art initiative stimulating and constructive, precisely because there is no therapeutic atmosphere and they are approached as artists and not

as patients within this context. The experience of mental illness is not ignored, however, it is neither seen as something negative nor as something that needs to be fixed. Making art is also not seen as an intervention, but as an end in itself.

> James: The name "living museum" says it all: when you walk in here you are just an artist. That just helps. And you are also taken seriously. They even say: take yourself seriously as an artist. Seeing yourself as an artist is really taught here … well not taught, but the whole atmosphere is like that.

> Patricia: In healthcare, I know that myself, you need a diagnosis to get help at all. That's the entrance, otherwise you won't get it, it won't be reimbursed. It doesn't work like that here. Here you enter and you are addressed as an artist immediately and that is how you are looked at. Even while I'm not yet ready to call myself an artist, that's how I am addressed here because that applies to everyone who comes in here.

All the art initiatives included in this study seem to embody the idea that there doesn't have to be a ready-made solution that solves all problems, but that one should just start doing what one likes and then see where it takes them. This approach, based on positive health and opportunity and an open attitude to what is and what is to come, boosts participants' confidence and clears the way for participants to grow. It makes people aware of their own responsibility and also offers a positive identity that can help them to claim a place in the outside world.

> Virginia: Do you know what it is, the approach there is based on the "healthy part," if you are a little sad or you are stuck, there is time for that, someone takes a moment listening to you and an arm around your shoulder, but then it's like: guys sit down, instruction, let's get to work. And I find that's very good. First you're all in your head and [you think] "this is really terrible." But you get to work and then you think, "Oh, there's more." And you're having a good time and it's getting a little more normal every time. So that's fantastic. And from that on, you also are an artist in the outside world. "That you say to others: no I can't come because I'm drawing, Or I'm going to drawing class." And that people immediately say, "Ooh how nice, a lot of fun." That also has a very … other people like it too.

For many participants participation in a art-initiative is a first step toward a more fully-fledged place in society from a marginalized position. Their participation truly sparked a flow of creativity that gave them a new direction in their lives. Some participants have also been given opportunities by the art initiative to develop further toward professional art practice, starting, for example, with taking on more tasks and responsibilities within the initiative, as a prelude to artistic work outside its walls.

> Janet: I'm now an assistant director, supervisor, we do all kinds of exercises and I help, you know? So I've grown a lot there too. [It] has also been quite a process. I'm still an outsider, but now I'm that outsider that makes other people happy, and who isn't bullied but is respected in my differentness.

Opening the dialogue on psychological suffering: Finally, a large part of the participants experience that being part of a creative community not only has effects on their own personal lives, but that the effects extend further. Making art, especially in a collective context, as well as its outputs in the form of exhibitions, performance or plays, are a very good medium for communication, and even challenging common public perceptions about mental illness and psychological suffering. For the participants engaged in visual arts and music, this is mostly an implicit process that is related to the fact that the community exists and its output occupies part of the public space. Dialogue about the work arises spontaneously, for example, during exhibitions and performances e.g., when spectators are moved by what is presented, which may lead to conversations about psychological suffering.

> Patricia: I don't necessarily find suffering beautiful, but I do think it is good—and this brings us back to the idea of turning your vulnerability into strength—to use it to start a conversation with people, to show that I am not a diagnosis, but a person. Breaking that taboo is really important.

> Harold: Emancipation is also part of it. I especially like it when we do an open studio route because then people will come that would otherwise not be in your studio, and you can exchange stories. You make contact with viewers in this case, someone who comes to see the work. And perhaps that will lead to a bit more acceptance.

For the participants involved in theater, it is a much more explicit process. In all theater groups involved in this research, it is common that performances are made about a theme that relates to mental illness or psychological suffering. The aim of these performances is to put difficult experiences in a different light and to open a dialogue. In the process of putting on such a performance the actors exchange a great deal of experiences with each other about the central theme, thus creating a collective experiential knowledge base that forms direct input for the play in the making.

> Linda: Our plays are often structured in such a way that the story ends badly, but that leads to a dialogue at the end with the audience. And I honestly think that's the most fun thing to do. It's kind of vulnerable because you're standing in front of the group. We gave a performance for, I believe, 100 people, so there you are. And all kinds of questions are fired at you. But by talking to each other there, they see that reality is very different from the image. In fact, we sometimes ask the question, "Gosh, how would you do that part differently?" And may we invite you to come and play that out? So then one of the actors is taken out and that's where the audience comes in. The actors are then the ones who move along with how the audience tries to give its solution, so to speak.

Participants experience that the moment they enter into a dialogue on their experiences with others *through* their art, different power dynamics apply than when they conduct this kind of conversation in other ways. The artists who invite the viewer(s) to a conversation about the content of the work of art are in charge; after all, they have set the framework for the conversation. It can still feel very vulnerable to do this, participants say, but the context of art makes it a very empowering experience at the same time.

Opposing forces

Being inhibited by mental illness: Participants experience many benefits of making art in their recovery process. However, they all share that it doesn't always work that way. There are times when the threshold to create is so high that they cannot take advantage of the benefits of the creative process. Participants who suffer from

depression describe how incipient symptoms can evoke a feeling of inhibition and a sense of worthlessness that prevents them from being creative, and from attending the art initiative. Participants with psychotic experiences emphasize the detrimental effect that psychotic episodes can have on all daily activities, including creative ones, and the adverse effects of anti-psychotic medications on creativity.

> Harold: The threshold to get behind a canvas is a bit bigger, then you can feel that it's not worth it or that it's not good enough, or that it's nonsense. Those kinds of ideas can of course bother you and hold you back.

> Gary: I feel that my psychosis has an adverse effect on my creativity. It has been very hindering at times, especially due to the use of medication.

All participants emphasize that being part of a creative community helps to keep being creative, or at least be connected with others, even during difficult times. However, such challenges sometimes lead people to stop visiting the art initiative. Maintaining contact with participants during these periods is crucial. Several participants indicate that visiting the initiative is often the first activity they resume after the crisis is over. This is easier when the connection hasn't been broken.

The experience of too much "flow": Just as symptoms of mental illness can hinder creativity, the opposite can also happen. A few of the participants have experienced that through processes in their inner world, they can also end up in *too much* creative flow. This happens especially when they work on something alone. The feeling is often pleasant initially, because then participants can achieve a lot, and they feel sparkling and inspired; however, in the long run the feeling becomes somewhat negative, and actually exhausting. It can even lead to more psychological suffering.

> Edward: I think being very creative, being very much in a flow, also has a very bad … something in which you can overshoot. That's something I'm familiar with. That the moment you are in a nice flow, you forget the structure around you and start to freak out a bit and yes, nights go on and in that regard you actually enter a kind of manic period. It's something that's… something to consider. Yes. If at some point I feel like "now it's enough" then I also have to say "now I stop." As a result, you remain in your own strength and your own peace. Not going into stress mode. But it's such a flow that you can get into. Then it's hard to pull yourself back.

Like Edward, several other participants recognize that it is necessary but sometimes quite difficult to curb creative energy. Frank is often told by people around him that he needs to stop, even when he himself feels that it isn't necessary. "People say, 'It's not good for you; it's like there's no brake anymore, and you start behaving strangely." But he feels that in that state, he can set things up much more easily, and everything goes much faster. When he's not in that mode, he actually misses it.

Olivia also struggles with this dilemma: to what extent do you have to slow down creative flow, if it undeniably also has an attractive side?

> Olivia: I happen to have a period like this now when I … I just don't really want to stop drawing, practicing, painting, I can get completely exhausted and overstimulated by that. And then I lie in bed at night thinking about everything. After such a period of time I have a period when I just want to do nothing at all for a week and I can't really do anything, because then the dishes are already too much or something. But still. sometimes I want to… If I look at this week, I have gathered so much information and have been really busy with following lessons and trying things with paint and yes when I look at my development then I think: I am developing, that is better than sitting on the couch. But I still have not found the right balance, and I also do not know to what extent that is feasible. Sometimes I just try to accept that this is how it goes.

For some participants, this dilemma is less in the foreground because their art practice mainly takes place in the context of the art initiative, which ensures that there are fairly clear frameworks and boundaries (in time, space and the fact that there are others who know you) that prevent the creative process from becoming excessive.

Discussion

This study was conducted to gain more insight into the relationship between creativity and personal recovery underlying the claim that art can facilitate health, and in particular, that participatory art activities may facilitate personal recovery from mental illness. Our findings demonstrate that the idea of recovery through creativity resonates with and is rooted in the experiences of the people in this study. In other words, participants indeed find that engaging in creative processes contributes positively to their recovery. The participants' narratives offer insight into the underlying mechanisms of this process, which are situated both in the collective and stimulating aspects of the arts-based intervention, and in the creative and artistic process itself. Their narratives also reveal that people encounter opposing forces, which can make the relationship between creativity and recovery feel like a delicate and precarious balance. These findings can inform the development of activities and policies related to art and recovery in a way that aligns with the needs and experiences of the people concerned.

The findings underscore the important role of the contextual characteristics of arts initiatives in shaping the positive relationship between creativity and recovery. This effect appears to be strongly driven by the emergence of a creative community. Being part of a creative community is a powerful catalyst for all kinds of recovery processes, as has also been demonstrated in previous research (8, 13, 14, 16, 23, 32, 39, 40, 55–57). Key ingredients include "connectedness and acceptance," "sharing a passion for art," "not being judged," "the willingness to help each other," "commitment instead of pressure," and "the invitation to be yourself." These elements create a sense of homecoming, and for many, it means emerging from a situation of social isolation and loneliness and moving toward a situation of (greater) connection and belonging.

Yet, the art initiative offers more than just a place for social connection. It is described as a kind of artistic sanctuary: a space where people reconnect with themselves through creation. It therefore also serves as a space for personal transformation, creative exploration, and identity redefinition. This is linked to the opportunity to step outside the patient frame and into the artist frame, which helps to expand narratives about oneself by

developing new, positive identities, while also allowing the "old" identity to remain (and not be rejected by others) [see also: (8, 16, 23, 39, 40, 55, 56, 58)]. In these contexts, art is also naturally used as a means of communication, which can provide participants with opportunities to (re)connect with their communities (13, 39, 59) or even counter stigmas and challenge dominant ways of conceptualizing mental illness (56).

The fact that the positive relationship between creativity and recovery is so dependent on the context of the art initiative, as shown in our and other studies, raises the question of whether creativity and recovery *per se* have anything to do with each other. After all, mechanisms such as the development of positive identities and empowerment through meaningful activity, group interaction and connection with a community are very similar to findings from studies on recovery programs in a broader sense [see for example the work on Recovery Colleges: (60–62)], which may indicate that it is primarily the setting itself and engagement with a meaningful topic or activity—of any kind—that is associated with recovery. However, that would not do full justice to the stories of our participants, which seem to underline that creativity and making art *in themselves* have unique characteristics that can change the experience of mental illness and promote recovery, although associated mechanisms remain relatively underexplored in the existing literature.

In line with previous literature. (8, 13, 16, 23, 32, 39, 40, 55, 57, 63), our research confirmed that within the flow and timelessness of creative processes, negative thoughts and emotions fade into the background, and creativity can improve mood and generate a deep sense of satisfaction. The creative process, therefore, also functions as a coping mechanism for participants—one that is experienced as healthier than the (usually more destructive) coping strategies they may otherwise be familiar with. Moreover, the creative artistic process offers the opportunity to express, make tangible, transform, and process difficult and painful experiences. This, too, is a form of coping, giving meaning and space to one's own experiences.

In our study, however, we also saw a much deeper meaning of creativity. We saw how important creativity and art-*making* are to our participants in understanding themselves and the world around them. Being creative and being drawn to art is part of who they are, or, as Stacey & Stickley (59) put it, creativity represents an integral aspect of the person's perception of themselves, as for many it is an essential component of the way they wish to live their life. For them, recovery from mental illness therefore naturally includes recovering their creativity as a central feature of their identity. This entails not only restoring creativity but also (re-)engaging in aesthetic experiences, particularly experiences of "beauty" and "wholeness", as these kind of experiences appear to have potential for eudaimonic wellbeing and transcending painful and alienating experiences on the road to recovery. In fields such as creative therapy (64), public art (65), care ethics (66), and neuroaesthetics (67), the importance of aesthetic experiences in relation to wellbeing, psychological healing, and health has already been emphasized. However, this topic has remained underexplored within research on recovery and recovery-supporting practices. Nevertheless, it is not far-fetched to connect concepts of recovery and aesthetics, particularly within a hermeneutic framework.

According to Gadamer (68), a leading figure in modern hermeneutic philosophy, our main source of suffering as humans is our incompleteness. Following Gadamer's vision of aesthetics, "beauty" is a way of overcoming incompleteness, because it represents an "earthly truth" about who and how we (essentially) are. In the moment of the experience of "the beautiful," we recognize our (full) selves in a sense, and this experience can provide relief and make us feel like a complete person, even if only for a moment. The participants' stories in our study seem to resonate with this idea: the effect art-making has on the self-image, self-acceptance and the sense of meaningfulness and connectedness has common ground with the idea of overcoming incompleteness and returning to "being human." From Gadamer, we can hypothesize that art may provide a unique access to a sense of completeness or "wholeness" that is difficult to access through other avenues, and which could explain the specific effect of art on people recovering from mental illness [see also: (21, 58, 69)].

Evidently, this constitutes a domain that warrants further scholarly inquiry, ideally through a multidisciplinary approach. Such investigation may contribute to a reconsideration—and potential repositioning—of the concept of 'suffering' within the recovery paradigm. Within recovery thinking, people with mental illness are invited to confront their suffering, to name it as part of their life story, and to move forward to a position where they are no longer defined by it. Considering suffering as an inherent condition of human existence, just like beauty, where both extremes can even merge in the experience of art, offers an alternative or broader perspective on this idea, which may be relevant as a basis for sustainable recovery.

Other avenues for further research raised by this study include the differences between art disciplines, whereby each discipline may have its own specific opportunities in the recovery process, as well as drawing attention to the opposing forces that stand in the way of recovery through art. With regard to this last point, some authors have pointed to challenges related to art-making, including encountering frustration and experiencing the gap between wanting and being able (70); the possibility of triggering negative, distressing memories (13); struggles with self-esteem and motivation (71); and feelings of "emptiness" once workshops end (38). To our knowledge, however, the specific challenges found in our study (inhibition and acceleration of the creative process) have not yet been extensively studied in relation to recovery. Exploring these opposing forces has relevance to practices that focus on recovery from mental illness through art and face challenges when participants do not seem to benefit from the art environment or even drop out.

Strengths and limitations

While the strengths of our study include the large sample size and the breadth of the findings due to the inclusion of participants from different art disciplines and organizations, the study also has several limitations. While the strength of the interpretive methodology, based on experience, lies in its

ability to shed light on the meanings of various aspects of creativity and recovery, a drawback of the methodology is the difficulty of distinguishing between recovery *mechanisms* and *outcomes*. Because the pursuit of a robust, data-driven theory—as is common in, for example, a grounded theory design—was not the goal, the presented results remain rather noncommittal and exploratory in nature, leaving considerable room for interpretation and many unanswered questions. Other limitations include the absence of a member check, uncertainties about the nature and seriousness of the participants' psychological complaints (because these were not measured), and the limitedness of a single interview-methodology to capture the dynamic nature of the recovery process. In retrospect, the difference between different art disciplines (visual vs. performing) should perhaps have taken a more central place in the main question and design of the study, as well as the difference between people who were already fascinated by their art discipline as a child, and people who only came into contact with their art discipline after the onset of mental illness.

Despite the limitations, we believe the study contributes to the theoretical understanding of recovery through art in a way that does justice to and promotes the voices of people with lived experiences, with relevance for mental health care and art policy.

Practical implications

The results confirm the importance of the existence of accessible creative sanctuaries and communities where people can make art and work on their recovery. Furthermore, it is important that caregivers of people with a creative affinity understand the meaning of creativity and consider the necessity of recovering creativity during times of relapse and crisis, as restoring creativity can potentially act as a catalyst for recovery in all other areas.

Data availability statement

The datasets presented in this article are not readily available because the dataset consists of rich and complex qualitative data that is difficult to anonymize without losing crucial information. Data can be requested from the lead author, but any portions that may contain identifiable information will be removed. Requests to access the datasets should be directed to Jenny Boumans, Jboumans@trimbos.nl.

Ethics statement

This study was reviewed and approved by the ethics committee of the Trimbos-institute (registration number: 3028631/25-05-2020). All procedures were in accordance with the local legislation and institutional requirements, and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards. This non-invasive, qualitative study was judged exempt from a review by an external medical-ethical review board because it concerns a non-invasive, qualitative study. The participants provided their written informed consent to participate in this study.

Author contributions

JB: Writing – original draft, Investigation, Methodology, Conceptualization, Formal analysis, Funding acquisition. AO: Project administration, Methodology, Writing – review & editing, Supervision, Funding acquisition, Conceptualization. HK: Writing – review & editing, Supervision.

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Going beyond: an exploration of residents' experiences in recovery and homelessness supported housing provision in the United Kingdom

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Appropriate support is essential for the recovery of individuals with complex needs. In the United Kingdom, individuals with multiple complex needs such as those experiencing homelessness or recovering from substance use reside in supported housing. This type of housing is provided by a range of housing associations, local authorities, and charities. Often, a proportion of these individuals require tailored support to address their overlapping needs relating to health and daily living. However, there is a paucity of United Kingdom research on this topic. The aim of this present study is to explore the experiences of residents' living in recovery and homelessness supported housing provision. Semi-structured interviews were conducted with 11 residents from a coastal town in the North-West of England. Data collection occurred between February and March 2024. To analyze the interviews, thematic analysis was used. Two overarching themes were identified. The first was "going beyond" which unpacked into four subthemes "compassionate care," "availability of support," "comfort and safety," and "personalized approach." The second theme was "community and relationships" which unpacked into three subthemes "other residents," "activities" and "stigma." Findings showed that tenants valued staff who provided support beyond their formal roles, especially those with lived experience. The findings also highlight the importance of housing conditions, personal autonomy, and community engagement in fostering a sense of home and identity. The implications of this study highlight the need for service models that extend beyond basic care.

KEYWORDS
homelessness, housing, mental health, recovery, supported housing

Introduction

Housing is a key determinant of health and well-being (1, 2). Yet many groups encounter housing instability and need to access and engage with supported housing. The United Kingdom government defines supported housing as accommodation that is provided along with support, supervision, or care to help people live as independently as possible. Supported housing exists to support people often with multiple and overlapping needs, including older people who can no longer live at home (3–5); have a diagnosis of dementia (6); people with

mental health issues (7, 8); those who have experience of the criminal justice system; individuals and families at risk of homelessness; and domestic abuse; and those in recovery from drug and alcohol dependence (9). In the United Kingdom, supported housing is a mixed economy of provision, mostly provided by housing associations and local authorities, but also charities, the voluntary and private sectors (10). The United Kingdom National Audit Office (11) estimates 651,000 supported housing units in the United Kingdom, of which 85% are in England (based on a 2016 government review) and has associated costs of £3.5 billion per year.

Given that supported housing serves many groups, often with multiple complex needs, unsurprisingly existing literature is disparate. Complex needs can be defined as any adult who requires a high level of support across multiple aspects of their daily life and who rely on a range of health and social care services (11). However, for supported housing research in the context of homelessness there is an international evidence base, although there are also notable gaps. The international evidence base highlights how supported housing provides a foundational place of safety where people can, with the right support, begin to rebuild their lives. A high proportion of the evidence base that demonstrates mixed efficacy is from North America and mostly focuses on provision for military veterans and schemes delivered through the federal Collaborative Initiative on Chronic Homelessness (12). While limited to the Norwegian context, Nesse et al. (13) highlight the role staff play in recovery and life satisfaction. However, it is noted a systematic review that the United Kingdom is poorly represented in the international evidence base on supported housing concerning groups who are homeless and or can be in recovery (12).

A 2018 systematic review included no research from the United Kingdom in respect of supported housing for homeless people (12). A more recent systematic review published in 2024 on recovery experiences of homeless people with substance use disorder found 15 papers, only three of which report research undertaken in the United Kingdom (including one with a partial focus on the United Kingdom) and only two of these were published since 2015 (14). Another relevant systematic review published in 2024 of service users' and providers' experiences and perceptions of mental health accommodation services found 43 papers, with only one reporting United Kingdom research (15). This limited United Kingdom evidence focuses on conceptualizations and meanings of personal recovery (14), residents' social capital (16, 17) and a strength-based approach for those encountering homelessness (18). With limited evidence, United Kingdom researchers have developed a logic model that highlights the hypothesized impact housing interventions have for homeless people, including intermediate outcomes, moderating factors and more distal outcomes (12). However, ultimately the logic model is based on moderate to low-quality evidence mostly from outside of the United Kingdom and on housing interventions which are inclusive of supported housing but not specific to it (12, 14, 15).

With complex provision, and with the nature of overlapping and multiple needs of residents, it is difficult to contextualize, frame, and interpret evidence in respect of national context and population group. It is noted that governance is an underrepresented dimension in supported housing research (12). Subsequently, it is important to situate research in the relevant policy and governance context. Broader United Kingdom state intervention in housing predates the welfare state by at least 50 years (19), and yet commentators have referred to housing as the 'wobbly pillar' of the welfare state because it is seen as being on the periphery of welfare policy (20). Specifically on homelessness, direct state intervention was established long after welfare intervention in other areas such as education, health, and social security. Currently, policy and the governance structures that overlie supported housing for homeless people can be considered multiple, complex, and reliant on the priorities of several central and local government actors (19). For example, while the Department of Health & Social Care develops policies that aim to enable independent living, it is The Ministry of Housing, Communities and Local Government (formerly The Department for Levelling Up, Housing & Communities) who are responsible for the supply and quality of supported housing (21). In addition, The Department for Work & Pensions (DWP) reimburses local authorities (who manage provision in their area) for paying housing benefit claims. Within the context of complexity with respect to the needs of the population group and the overarching policy context, this research aims to explore residents' experiences of recovery and in homelessness supported housing provision in the United Kingdom.

Methods

Context

The study took place in the North-West of England at recovery and homelessness supported housing provision. The supported housing provision in this study is in a coastal town with extremely high levels of social and economic deprivation, some of the poorest health outcomes in the country, a poor housing stock, and a relatively transient population. Given this location is a small town, and while it is important to contextualize this research, we do not provide references or demographics to protect the anonymity of participants.

Participants

Residents who lived in either recovery or homelessness supported housing provision from across five sites were invited to participate. Staff shared the poster invitation and participant information sheet with potential participants. Eleven participants were recruited using purposive sampling. Participants were given a £10 gift voucher as compensation for their time.

Data collection

A qualitative approach using semi-structured interviews was used to explore participants' experiences of living in supported housing following ethical approval from Lancaster University Faculty of Health and Medicine Ethics Committee. Interviews were conducted between February and March 2024 at a time agreed upon by the participant. After gaining verbal consent, the interviews were conducted by two researchers. The first author led the interview and asked the questions, while the second interviewer asked follow-up questions where appropriate. Interviews lasted 25 min to an hour, were audio recorded, and transcribed verbatim.

Analysis

The recordings of the interviews were transcribed, and transcriptions were securely electronically stored. The data was analyzed

following the six steps of reflexive thematic analysis approach (22). Data was analyzed inductively, meaning it was not shaped by pre-existing theory. Initially, the first author familiarized herself with the data and coded according to the interview guide topics. Following this, codes were then analyzed into provisional themes when they had shared similarities. The first author then met with the rest of the research team to discuss and reflect on the initial themes and sub-themes. The research team engaged in critical reflection to finalize the themes.

Ethical considerations

Written consent was required for participation in the interviews. Before the recording started, participants were informed about their right to withdraw without a reason or consequence and that their participation was voluntary. Staff were not present during the interviews and verbal consent was taken from the participants prior to the interview starting. All data was anonymized before sharing with the wider research team.

Results

The following section outlines the two themes and seven sub-themes that resulted from the thematic analysis. The direct quotes from the interviews are displayed using pseudonyms. These themes are (i) going beyond and (ii) community and relationships.

Going beyond

This overarching theme captures the multifaceted nature of support provision, contributing to and affecting a resident's experience. It reflects how staff exceed care expectations and go the extra mile for residents. There are four subthemes within this theme: (i) compassionate care, (ii) availability of support, (iii) comfort and safety, and (iv) personalized approach.

Compassionate care

This subtheme emphasizes how staff display empathy and understanding towards residents. Residents sometimes expressed frustration with staff interactions lacking empathy. It suggested staff may benefit from a deeper understanding and patience when residents exhibit challenging behaviors.

> *"We're not doing it because we think it's a smart thing to do, but because we are just kids at the end of the day. We've had bad, we have had shit childhoods, so of course we are gonna act up…We're doing it because that's what we think, what we have been brought up to think is right."* (Carl)

Residents emphasized how staff went above and beyond to monitor and notice changes in behavior among residents. It highlights a proactive approach taken by staff to check in and provide support if a resident was acting out of character. *"So then [staff] and [staff] will come in, they always ask how's such-a-body, have you seen such-a-body, and we'll say we have not seen them for a couple of days, and then they go and either ring them or knock on the door and see if they are alright"* (Lisa).

Availability of support

This subtheme recognises the benefit of reliable and available support. Residents emphasized the importance of having access to round-the-clock support. They expressed an appreciation for the dedication of the staff, highlighting how they made themselves available to residents when they needed it. This accessibility provided reassurance to the residents knowing they could reach out at any time. *"If you are feeling down…they'll just sit there and talk to you, or if they are not available you can send them a text and they'll get back to you"* (Daniel).

Comfort and safety

This subtheme describes how creating a sense of home and safety for residents was important. Residents appreciated the autonomy to customize their living space to their preference if they wanted. *"We're allowed to customize our rooms if we get the permission and the money ourselves, so they are also willing to help you with that"* (Ava). Security equipment played an essential role in fostering a sense of safety for residents. *"I feel safe in my flat. There's a camera directly at the front door outside, there's one at the back door, there's three, there's four in the building"* (Felix). For residents in recovery housing, the housing space was seen as symbolic and represented transformation in their recovery journey. This suggests the importance of creating a nurturing environment that not only provided a roof over their head but represented their future. *"I was in the other housing, and when I was in there I'd look around and it was like still being in addiction, the houses were just not up to scratch, dirty carpets, do you know, dirty walls, half decorated. And then coming here was like wow"* (Lisa).

Personalized approach

This subtheme highlights the importance of staff understanding residents' unique needs and preferences. One resident shared how staff had gone the extra mile to personalize their Christmas experience which had left a marked impact. Personalized touches contributed to the residents feeling valued and appreciated for who they are.

> *"We got these like massive food hampers, they were literally just a massive B&Ms bag full of food…And it wasn't like everyone got the same thing, it was like everyone got like sort of the same thing but different…I like my hoodies, so I got a hoodie, some got caps and stuff, It was like they really thought about it."* (Carl)

Residents valued the presence of staff members who had lived experience of substance use, homelessness, or supported housing. The shared background created a mutual understanding and residents looked up to these staff members as role models for their own journeys having seen them successfully transition into society. *"Knowing, they've got wise words, they've been there before, that I keep coming back to that because that is massive. They understand, they've been there. There's nothing that we can say to them that they think oh, i'll be shocked by"* (Lisa).

Community and relationships

This theme captures the importance of interpersonal relationships between residents within their supported housing environment and the community around them.

Other residents

This subtheme explores residents' relationships with each other where they bond over shared experiences but also experience challenges and conflict. Residents shared their experiences of living with others within the accommodation. They highlighted how trust was an important value to have. *"You've got to trust people, you cannot just go through it not being able to trust anyone, cause when you live with X people that's a lot of people around, you have got to trust sometimes"* (Felix). Residents highlighted how shared experience helped them bond and offer support to one another. These common experiences served as a foundation for building empathy among the residents, demonstrating strength in each other's company. *"Everyone's so tight knit, because we have all been through the same type of situation"* (Jasper). Residents also faced challenges with each other. The challenges came from differences in personalities, needs, and points of their journey. "I *always use my manners wherever I go. But some people in X they do not know what manners are…A lot of residents I've spoke to treat [accommodation] like a doss hole"* (Mike).

Activities

This subtheme explores the variety of activities available to residents inside and outside of the accommodation and the benefits these activities provided for their well-being and sense of community. Residents expressed their appreciation for the variety of activities offered to them. *"We also do meditation and stuff, and sometimes we do step work as well…or listen to a podcast"* (Ezra). The activities provided to residents offered immediate and long-term benefits including a sense of purpose, establishing routine, and freedom from boredom. The activities served more than just a pastime but fostered a sense of belonging and fulfilment in residents' lives.

> *"We're on, they were on about going abroad this year, so I've just put in for my passport, which I've never had a passport in my whole life…So yeah, all this stuff, it's getting me into the real world, do you know what I mean? And that's what we do, and yeah. I feel part of society today, I do!"* (Lisa)

Stigma

This subtheme details the resident's experience around internalised feelings of shame due to their living situation or other aspects of their background. Residents were aware of the differences between themselves and their peers, as well as the stigma associated with living in supported housing. *"Then going to college, you make friends but oh what do I say to them? That I live by myself, do I live with my parents, you know stuff like that"* (Ava). Residents were frustrated when assumptions were made by staff about their future. The frustration stemmed from the perception of being unfairly judged based on their background.

> *"You are not always gonna have that amount of money sitting around. And it's like well, you do not know that, I could move out and become really successful…you do not know where my future goes, you are making it out as if I've got to live off the cheapest, I've always got to live off my benefits"* (Carl).

Discussion

Within the context of population, deprivation, and policy complexity, this study aimed to explore the experiences of residents in two types of supported housing provision. The sample consisted of 11 residents who resided in either homelessness or recovery supported housing. The collection of detailed descriptions in this analysis makes possible for a wide range of relevant discussion. However, we have chosen to highlight the findings most congruent to existing literature.

Within the themes presented in the findings, the residents describe the staff's ability to go beyond their role, ranging from providing round-the-clock access to support, sharing lived experiences, and facilitating autonomy. Previous literature has pointed to the central role that support staff play in the lives of residents, emphasising how the quality of relationships between staff and residents can impact health outcomes (23, 24). This is similar to the residents in our study who recognized the dedication of staff and valued the seemingly small acts of genuine interest and support. This is shown in other literature, which emphasizes the fundamental importance for users to be seen, heard, and respected as normal human beings by professionals, an approach regarded to impact their improvement (25). According to residents in our study, staff having their own lived experience were viewed as role models for their own recovery. The benefits of having lived experience within the workforce for users have been cited in the mental health literature, including increased independence and strengthened social networks (26). However, it is worth acknowledging that the effectiveness of professional relationships can be shaped by the support available to staff, including ongoing supervision which is essential when managing the emotional demands of the role (27). Given that concepts such as therapeutic alliance and helping relationships are well documented as predictors of outcomes in psychotherapy literature (25, 28), the above findings should not be surprising. However, these findings highlight how lived experience can be embedded into professional practice in helping relationships (25, 26).

Historically, homelessness and recovery housing have been in poor physical condition and existing literature suggests factors such as open or closed spaces, noise levels, and light can impact psychological well-being (29, 30). Furthermore, the psychological conceptualization of home extends beyond being a material object representing something that can provide autonomy and control (1, 31). Having the opportunity to have resources such as personal storage, access to a television, and furniture helps residents in supported housing feel engaged and establish social networks in the community (32, 33). From the perspective of ontological security, the home serves as a secure base where people can develop social identity and improve mental health outcomes (34, 35). Furthermore, the development of agency and personal autonomy are essential goals of many supportive and therapeutic interventions (36). It is suggested that when behavior is autonomous it is congruent to a person's authentic interests and can improve well-being (37). Supported housing can provide a foundation for identity renegotiation through regaining agency and autonomy (38). Autonomy can be experienced through making everyday decisions and accessing the accommodation independently (39). These ideas are supported by the findings from residents in this study who were given the autonomy to customize their living spaces or were in well-kept accommodation which residents valued. This reinforces housing services as important in creating a sense of home and security.

The residents of this study touched on aspects of forming community around them. Residents emphasized the role of their peers in the facility in providing support during their journey. These findings

align with previous research that participating in relationships of support with others contributes towards belonging and integration in a community (33). Residents in our study engaged in support roles with one another through sharing mutual experiences. Engaging in support roles and being a source of kindness for other residents have been identified as vital elements to becoming embedded in a community (33, 40). Moreover, having access to activities such as gym facilities and cooking lessons impacted residents' well-being and sense of community. Participating in wider activities beyond supported housing has been cited as necessary to become socially included in the wider community through providing residents with experiences of social connection and interaction. This further supports that housing provides a foundation for individuals who live with complex needs to engage with activities outside of the accommodation (41). Having the opportunity to engage in activities, such as applying for a passport or attending a cooking class meant residents took on new responsibilities and contributed to them feeling a part of society. This supports how when satisfying one's basic needs of shelter and safety, people can rebuild and focus on meaningful activities, suggesting the provision of such activities in supported housing can facilitate a turning point in meaning and identity (8, 42).

Strengths, limitations and future research

One strength of this study is its social and geographic context. The accounts are contextual to the housing challenges of a town with significant social and economic deprivation, a relatively poor housing stock, poor health outcomes, and a transient population. In this challenging context, these findings are particularly illuminating and demonstrate the promise of this type of provision in supporting the housing needs of a vulnerable population with complex needs. However, we note that because of this context, the findings are not generalizable but may be relevant and transferable to other local contexts.

Given the lack of a substantial evidence base as discussed earlier, there are several possibilities for further research within the area of supported housing and the wider field concerning this population. For example, this study was undertaken with a small sample and was not able to follow residents' individual journeys for any considerable period, and as such we are not able to take a longitudinal perspective on what happens to residents in the medium or long term. Further research that takes a longitudinal approach could provide deeper perspectives on the sustained impact of supported housing interventions. Additionally, further research conducted across multiple localities may be able to highlight if support needs or findings are consistent across multiple localities or whether there are any differences and, importantly, what the drivers are for any variations. While this study provides insight into residents experiences of supported housing, it does not explore causal links between these experiences and individual recovery outcomes. Nonetheless, understanding residents valued features of supported housing offers practical implications for public health and service design. For example, interventions can be tailored to prioritize staff training in lived experience-informed support, foster supportive community networks within housing, and ensure housing conditions promote autonomy.

It is important to acknowledge that this paper highlights one form of support for this population. Other types of housing interventions exist to support this population, such as Housing First which is gaining prominence in the United Kingdom and internationally (43–45). As we established earlier, there is a paucity of evidence for housing interventions with this population and particularly in the United Kingdom. Given this population often has different, often overlapping and multiple complex needs, another area for further research is to develop understanding on the efficacy of what housing interventions work best for groups where support needs are different. In other words, little to nothing is known about the comparative effectiveness of different housing interventions for this population.

Conclusion

This study explored residents' experiences in recovery and homelessness supported housing provision in the North-West of England. The findings highlight the role that meaningful relationships with staff, other residents, and the wider community have on residents' sense of connection and belonging. The findings also highlight the role of the physical environment demonstrating how safe and secure spaces contribute to residents' autonomy and align with wider psychological theories of ontological security. Overall, this study contributes to the wider literature by reinforcing the complex nature of supported housing and demonstrates the need for multifaceted support that considers both interpersonal and environmental needs.

Data availability statement

The datasets generated for this study consist of anonymized qualitative interview transcripts. Although all transcripts have been anonymized, they may still contain contextually sensitive information. For this reason, the data are not publicly available. Access to the anonymized transcripts can be requested from the corresponding author and will be considered on a case-by-case basis, subject to appropriate confidentiality safeguards and alignment with ethical approvals.

Ethics statement

The studies involving humans were approved by Lancaster University Faculty of Health and Medicine. The studies were conducted in accordance with the local legislation and institutional requirements. The participants provided their written informed consent to participate in this study.

Author contributions

AS: Conceptualization, Data curation, Formal analysis, Methodology, Project administration, Writing – original draft, Writing – review & editing. HM: Conceptualization, Formal analysis, Resources, Supervision, Writing – review & editing. RL: Conceptualization, Writing – review & editing. SB: Data curation, Formal analysis, Writing – review & editing. CB: Data curation, Formal analysis, Writing – review & editing. AH: Supervision, Writing – original draft, Writing – review & editing.

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Supplementary material

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3for1 intervention program—short-term psychotherapy, job coaching, and peer support for unemployed individuals facing psychological distress: a community case study

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This community case study examines the 3for1 intervention program, a multidisciplinary intervention designed to support individuals affected by unemployment experiencing psychological distress. The program integrates short-term psychotherapy, job coaching based on the approach of Individual Placement and Support (IPS), and peer support. Thus, individuals affected by complex and interrelated psychosocial challenges can find support through individualized, low-threshold care. Two participants are presented: Participant A regained employment, Participant B primarily improved mental health outcomes. In both cases, psychotherapy mobilized personal resources and supported decision-making, job coaching facilitated re-employment and peer support enhanced self-efficacy. Close multidisciplinary collaboration enabled tailored support. Participants' trajectories indicate the value of individualized, cross-sector approaches in addressing barriers to labor market participation for individuals affected by psychological distress. Structural challenges underscore the need for longer-term, integrated support for individuals with complex psychosocial needs.

KEYWORDS
job coaching, mental health, peer support, psychological distress, short-term psychotherapy, unemployment

1 Introduction

This community case study illustrates the application of the 3for1 intervention program offered by six job centers in south Germany funded by the German Federal Ministry of Labor and Social Affairs (1). Job centers in Germany are government agencies responsible for administering basic income support and providing employment services as part of the country's social welfare system. The 3for1 intervention program addresses the challenges faced by individuals affected by unemployment and psychological distress, as they are less likely to find reintegration into the primary labor market (2). This lack of reintegration hinders their ability to secure

competitive employment and burdens the German social insurance system (3). The 3for1 intervention program consists of short-term psychotherapy, Individual Placement and Support (IPS)-based job coaching (4, 5), and peer support. It aims so reintegrate job center clients in the primary labor market and improve their mental health.

Existing programs targeting job center clients have either focused on job coaching and training ("first train, then place") (6), or primarily addressed mental health issues (7–10). The first train, then place approach aims to prepare individuals for employment through pre-vocational training and stabilization before entering the labor market. While this approach may provide a structured environment and support skill development, it can be criticized for delaying labor market integration and for limited transferability of acquired skills to real work settings.

In contrast, approaches such as IPS follow a first place, then train principle, emphasizing rapid placement in competitive employment combined with on-the-job support. This model has shown strong evidence for improving employment outcomes, particularly among individuals with severe mental health conditions, but may require substantial coordination and ongoing support, and may not be equally suitable for all individuals depending on their diagnosis and the specific service context in which it is implemented (11). Research indicates that programs that address both, mental health concerns and reintegration into the primary labor market, yield more effective results (9, 12), for an overview see (7).

Hence, the 3for1 intervention program aims to contribute to the ongoing discourse on interdisciplinary approaches for labor market reintegration of individuals with complex psychosocial needs. The aim of this community case study is twofold: to illustrate the structure of the 3for1 intervention program and to demonstrate the application of the three intervention components (short-term psychotherapy, IPS-based job coaching, and peer support), provided by case studies of two clients. Particular attention is given to the collaborative processes between intervention providers, the challenges encountered, and the individual adaptations required to support clients effectively.

2 Context (setting and population)

There is a strong correlation between unemployment and disadvantaged mental health outcomes, with the two conditions mutually reinforcing each other in a vicious circle (13–15). Loss of employment can lead to feelings of hopelessness and impaired mental health (16, 17), while also contributing to various physical health struggles, such as poor cardiovascular health and cancer, and increased risks of mortality, including suicide (18–24). At the same time, individuals experiencing psychological distress may find it particularly difficult to maintain employment, which can further exacerbate life management problems such as keeping time structure, engaging in social contact and remaining an active life (3, 14, 25). It is therefore of crucial importance to recognize these interconnected challenges and to offer adequate support.

Individuals targeted by the 3for1 intervention program typically experience a broad range of psychosocial challenges that extend beyond a single diagnostic category. These challenges include clinically relevant mental health issues, such as depression and anxiety, but also subthreshold mental health problems that significantly impair daily functioning without necessarily meeting formal diagnostic criteria. In addition, many individuals face reduced self-efficacy regarding job search and employment, pronounced fears related to returning to work, and experiences of both public stigma and self-stigma associated with unemployment and mental health problems. Also, barriers to help-seeking are common and may include limited mental health literacy, uncertainty about available services, and structural difficulties in navigating the health care and social security systems. These psychological challenges are closely intertwined with social and functional difficulties. Affected individuals often struggle with structuring their daily lives, maintaining social participation, and managing administrative demands. At the same time, they may encounter fragmented support systems and bureaucratic barriers, which can delay or prevent access to adequate care.

Taken together, these factors result in complex and interrelated psychosocial challenges that simultaneously affect mental health, social integration, and the ability to retain employment. Thus, the 3for1 intervention program is designed to address these challenges through a multi-level, individualized approach that integrates mental health support, vocational rehabilitation, and peer-based guidance (1).

Against this background, it is essential to consider the structural support context. In Germany, people who are unable to support themselves financially are eligible to apply for basic income support, which is administered by local job centers. Alongside financial assistance, job center *clients* are offered a potentially wide range of support services to facilitate their reintegration into the labor market. However, support for individuals with mental health challenges in the German social security system is often fragmented. While job centers are mainly responsible for promoting employability and labor market reintegration, the health care system focuses on treatment and recovery, and other institutions, such as the pension insurance system, may become involved if individuals are considered unable to work. At the same time, untreated or insufficiently addressed mental health conditions are highly prevalent among job center clients and represent a major barrier to labor market participation (26). Many individuals have complex and overlapping needs that require coordination across these systems. In practice, however, collaboration between services can be limited due to differing institutional responsibilities and regulatory frameworks. This can result in delays in accessing appropriate support and create substantial barriers for both clients and professionals navigating the system (27, 28). Within this complex system, job centers play a central role in supporting individuals' labor market reintegration. However, job center employees often find it difficult to recognize mental health problems, for which they are typically not trained (29).

This is where the 3for1 intervention program takes action. It aims to support individuals experiencing subclinical and clinically relevant psychological distress within job centers, with the goal of promoting mental health recovery in daily life and facilitating access to and retention of employment in the primary labor market. The project achieves these goals by providing individualized support tailored to participants' specific needs.

3 Programmatic elements

The study was designed as a multi-center, non-randomized controlled trial with time-based allocation to either a treatment-as usual

(TAU) control group (CG) or the intervention group (IG) and registered in the German Clinical Trials Register (DRKS00029002). Potential participants of the 3for1 intervention program were recruited via employment advisors in the six collaborating job centers in the southwest of Germany and screened for eligibility, including the assessment of psychological distress using the Kessler Psychological Distress Scale (K6; range: 0–24 (30)) where participants had to display at least moderate psychological distress indicated by a score of nine or greater.

Both groups received TAU within the job center setting, while participants in the IG were additionally offered access to the 3for1 intervention program. Eligible participants were informed about the study procedures by research staff, provided written informed consent, and completed a baseline assessment prior to entering the intervention phase. Participants in the IG received access to 3for1 over a total period of 12 months. The intervention followed a flexible and participant-centered approach: participants could choose between the three components (short-term psychotherapy, IPS-based job coaching, and peer support) and decide independently if, when and how to engage with them. Components could be initiated concurrently or consecutively, paused, or discontinued at any time, depending on individual needs and preferences and not all of the three-component needed to be used. Further details regarding recruitment, time frame, inclusion- and exclusion criteria can be found in the study protocol (1).

Short-term psychotherapy follows an integrative psychotherapeutic approach based on the well-established model of psychotherapeutic consultation in the workplace (31). Participants are offered up to 10 sessions, along with three optional additional booster sessions. A key feature is that individuals were able to seek counseling without long waiting times (32, 33) and without a formal record of utilization with their health insurance. Sessions are delivered by clinically trained psychotherapists or psychologists affiliated with the project and typically last up to 50 min, corresponding to standard outpatient psychotherapy sessions in the German health care system. Sessions could take place either in dedicated rooms within the job center or at the respective university outpatient clinics, allowing participants to choose a setting that ensured sufficient distance from the job center environment if desired. Appointments were arranged flexibly and individually, depending on participants' needs and available capacities. The intervention is designed as a low-threshold service, allowing participants to access support without long waiting times and without formal registration within the health insurance system. Initial sessions focus on comprehensive assessment and goal clarification, as well as promoting motivation for change. Subsequent sessions are tailored to individual needs and may include psychoeducation, development of a biopsychosocial understanding of mental health problems, resource-oriented work, support in structuring daily routines, and the promotion of self-efficacy, problem-solving skills, and social and emotional competencies. In addition, the indication for further treatment is assessed throughout the intervention, and participants may be supported in accessing outpatient or inpatient care if needed. Booster sessions may be offered to support relapse prevention, maintain treatment gains, or bridge waiting times until further treatment begins.

IPS-based job coaching (4, 5) implements the principle of "first place, then train". Individuals are placed in the primary labor market as soon as possible and then trained in the workplace. Core IPS principles include rapid job search, a focus on competitive employment, and individualized, client-centered support integrated with mental health care. In the present intervention, IPS principles were followed and partially adapted to the specific context of job centers and to a broader target group including individuals with varying levels of psychological distress. Therefore, the intervention represents a context-sensitive application of the IPS approach within a multidisciplinary support framework. A total of 25 appointments were available with the job coach. If participants managed to find employment, the job coaching could continue until the end of the 12-month period to support participants during the transition back into the working environment.

Peer support was delivered by peer navigators, for the use of this project defined as individuals with lived experience of mental illness and life crises (1, 34). Many peer navigators within the 3for1 intervention program also had experienced periods of unemployment, reduced earning capacity, or receipt of disability benefits. In contrast to professional health or social care providers, peer navigators are considered "experts by experience," whose role is grounded in shared lived experience rather than formal clinical training. Thus, peer navigators were recruited based on their lived experience with mental health challenges and/or unemployment. A formal qualification as a peer-support worker (e.g., EX-IN or comparable training) was not a prerequisite for this role. However, where such qualifications were present, they were integrated into the respective roles and competency profiles of the peer navigators. They received ongoing supervision within the project and were financially compensated on a part-time, marginal employment basis. In addition, regular supervision and team meetings were provided to support peer navigators in managing the emotional demands of their role. Each local intervention team included four peer navigators, each employed on a marginal part-time basis (approximately 7 h per week). All peer navigators worked according to a manualized approach [adapted from (35), received a standardized 1.5-day in-person training].

A central component of peer support is the disclosure of lived experience with mental health challenges in order to foster mutual understanding, reduce perceived stigma, and build a trusting relationship with participants (34, 36). Peer navigators support participants both emotionally and instrumentally in navigating everyday challenges, particularly within the health care system, social security system, and interactions with official authorities. This may include accompanying participants to appointments (e.g., with health professionals, job centers, or debt counseling services), supporting activation in daily life (e.g., engaging in physical activity or initiating new routines), and facilitating the development of social networks (e.g., through self-help groups).

An important element of the peer-support component was the collaborative definition of individual goals, which could vary depending on participants' needs. These ranged from emotional support and activation of personal resources in daily life to more practical forms of support, such as guidance in dealing with administrative tasks (e.g., completing forms). Such activities were understood as part of supporting participants in navigating perceived everyday challenges and did not replace professional services such as social work or employment assistance.

Peer support follows the principle of working on equal footing, with a focus on empowerment and supporting individuals in regaining control over their lives and recovery processes (37). Within the intervention, peer support was available without predefined limits

throughout the 12-month period and was provided in a flexible, needs-based manner.

4 Utilization of all three interventional components and selection of participants

The selection of the case studies followed several criteria. Participants were recruited toward the end of the intervention period, in line with the overall project and publication timeline. In collaboration with the treating staff, individuals were selected who had engaged with all three intervention components, as not all participants made use of each module. Furthermore, we aimed to include cases from both study sites and to select participants whose trajectories allowed for the illustration of meaningful development, interactional dynamics, and interconnections between the intervention components. Additional practical considerations included participants' availability for follow-up contact and their willingness to provide informed consent for the use of their data in a scientific case study, which further limited the pool of eligible cases. Importantly, prior experience with psychiatric care and the job center system was common within the study population and therefore reflects typical rather than exceptional characteristics of the target group. Accordingly, the selected cases should be understood as illustrative examples of broader patterns observed within the intervention rather than as extreme or atypical cases.

4.1 Participant A

4.1.1 Participant demographics for Participant A

Participant A is a woman in her late 40s who joined the 3for1 intervention program in mid-2023. Born in Eastern Europe, she moved to Germany as a child and holds dual nationality. She has three siblings and is married. They have three children (aged between 16 and 20) who all still live at home. She holds a commercial qualification but has mostly worked in childcare as a part time employee. She was dismissed from her last job as a commercial clerk 4 years ago. No reasons were given for her dismissal. She described her partner as emotionally unsupportive. Though in divorce proceedings, she still lived with him at the start of the intervention and faced financial hardship. She has received treatment at a psychiatric day clinic 6 months before the study.

4.1.2 Diagnostic findings

The initial assessment revealed notable psychopathological symptoms. Concentration and memory were found impaired. She focused on negative experiences with her estranged husband and also voiced concerns about her future and finances. A moderately depressed mood and sleep disturbances were reported. No suicidal tendencies were reported. Prior to joining the 3for1 intervention program, she had been on sick leave for 6 months. She reported headaches and back pain from herniated discs. Health status was assessed via questionnaires during inclusion. Further information can be found in the study protocol (1). Interviews and questionnaires revealed symptoms of anxiety, depression, reduced quality of life, and high stress.

4.1.3 Interventions

Participant A initially chose the component of short-term psychotherapy. Her motivation was to "get her things done" and maintain this ability long term, aiming for a meaningful, self-directed life. In session two, peer support was deemed helpful for managing administrative challenges. Peer support began about 1 month after psychotherapy started. Near the end of psychotherapy, she requested job coaching, which began 4 months after enrollment. Peer support and job coaching were initiated based on challenges discussed in therapy or directly requested. Figure 1 illustrates the interaction of short-term psychotherapy, IPS-based job coaching, and peer support and their contribution to key goals in Participant A.

Psychotherapy included ten sessions over 12 months and one booster session. She attended ten planned sessions and one booster. Peer support included 22 contacts. Job coaching totaled 18 sessions.

All providers met weekly to review progress and address issues. Additional informal meetings were held as needed. One joint meeting with all providers and Participant A reassessed goals and support needs. At the peer navigator's request, a meeting with the psychotherapist and job coach addressed organizational challenges. Due to barriers with the basic income application, the job coach met with local job center staff, who offered targeted support with the application.

The following outlines collaborative efforts to achieve Participant A's goals or those identified during sessions.

4.1.3.1 Financial issues

In the first psychotherapy session, a comprehensive assessment revealed several stressors, with finances being a central concern. Limited financial resources prevented her from attending psychiatric advised cognitive training, and existential fears made it hard to focus on other areas. Peer support further aimed to stabilize her finances and helped manage related life transitions.

Psychotherapy then focused on identifying personal strengths and social resources. To bridge the financial gap before income support began, she borrowed money from family and friends. Her network also helped to furnish and paint her new apartment - support she found encouraging. Financial hardship was expected to be temporary due to the pending home sale. A short-term plan was created to leverage her strengths, social ties, and interim funding options.

Peer sessions prioritized accelerating the income support process. The peer navigator accompanied her to appointments and helped gather job center related documents. Some administrative tasks, such as locating paperwork, remained difficult (see Section 4.1.3.2). The aim was to empower her in areas she valued. She saw the home sale and divorce progress as key to stability. Psychotherapy and peer work supported her in communicating these needs to legal and personal contacts, though progress was partly out of her control.

Job coaching began near the end of psychotherapy to support employment as a path to psychological stability. Her perseverance and parenting experience were seen as assets. The job search focused on roles in childcare and after-school settings. She started with a mini-job that was not subject to social insurance contributions, with potential for increased hours. Though initial issues arose with punctuality and confusion regarding work locations, she later expanded her role. By 18 months after enrollment, and based on self-report during a follow-up interview, she had secured sufficient working hours to qualify for social security benefits.

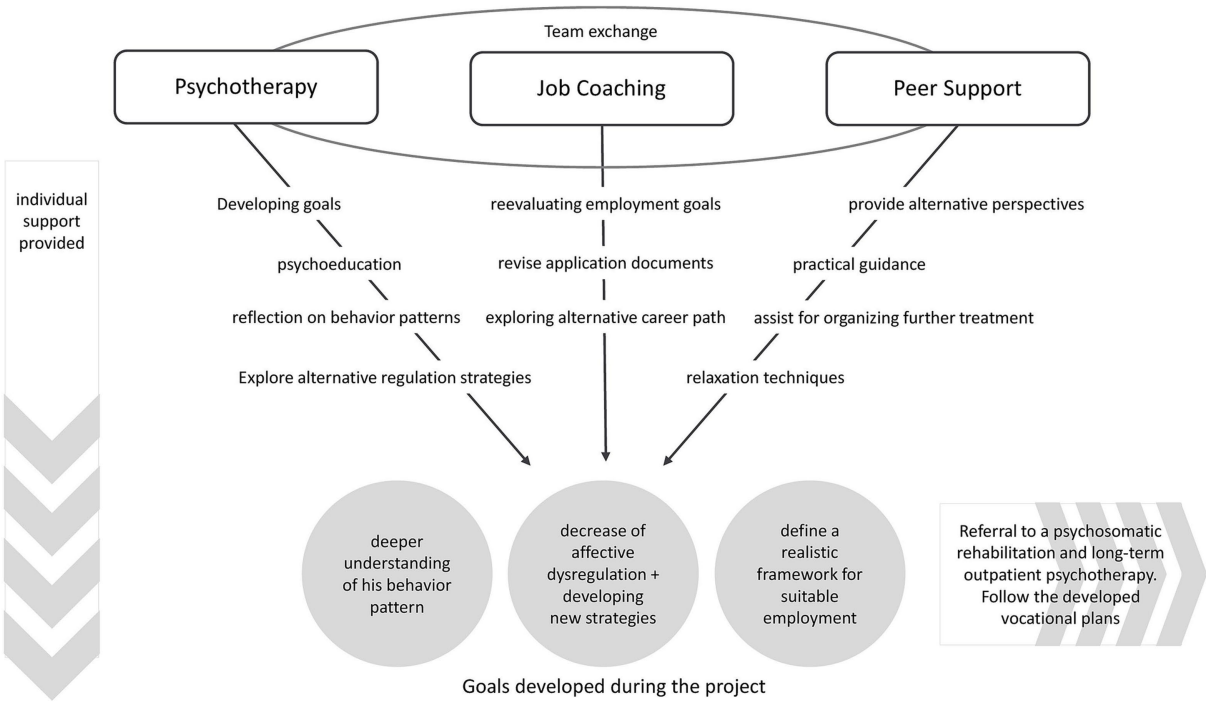


FIGURE 1
Integrated application of short-term psychotherapy, IPS-based job coaching, and peer support in Participant A.

4.1.3.2 Improving organizational skills and decision-making

At the beginning of her psychotherapy sessions, Participant A struggled with decision-making and had difficulty identifying goals or important topics. Her background revealed a strained relationship with her mother and limited emotional expression in the family, likely contributing to a lack of emotional markers that can guide decisions (38).

To address this, a psychoeducational approach was used to emphasize that emotional markers aren't always necessary in decision making. Also, cognitive-behavioral techniques supported structured evaluation of choices, such as weighing pros and cons and using personal values. Mindfulness-based exercises enhanced awareness and tolerance for uncertainty, while scenario-based exercises provided a safe space to practice and build confidence.

Both the peer navigator and the job coach noticed that she often failed to complete tasks like locating documents. These challenges became apparent when Participant A frequently arrived at sessions unprepared, often citing forgetfulness or feeling overwhelmed by the tasks. Recognizing that this behavior was affecting progress across multiple interventions, a joint discussion between providers led to coordinated strategies focused on breaking tasks into clear, manageable steps and fostering accountability.

The peer navigator applied empowerment and scaffolding techniques, helping her create personalized checklists and celebrating small successes to build self-efficacy (39).

The job coach, meanwhile, adopted a pedagogical approach, focusing on teaching practical skills for organization and time management, such as organizing documents with folders and labels, creating a designated space, and using reminders such as texts or calendar alerts tailored to her routine.

In addition to these individual approaches, the peer navigator and job coach worked collaboratively to reinforce skills and strategies. This combination of empowerment, scaffolding, and teaching created a structured support system that improved her ability to manage tasks and supported her broader goals of independence and functioning. Coordination across providers ensured consistent and motivating guidance.

4.1.3.3 Emotional reflection and confrontation

Emotional reflection was addressed across all three intervention components. In psychotherapy, sessions explored the pros and cons of Participant A's emotional detachment. While detachment was seen as protective in reducing stress or promoting objectivity, exceptions showed that unresolved issues and external pressure still caused emotional strain. This exploration helped her differentiate adaptive and maladaptive emotions.

Peer support built on this by addressing her tendency to avoid emotions and ruminate instead. The peer navigator shared his own experiences to model emotional growth and resilience, offering a safe, relatable space for reflection. This encouraged her to view emotional discomfort as a path to self-awareness rather than something to avoid.

The job coach added a practical angle, linking emotional regulation to job retention. Volatility and distractibility were discussed as possible signs of unprocessed emotions. To increase stability at work, the coach helped her recognize stressors, build daily routines, connect with resources in the community, and prepare for emotionally difficult situations, including how to seek support from supervisors.

Together, the interventions created an integrated approach: psychotherapy offered introspective grounding, peer support added lived experience, and job coaching translated emotional regulation into workplace skills.

4.2 Participant B

4.2.1 Participant demographics for Participant B

Participant B is man who in his late 20 s who at the time of enrollment in the 3for1 intervention program lived alone and was in no relationship.

He holds a vocational qualification and has several years of professional experience, along with various additional certifications. In his previous job, he reported experiencing high workloads and a growing sense of overwhelm, which ultimately led to psychological distress and prolonged sick leave, culminating in the termination of his employment. Following this, he was receiving unemployment benefits for a couple of months while being employed in a mini-job arrangement (marginal employment without social security benefits).

Participant B reported having made considerable efforts to secure new employment. However, he expressed concerns about finding a position that would align with both his qualifications and his mental well-being. He was receiving outpatient psychiatric care and was undergoing treatment with antidepressant medication which he perceived as only partially helpful. Despite persistent efforts, he struggled to access appropriate treatment and support prior to entering the 3for1 intervention program.

4.2.2 Diagnostic findings

During the initial assessment, Participant B reported experiencing a persistent sense of inner emptiness and pronounced lack of motivation. Also, he reported intrusive, ruminative thoughts, often accompanied by intense feelings of shame and guilt. He described structuring his daily and nightly routines as cognitively and emotionally demanding, which, among other things, often leads to him missing appointments.

Episodes of binge eating occurred several times per week, followed by self-induced vomiting. These episodes served as a maladaptive strategy for affect regulation, providing temporary relief from emotional emptiness and internal tension. Outside of these episodes, he reported placing a high value on healthy nutrition and frequently engaged in excessive physical exercise. He denied any substance use and reported only occasional alcohol consumption.

4.2.3 Interventions

Participant B's primary motivation for engaging in the 3for1 intervention program was to reduce his depressive symptoms, improve his ability to structure daily routines, and secure sustainable employment that aligned with both his professional qualifications and emotional well-being. Based on his prior work experience and educational background, he was considered a suitable candidate for reintegration into the primary labor market.

The close collaboration between the intervention components, short-term psychotherapy, job coaching, and peer support was considered a key element of the support process.

Participant B decided to start with the short-term psychotherapy. He attended the maximum of 10 sessions, as well as 3 additional booster sessions.

Four weeks after starting psychotherapy, Participant B requested the assistance of a job coach, utilizing the maximum allowance of 25 sessions.

After completing short-term psychotherapy Participant B also decided to take part in peer support. These sessions were held weekly in low-threshold settings, such as outdoor walks or café meetings. He remained actively engaged in peer support until the end of his intervention period, participating in a total of 13 sessions.

Although he faced challenges with punctuality, he demonstrated a strong commitment to the program by consistently adhering to the scheduled sessions across all intervention modalities and early difficulties improved over time. The close collaboration between the intervention components was considered a key element of the support process to identify the following key topics and the specific foci of each specific intervention. Figure 2 illustrates the interaction of short-term psychotherapy, IPS-based job coaching, and peer support and their contribution to key goals in Participant B.

4.2.3.1 Self-representation and the struggle for coherence

In the psychotherapy sessions an incongruence between Participant B's high aspirations for job status and his pronounced anxiety about failing to meet occupational expectations first became apparent. The psychotherapist helped to understand underling patterns as a basis for behavior change. Important biographical factors were his father's strong emphasis on academic success and aggressive reaction to perceived underperformance. Ongoing family conflicts as well as frequent relocations in childhood forced him to continuously adapt to new social environments. Thus, he developed a highly adaptive self-presentation style to facilitate social integration and acceptance. However, Participant B recognized that this adaptation came at the cost of expressing his own needs and boundaries and asserting himself.

Working with the job coach, the described pattern also became evident. Participant B actively sought to present himself as cooperative and highly motivated. However, vocational tasks, such as revising his already decent CV, elicited significant psychological distress. Due to the integrative approach of the intervention, these issues were explored within short-term psychotherapy, where he was encouraged to discuss his anxieties with the job coach. He recognized that openly addressing his fears and emotions significantly alleviated his distress. Positive feedback from his mini-job employer and initial success in job applications further boosted self-esteem and self-efficacy.

Later in the process the peer support sessions provided a valuable opportunity for him to engage in open dialogue on equal footing. The exchange allowed him to critically examine his core values, explore alternative perspectives, and to cultivate cognitive and emotional flexibility.

In sessions of all three components, Participant B reflected on the significance of social status, contemporary gender norms, and the intricacies of work-life balance. Step by step his rigid perfectionism became less dominant. Over the course of time, his self-concept became more coherent and allowed realistic ideas about future vocational options.

4.2.3.2 Affective regulation and compensatory behaviors

An important factor of Participant B's psychological distress was his persistent ruminative thinking, which he experienced as highly burdensome. A central focus of the psychotherapy sessions was the collaborative exploration of this vicious cycle. Negative emotions

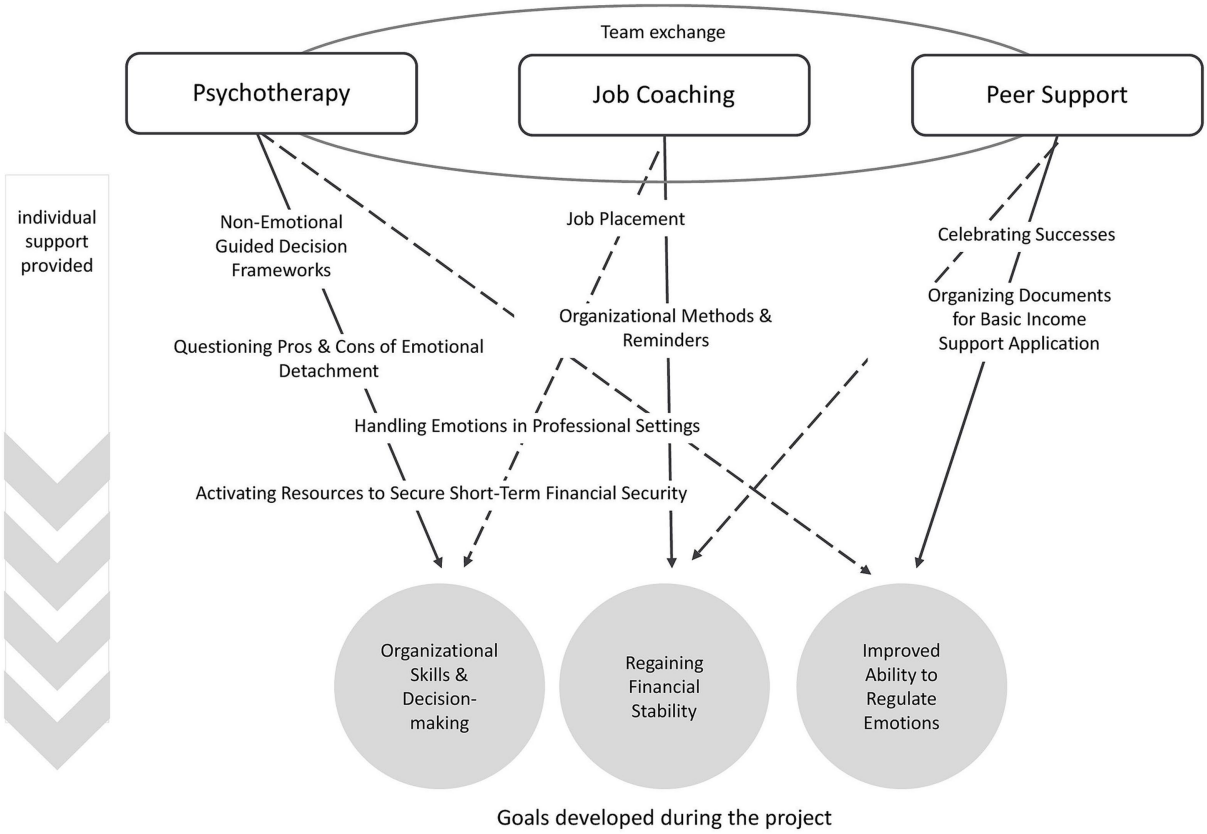


FIGURE 2
Integrated application of short-term psychotherapy, IPS-based job coaching, and peer support in Participant B.

associated with demanding tasks led to procrastination, which in turn triggered feelings of shame and frustration. To alleviate these feelings, Participant B resorted in binge eating, followed by purging or excessive exercise. A key aspect of the therapeutic approach included psychoeducation on the functional role of emotions and the development of alternative emotion regulation strategies. Relaxation techniques and attention focusing techniques were introduced to help him manage physiological arousal and cognitive distress.

The peer support provided both validation and practical guidance concerning the topic. The peer navigator, drawing from her own experience with burnout and sleep disturbances, shared adaptive coping strategies, such as evening walks and structured bedtime rituals. Furthermore, peer support facilitated a shift from avoidance to behavioral activation and therefore self-efficacy, i.e., by helping to organize a move.

4.2.3.3 Reevaluating employment goals in the context of mental health

With the job coach, Participant B was able to establish more realistic expectations for suitable employment. This was facilitated by understanding cognitive-emotional patterns with the help of the psychologist and reflection on his values and expectations with the peer navigator. In the past, he had set high standards regarding job status and salary, frequently terminating positions within a few months when these expectations were unmet or when job demands exceeded his perceived coping capacity. Exploring alternative career paths with the job coach led him recognize that, he still felt fundamentally aligned with his trained profession. He could envision re-entering this field, given that adequate conditions were met, such as part-time employment, limited travel requirements, and a well-structured onboarding process.

However, despite significant progress throughout the 3for1 intervention program and partly remission of the symptoms, the persisting eating disorder symptoms remained a major barrier to transition directly into sustained employment. Through the interventions, a readiness for treatment was established. A referral to an inpatient treatment was recommended, followed by long-term outpatient psychotherapy. Close collaboration with the peer navigator proved invaluable in this phase, as she assisted with the application process for inpatient treatment and the search for a suitable psychotherapist. The subsequent steps were coordinated with the job center and his treating psychiatrist.

After the intervention phase, Participant B reported that he perceived the inpatient treatment as very beneficial and was able to apply for various positions considering the prerequisites, which he had formulated during the project.

5 Discussion section that shares practical implications, lessons learned for future applications

The aim of this community case study was to illustrate the implementation and cooperation of the intervention components

using the example of two participants and to describe their progress throughout the intervention. The two presented case studies offer an extract of the stressors and strains experienced by individuals who are dependent on financial support from the state. Throughout the intervention period, the complexity and multifaceted nature of the burdens and challenges faced by participants were evident. However, the range of daily hassles often made it difficult to define clear goals together with participants. In some cases, developing a personal goal took up a large part of the project time. The programs multi-level approach was therefore a crucial prerequisite for providing support tailored to these individual needs. The examples illustrate how essential the close cooperation within the program was to develop and maintain a shared focus across all components.

Both participants entered the 3for1 intervention program with different capabilities and difficulties, but in both cases, establishing a trusting working alliance was essential across all interventional components. Only after some times were the participants able to open up and become ready for joint exploration with each intervention provider.

In addition, each intervention component revealed individual challenges that did not necessarily overlap across all areas. The following key lessons emerged, listed separately for each component.

5.1 Lessons learned from short-term psychotherapy

During short-term psychotherapy, both participants presented distinct yet overlapping challenges that impacted the therapeutic process.

In the case of Participant A, biographical factors were linked to difficulties in decision-making, emotional awareness and interaction patterns. These factors hindered progress and complicated a focused therapeutic approach. A resource-oriented strategy was used to build self-efficacy by activating social support and strengthening emotional and decision-making capacities. This aligns with findings that focusing too strongly on deficits can feel threatening and disempowering for clients with chronic relational issues (40). Research (41) highlights that such clients' strengths are often overlooked within therapy and counselling, thereby reinforcing experiences of helplessness.

Participant B attended regular psychological sessions, allowing for an early completion of the short-term therapy. However, emerging topics could no longer be addressed within the initial timeframe. A key issue was his ambivalence towards his binge-eating behavior. Therefore, elements of the Transtheoretical Model of Change were applied. It sees ambivalence as a normal part of change (42), and emphasizes therapeutic dialogue as a means to enhance motivation and resolve ambivalence (43).

The presented cases highlight the importance of flexibility in the structure and duration of short-term psychological support within this setting. In both cases, the standard format of 10 to 13 sessions was not always sufficient to fully address entrenched patterns or ambivalent motivation. Rather than extending psychotherapy per se, the intervention often functioned as an initial step to foster problem awareness, stabilize participants, and enhance motivation for change in order to facilitate engagement with appropriate follow-up treatment or support. This is consistent with a stepped-care perspective, in which short-term interventions serve as a bridge to more intensive or specialized services where needed.

Research suggests those with mild to severe mental health issues often benefit from such tailored and staged approaches (44).

5.2 Lessons learned from peer support

Peer support proved especially valuable to help Participant A managing complex stressors, most notably financial insecurity and organizational daily challenges. Through the supportive relationship with a peer navigator, Participant A was able to reflect on her situation, access concrete guidance, and receive low-threshold assistance rooted in shared lived experience. The peer support relationship offered not only practical help but also emotional validation, which appeared to increase her sense of agency in navigating difficult everyday situations.

These findings align with the previous mentioned research (9, 12), which suggests that individuals experiencing unemployment facing mental health challenges benefit most from interdisciplinary care. In Participant A's case, it was also clear that the in- and outpatient treatment she had received before entering the 3for1 intervention program was unable to meet all of her problem areas. At the same time, these prior treatment experiences may have contributed to the development of problem awareness, readiness for change, and the ability to engage with and benefit from the support offered within the 3for1 intervention program.

In the case of Participant B, it became apparent that emotionally engaging in peer support required a stable, trusting relationship, and above all, time. The more personal nature of peer exchange compared to official support providers like job center staff often means that participants began to open up within the 3for1 intervention program. As a result, time constraints at the end of the program sometimes limited the full potential of the intervention. This insight highlights the importance of early exposure to peer support within such programs, allowing participants to make informed decisions about if and when to engage with this component. Both peer navigators as well as participants benefit from clarity in peer support roles (45) as well as adequate time to build trust (46). This is in line with findings from recent systematic reviews and meta-analyses on peer support interventions which consistently highlight relational processes, as well as mechanisms such as hope and empowerment, as central to the effectiveness of peer support (37, 47). Therefore, an early introduction to peer support can be vital to initiate a process of change.

5.3 Lessons learned from IPS-based job coaching

The job coaching approach emphasized the strengths and aspirations of the participants, following the principles of the Individual Placement and Support (IPS) model.

For Participant A, this meant securing a mini-job in the childcare sector. Although the position was not subject to social security contributions, the arrangement was appropriate given her personal circumstances and the program's structural limitations. This case supports the findings that flexible employment models are effective for individuals experiencing psychological distress (48). In line with the IPS principle of "first place, then train" (4), the needs and goals analysis revealed that further training was unnecessary. Participant A already possessed the skills required for the role. This underscores the efficacy of a resource-oriented coaching approach that leverages existing competencies rather than focusing on deficits.

Participant B entered the program with strong qualifications and initially demonstrated high levels of engagement. However, over time it became clear that there were psychological and emotional barriers impeding rapid job placement. Through a trusting coaching relationship, he was gradually able to reflect more realistically on the type of job that would suit his needs and capabilities. This self-reflection led to the acknowledgment that a temporary withdrawal from the job market, via inpatient treatment, was a necessary step before re-entering the first labor market. Participant B's trajectory highlights the importance of respecting this readiness and of adjusting the job search so that a stable long-term employment becomes more likely.

6 Strengths, limitations, and conclusion

The presented community case study illustrates the impact of support structures for individuals experiencing unemployment and psychological distress by helping them navigate challenges and reenter the labor market. Collaborative discussions among providers proved particularly beneficial. More specifically, regular interdisciplinary meetings and structured team exchange, as well as case-specific exchanges, were used to coordinate the different intervention components, identify emerging challenges, and adjust support strategies accordingly. For example, difficulties in emotional regulation, which became apparent in one component, could be addressed jointly and translated into concrete strategies across psychotherapy, job coaching, and peer support.

These discussions and team exchanges facilitated shared goal-setting, ensured consistency in the guidance provided to participants, and allowed for timely and coordinated responses to individual barriers. The interaction between components, as illustrated in Figures 1, 2, reflects how these collaborative processes contributed to individualized and adaptive support.

However, limitations remain. The upper limit of 10 + 3 psychotherapy session was often found insufficient for participants with complex health issues or persistent interpersonal patterns. Joint meetings among psychologists, job coaches, and peer navigators revealed that some difficulties, such as those seen in Participant A's case, surfaced more clearly in specific components like peer support or job coaching. Close interdisciplinary communication remains essential for identifying and addressing such barriers collaboratively. Although regular meetings were built into the program, coordination could have been improved through more intensive shared goal-setting and stronger collaboration. In addition, collaboration with the broader support system was at times challenging and revealed room for improvement, particularly regarding responsibilities and coordination across institutions. This was especially evident for unemployed individuals with mental health conditions, whose needs often span multiple systems, including employment services, health care, and social welfare. While the 3for1 intervention program aimed to provide low-threshold and coordinated support, challenges became especially apparent when participants required services beyond the project. In particular, navigating the interfaces between job centers, health insurance providers, pension insurance, and mental health services proved difficult. Responsibilities were often unclear, services were not easily accessible, and bureaucratic procedures posed substantial barriers, for example in accessing outpatient psychotherapy. As a result, both participants and intervention providers frequently required active effort to navigate the system, including attempts to contact services despite the absence of clearly defined contact persons or responsibilities. These challenges highlight structural gaps in the support system, where individuals with complex needs, as well as the professionals supporting them, may struggle to coordinate care across institutions with differing mandates.

While no *one size-fits all solution* should be derived from the present study, the findings underline the need for more integrated care pathways, clearer allocation of responsibilities, and more accessible, low-threshold points of contact tailored to the needs of unemployed individuals with mental health conditions and the professionals involved in their care.

At the same time, the strengths of the 3for1 intervention program lie in its provision of low-threshold, needs-based support without waiting times. As outlined by the two case studies, this intervention program may help across various problem areas, including accompanying individuals to appointments, particularly for those encountering challenges related to paperwork or language barriers.

However, the intervention program also encountered structural limitations which could not be circumvented within the scope of the project-inherent implementation. It lacked the capacity to provide high-frequency, intensive, or pharmacologically supported interventions for individuals with severe and chronic mental health conditions - needs that are common in this target population. Broader system gaps, like long waiting times for inpatient care or limited outpatient access, constrained its overall effect. The 3for1 intervention program was originally planned as a means of prevention, as outlined in the study protocol (1). Some participants were already too unwell for preventive measures to be effective. Reentry into the primary labor market, as in the case of Participant B, first required more intensive curative treatment.

Data availability statement

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author.

Ethics statement

Written informed consent was obtained from all participants prior to study participation.

Author contributions

SA: Writing – original draft, Writing – review & editing, Visualization. ST: Visualization, Writing – original draft, Writing – review & editing. J-MK: Visualization, Writing – original draft, Writing – review & editing. HW: Visualization, Writing – original draft, Writing – review & editing. NW: Methodology, Writing – review & editing. MG: Visualization, Writing – original draft, Writing – review & editing. OS: Methodology,

Writing – review & editing. MC: Visualization, Writing – original draft, Writing – review & editing. DS: Writing – review & editing, Methodology. JW: Writing – review & editing, Funding acquisition, Project administration, Supervision. MM: Writing – review & editing, Methodology. RE: Conceptualization, Funding acquisition, Project administration, Supervision, Writing – original draft, Writing – review & editing.

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Conflict of interest

The author(s) declared that this work was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Experiences and wellbeing of family members and carers, regarding PARCS across Victoria

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Introduction: When consumers experience mental health crises, carers are often key supporters and are also impacted significantly themselves. The Prevention and Recovery Care (PARC) model offers a community-based residential program for consumers, in times of mental health crisis. The potential of PARC services to engage carers is under-examined. This study addresses two questions: How do carers experience the PARC service; and what are carers' experiences of their own wellbeing, during and after engagement with PARC?

Methods: This is a mixed-methods convergent study of carer experience, whereby quantitative survey data and qualitative survey and interview data were gathered, analysed concurrently, and integrated to report carers perspectives of PARC services. Carers reported their wellbeing across 4 timepoints (n = 71) and also their experience of PARC services in a Carer Exit Survey (n = 50). An independent sample of six family members, each from a different PARC service, engaged in semi-structured telephone interviews.

Results: For service experience, carers rated the PARC service as highly satisfactory. Interviewees reported a sense of relief, gratitude, and period of regrouping, while valuing the PARC service and feeling positive about accessing PARC services in the future. Positive experience was defined in contrast with distressing experiences of acute wards; concerns were expressed about limits to timely access of PARC services in future if needed. Regarding carer wellbeing, time 1 levels varied across participants, and all measures showed improvement for carers over time. They reported experience of respite, with confidence to entrust their family member to the team, and learning from PARC service staff ways to cope and interact with their family member.

Discussion: Carers considered the PARC service a positive environment for the person to receive treatment and support and also experienced PARC services as supporting their own quality of life and wellbeing. This study contributes evidence

about how highly valued these recovery oriented sub acute residential services are for carer service users; however, there is potential to further enhance the engagement of carers in PARC service delivery, including through inclusion of carers in co-design.

KEYWORDS

carers, experience, family, recovery, sub-acute care, wellbeing

Background

Most people with direct experience of mental health challenges and service use (referred to here as consumers) have ongoing and mutually supportive relationships with family members (1). Support provided by families to consumers may include: emotional support, practical assistance, financial support and advocacy and assistance to access healthcare services (2, 3). Families also provide relational support and facilitate connections for loved ones within communities. Depending on age and stage, and life circumstances, families may engage more in times of crisis or when a consumer is experiencing poorer health (4), or they may be the mainstay of continuous support for people.

The impacts of mental health issues are experienced by families (the term here may refer to partners of people, children and siblings, wider extended family members and kin) and significant others as well as consumers. Positive impacts experienced by families include enjoying satisfying relationships with the consumer and personal skill development (2). Negative impacts include: distressing emotional responses, ranging from grief and loss to guilt and self-blame; disrupted family relationships; and reduced employment and financial hardship (3, 5–7). Family members also experience depression and anxiety, social isolation, physical health impacts and decreased quality of life (2, 8–10).

Many family members want to be involved in finding the right assistance and in supporting recovery of their relative living with mental ill-health, and this is also desired by most consumers (5, 11, 12). Family members and carers often seek information about the diagnosis of the person they care about and the impact of illness, as well as how to navigate services and become involved in care planning (1, 13, 14). Families also need their own support, including: to discuss their experiences; improve family relationships; access financial assistance; and to consider alternate caring arrangements (1, 13, 14). This includes that children within families in particular may need greater attention in care models and support provision.

The focus of this paper is the experience and needs of family members, supporters and kin who are engaged with a consumer during a period of crisis occasioning a PARC service admission. While acknowledging the diversity of roles and preferred descriptors also evident across literature, here we mainly use the term 'carer'. New models of care often express intention to improve both consumer and carer engagement and experience, including maximising choice and consent. Internationally, residential alternatives to hospitalization in psychiatric inpatient units, such as the Australian Prevention and Recovery Care (PARC) services based in Victoria (15, 16), are increasingly available across Australia and may be preferred by both consumers and carers, as they aspire to provide a less restrictive and more home-like alternative (17–19). They may also enable opportunities for more recovery-oriented service delivery (20) and residential rehabilitation (12).

PARC services are operated as a partnership between nongovernment agencies (known as Mental Health Community Support Services (MHCSS) in Victoria working across States and Territories) and local clinical mental health services. Short-term treatment and care are offered for up to 28 days, to support people with severe mental ill-health to either avoid a psychiatric hospital admission (step-up care) or transition from hospital back into the community (step-down care). These services have potential to provide needed support to families as well as consumers (15). According to the Victorian government's PARC services framework and operational guidelines (21), potential benefits to families of the service model include decreasing "the possible difficulties and stresses experienced by carers, in supporting people who are acutely unwell and are receiving community treatment." (Department of Health, page 10). Possibilities for early intervention in crises are particularly emphasised. PARC services could be useful for encouraging links to consumers' natural supports, including family and friends. The guidelines encourage collaborative therapeutic relationships with families and carers, carer participation in planning, delivery and evaluation of adult PARC services, and a facility which is welcoming of families and responsive to consumers' diverse family circumstances (21).

Existing knowledge is limited about the appropriateness and effectiveness of PARC services and their place within the wider mental health system, especially in relation to families (22, 23). However, a mixed-methods evaluation of a Victorian PARC service for young people indicated that families viewed the service as filling a gap on the continuum between community services and acute inpatient wards, consistent with their intended purpose (24). Findings also suggested that families felt included in service delivery, valued the service's recovery-oriented practice (such as promotion of their relative's autonomy and self-help), and found the youth PARC service environment safe and welcoming (24). However, negotiating the appropriate level of involvement of family in care (e.g., in decision making) can be challenging (25), as also reported in an evaluation of an adult PARC service in Queensland (22). It has been found in previous work by this team that engagement with families varies across PARC services in Victoria (15), specifically in regard to how they were included in care meetings. This study explored the experiences of family members and carers of consumers who have used PARC services across Victoria. The research questions addressed were:

- How did family members, carers and supporters experience the PARC service?
- What are carers' experiences of their own wellbeing, during and after engagement with PARC?

Methods

Study design

This was a mixed-methods longitudinal convergent triangulation study of carer experience, nested within a longitudinal cohort study of Victorian PARC services (26). A detailed description of the overarching study design, recruitment and data collection can be found in Brophy et al. (26) but in brief this was an analysis of the experience and trajectory of self-reported personal recovery and other outcomes, for consumers from Victorian PARC services, using data collected over 4 time points from admission to 12 months post discharge. This carer sub-study employs a convergent triangulation design (27) whereby quantitative and qualitative data were gathered and analysed separately and then integrated, to strengthen findings regarding carers' perspectives of PARC services. The impact on carers' quality of life and wellbeing were explored via a longitudinal survey (see Table one) and that approach was complemented by a satisfaction survey and qualitative interviews conducted soon after an episode of PARC service for a consumer. Interviews were included to elicit rich accounts of carer experiences, beyond what is commonly gathered through collection of carer satisfaction data. Both survey and interview samples were stratified, to include perspectives from carers across as many Victorian PARC services as possible.

Setting

In the research period, 20 adult PARC services were offering 194 beds and some day-visit only places in Victoria, Australia. Nineteen of the 20 PARC services were sub-acute, offering a 28-day maximum stay, while the remaining service offered an extended stay of 6 months (26). One of the 19 sub-acute PARC services was a woman-only service and the others were mixed gender environments. All 19 adult sub-acute PARC services were included in this study, but the extended-stay PARC service was excluded. Of these PARC services, three were located in inner-city (metropolitan) areas, 12 in suburban areas, and the remaining four in regional areas. At the time of writing, 19 adult PARC services were in operation in Victoria.

The staffing profiles of PARC services varied, but may have included Occupational Therapists, Social Workers, Psychologists, Peer workers, Art Therapists and Mental Health Support workers. PARC consumers movements in and out of the PARC were not restricted. Whilst staying in a PARC services consumers had access to a range of group programs focused on some of the following areas, recovery and wellness, psychotherapeutic interventions, physical health and activities of daily living.

Recruitment and data collection

Recruitment of consumer participants was conducted by a team of consumer and non-consumer researchers who visited PARC services and invited eligible residents to participate. Consumers were also informed about the carer arm of the study and were invited to nominate a carer contact who may want to be involved. A carer researcher contacted each nominated carer by phone, email or post and invited them to participate in the study. If the carer agreed to participate, they were offered options of a survey online or over the phone, or via post and were provided with a $25 supermarket gift voucher for their time. Two weeks following the consumer participant's exit from the PARC service, carer participants were contacted again to complete a second set of questionnaires and received a $10 supermarket gift voucher. This process was repeated at 6 and 12 months following the consumer participants PARC service exit date; see Table 1 for timing of measure completion.

Recruitment for the semi-structured interviews occurred via flyers posted at each PARC service and by contacting individuals who expressed interest in participating in the longitudinal study who were ineligible, as quotas were filled. Only one interview participant from each PARC service was sought, and all family members and carers were recruited with the knowledge and permission of the consumer. Interested parties contacted the research team and interviews were conducted via phone. All Interviews were conducted by a carer researcher and lasted for between 15 and 35 minutes. These were audio-recorded, transcribed and deidentified; all data were stored securely.

Measures

Quality of life was chosen as an important outcome measure to determine the impact of a PARC service stay on carers, and whether any benefit from a PARC service stay for the consumer translated to improved carer quality of life. The quantitative wellbeing outcome measure used in this study was the Assessment of Quality of Life (AQoL)-8D (28). Other quantitative outcome measures were the Kessler Psychological Distress Scale (K10) (29), Warwick Edinburgh Mental Well-Being Scale (WEMWBS (30) and the Carer Exit Survey, a bespoke instrument previously developed by Mind Australia to gauge carer satisfaction with the service (31). Table 1 summarises all measures.

Data analysis

Quantitative data were analysed using SPSS 26. Following data cleaning and assumption testing, data across the four time periods were analysed using longitudinal growth curve analysis via the SPSS linear mixed model procedure. Change trajectories were analysed for linear, quadratic, and cubic trends. Effect sizes measures with associated 95% confidence intervals are provided for all inferential outcomes.

Growth curve analysis

The growth curves for the five measures recorded at four time periods were analysed using linear mixed modelling. All models

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TABLE 1 Description of measures and timing.

Measure	Reference	Domain	Description	T1 one-week after entry	T2 within one-week of exit	T3 six-months after exit	T4 12-months after exit
Assessment of Quality of Life – 8D (AQoL8D)	(28)	Quality of Life	The AQoL8D is a 35-item quality of life measure with eight dimensions: independent living, relationships, mental health, coping, pain, senses, self-worth, and happiness. Utility scores derived from the AQoL8D algorithm range from 1.00 (representing perfect health or best possible health on that questionnaire), to a negative score of – 0.04 (representing the worst possible health state that has been valued as worse than death). The Australian utility scoring algorithm was used.	X	X	X	X
Kessler 10 (K10)	(29)	Psychological distress	The K10 consists of 10 items measured on a five-point Likert scale and is scored by adding all responses. Possible scores are between 10-50, with higher scores indicating greater distress	X	X	X	X
Warwick Edinburgh Mental Wellbeing Scale (WEMWBS)	(30)	Wellbeing	The WEMWBS consists of 14 items measured on a five-point Likert scale with a total score calculated by adding all responses. Possible scores are between 14-70, with a higher score indicating greater wellbeing.	X	X	X	X
Carer Exit or Satisfaction Survey	(31)	Satisfaction	The Carer Exit or Satisfaction Survey is a 13-item self-report questionnaire developed by Mind Australia to assess consumer satisfaction of mental health services. It is a bespoke instrument based on the Mind Australia Satisfaction Survey that was initially based on a similar survey developed by Rethink in the UK. It includes 10 quantitative questions with responses on a four-point Likert scale with a fifth option to decline to respond. The possible score ranges from 0-40, with a higher score indicating greater satisfaction. The remaining three items are open-ended questions asking "What has been the most helpful thing about the PARC service for your family?"; "If you could change anything about the service what would it be?"; and "Any other comments and feedback?".				X

were fitted with random slopes and intercepts. A range of covariance structures were evaluated for both the random effects and the repeated measures. A diagonal covariance matrix for the random effects combined with a scaled identity matrix for the repeated effects resulted in all models converging satisfactorily along with adequate model fit according to the AIC criterion. Full information maximum likelihood estimation was used for all models, and assumption testing found that data were missing at random (MAR). Linear, quadratic, and cubic growth trajectories were evaluated.

Carer exit survey

The Likert scale responses in the carer exit survey were analysed descriptively (frequencies and percentages).

Quantitative data preparation and assumption testing

Data for quantitative outcomes were entered into a single SPSS 26 data file for analysis.

Although data were available from a potential pool of 71 participants, missing data levels were high, ranging from 1.4% (WEMWBS at time 1) to 49.3% (K10 at two weeks). As might be expected, missing data levels increased across the duration of the study with a mean of 43.7% missing data across the five outcome measures at 12 months (time 4) versus 17.4% at time 1. Generally, missing values were highest for the K10 (M = 40.9% across the four time periods) and lowest for the WEMWBS (M = 25.1% across the four time periods). Despite assumption testing showing that data were missing at random, the level of missing data precluded any

form of data imputation, so data were analysed as available, which should be considered when evaluating the findings. In support of this decision, simulation testing using a hypothetical imputed data set revealed no notable difference in the pattern of outcomes.

Power considerations were based on a single-group within-subjects design measured over four periods. The lowest sample size (n = 36) had adequate power (.8) to detect at least medium effects (f = 0.25), with the average sample size across the four time periods (n = 55) having adequate power to detect small effects (f = 0.1). Large effects had very high power for being reliably identified (>.95). Hence, the study was seen to be adequately powered.

Some level of skew was evident for all outcomes, but not to the extent of compromising the outcomes of the desired analyses. Further, a range of transformations failed to notably improve the distribution of scores, so the data were analysed in their original form. All other assumptions for the reported analyses were adequately met.

Qualitative data analysis

The semi-structured interview transcripts (n = 6) and the qualitative responses from the Carer Exit Survey (n=50), consisting of 230 individual free text responses ranging from single word to 100 word responses, were analysed thematically by two researchers (BH and JF). Sub-themes and themes were developed inductively during data analysis (32). As the analysis team did not conduct the interviews, the audio files of the interviews were listened to several times while reading transcripts. Likewise, the collated free text responses were read and re-read by both analysts for data immersion in preparation for coding. Coding was undertaken by the primary qualitative researcher BH; a subset of data was coded independently by CH and only minor differences of emphasis were found. The matrix of data, coding and thematic structure was discussed in detail until agreement was reached across 4 authors: BG CH JF and LB. As qualitative data was generated from both the survey and the semi-structured interviews and analysed together, the quotations reported here are identified as arising from an interview or a survey. Quantitative and qualitative findings were integrated for explanatory value in the process of reporting (27).

Mixed methods integration

Qualitative answers from survey participant were combined with interview transcript data, for qualitative coding and thematic analysis. Then all authors met and compared in detail the quantitative and qualitative data analyses, observing contrasting and confirming intersections and then developing cross cutting points for discussion. For triangulation we considered: How do qualitative themes and subthemes relate to quantitative findings? How do they provide explanatory detail for the quantitative findings?

Results

Carers rated their PARC service experience and qualitatively described their encounters with PARC services and staff, including the environments, programs, personal impact, and their contact with consumers. Carers also rated their own quality of life, wellbeing, and distress through the time of the PARC service stay. After reporting the study samples for surveys and interviews and descriptive statistics for the survey data, the qualitative and quantitative findings are presented in two integrated findings sections; Part 1: Carer experiences with PARC services and Part 2: wellbeing of carers.

Sample

Via surveys, carers (n = 71) reported details relevant to their wellbeing in the K10, WEMWBS and AQOL (at two-4 timepoints). From that sample 53/71 carers completed the Carer Exit Survey (T2). Only 35 respondents provided data for all four time points, and 47 respondents provided data for at least three time points. These calculations account for non-consecutive time points: for example, an individual with data at two time points may have contributed responses for time 1 and time 3, but not time 2. An independent sample of carers, each from a different PARC service (n=6 in total) engaged in the semi-structured telephone interviews. The aim was for a larger sample of upto 22 carers, being one from each PARC. However, recruitment relied on two steps of carers opting in after gaining consumer consent and this proved to be challenging, while people were navigating family crisis. Table 2 presents the sociodemographic data for all survey participants at time 1 and then for the interview participants (Note that not all demographic questions were asked of interviewees).

Findings are presented in two sections, bringing together qualitative and quantitative data to address each research question in turn.

Part 1: family carer experiences with PARC services

This section of analysis answers the question: How did family members experience the PARC services? The context for qualitative themes from interviews and surveys is set by first presenting results from the Exit survey, reporting carers' overall satisfaction with PARC services.

Exit survey

Fifty-three participants completed the satisfaction (exit) survey, representing all 19 PARC services involved in the evaluation. Each service was represented by between one and five carers. Carer participants supported people with various relationships to themselves; most were reporting about parents or partners (see Table 2.). Three respondents were carers with granddaughters and an ex-partner.

The Likert scale response percentages are displayed in Figure 1 below. The majority (92%) of participants agreed or strongly agreed that the service respected their family, that relevant and sufficient information was provided, and that they were listened to by staff. Participants agreed that the PARC service had supported their loved one towards achieving their own goals, that they felt safe and comfortable at the PARC service, and would use the PARC service

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TABLE 2 Socio demographics of participants.

Demographics	Carer survey participants (*n* = 71)		Carer interview participants (*n* = 6)
	n	%	
Gender			
Male	18	25.4	1
Female	52	73.2	5
Missing	1	1.4	
Country of Birth			
Not Australia	11	15.5	
Australia	60	84.5	
Missing	0	0	6
Children			
Yes	55	77.5	3
No	15	21.1	1
Missing	1	1.4	2
Highest Level of Education			
High school or less	37	52.1	
Diploma, certificate, or university	33	46.5	
Missing	1	1.4	6
Marital Status			
Single	14	19.7	
Married or de facto	40	56.3	4
Separated, divorced, or widowed	16	22.5	
Missing	1	1.4	2
Age			
<20 years	3	4.2	
20–31 years	4	5.6	
32–41 years	6	8.5	
42–50 years	8	11.3	
51–65 years	33	46.5	
66+ years	16	22.5	
Missing	1	1.4	6
Relationship to Consumer Participant			
Partner or spouse	15	21.1	0
Daughter or son	20	28.2	0
Father or mother	17	23.9	3
Brother or sister	10	14.1	3
Friend or room/housemate	4	5.6	0
Other	4	5.6	0
Missing	1	1.4	

again if they had a similar need for support in the future. The majority of participants reported they received the right kind of support from the PARC service.

Participants were generally positive about their involvement in deciding on the support they were given. In terms of the families' cultural and spiritual needs being met, participants responses were equally divided between no comment (34%), agree (30%) and strongly agree (34%). There was greatest variation in participants' views about their influence over how the PARC service was run, with 34% with no comment, 32% agreed and 24% disagreed.

Overall, family members rated the PARC service as highly satisfactory. In addition to the quantitative responses, 53 family members provided qualitative comments across three questions in their surveys, related to every one of the Victorian PARC services. In response to the question What has been the most helpful thing about the PARC service for your family?, 50 participants commented. Likewise in response to the question If you could change one thing about the PARC what would it be? 17 out of 53 participants said they would not change anything, four did not comment, and 34 participants commented. When given the opportunity to provide any other feedback, 27 participants made comments, 26 did not.

Thematic analysis of interviews and qualitative survey responses generated two overarching themes, PARC services work for families and PARC service limitations, and within these were six sub-themes. These were: Relief from crisis; Supportive and safe; PARC service is better than hospital; Recovery through learning & relationships, Limited access to PARC services; Limited family involvement. Supporting quotations from both interviews and surveys are provided in Table 3.

Relief for all from crisis

Carers placed their recent PARC service experiences in the context of an intense crisis being experienced by the family, with a lead up of many months. They reported heightened stress and distress between family members, in the time leading up to a PARC service stay and then a very significant sense of relief for all family members when the family member entered the PARC service. After the point of PARC service exit, when engaged in surveys and interviews, carers were processing their experiences and regrouping, with heightened emotions.

Supportive and safe

Many carers were effusive in praising the staff and the care provided at PARC services. The sense of safety and confidence in PARC services was expressed by a diverse range of carers and in relation to a wide range of consumers, young and older, men and women, with such comments as: The security it has given our son, in a caring environment; I felt the staff were tremendous and supportive to my daughter and myself; and That my wife was in a safe and helpful environment (Surveys). Many carers also appreciated the

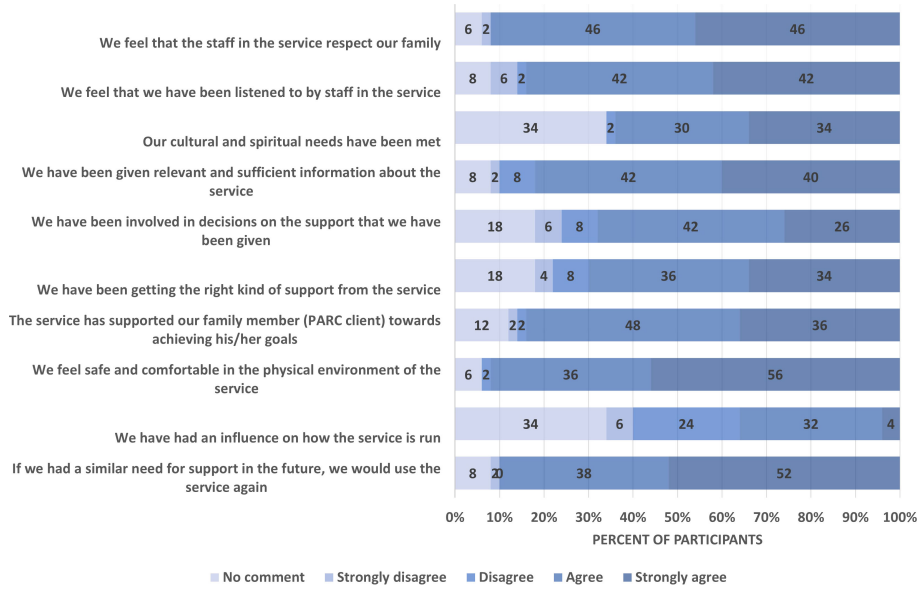


FIGURE 1
Exit survey (n=53).

physical environment of PARC services, for being homelike, well cared for and welcoming: The units were very nice - I could live in one of them! (Survey). Not every participant experienced their PARC service setting so positively: Perhaps [PARC needs] a facelift to building (Survey). Except for three less satisfied comments, carers were overwhelmingly positive about trusting PARC service if needed in the future.

PARC service is "better than hospital"

For most carers, the experience of PARC services commonly occurred in the context considerable experience with a full range of mental health services. This was apparent in the qualitative survey comments, when participants placed their recent experience of a PARC service in comparison with other experiences of service use. For example: [PARC is] The sole thing that has helped my son the most, of every other type of assistance (Survey).

Most carers emphasised the value of PARC services to their family, in contrast with challenging experiences of acute inpatient wards, details of which they also recounted. Hospital admissions were spoken of as highly problematic for the family member, stigmatised, frightening, unsafe and a situation to be avoided. Acute admission was considered regrettable, even if necessary or the only option at crisis points. In contrast, an episode of care at PARC services if a crisis arose was highly acceptable to carers, and consumers, safe and constructive. Carers recognised the place of PARC services in enabling transitions, especially as a step-down from hospital. They contrasted perceptions of the physical spaces of hospital wards with the quiet and homelike PARC services. The warmth and gratitude carers expressed regarding PARC services contrasted with the mixed emotions they experienced when reflecting on admissions to hospital. We underscore that comparison between service types was not a primary question of the study but was notable in the qualitative data.

Recovery through relationships

The topic of how PARC services might enable personal recovery was probed in interviews. Carers responded that they were uncertain in their observation that PARC services enabled recovery. Only three qualitative survey comments specifically addressed the topic of recovery, perhaps unsurprising in regard to the inner experience of recovery for the person. However, some participants saw the importance of pursuing goals and identified that PARC services did support learning and recovery, including through the peer relationships. One carer thought more allied health staff could increase structured group activities to the group and individual support, to help residents with their individual goals/issues. Mainly, carers were focussed on the goal of overcoming a crisis, more than on the broader goal of recovery.

Limited access to PARC services

Though carers were overwhelmingly positive in describing PARC services, one consistent critical theme related to problematic experiences of accessing PARC services when needed. Because they valued PARC services, carers were frustrated and dismayed if they could not access PARC services as a crisis was developing, even if they sought help several times as this was occurring over months. Similarly, some carers were critical of PARC service stays being too short. It appeared that at some PARC services, the standard duration may be two weeks. In response to the survey prompt if you could change one thing about PARC services most participants referred to wanting either easier access or longer stays or more follow up on exit. One survey participant was dissatisfied, expressing concern that PARC service staff did not listen to the carer's perspective. Many carers described consumers leaving PARC services before they were ready and felt that this was a constraint on the contribution of PARC services to recovery.

TABLE 3 Carer experience of PARC services- thematic structure and exemplar quotes.

Themes	Subthemes	Quotes
PARC services works for families	Relief for all from crisis	it's very nice to know that he's being looked after, that he's in care with somebody 24/7 so that's very helpful and a big relief to us his family who can't be checking on him constantly (Interview)
		We appreciate the help that my brother has been given - we would call it a life saver. We really appreciate it (Survey)
	Supportive and safe	I cannot praise PARC enough, it has been the sole thing that has helped my son the most of every other type of assistance he has ever had, the staff have an incredible supportive compassionate manner and the staff listen to the client (my son) and are open to helping the carer (myself) and to work together on whatever the issues are specific to the situation (Survey)
		I found it extremely supportive and made everyone feel welcome. They treated everyone there so well - I was amazed (Survey)
	Better than hospital	"There's been several very unhelpful incidences in the emergency ward at [Hospital] – but I can't think … that we've ever had any issues at PARC"(Interview)
		Offering [daughter] a safe place to prevent in most cases hospitalisation because she just gets so fearful of hospitals and won't go and this just gives her a safe place and respite. Hospital doesn't help her at all. She gets worse in fact (Survey)
		"The first time we got her into recovery without PARCS, didn't even know about it, at that stage she was backwards and forwards into the acute ward, …I can't emphasise enough how much PARCS is important for us" (Interview)
	Recovery through relationships	Support and accountability for our son to follow expectation to rebuild himself (Survey) When you are dealing with the same people more often, I guess you're able to develop more of a relationship with them, I think brings about more learning really (Interview) I see a major change in the positive direction of his recovery and learning to function in society and at home (Survey)
PARC service limitations	Limited access	The only thing I would say is she definitely wasn't ready to come home, but believe me I understand that these places are so few and far between that it's unfortunate that there are people that they consider more critical, she still wasn't well (Interview) Took a long time to get help. Took forever to get him in there. He had to wait about 8 weeks. Was in a really bad way before he went in. (Survey)
	Limited family involvement	I am not sure if there is an actual care plan or how that works while he's there (Interview) [I would like] For them to potentially be a bit more inclusive of me [carer] and to let me know a bit more of what is going on with him. Then I will be able to support him along the way. …I would also like to know more so that I can be more of a resource for him, as I am his main support. I would like to know the strategy they have for him after he leaves so I can encourage him in that. I don't know the plan or what to do when he is having a down moment. I would like to continue on the path that they have set for him. (Survey) They don't listen to the person that's actually dealing with the consumer every day. They just take on board what the consumer does and they don't take notice of what other people say (Survey).

Little family involvement

At a fundamental level, several participants clearly indicated they wanted more communication with the PARC services team than was experienced. This contrasts with overall findings in the exit survey, that participants reported being listened too (84% agree/strongly agree) and receiving relevant and sufficient information (82% agree/strongly agree), but there were significant dissenting voices. Moving beyond pleasant communication and information sharing, family involvement in planning and care was lacking. In response to direct interview questions about inclusion of families in planning and care, several carers reflected they had little active involvement with PARC services, in accord with the item on the exit survey: We have had an in*fl*uence on how the service is run (only 36% agreed). Not all participants were seeking such collaboration. However, participants who strongly identified with the role of carer explained they wanted to be involved more actively and in more depth. They were keen to continue with constructive strategies initiated in PARC services, to be "more of a resource" to the family member, and to learn about having positive family interactions. These carers felt under-prepared by PARC service teams to provide support when the persons returned home.

Overall, carers highly valued PARC services. In terms of critical comments, they mainly wanted easier access and more time with the particular residential settings, interactions, support and programs they had experienced at PARC services.

Part 2: wellbeing of family/carers (associated with a PARC service stay)

This section begins with analysis of the quantitative data; the self-rated K10, Warwick, AQOL, considered important for family carer wellbeing associated with a consumer's PARC service stay. Then themes from interview data and qualitative free-text items from the Exit Survey provide family members' perspectives on the impact of PARC services for themselves. Together these data address the study question: What was the impact of PARC service engagement on carers' wellbeing and quality of life?

Descriptive statistics for survey responses

Table 4 presents the descriptive outcomes for all measures across the four phases of the study. Data for the Carer Exit survey was recorded only at time 2, M = 37.98, SD = 9.60, N = 50.

Correlations among the outcome measures at each time point are shown in a Supplementary Table. In general, the descriptive results depicted in Table 4 demonstrate change in the desired direction for all outcome measures: K10, and AQOL Mental ie higher quality of life, lower distress.

Growth curve analysis detected no significant trends higher than linear. Two outcome measures showed a significant linear trend in the expected direction: the K10, $F(1, 52.32) = 4.96$, $p = .030$, $\eta_p^2 = .09$, 95% CI[<.01,.25], and AQOL Mental, $F(1, 50.89) = 8.62$, $p = .005$, $\eta_p^2 = .14$, 95% CI[.01,.32]. The results approached significance for both WEMWBS, $F(1, 58.48) = 3.24$, $p = .077$, $\eta_p^2 = .05$, 95% CI[<.01,.19], and AQOL Physical, $F(1, 49.36) = 3.91$, $p = .053$, $\eta_p^2 = .07$, 95% CI[<.01,.23] and AQOL Utility was not significant, $F(1, 80.47) = 0.78$, $p = .38$, $\eta_p^2 = .01$, 95% CI[<.01,.09]. All models found significant variability in intercepts at $p < .001$, but no significant variation in slopes, indicating that there was significant variability among participants at time 1, but no significant variability in the nature of participants' growth trajectories. Significant variability across repeated measures was also found at $p < .001$ for all outcomes. This analysis examines trends and shows that carers started at significantly varying points on these measures. Descriptively we see that wellbeing and quality of life improved for carers over time, consolidating at the 12 month (time 4) point.

The participants' responses regarding their wellbeing across the qualitative interviews and survey sources are reflected in the themes Relief, Respite and Learning for families as depicted in Table 5.

Relief and feeling good about PARC services

All interviewees were asked explicitly about their own feelings and experiences of wellbeing. Several family members identified the time around PARC service stay as highly distressing for them, expressing their own emotions in self-deprecating terms, such as "people who need reassurance and who burst into tears." One survey participant reflected on the powerful impact of PARC services at a point of personal extremity: "seriously on the edge of giving up on my own life". Many carers reported very strong personal sense of relief associated with a PARC service stay.

Respite and trusting the team

Many interview and survey participants spoke of valuing the break and respite from responsibility that PARC services afforded them. The ability to experience respite was enabled when carers felt that they could trust the care at PARC services. In many instances carers named particular PARC service team members in whom they particularly placed their trust. Respite and relief for carers was intertwined in their experience with their sense of confidence in the care. Again, this experience was set against a background of

TABLE 4 Descriptive outcomes across four study phases.

Outcome		Phase				
		Time 1	Two weeks	Six months	12 months	Total
K10	M	19.42	18.86	17.92	17.63	18.43
	SD	7.68	6.75	6.10	6.63	6.77
	N	43	36	49	40	168
WEMWBS	M	49.54	50.73	50.10	52.03	50.44
	SD	8.37	7.94	7.96	8.92	8.27
	N	70	52	49	40	211
AQOL Mental	M	0.35	0.38	0.38	0.43	0.38
	SD	0.16	0.18	0.20	0.21	0.19
	N	64	51	49	40	204
AQOL Physical	M	0.67	0.68	0.67	0.68	0.67
	SD	0.23	0.24	0.24	0.25	0.24
	N	64	51	49	40	204
AQOL Utility	M	0.66	0.69	0.68	0.72	0.69
	SD	0.20	0.20	0.21	0.22	0.20
	N	61	51	49	40	201

TABLE 5 Carer experience of PARC services & wellbeing - thematic structure and quotes.

Theme	Subtheme	Quotes
Relief, respite and learning for families	Relief and feeling good about PARC services	Eased my burden and showed us how to get help. (Survey) Well the staff were fantastic, they're obviously used to people who need reassurance and who burst into tears at the slightest you know opportunity, and they were very, I just felt so glad to be able to trust her to their care (Interview)
		The thing about PARCS that it was just the most lovely environment, because it's a lovely building, and all the staff were wonderful, and they were very, very warm and caring and calm, and I think that really helped [my daughter] – it certainly helped me. (Interview)
	Respite and trusting the team	It has also provided me with a break when I was at breaking point (Survey) I can only say from my heart a big thank you to PARC for giving my partner the opportunity of simply some time out and regrouping. Which gives us both positive outcomes (Survey)
		I felt completely at ease with my husband being cared for in this facility under the clinician [name] who was extremely attentive to my husband's needs (Survey) I felt I had real help and I wasn't alone any more, because of the existence of PARC as a service and more importantly, the people that work there (Survey)
	Learning from PARC services	Some of the things that the staff talked to me about, just little you know small conversations, just about the way [her daughter] or some of the other girls were feeling, or the way they reacted and what the staff did with them, you know it just was really helpful … I just felt I understood better (Interview).

struggles in help-seeking and distress carried by carers, about experiences of acute hospitalisation. Having trusted their family members to PARC services and teams, carers felt able to properly step back from caring responsibilities and regroup.

Learning from PARC services

Some carers were then also invested in learning more about mental health and wellbeing, for themselves and for their family member. They appreciated the opportunity to learn in conversation with PARC service staff, or by being present when staff and consumers were interacting and engaged in groups. As noted in an earlier section, many carers wanted more opportunities to learn from the PARC service team about the best ways to support their family members.

In general, the personal experience and impact of PARC services for family members, carers and supporters was emotionally powerful, though often understated. They touched on their sense of "burden" in a "difficult time". Carers spoke of themselves as being at "breaking point" and PARC service involvement as "a lifesaver", and "critical" for their family member. Finding PARC services to be a trustworthy and safe place, they were able to experience "much needed relief" for themselves. From that point, some carers were ready and keen to engage and learn.

Discussion

Recovery oriented practice and service delivery have previously been relatively silent regarding the role of carers and other informal supporters, and the impact of recovery oriented service delivery and new and emerging models of care on carers. This is despite evidence that most consumers experiencing mental health problems have ongoing relationships with their families, that families and supporters often need support for themselves and want to be involved in the care of their loved one (1). This project deliberately included carer perspectives and also anticipated that a stay at a PARC service may have an impact on the wellbeing of that person's carers.

The findings confirm that carers have important perspectives on PARC services. It appears that PARC services can support carers who are distressed and experiencing a family crisis in the context of the person they care for requiring an increased level of care. For many carers a PARC service admission follows experiencing their loved one having an inpatient admission – described as step down admissions - and carers in this study frequently positively compare PARC services to inpatient units and see PARC services as a valued alternative, as have consumers (19, 33). While carers conveyed little to no scope to influence the service provision, they were highly positive both about its contribution to them and the consumer and their wish to access PARC services into the future.

Further, the findings highlight contributions of a PARC service stay to wellbeing of the carers. Quantitative data showed the participants quality of life and experience of distress improved across time and qualitative data (from open ended survey responses and a small number of interviews) conveyed that the experience of respite from worry about the person's safety and from caring roles were fundamental to this improvement (34). When families spoke of PARC services as safe and supportive, their gratitude was heightened by contrast with other experiences of feeling overwhelmed and lacking support and being deeply concerned for the suffering and situation of their family member, whether at home or in hospital. This concern is echoed in studies of family/carer distress through mental health crisis care (4). Carers in Australia (35) and internationally (36) report that their own recovery and sense of respite is constrained when a family member is in hospital care, because of distress and concern about adverse consumer experiences in these settings. In an interview study carers also report

needing and not receiving support for trauma associated with crises and crisis responses by police and community teams and subsequently they avoided help seeking for themselves and the consumer (37). The carer experiences of PARC contrasts with such adverse experiences.

However, some of the features of previous research exploring family experiences is repeated here. Families and carers in this study, despite their generally very positive feedback, expressed that they did not have the amount of information about the services as they would have preferred, both prior and during the stay. They also commonly experienced a lack of engagement and involvement in the care of their loved one. This aligns with Harvey et al. (15)'s findings regarding a lack of consistent involvement of carers by PARC services, despite this being a goal. Also, for some carers and families PARC services were a limited resource – both in in the ability to access the service and in relation to the length of stay. While access is less than desired for any residential support through crisis (38), a clear message from carers is heightened by their unalloyed positive experience of PARC services. Interview methods yielded these nuanced findings; satisfaction surveys (such as the exit survey) are criticised as a measure of experiences and these are best learned from qualitative approaches (39), affirming the value of this mixed method approach to the question.

Our PARC services program of research found evidence that PARC services are associated with many consumers reporting a more positive trajectory in relation to their service use, recovery and wellbeing (40). These findings suggest this may be similarly the case for carers. In relation to our outcome measures, while there was significant variability at time 1, we see a relatively positive trajectory for the participants following contact with a PARC service through improvements in quality of life and reduced distress over time. This contrasts with findings by Poon et al. (6) that did not see a change over time on similar measures. While a direct comparison needs to consider that Poon et al. (6) did not undertake time one assessments at a time of crisis, which it could be argued was a stronger feature of this sample, we do see that the trajectory families and carers went on shares similarities with consumers of PARC services. The qualitative data also supports these outcomes. Although only collected at time 2, the exit survey does suggest that carers and families achieved personal benefits from a PARC service stay – such as "a life saver" for all family members and being relieved from high levels of distress, a finding in line with consumer and carer aspirations for crisis care (38).

However, the findings suggest that overall there was only modest engagement with carers in general –and some scope to increase communication with carers. This is consistent with the potential that others have identified for recovery-oriented practice to take a more relational and family focus (41). This suggests that personal recovery is linked to interpersonal relationships with others. As Rhys Price-Robertson et al. (41) suggest, people with lived experience normally adopt, or at least aspire to adopt, numerous different relational identities – spouses, lovers, friends, children, parents, siblings, aunts and uncles, grandparents, carers of loved ones themselves – all of which entail complex networks of interdependence. (p. 117). In this study, all the participating carers were nominated by the consumer, reflecting that they are an important person in the consumer's life and potentially carry an ongoing caring and support role (13), and yet carer participants identified patchy opportunities for involvement in PARC service work, to support the person's own recovery.

PARC services may be missing opportunities for developing the wellbeing of whole families, enhancing family interaction and enabling family or relational recovery (22). Active engagement with families and others in caring roles, including attentive listening to their needs (42), would require development of the current model of care, necessitating careful attention to information sharing with regard to consumer autonomy and confidentiality. Hence, recovery-oriented practice could be extended to be less individualistic and more consistently inclusive of carers and family members who might then be better informed, supported and included.

Finally, a valued role of PARC services for carers is respite and this appears to assist carer wellbeing (34). Currently, the description of these services as 'sub-acute', which suggests they are not providing urgently required care, is dissonant with common participants' reports of experiencing crises and intense distress at the point of a PARC service admission. There may be potential for PARC services to do more in that space, such as through more opportunities for planned PARC service stays, although this may also depend on the expansion of the availability of PARC services.

Limitations

An important limitation in this study is the timing of the time 1 survey completion. This relied on consumers nominating a carer or family member to participate in the study and also contributed to delays in then making contact and recruiting carers (43). Hence time 1 may have occurred well into the consumer's PARC service stay so may not fully reflect a "baseline" or at least the time when participants were most in need of PARC services support for themselves and the person they care for or loved one. Another limitation was the high rate of missing data at the later timepoints. This was accommodated for in power considerations for our analysis. Also the sample did not capture the experience of a significant minority of carers with language other than English (LOTE). This is a limitation, as carers in LOTE communities are known to have specific mental health service needs (44) and poorer experience of health services in general. A strength of the qualitative interviews was that they were conducted by a carer researcher, to encourage open and safe communication, and the sample was drawn from 6 different services, adding credibility to the discussion of PARC services as a model of care. But the study included only a small number of interviews that were brief and by telephone. We do not claim that the modest qualitative interview sample achieved saturation but they did provide complementary insights to the qualitative and qualitative data in the survey. Together the mixed methods data provides a valuable account of carer experiences. In terms of the quantitative data analysis, it is important to note the high level of missing data for some measures at certain time points. Even though the missing data were found to be missing at random, which supported the use of full information maximum likelihood estimation in our modelling, imputation was considered inappropriate. This level of missing data should be considered a limitation, despite appropriate statistical attempts to account for it. There is the

possibility that participants who did not provide data at all time points were qualitatively distinct from those who did. Further, the different timing associated with the administration of time 1 surveys complicates interpretation of the linear mixed model growth curves by impacting the results of the random intercepts. Finally, it is important to note that the effect sizes reported for the inferential results were generally in the small to moderate range, according to convention; therefore, the clinical and practical significance of these findings needs to be considered in the context of this modest magnitude of effect.

Conclusion

We found that carers generally considered PARC services to be a positive environment for the person they cared for (or loved one) to receive treatment and support. We also found promising evidence in support of the association between PARC services and improvements in the quality of life and wellbeing of carers. However, PARC services have the potential in future to further enhance the engagement of carers in service development and improvement. This could be achieved through more consistent efforts to receive feedback, such as via an exit survey, and emphasis on experience based co-design. This study contributes to a growing body of evidence about how highly valued recovery oriented sub acute residential services are for services users. It also supports the potential for more emphasis on relational recovery to be a feature of the PARC service model, to acknowledge the potential for carers to benefit from PARC services as well as enabling them to contribute to consumer recovery.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

The studies involving humans were approved by Monash Health Human Research and Ethics Committee. The studies were conducted in accordance with the local legislation and institutional requirements. The participants provided their written informed consent to participate in this study.

Author contributions

BH: Data curation, Formal analysis, Writing – original draft, Writing – review & editing, Supervision, Validation. LB: Conceptualization, Funding acquisition, Investigation, Methodology, Project administration, Writing – original draft, Writing – review & editing. CH: Formal analysis, Writing – original draft, Writing – review & editing. EF: Conceptualization, Methodology, Writing – original draft, Writing – review & editing. MS: Funding acquisition, Investigation, Methodology, Resources, Writing – original draft, Writing – review & editing. JR: Conceptualization, Data curation, Formal analysis, Methodology, Writing – original draft, Writing – review & editing. EM: Data curation, Investigation, Methodology, Project administration, Writing – original draft, Writing – review & editing. VP: Methodology, Writing – original draft, Writing – review & editing. GM: Conceptualization, Resources, Writing – original draft, Writing – review & editing. JP: Conceptualization, Funding acquisition, Methodology, Writing – original draft, Writing – review & editing. CM: Conceptualization, Funding acquisition, Writing – original draft, Writing – review & editing. LL: Conceptualization, Writing – review & editing. VE: Conceptualization, Funding acquisition, Writing – original draft, Writing – review & editing. JF: Conceptualization, Data curation, Formal analysis, Methodology, Project administration, Resources, Writing – original draft, Writing – review & editing.

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Conflict of interest

The author(s) declared that this work was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Supplementary material

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A qualitative analysis of experiences in veteran voices and visions groups: developing a participant-informed model of connection, acceptance, and social integration

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Purpose/Aims: This study applied a model of transformation for Hearing Voices Groups in the US developed by Hornstein et al. to Veteran Voices and Visions (VVV) groups adapted for a Veterans Affairs healthcare system. The aims were twofold: (1) identify instances of Discovery, Reframing, and Change and empirically confirm the salience of this model for our groups; and (2) identify the specific dynamics of change in our groups, thus refining and elaborating upon the existing model.

Method: This study used a qualitative design with in-depth semi-structured interviews that were assessed pre-intervention, at 8 weeks, and at 16 weeks with 24 participants within five groups. Interviews were recorded and transcribed. Abductive analysis of the interview transcripts was conducted, first drawing theoretical insights from Hornstein et al.'s framework to organize and synthesize qualitative data deductively then using inductive rapid qualitative analysis to enrich and develop a theory of change specific to this study population.

Findings: While data from this study mostly align with the Hornstein et al. model of transformation, in our data, findings from each phase seemed to emphasize a different theme than that foregrounded in the Hornstein et al. model. We articulate these differences in a refined model of transformation. Our model makes an additional refinement by delineating two distinct tracks: an inner track reflecting how the group influences participants' relationships with themselves and their own experiences, and an outer track reflecting how participants relate to fellow group members. We also consider barriers and facilitators within each phase.

Implications: Our findings indicate that the Hearing Voices approach can be successfully adapted to a large public mental healthcare system. They also

provide a model for engagement with groups during the initial weeks and months of group attendance. VVV groups provided a valuable setting for connection, acceptance, and community that led to a greater sense of belonging and social integration.

KEYWORDS

conceptual model, hallucinations, hearing voices, support group, veteran mental health, peer support, recovery, qualitative research

Introduction

Clinical approaches to psychosis

Psychotic experiences vary widely, often involving unusual perceptions – such as hearing voices or seeing visions – or beliefs not typically shared by others. Clinical services traditionally position psychosis as a marker of pathology and are oriented toward eliminating, reducing, suppressing, or otherwise finding ways to correct what are understood to be distorted perceptions of reality (1–4). First person accounts of psychosis, on the other hand, reveal phenomenologically rich, nuanced experiences relating to sense of self and one's place in the world and a complex range of associated emotions (5, 6). While reduction and suppression of psychosis can be helpful, particularly in times of crisis, a health system that is organized around prioritizing this approach risks a reduction and flattening of subjectivity that can silence and exclude human experience, foreclosing opportunities for meaning and growth and rendering the person experiencing psychosis powerless and untrustworthy in the context of their own care and recovery (7, 8). Over the past forty years, service users have called for a person-centered approach to mental health care that is attuned to the process of strengthening resilience in the existential domain of personal recovery, fostering meaning, identity, and sense of purpose, as well as in the social domain, promoting citizenship, connectedness, and social resources (2, 9–12). This has contributed to calls for the concept of personal recovery, rather than symptom remission, to serve as the organizing and integrating principle for mental health services (2, 13, 14).

These calls have been taken up institutionally for over twenty years. In the United States, the President's New Freedom Commission report of 2002 (15) stated "care must focus on increasing patients' ability to successfully cope with life's challenges, on facilitating recovery, and on building resilience, not just on managing symptoms." The Veterans Affairs Healthcare System (VA), one of the largest public mental health providers in the country, adopted this orientation in 2004 (16). Yet, studies and evaluations of VA and other health systems since that time indicate that treatment remains driven by symptom reduction for diagnosable disorders through application of evidence-based practices, and there remains substantial room to grow in a recovery-oriented, person-centered direction (2, 17, 18).

This study is a part of a project that seeks to facilitate the transformation of the VA to be a more recovery-oriented health system by adapting Hearing Voices (HV), a meaning-centered, recovery-oriented, peer-led approach to psychosis, to the VA Greater Los Angeles Healthcare System (VAGLAHS), which serves a large and diverse community of Veterans in the Southern California region of the US.

The Hearing Voices approach

The Hearing Voices (HV) approach emerged from a partnership between a voice hearer, her psychiatrist, and a researcher in the Netherlands in the late 1980s (19). It has developed into the worldwide Hearing Voices Movement (HVM), a survivor-led initiative advocating for the reform of mental health services, promoting the rights of voice hearers, and collaborating with individuals to explore the meaning of their experiences and work toward recovery (20).

The HV approach takes a non-pathologizing, non-judgmental approach to psychosis, understanding these experiences as a natural part of being human and accepting diverse explanations for the origins of voices (20). It draws on the strengths and unique perspectives of voice hearers to better understand how they relate to and cope with voices and related phenomena (21). The approach advocates for a holistic, empowering understanding of these experiences, emphasizing the cultural, contextual, and personal factors that shape them (19, 20).

Hearing voices groups

The core of the HVM is organizing self-help groups run by and for people who hear voices and have other unusual experiences that often get diagnosed as psychosis (20). HV groups (HVGs) are typically co-facilitated by a pair of facilitators, at least one of whom should be a voice hearer. The groups focus on normalizing unusual perceptual experiences, encouraging the process of meaning making by considering diverse explanatory frameworks, sharing strategies for coping and acceptance, and building community among voice hearers (20).

HVGs have historically operated independently from clinical services, validating subjective understandings of voice hearing, and emphasizing expertise-by-experience and learning to live with voices (20, 22, 23). HVGs are distinct from clinical services in that the goal is to build mutual relationships and supportive community, not to achieve a pre-specified clinical outcome (24, 25). The HVM prioritizes personal experience and testimony as a primary source of evidence (20). Due to these differences, there have been questions whether HVGs could operate within clinical services (20, 26–29). As such, the HVM has had an "uneasy" relationship

with the traditional research methods of the medical and social sciences, which tend to favor clinical outcomes over personal experiences of transformation (20). Nonetheless, there is a tradition of research and collaboration between the HVM and academic and clinical allies, and this study is positioned within that literature (22, 27, 30–33). As the popularity of the HVM grows, a greater understanding of how HVGs work, as well as factors that facilitate and impede change, is essential for strengthening their impact and enhancing the lives of those who participate in them.

Hornstein et al.'s three-phase model of transformation

Drawing from extensive group facilitation experiences as well as qualitative study of HV participants in the US, Hornstein et al. (24) proposed a three-phase model of transformation to illustrate how change occurs within a HV group. The model emphasizes a non-linear, evolving process of personal growth, where group members move between phases of Discovery, Reframing, and Change. In the Discovery phase, group members come to learn that others share experiences like theirs but may understand or respond to their experiences differently. Further, they come to view the group as a safe space where such experiences can be discussed openly and without consequences. In the Reframing phase, group members begin to experiment with new ways of understanding and living with their experiences, particularly in relation to their unique life circumstances. They may negotiate new relationships with their voices, find that voices themselves may change, and develop greater confidence and self-efficacy from new ways of relating to voices. In the Change phase, group members take new chances outside the group and address valued life projects, such as reconnecting with family or applying for jobs, and use group support to deal with setbacks.

The current study

The current study is embedded within a larger project adapting Hearing Voices groups to VAGLAHS that involves collaboration among VA researchers, clinicians, peer specialists, and service users, and US-based Hearing Voices leaders. The groups, called Veteran Voices and Visions (VVV), are conducted virtually, run within the VA, and designed to conform to HV practices and values. In this study, our aims were twofold: (1) identify instances of Discovery, Reframing, and Change, as proposed by the Hornstein et al. (24) model, and empirically confirm the salience of this model for our VVV groups; and (2) refine and elaborate upon the Hornstein et al. (24) model by identifying specific dynamics of change in our groups.

Quantitative data and a focused portion of the qualitative data from this study were analyzed using a modified grounded theory approach and previously published (34). Here, we focus exclusively on our qualitative data, utilizing the Hornstein et al. (24) model as the point of departure to examine Veteran experiences in VVV groups and explore whether these groups had similar dynamics to the community-based, mostly in-person HV groups that Hornstein et al. (24) studied.

Methods

Study design

To understand participant experiences in our VVV groups, we conducted an abductive rapid qualitative analysis of semi-structured interviews with participants pre-intervention, at 8 weeks, and at 16 weeks, based on the Hornstein et al. (24) framework. We received human subjects approval from the VAGLAHS institutional review board.

Setting

VAGLAHS serves a large and diverse community of Veterans in the Southern California region of the US. It cares for several thousand Veterans with serious mental illness diagnoses, providing a range of services including housing support, intensive case management, recovery and rehabilitative services (e.g., vocational rehabilitation), psychiatric consultation (e.g., medication management), a range of psychotherapies (e.g., individual and group psychotherapy), substance abuse services, and emergency and inpatient services when needed. VA is a nationwide healthcare system and is the largest employer of peer support specialists in the country.

Intervention

A VA peer support specialist and VA mental health clinician dyad co-facilitated the VVV groups. Due to the COVID-19 pandemic, all groups were held virtually. Groups met online for one hour per week for 16 weeks. All participants were asked about their comfort with participating in a virtual group during pre-intervention and follow-up interviews. Participants were also informed that camera use during group was optional and that they could still participate with their cameras off if desired. All facilitators received specialized training from the Wildflower Alliance, a peer support and advocacy organization that is a leader in US-based Hearing Voices group facilitation training (35). In accordance with HV values, Wildflower Alliance trained facilitators to explore diverse participant experiences through multiple frameworks of understanding, with a focus on personal meaning. Topics such as predatory recruitment, reintegration into civilian life, harassment, bullying, sexual trauma experienced in the military, and difficulties dealing with government bureaucracies are centered in the HV training developed for VVV groups, emphasizing life experiences unique to Veterans. Future VVV facilitators also practiced establishing a safe space where any topic, including frustrations with medical and mental health care, could be openly discussed. Facilitators met together twice monthly to promote fidelity and discuss challenges or concerns.

Recruitment

Group participants were referred by VA mental health clinicians and were recruited from multiple clinical programs across

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VAGLAHS, including outpatient psychiatry and psychology clinics, recovery-oriented group programs, residential rehabilitation programs, substance use programs, case managers, peer specialists, housing specialists, and inpatient programs. Eligibility criteria included: active, chronic psychosis of at least 6 months duration not exclusively due to substance use and ability to attend virtual weekly group sessions as an outpatient. All VVV groups were begun for the study, and all participants were new to the groups and the HV approach. In total, 29 Veterans consented to the study, attended at least one group, and provided at least one interview. Interviews from 24 Veterans who attended at least one group and completed pre-intervention and 8-week and/or 16-week interviews are included in this analysis (20 completed all 3 interviews, 4 completed only pre-intervention and 8-week interviews).

Sample characteristics

Demographic and clinical characteristics of the sample are presented in Table 1. Gender, race/ethnicity, and marital status were self-reported, and other data were obtained via chart review. The 24 Veterans in this study ranged in age from 25 to 61 years old (M = 41.9, SD = 11.3). Most participants were male (79.1%), never married (70.8%), and had completed at least a high school education (95.7%). The sample was racially and ethnically diverse, with half identifying as Black/African American (50%), followed by Latine/Hispanic (29.2%), White (16.7%), and Asian, Native Hawaiian, or Pacific Islander (4.1%). All participants were diagnosed with a psychosis spectrum disorder and were prescribed antipsychotic medication, with many also diagnosed with comorbid psychiatric concerns. Relatively few Veterans had current substance use disorder diagnoses. While 11 Veterans (46%) currently used cannabis, only 2 (8%) had an active cannabis use disorder while 5 (21%) had a cannabis use disorder in remission, perhaps reflecting the recent legalization and normalization of cannabis use in California. Similarly, 10 Veterans (42%) used alcohol, but only 2 (8%) had an alcohol use disorder, while 12 (50%) had a history of alcohol abuse but were in remission. There were higher rates of substance use disorders in remission, perhaps reflecting our recruitment strategy that included substance use clinics and rehabilitation programs. Most participants (83%) reported at least one prior psychiatric hospitalization. On average, Veterans attended 10 of the 16 group sessions. Veterans in the study received their usual care through VAGLAHS.

Data collection

Data collection for this study took place from February to December 2021. Interviews were conducted prior to the participant's first group, at 8 weeks, and again at 16 weeks. Our semi-structured interview guide explored overall experiences in the group, changes in one's understanding of their experiences and ability to live with them, and how involvement in the group impacted relationships and life outside the group (see Appendix 1). Interviews were audio recorded and professionally transcribed.

Two interviewers performed all the qualitative interviews virtually (IK and RC). IK is an MD-PhD psychiatrist-medical anthropologist who practices at VAGLAHS. He is the principal investigator of the

TABLE 1 Sample characteristics.

Characteristic	N(%)
Age (Years; Range = 25–61)	
M, SD	41.9, 11.3
Gender	
Male	19 (79%)
Female	5 (21%)
Race/Ethnicity	
Asian, Native Hawaiian, Pacific Islander	1 (4%)
Black/African American	12 (50%)
Latine/Hispanic	7 (29%)
White	4 (17%)
Highest Level of Education	
Some high school	1 (4%)
High school graduate/GED	10 (42%)
Some college	12 (50%)
College graduate	1 (4%)
Marital Status	
Never married	17 (71%)
Married	1 (4%)
Divorced/separated	4 (17%)
Unknown	2 (8%)
Diagnosis	
Psychosis spectrum	24 (100%)
PTSD	8 (33%)
Mood disorder	7 (26%)
Anxiety disorder	4 (17%)
Substance Use	
Cannabis Use	11 (46%)
Cannabis Use Disorder	2 (8%)
Cannabis Use Disorder, in remission	5 (21%)
Alcohol Use	10 (42%)
Alcohol Use Disorder	2 (8%)
Alcohol Use Disorder, in remission	12 (50%)
Methamphetamine Use	1 (4%)
Methamphetamine Use Disorder	1 (4%)
Methamphetamine Use Disorder, in remission	4 (17%)
Cocaine Use	0
Cocaine Use Disorder	0
Cocaine Use Disorder, in remission	9 (38%)
Opiate Use	0
Opiate Use Disorder	0
Opiate Use Disorder, in remission	3 (13%)
Lifetime Number of Psychiatric Hospitalizations (Range = 0–10)	
M, SD	3.0, 3.0

(Continued)

TABLE 1 Continued

Characteristic	N(%)
Lifetime Number of Psychiatric Hospitalizations (Range = 0–10)	
≥ 1	20 (83%)
Prescribed Antipsychotics	
	24 (100%)
Group Attendance (Number of Sessions; Range = 1–16)	
M, SD	10, 4.8

Diagnosis numbers exceed 100% due to most Veterans carrying multiple diagnoses.

study and co-facilitated at least one session of four of the five VVV groups in this study but was the regular facilitator in only one of the groups. He has co-facilitated VVV groups outside of the study and HV groups outside of the VA. He worked at an outpatient clinic where four of the participants were patients during the study, though he did not have relationships with any of the Veteran participants prior to the start of the study. He conducted all the pre-intervention interviews and a portion of the 8-week and 16-week interviews. RC is a social worker and health services researcher who conducted most of the 8-week and 16-week interviews. He also practices clinically at VAGLAHS but had no pre-existing relationships with study participants. Interviewers shared their occupation and background with study participants. Interviews averaged 45 minutes in length.

Data analysis

We conducted abductive analysis (36) of the interview transcripts, first drawing theoretical insights from Hornstein et al. (24)'s framework to organize and synthesize qualitative data deductively, then using inductive rapid qualitative analysis (37) to enrich and develop a theory of change specific to our population. We chose an abductive approach to sequentially integrate deductive and inductive analyses. We used the rapid qualitative analytic approach described here to maximize efficiency and consistency across our research team. Two authors (LAS and LL) who were not involved in data collection or group facilitation independently reviewed all interview transcripts. They condensed and synthesized data from the interviews, transferring data from each interview into a templated summary based on the interview question domains. Interview themes were then discussed with members of the research team (LAS, LL, EF, SF, IK) to guide further analysis. From there, data regarding how Veterans engaged in the discovery process, reframed their experiences, or engaged in meaningful life projects – based on the Hornstein et al. (24) model – were extracted and organized in a thematic matrix by participant and time point, allowing for the analysis of trends across Veterans and changes within Veterans from pre-intervention to 8-week and to 16-week time points. Instances of confirming or disconfirming cases, based on the Hornstein et al. (24) model, as well as departures from the model, were noted.

The research team then examined the data in the matrix and inductively reviewed it for emergent themes using a consensus approach to characterize dominant participant experiences with respect to the three phases. The identified themes were discussed with one of the study participants, and their feedback was incorporated into the refined conceptual model that resulted (Figure 1).

The repeated interviews allowed for the detection of changes that may have resulted from group involvement within individual participants. Pre-intervention interviews inquired about participant understandings of their experiences, how they live or cope with

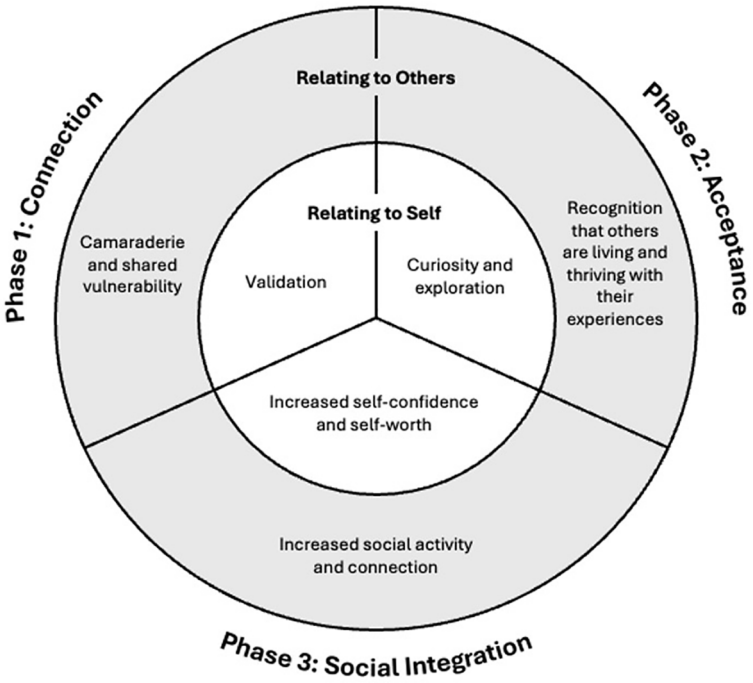


FIGURE 1
Proposed model of transformation in veteran voices and visions groups.

them, and their social relationships and supports. Eight- and 16-week interviews explored whether there were any changes in any of these domains following group participation, thus allowing us to assess the specific area of change for each individual participant.

Results

This results section presents findings as they related to each phase of Hornstein et al. (24)'s model: Discovery, Reframing, and Change. Within each of these sections, both confirming and disconfirming evidence of Hornstein et al. (24)'s phases are provided. While data from this study mostly align with the Hornstein et al. (24) model of transformation, findings from each phase emphasized a different theme than that foregrounded by the Hornstein et al. (24) model. We articulate these differences in a refined model of transformation presented in Figure 1. Our refinements are noted in the section subtitles discussing each respective phase: From Discovery to Connection; From Reframing to Acceptance; and From Change to Social Integration. Our model makes an additional refinement by delineating two distinct tracks: an inner track reflecting how the group influences participants' relationships with themselves and their own experiences, and an outer track reflecting how participants relate to fellow group members. The sections below elaborate on each phase of our proposed model, comparing it with Hornstein et al. (24)'s framework in the context of the current study findings, while also considering barriers and facilitators within each phase (Table 2). The qualitative data presented here reflect a heterogeneity of experiences, indicating that different individuals will experience the same groups in distinct ways.

From discovery to connection

In their proposed three-phase model of transformation, Hornstein et al. (24) describe the Discovery phase as an initial period of change in which group participants are exposed to a diverse range of voice hearing experiences (including differences in content, explanatory frameworks, coping styles, and ways of living with these experiences) in a nonjudgmental, person-centered context. The authors posit that this process can lead to an increased sense of awareness that is associated with increased feelings of "wonder and relief" (24, p. 6), belongingness, and hope, and decreased avoidance associated with voice hearing experiences.

In line with Hornstein et al. (24)'s model, most Veterans (17/24) in the current study reported feeling validated and less alone in their experiences because of participating in the group. These benefits were endorsed even among Veterans who reported minimal changes in other proposed phases of Hornstein et al. (24)'s model. One Veteran stated, "I'm not alone in my struggle. There is help if you seek it … Just listening to everybody else gives me hope" [17, interview 2][1]. For some Veterans, the group setting was the first place where they realized others could have similar experiences. As one Veteran shared, "…for a long time, I just thought… 'What's wrong with me?' and I thought it was just me" [29, interview 2]. Another Veteran compared the unique group process to his prior treatment experiences, noting, "I feel like I'm part of a team, rather than feeling like I'm under a microscope … other times I've met with psychologists and psychiatrists, and it feels like … they're extracting data from you" [25, interview 2]. This Veteran also felt more hope after participating in the group, stating, "It's nice to see a light at the end of the tunnel … this group has shown me that … even with what I'm going through, I can still … find a path to success and happiness."

Several factors appeared to interfere with the process of discovery. One Veteran described perceived invalidation from other group members when discussing his interpretation of voices, stating, "Like they're not even willing to listen to what I'm saying. I've shared videos and they don't even want to respond or share" [2, interview 3]. Other Veterans noted discomfort from receiving unwanted or unhelpful advice, feeling pressured to share their experiences, and difficulty trusting other group members.

Some Veterans also highlighted other difficult group dynamics relating to the amount each participant shared. One Veteran expressed, "Sometimes a lot of people do all the talking, and I'm doing the listening" [18, interview 3]. Another Veteran described feeling self-conscious about talking too much and being perceived as a "know it all", stating, "I wish other people would talk, too" [9, interview 2]. Similarly, one Veteran reported that inconsistent participation from other group members interfered with her ability to establish trust [10, interview 2]. A Veteran who initially reported a positive experience [20, interview 2] only attended the first group session and did not return for subsequent sessions. Later, she shared that she struggled to trust the facilitators and other group members [20, interview 3]. It was also noted that at-times smaller group sizes (e.g., 2–4 members) made meaningful engagement challenging, and that sometimes most of the group time was spent on "small talk" rather than deeper topics. As one Veteran stated, "Sometimes … it's slow to start and then it gets going and then it's done too fast" [25, interview 2]. While these observations may suggest a preference for deeper conversations over small talk, it should be noted that casual conversations may also serve a valuable role in HV groups, helping build rapport and foster feelings of comfort and connection. Finally, two Veterans did not endorse any changes related to Hornstein et al. (24)'s proposed Discovery phase. One of these Veterans did not identify as a voice hearer, whereas the other Veteran only attended the first group.

Based on these findings, it appears that the process of discovery as outlined by Hornstein et al. (24) may best describe Veterans in instances where there is: a) some personal acknowledgement of unusual experiences (regardless of explanatory framework), b) some minimum level of group participation, and c) a perceived solidarity and community in the group built around shared experiences.

Hornstein et al. (24)'s conceptualization of the Discovery phase, which focuses on the sharing of unusual experiences among group members, may not fully capture the broader benefits we identified with VVV groups. Several participants described how being part of the group provided a general sense of connection and community, particularly when mental health challenges resulted in a lack of

1 Study participant number and interview number (in that order) are provided after a participant's comments or experiences are described.

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TABLE 2 Facilitators and barriers of transformation across model phases.

Phase	Domain	Facilitators	Barriers
1. Connection	Relating to Self	- Validating, nonjudgmental group atmosphere - Open invitation to share - Others modeling vulnerability	- Holding certain military values – e.g., stoicism; deprioritization of self/needs
	Relating to Others	- Feeling of camaraderie and shared experiences - Flexible virtual format	- Not resonating with others' stories - Not feeling heard - Receiving unwanted advice - Feeling pressure to share - Unequal participation from group members - Concerns about oversharing - Suspiciousness - Others keeping their cameras off - Preference for more structured interaction
2. Acceptance	Relating to Self	- Validation of experience-based expertise - Acceptance of multiple frameworks beyond illness model - Use of tools such as voice mapping and voice dialogue - Curiosity and respect for experiences - Self-compassion	- Fear of engaging with experiences - Belief that examining experiences is unsafe - Preference for avoidant coping strategies - Negative messages from prior treatment/society - Belief that further exploration of experiences is unnecessary/offers no benefit
	Relating to Others	- Curiosity - Respect for differences - Supportive feedback	- Fear of hearing others' experiences - Feeling invalidated
3. Social Integration	Relating to Self	- Feeling a sense of agency or self-efficacy - Increased social motivation	- Feeling confined by illness/condition - Feeling incapable of taking risks
	Relating to Others	- Identifying with other group members; recognizing oneself in others' stories - Seeing others take risks or initiate change - Feeling supported by the group	- Feeling content with – or resigned to – present conditions - Fear of distress and potential rejection

outside support. After hearing about another group member overcoming personal struggles in securing better housing, one Veteran expressed, "We were all super happy for him and super proud that he found somewhere else [i.e., another place to live] that was safer and better for him" [30, interview 3]. Another Veteran emphasized that group members are genuinely invested in each other's well-being, which helps foster a sense of accountability: "You got to show up, because other people are counting on you to show up. Like, if a person is missing from the group, I'd be like 'where are they? Where is so-and-so? How come he ain't on here? Or … where is she at? Is she sick? What's going on?'" [21, interview 2]. Additionally, the opportunity to encourage others in the group was noted to be a healing experience. As one Veteran stated, "By helping [other group members], I'm helping myself" [9, interview 2].

For some participants, feeling validated and having the opportunity to connect with others in this unique context was a powerful experience, regardless of any additional discoveries or changes in behavior or functioning. The most common sentiment expressed by Veterans in our groups was the newfound sense of connection, of no longer being alone in their experiences. Many of the participants described a profound sense of alienation and isolation that was shattered by the group: Veterans were able to share about their experiences in the military and struggles with reintegration after their service ended and felt camaraderie with fellow Veterans living with unusual experiences. One participant favorably compared the groups to other groups he had experienced: "that fact that we have one shared experience [hearing voices] is something that makes me feel more comfortable. …I also feel more comfortable having the same people show up to group … and people remember what you say in group" [15, interview 2]. This Veteran noted the commonality of experience, the consistency of attendance, and the continuity of group members contributing to comforting relationships and camaraderie. They also resonated with what others shared: "one of the Veterans shared that they tend to hear voices when they're stressed, angry, upset. That's something I share with them." Feedback from group members also appeared to serve as valuable information that could be used to challenge stigmatizing beliefs about unusual experiences.

Facilitators and barriers to connection

The most important facilitator of connection was creating a space of nonjudgemental openness and collaboration in which all participants were invited to share their experiences; such experiences were then received and validated with nonjudgmental curiosity. Participants are regarded as the experts of their own experiences, a core HV value. The peer facilitators often played an important role in this process by sharing their own experiences and modeling vulnerability, but frequently group participants played this role as well by opening up about their own experiences. As previously mentioned, one likely facilitator to connection and cohesion was the camaraderie every participant shared as a Veteran. Another facilitator identified by several participants was the lack of pressure to share, and the fact that group participants speak more frequently than group facilitators. Likewise, a Veteran shared that they appreciated being able to just listen in early groups but then become comfortable sharing as the groups progressed [15, interview 3].

While some Veterans mentioned feeling more comfortable sharing personal experiences with other Veterans than with civilians, certain aspects of military culture – such as values of discipline (as mentioned by one Veteran [26, interview 2]), stoicism, and the deprioritization of individual needs – may act as barriers to group participation and to connection. Participants frequently described a military culture that discouraged help-seeking, framed help-seeking as a sign of weakness, and contributed to delays in their own search for help.

For a few Veterans, perceived invalidation seemed to impede connection. Veterans at times mentioned feeling invalidated by participants who seemed to doubt the veracity of their claims, offered unsolicited advice, or provided otherwise unwanted or unwelcome responses. Unequal participation from group members also appeared to interfere with group cohesion and trust. All groups were held online, which may have influenced Veterans' level of participation or ability to read and respond to social cues. For example, one Veteran described discomfort interacting with participants who kept their cameras off during the group: "We can't see everybody. I don't think that's fair" [21, interview 3]. However, only a few Veterans expressed preference for in-person versus virtual groups, while quite a few Veterans expressed preference for virtual groups. One Veteran stated, "I like [virtual groups] because it's more flexible" [10, interview 3]. Other Veterans described feeling "less paranoid" when interacting with others in an online format [18, interview 2], as well as finding it "easier to open up" [25, interview 2]. One Veteran, when asked about in-person groups said, "Well, I'm not ready for that" [18, interview 3]. These findings highlight potential challenges in meeting the varying needs and preferences of Veterans in the group while ensuring a safe space for all to share.

Our findings also highlight the role of facilitators to set expectations around sharing in group and creating equal opportunities for group members to participate (if desired). A few Veterans in this study expressed a desire for facilitators to encourage sharing by calling on group members or to provide more structure by suggesting topics for discussion.

From reframing to acceptance

According to Hornstein et al., (24) the reframing process involves learning new ways of relating to and coping with unusual experiences. This process can also include initial changes in the experiences themselves (e.g., reduced frequency/intensity of voices).

Many Veterans in the current study reported increased acceptance ("They'll probably never go away, but they're just something I have to learn to deal with" [18, interview 2]), an increased sense of self-control ("I can't turn them off … but I have control over how I react and respond to them" [9, interview 3]), decreased feelings of stigma, and decreased distress associated with unusual experiences after participating in the group[2]. Self-compassion emerged as a key theme. One Veteran stated, "The big thing is learning to be a bit kinder to myself when I am hearing stuff. I'm not so freaked out about it, and I'm a little bit kinder to myself when it does happen" [29, interview 2]. Another Veteran deepened his understanding of his voices and visions as motherly figures, linking them to past trauma and invalidation from his own mother in childhood – "A lot of my hallucinations have been older White women being kind and gentle and nurturing and trying to be helpful. So, I think that, in my darkest times, when I feel the worst … my brain is sort of manifesting some help for me" [25, interview 3]. Other Veterans also began acknowledging the complexity of their experiences, such as questioning whether voices really knew best, or realizing that voices may offer both good and bad advice. Finally, some Veterans appeared to shift their relationship with voices – e.g., approaching them with curiosity and respect rather than fighting against them, or viewing them as "just talk" with no real power.

In terms of decreased stigma, one Veteran reported that being in the group had "lowered the fear of what I think people are gonna say about me," and led him to wonder whether others outside the group may be more supportive than he initially assumed [24, interview 2]. Another Veteran shared that the group helped him become more understanding of others' struggles with mental illness, highlighting the potential benefits of the group in increasing empathy and reducing both self-stigma and stigma toward others. A third Veteran shared the groups "make me feel a bit more normal. It's brought me comfort that I'm not alone. That's the biggest thing" [15, interview 2].

Others began to consider their experiences from a more positive perspective (e.g., viewing experiences as a "special power" and not necessarily pathological). One Veteran mentioned enjoying discussions about cultural differences in mental health, and how unusual experiences may not always be seen as an "affliction" in certain cultures [25, interview 3]. Finally, some Veterans reported that it was helpful to engage in reality checking with other group members, or to be reminded that their experiences were attributable to mental health concerns, trauma, or other life events. For these Veterans, exposure to other group members' perspectives helped shape their

2 This analysis is based on qualitative interview data, though our other study analyzing quantitative data including this sample found that group participation led to a statistically significant reduction in distress and increased benevolence associated with voices, as measured by two separate rating scales (see 34).

own understanding of unusual experiences in beneficial ways. One Veteran even shared that being in the group helped reinforce and deepen her appreciation for her voices – "I thought all voices were friendly, but I found out that they're not. And I'm so glad mine are" [21, interview 2].

In contrast with Hornstein et al. (24)'s model, however, a few Veterans also did not report changes in understanding and/or coping with unusual experiences. Whereas Hornstein et al. (24) suggested that the 'reframing' phase would be associated with increased flexibility in thinking about unusual experiences and enhanced coping, one Veteran appeared to become more convinced of his framework. This Veteran endorsed beliefs in "telepathy" as well as the possibility that "I may replace certain sounds from outside and replace the noise with other noises, like voices" at the pre-interview [2, interview 1]. By the 8-week interview, the Veteran reported "I know what I have," endorsing telepathy as the only explanation for his voices. Interestingly, one Veteran who did not endorse overall changes in unusual experiences was observed as endorsing certain experiences (suspicious ideas; believing thoughts could be heard by others) at the start of the group, but none at 16 weeks. It is unclear if this change is due to the group, a shift in this Veteran's perspective or memory, or potential discomfort in the 16-week interview.

For many, having the opportunity to openly explore and consider various frameworks of understanding represented a new and transformative experience in and of itself. Rather than trying to avoid, control, or get rid of uncomfortable or confusing experiences, Veterans may instead be encouraged to approach these experiences with a sense of curiosity and self-compassion. In this way, Veterans may notice patterns or unique features of their experiences that lead to increased insight and meaning making.

As emphasized in our revised model, we observed a notable shift among Veterans in this study: instead of trying to eliminate, avoid, or suppress voices and other unusual experiences – or staying silent about them – participants gradually moved toward greater acceptance, curiosity, self-compassion, and a willingness to discuss these experiences and consider what they might mean (e.g., through questioning the origin, meanings, and cultural and contextual factors associated with these experiences and examining them through a more "analytical" lens). Most participants had previously been told their experiences were meaningless, "not real," and revealed something wrong with them. For many, the group space represented a new opportunity to share and explore experiences that they had previously considered shameful, frightening, and indicative of pathology. The group's connection, camaraderie, and acceptance of each member, along with seeing others in the group live and often thrive in different ways with their unusual experiences, seemed to encourage individuals to accept and explore their own experiences. One Veteran described this phenomenon:

> "I haven't had an experience with any medical professional talking about the specificities of what's happening. Usually, they talk about these things in general terms, you're seeing things, you're hearing things, so we have to get you these medications. But it's different to talk about what's actually happening, what we're actually seeing and hearing, and what it might mean to us. And hear about other people's experiences. It's just more human to me. I feel like a part of the conversation, and we're all working through these things together and seeing what we can do. It's different because a lot of times, medical professionals can make you feel like something's wrong with you." [25, interview 3]

In line with the idea of acceptance, some Veterans also spoke of allowing experiences to exist while redirecting attention and energy toward other goals: "I don't really hope for them to go away, but I just hope to be able to live with them. Like, you're not going to try to mess up my day, and I'm not going to try to mess up yours" [30, interview 3]. The positive coping strategies modeled by other group members appeared to reinforce these ideas, providing hope for living with these experiences rather than merely surviving them or waiting for a 'cure' to eliminate them.

For some Veterans, the process of acceptance manifested in changes in their beliefs about their own unusual experiences and ways of responding to them. Some Veterans made connections between their unusual experiences and adverse events they had lived through. Others realized their experiences were nuanced, had beneficial as well as detrimental aspects, and served needs for companionship or protection during difficult times. Others found a supportive space to share their own non-biomedical explanatory frameworks without being corrected or otherwise invalidated.

Finally, even Veterans who did not explicitly reframe or change their beliefs about their experiences were nonetheless still able to discuss and explore them in new ways within the group, leading to new insights and understandings.

Facilitators and barriers to acceptance

The process of acceptance was facilitated through the validation of experience-based expertise and of explanatory frameworks beyond the illness model. Many Veterans commented that these frameworks were invalidated in their clinical care, but within the context of the groups, validating and paying attention to the personal meanings and interpretations of their experiences could be empowering, creating the possibility for new interpretations and coping strategies.

When participants shared their experiences, other group members often pointed out previously unrecognized strengths and forms of resilience. This type of supportive feedback tended to encourage further sharing and exploration within the group and reinforced the idea that one can have unusual experiences and still live a fulfilling life.

Barriers to acceptance included a persistent fear of engaging in one's own or others' unusual experiences – whether through reflection, exploration, or sharing – due to concerns that such engagement could worsen feelings of discomfort or distress. Some participants had been taught, often through prior treatment experiences or societal messaging, that the only appropriate response to unusual experiences was to eliminate or avoid them. Several participants expressed a preference for coping through avoidance or distraction, often because their experiences felt too noxious, malignant, or evil to try to understand or accept. For example, one

participant described his voice as coming from Satan, and expressed that he would never turn toward Satan or try to understand his words [17, interview 2]. Others simply felt they already had an adequate understanding of their experiences and saw no value in exploring them further.

From change to social integration

The third phase of the Hornstein et al. (24) model is Change. Following the validation and normalization of their experiences in Discovery and initial reductions in severity and/or distress of voices from Reframing, many voice hearers then experience greater confidence and self-efficacy. This leads to making changes within and outside the group, including strengthening social relationships and pursuing housing, education, or career-related goals. Hornstein et al. (24) further describe individuals who report reduced frequency of hospitalizations, reduced antipsychotic medication dosage, and improved sleep. Importantly, the authors point to lifestyle and symptom outcomes that vary according to an individual's needs.

Among the Veterans in the current study, the most reported changes were 1) the adoption of new strategies for coping with voices and 2) increased social activity or desire for social connection. Nine Veterans reported utilizing new coping strategies following the group, including three Veterans who explicitly reported accepting their voices and two who reported various additional strategies (i.e., writing down what the voices say, talking back to voices, listening to music). One Veteran shared that while his coping strategy of listening to music remained the same, he now used it more intentionally – actively redirecting his attention with music rather than simply using it to avoid or drown out voices [29, interview 2]. Another Veteran shared that he started seeing an individual therapist, and that the combination of individual therapy and groups greatly enhanced his overall coping [30, interview 3]. Two Veterans mentioned reductions in medication dosage.

Additionally, nine Veterans endorsed changes in their social interest and behavior. Eight Veterans reported discussing their unusual experiences with friends or family members, which can serve to increase closeness as well as meaningful support outside of group members and treatment providers. Another Veteran reported sharing about unusual experiences with someone from his church ("It was like relief and release and just like, a burden was taken off me") and connecting with another group member who also identified as Christian [6, interview 3]. This same Veteran reported that participating in the group helped him reflect on his social relationships more broadly: "I'm also realizing that some people that I've been hanging out with … don't have my best interest at heart." Other Veterans noted improved relationships with friends and family members due to enhanced communication skills, confidence, and self-awareness, reconnection with core values, and the ability to use the group space as an outlet for stress. Other social changes endorsed by Veterans included interest in meeting group members in person, desire to join a social or professional club, organizing community activities, and one Veteran who began a romantic relationship.

Other domains of change endorsed by multiple Veterans were in spirituality and personal goals and responsibilities. Two Veterans reported a desire to attend church, and one Veteran began attending following the group. One Veteran mentioned that he had enrolled in school and was taking classes to become a mechanic, stating that being in the group had helped him to "not quit yet" [26, interview 3]. Four Veterans endorsed increased motivation to spend more time in public spaces ("I kind of force myself out of the house") [24, interview 3]. One Veteran, who initially struggled with feelings of suspiciousness and fear of leaving the house due to voices, shared that he had started using an evidence-checking strategy learned from other group members: "I look back on when I used to go out in the community, you know? How many times, when and where did I hear them? And nothing happened to me thus far, so nine times out of ten, ain't nothing gonna happen … As time went on now, I've learned to realize [the voices] are not real" [18, interview 2].

Our refined model proposes that these changes – whether internal (e.g., increased feelings of agency, self-efficacy, or desire for social connection) or behavioral (e.g., spending more time with others or getting involved in community activities) – represent a broader process of social integration, where participants begin to explore and adopt new ways to claim their space in society, incorporating the insights and experiences gained from the group. We also found that six Veterans did not endorse any significant life changes as described in Hornstein et al. (24)'s Change phase.

Facilitators and barriers to social integration

For Veterans in this study, facilitators to social integration included increased feelings of empowerment, motivation, and confidence to take social risks and expand social interactions. Identifying with others in the group – e.g., recognizing aspects of one's own experiences in fellow group members' stories – and hearing about others taking similar risks outside of the group appeared to reinforce participants' own efforts to pursue social changes.

Barriers to social integration included feeling confined or limited by one's unusual experiences and perceiving oneself as incapable of taking risks or initiating change – beliefs that may have been influenced by ongoing feelings of internalized stigma. Fear of distress and potential rejection also appeared to limit some participants' willingness to engage socially. Some Veterans also expressed contentment or resignation with their current life circumstances, which may have contributed to reduced motivation to pursue new social connections or explore different roles within their communities.

Discussion

This study makes several important contributions to the literature on the Hearing Voices approach by implementing an HVG-inspired group within a large, US-based public health setting, by using a longitudinal, repeat interview study design that begins with participants who are new to HV, and by providing a model of change for the first few months of engagement with groups. Veteran experiences in VVV groups largely aligned with Hornstein et al.

(24)'s three-phase model of transformation but also supported a refined model highlighting the processes of Connection, Acceptance, and Social Integration. Veterans commonly described feeling less alone, more self-compassionate, and more accepting of voices and other unusual experiences, as well as increased coping and social engagement due to group participation. These processes were facilitated by feeling validated and supported by peers, shared identity with other Veterans, and nonjudgmental, open discussion, while mistrust, perceived invalidation, unequal participation, avoidance, stigma, and fear of rejection were some of the observed barriers to change. In the following sections we consider aspects of our study with respect to Hornstein et al. (24) and the broader literature on HVGs.

Setting

While much of the existing literature on HVGs is on community-based groups within HV networks and outside of clinical spaces (23, 38), there is an emerging literature on HVGs within formal mental healthcare settings, though largely outside of the US (27, 31, 32, 39). This study contributes to the literature on HVGs within clinical systems from the vantage point of a US-based public healthcare system. Regarding our study question comparing the Hornstein et al. (24) model from civilian, largely in-person HVGs to virtual VVV groups in the VA, our findings indicate that these groups can be successfully adapted to this context in ways that maintain the core characteristics of HV groups based in the community.

While the VA is a biomedically oriented system, it does endorse a recovery approach and there are additional recovery-oriented services Veterans are able to access. VVV complements these services while offering a unique meaning-oriented, participant-driven approach to psychosis. Prior research has found that HV groups led by clinicians tended to be more structured which, while not inherently positive or negative, influences certain group processes such as information sharing and self-reflection (40). As the non-hierarchical, unstructured nature of HVGs is thought to be fundamental in promoting participant autonomy and empowerment (24), future research should continue exploring group facilitation approaches that uphold these values, particularly when clinicians are involved in cofacilitation.

Demographics

Although both studies took place in the United States and involved groups grounded in Hearing Voices Network-USA charter values and principles, there were important demographic and diagnostic differences between the populations studied. Hornstein et al. (24) sampled and interviewed a subset of community participants from across the US, where 56% of participants were diagnosed with psychotic disorders and most identified as White (66%). In contrast, this study was conducted within a single integrated healthcare system and included repeat interviews of group participants who were all diagnosed with psychotic disorders, with 50% identifying as Black. Additionally, all of our participants were Veterans, a group whose shared military service and service-related disability status distinguishes them from the general population in significant ways, including a unique group camaraderie based on shared military culture and adversities and access to resources from the VA. These differences likely reflect distinct lived experiences and social contexts that may account for some of the variation in our findings and models of change. While our pre-intervention interviews did indicate our participants held a broad range of explanatory frameworks regarding their experiences coming into the group, it could be that they also had internalized biomedical understandings to a greater extent than Hornstein et al. (24)'s sample, making it even more remarkable that their model aligned with our findings, but perhaps constraining the degree of reframing that was possible in the brief time span of the study.

Recruitment strategies differed between the two studies, which also influenced the sample characteristics. Hornstein et al. (24) relied on self-referral methods, which likely attracted individuals already positively and consistently engaged with the HV movement and various HV groups. In contrast, our participants were recruited through clinical providers within the VA, and all attended the same set of groups. Our study likely captured a broader range of participants, including regular VA service users who had not previously heard of HVM. Our sample also included those who attended infrequently and who may have had less favorable experiences, offering valuable insights into early facilitators and barriers to engagement and transformation.

Design

While much of the literature consists of cross-sectional studies and surveys (23, 38), this study takes a longitudinal approach with repeat interviews prior to group engagement and then after 8 and 16 weeks. This provides insight into within-person processes of change and gives our model additional depth and dimension. Our model pays attention to internal individual processes as well as relational processes within the group and outside the group.

A key difference between this study and Hornstein et al. (24) was the amount of time study participants had been involved in their respective groups. In Hornstein et al. (24), 57% of participants were in a group for over a year and 23% for more than three years. In our sample, attendance ranged from a single group session to 16 sessions (4 months), with a median of 10 sessions (2.5 months). This may underlie some of the differences in our data that led us to refine the model to better reflect the experiences of our study participants (Figure 1). Our refined model of change may represent early engagement experiences with the HV approach. Longer-term group involvement likely allows for more profound changes, particularly in the later phases of the models. Many of the Veterans who reported no major life changes did report reduced feelings of isolation and shifts in their thoughts about their voices, suggesting that these individuals made gains in the Connection and Acceptance phases, and may have endorsed additional changes with time.

Many aspects of our model have been reported in the literature on HV. Connection and reduced isolation are common themes (38, 40–42). Acceptance of voices and of oneself as a voice hearer is also a key value of the HVM (20, 39, 43–45). Social integration is

perhaps the most difficult of these factors to assess, but a sense of connectedness that extends beyond the group itself has been reported in the literature (26, 46, 47).

Limitations

The short-term nature of the VVV group study may have limited the degree of changes we were able to observe, particularly in the realms of self-understanding, reframing, and relating with others. While studying longer-term groups may offer more opportunities for sustained growth and transformation, the 16-week timeframe was chosen for feasibility within the study timeline and alignment with other evidence-based group psychotherapies offered by the VA and similar health systems. A follow-up study with these same participants might provide insights into changes that occur over longer periods.

All the groups in this study were virtual, a condition initially imposed on the cohort by the COVID-19 pandemic, but which many Veterans felt facilitated their participation. It is possible that the virtual format affected group composition, however, as while it may have included certain individuals, it likely excluded others. The virtual format also could affect group dynamics, and most research on HVGs likely has been on in-person groups, though there is an emerging literature on virtual groups as the format has become more common (48, 49).

The VA is a unique population and context, as Veterans share a camaraderie around their shared military background and have access to more resources within the VA Healthcare System than is typically available in non-VA public health systems in the United States. At the same time, Veterans experience significantly higher rates of mental health disorders compared to the general population, driven by unique military-related exposures and the challenges of transitioning to civilian life (50). Prevalence of schizophrenia, the prototypical psychotic disorder, is particularly high among US Veterans (51). Veterans are predominantly male, as is reflected in our sample (52). Half of our sample also identified as Black, reflecting the demographics of this health system. All these factors may influence the transferability of our findings to other populations and healthcare settings.

VVV was a novel intervention at VA, and most of our facilitators were newly trained and had never facilitated an HV group before. This could also have affected our outcomes, as expert, experienced facilitators may have achieved different outcomes, but the fact that novice facilitators could still produce these outcomes bodes well for our ability to offer groups that approximate HV dynamics.

Conclusion and future directions

This study examined the impact of a Hearing Voices-inspired group approach, Veteran Voices and Visions (VVV) group, on Veteran participants' perspectives and life experiences. We used the three-phase model of transformation proposed by Hornstein et al. (24) as the point of departure for our analysis. While we found many areas of alignment with their model, we also observed some interesting differences that led us to refine the model to better reflect the unique experiences of our study participants and the context in which the VVV groups were delivered.

For most participants, the groups provided a valuable setting for connection, acceptance, and community that led to a greater sense of belonging and social integration. Participants were encouraged to explore multiple, sometimes opposing, beliefs about their unusual experiences with curiosity and without judgment, in the face of important cultural and contextual factors. In this way, the group process helped normalize and validate these experiences as meaningful and worthy of understanding on their own terms, rather than viewing them solely as symptoms to be eliminated. As a result, many Veterans described increased self-compassion and even respect for these experiences, as well as an increased willingness to examine and engage with them.

Overall, our findings show that the process of transformation can take many different forms, rather than being defined by a single marker of success, emphasizing the importance of a person-centered approach to recovery. As groups are participant-driven and Veterans enter with varying needs and expectations, it is likely that not everyone will get exactly what they want out of every group session. This does not indicate a failure of the group or individual but rather reflects the diverse goals and perspectives of the participants, which can shape the group experience in unique ways. By making space for the complexity of lived experience, VVV groups can support personalized pathways toward recovery, or toward living meaningfully with voices and other unusual experiences. The HV and VVV ethos encourage group engagement without predefined behavioral targets or outcomes, allowing for individualized experiences. As each Veteran may gain something different from the group, non-conformity to the three-phase model does not necessarily imply a lack of meaningful benefit. Our framework accounts for diverse trajectories of growth, including the possibility that additional life changes may emerge over time and that social integration can take many forms and may unfold gradually or internally. Future research should consider exploring these alternative outcomes with the understanding that an individual's way of relating and responding to their unusual experiences may be continually evolving.

Our findings also suggest that the VVV group model may be adapted to other healthcare contexts, including other VA systems and settings serving Veterans and individuals with serious mental illness. Further research is needed to determine how best to integrate these approaches into formal health systems (53). Future research should also explore the longer-term effects of VVV groups to better understand their potential for fostering change.

Data availability statement

The datasets presented in this article are not readily available because they cannot be fully anonymized. Requests to access the datasets should be directed to the corresponding author.

Ethics statement

The studies involving humans were approved by Veterans Affairs Greater Los Angeles Healthcare System Institutional

Review Board. The studies were conducted in accordance with the local legislation and institutional requirements. The participants provided their written informed consent to participate in this study.

Author contributions

LA-S: Conceptualization, Data curation, Formal analysis, Investigation, Writing – original draft, Writing – review & editing. LL: Conceptualization, Data curation, Formal analysis, Investigation, Writing – original draft, Writing – review & editing. EF: Conceptualization, Methodology, Writing – review & editing. RC: Data curation, Methodology, Project administration, Writing – review & editing. SF: Conceptualization, Supervision, Writing – review & editing. IK: Conceptualization, Data curation, Funding acquisition, Investigation, Methodology, Resources, Supervision, Writing – review & editing.

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Conflict of interest

The author(s) declared that this work was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Generative AI statement

The author(s) declared that generative AI was not used in the creation of this manuscript.

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Appendix 1: Qualitative Interview Guide for weeks 6 and 12

1. Tell me about your experiences in the Veteran Voices and Visions group. What is it like going to the group?

2. How is the Veteran Voices and Visions group different from other mental health services you have used?

3. What do you like about the group?

4. Which experiences have you had in the group which most stick in your head?

5. How has your understanding of your voice hearing (or any other) experiences changed since attending the group? How has the group changed this?

6. Has your ability to live with your voices changed as a result of your participation in the group? If so, how?

7. How has it been/what has it been like to get to know the other Veterans in the group?

8. Have relationships with people outside the group changed at all for you since you started the group? Has your experience in the group played a role in this at all?

9. What are your hopes for your (voice-hearing) experiences in the future?

10. How would you describe any changes in your life (if any) because of going to the groups? How did going to the group bring about this change?

11. Is there anything you dislike about the group?

12. Why have you kept/stopped attending? What might keep/stop you from coming to the group?

13. How was it participating in the group over video conference?

a. If you had the choice of an in-person vs. a virtual group, which would you choose?

14. What did you find most important about attending the group?

15. What would you recommend to us as we go forward with the approach?

16. Is there anything we have not talked about that we should know to better understand what VVV is all about?

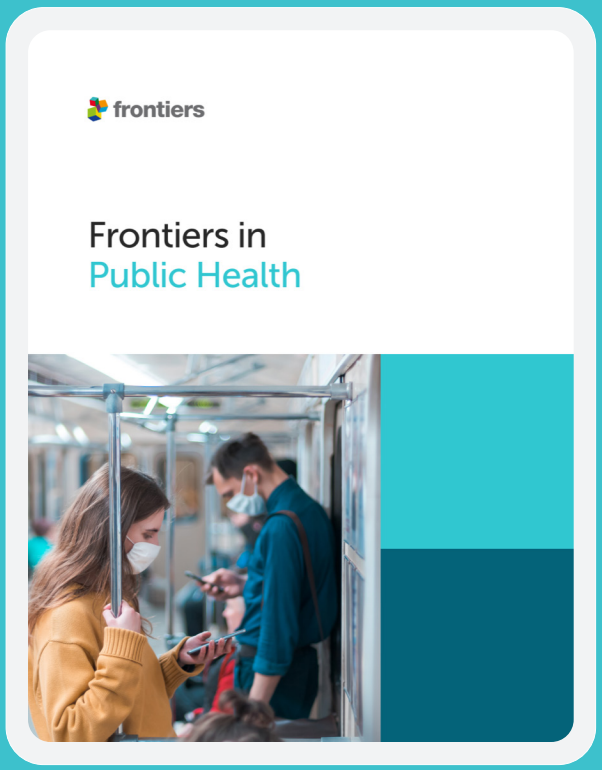
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