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Original Article

Baseline findings from the Longitudinal Outcomes of Gender Identity in Children (LOGIC) study

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Background

Children and young people are increasingly being referred to specialist gender services, and available data on their characteristics are limited. The Longitudinal Outcomes of Gender Identity in Children (LOGIC) study is the first independently funded UK research programme to comprehensively assess quality of life, autism, service use and the psychological well-being of children and adolescents referred to gender services.

Aims

The aim of this baseline assessment is to obtain a multidimensional profile of children and young people on the waiting list for the gender service.

Method

Data were obtained from 617 parents and caregivers and 565 children and young people, representing a quarter of those on the waiting list eligible to participate. Participants were assessed across a range of domains including gender identity, gender dysphoria, mental health and well-being, autism, physical health, service use and quality of life.

Results

Gender dysphoria rates among our sample were high, particularly among adolescents. Almost all participants had socially transitioned. Compared with children, adolescents reported significantly poorer quality of life, particularly in relation to self-perception and psychological well-being. Relative to reference population samples, our cohort demonstrated elevated levels of mental ill health and reduced quality of life, although the magnitude of these differences varied. In addition, 59% of young people aged 11 years or over reported self-harm in the past year. Over half of the cohort had received a psychiatric diagnosis, and co-occurrence rates were high. A third of the cohort was either diagnosed with autism or undergoing assessment for autism.

Conclusions

Self-perception and psychological well-being represent particularly impaired quality of life dimensions for adolescents on the waiting list for the UK's gender service. Complementing existing knowledge, differences emerged between young people and children, reflecting that the onset of puberty is a critical factor in the well-being of this cohort.

Keywords

Children and adolescents; gender identity; gender dysphoria; mental health and well-being; quality of life.

Recent years have seen an increase in the number of children and young people referred to gender clinics worldwide.[1–3] Notably, in the UK, referrals to the national gender clinic increased from 51 children and young people in 2009 to 1715 in 2016,[4] and further increased to over 2700 in 2019/2020.[5] Following the publication of the Cass Review in April 2024, gender services for children and young people were reorganised in the UK and in March 2024 the national gender clinic was closed, to be replaced by regional services.[6] While more recently numbers of referrals have reduced, numbers on the waiting list have risen, resulting in lengthy waiting times.[7] In March 2025, it was estimated that there were 6225 children and young people on the gender services waiting list, up from 5560 a year earlier.[7] Despite these increasing numbers, understanding of the long-term outcomes for children and young people referred to specialist gender services remains limited. Most research in the field to date has been dominated by small clinic studies where there has been limited systematic data collection undertaken by independently funded and resourced research teams.[8] In recent years this has begun to change, with a small number of longitudinal studies being funded in the USA,[9] Australia[10] and Canada.[11]

In the current paper, we report the characteristics of children and young people participating in the Longitudinal Outcomes of Gender Identity in Children (LOGIC) study.[3] The LOGIC study aims to investigate the outcomes of a cohort of 622 children and young people who were referred to the national UK gender clinic by undertaking a comprehensive assessment of outcomes pertaining to gender identity, gender dysphoria, mental health and well-being, quality of life, autism, physical development and health service use. The objective of the LOGIC study is to obtain a multidimensional understanding of this cohort as young people navigate complex life changes such as puberty and social transition, and to explore how such changes relate to gender dysphoria.

Significant limitations have been identified in the comprehensiveness of data collection and reporting regarding the characteristics of children and young people referred to specialist gender services.[12] It is hoped therefore that the data presented

here will contribute to addressing this gap and enhance understanding of the needs of this cohort.

Method

Study design, setting and participants

The LOGIC study is a longitudinal study that follows 622 children and young people referred to the Gender Identity Development Service (GIDS), recruited between June 2019 and May 2021 from the waiting list. Before its closure in March 2024, GIDS was a nationally commissioned service covering England, Wales, Northern Ireland and, in part, Scotland and the Republic of Ireland. The service had centres in London and Leeds and outreach clinics across the UK. Children and young people were eligible for inclusion in the study if they had a referral to GIDS accepted when they were aged 14 years or younger, had not had their first appointment with the service, spoke English fluently and resided in the UK or the Republic of Ireland. Families remained eligible to participate even if, after referral, they no longer wished to be seen by the service.

Study recruitment followed a three-step process, which entailed the GIDS administrative team contacting eligible families and obtaining consent for their details to be passed on to the LOGIC research team. Consenting families were then contacted directly by a researcher and provided with detailed information sheets, including age-appropriate versions for their child or young person. Written informed consent was obtained from all parents or caregivers for each child. While the recruitment of parent–child dyads was sought, 57 parents participated without their child or young person and 5 young people participated without their parents. The recruitment process is shown in Supplementary Fig. 1 available at https://doi.org/10.1192/bjp.2025.10451.

Ethical standards

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. All procedures involving human patients were approved by the Health Research Authority and London – Hampstead Research Ethics Committee (reference no. 19/LO/0857).

Procedures

Children and young people completed one of two surveys. The child interview, which was administered to those aged 11 years or younger, consisted of age-appropriate questions and measures about gender, as well as the KIDSCREEN-52 questionnaire.[13] Children aged 11 years also completed the Strengths and Difficulties Questionnaire (SDQ)[14] and the short-form Mood and Feelings Questionnaire (sMFQ).[15] Most child interviews took place in person, with researchers travelling to families' homes or via video format (in both cases with parental presence), although some children chose instead a telephone conversation or self-completion of an online form via the Qualtrics survey platform.

The young person survey was designed for participants aged 12+ years, and featured a more extensive set of age-appropriate measures in addition to those in the child interview. Specifically, these were the Warwick–Edinburgh Mental Wellbeing Scale (WEMWBS),[16] the Youth Self-Report (YSR)[17] and an itemised version of the DSM-5 criteria for gender dysphoria.[18] Because it was deemed developmentally appropriate, four 11-year-olds completed the young person survey and one 12-year-old completed the child interview.

Parents/caregivers were invited to complete the parent survey, which provided the primary source of sociodemographic data, as well as additional measures about their child. These were the Child Behavior Checklist (CBCL),[17] the SDQ, the Autism Spectrum Quotient,[19,20] the DSM-5 Gender Dysphoria measure and the Child and Adolescent Service Use Schedule (CA-SUS).[21]

The young person and parent surveys were completed online via Qualtrics by most of the study participants, although some completed the questionnaires either with the researcher in-person, over the telephone or via a video call or postal questionnaires. Data collected via post, telephone and video call were subsequently entered into Qualtrics by one of the researchers on the LOGIC study.

In line with current co-creation research practices, there were three layers of lived experience guidance within the LOGIC Study: (a) a lived experience co-researcher; (b) an independent steering committee, including both researchers and people with lived experience, who met regularly to discuss study progress; and (c) the study advisory group, which included children, young people and parents participating in the study, who provided advice and guidance on study processes, procedures and interpretation of study findings.

Outcomes

Outcome measures focused on gender identity; gender dysphoria; mental health and well-being; autism diagnoses and traits; quality of life; physical health and well-being; family and peer relationships; and health service usage (see the study protocol[3]). Due to space constraints, data pertaining to the Utrecht Gender Dysphoria Scale (UGDS),[22] Gender Identity Self Stigma (GISS) Scale,[23] Child Health Utility Index (CHU-9D)[24] and Child and Youth Resilience Measure (CYRM)[25] can be found in Supplementary Tables 1–3.

Statistical analysis

Descriptive statistics were computed to summarise the demographics of the cohort. Demographics were presented as means and standard deviations for continuous, symmetric variables and as frequencies and percentages for categorical variables. For measures with categorisation bands, the proportion of participants within each band is reported. Likewise, for scales with inbuilt cut-off scores, the proportion of participants who exceed the score threshold is also reported. The agreement between young people who fulfilled the criteria for gender dysphoria based on self-report, versus those who met these criteria based on parent report, was examined using Cohen's kappa, which can range from 1.00 to −1.00 (with 0 indicating no agreement).[26]

Additional statistical analyses included a series of t-tests to compare our cohort and reference population scores on the SDQ, the KIDSCREEN-52 and the Autism Spectrum Quotient. The population mean for the SDQ was drawn from the 2020 wave of the NHS Mental Health of Children and Young People (MHCYP) survey in England, which included responses from 3570 children aged 6–16 years.[27] Normative data for the KIDSCREEN-52 were based on a large-scale survey involving over 20 000 children aged 8–18 years, and their parents, across 13 European countries.[13] The population mean for the child version of the Autism Spectrum Quotient was taken from a control sample of 1225 UK children aged 4–11 years,[28] while the reference scores for the adolescent version were based on a control group of 50 UK adolescents aged 10–15 years.[20] Independent-samples t-tests were also employed to examine whether Autism Spectrum Quotient scores varied according to birth-registered sex and ASD diagnosis. The Bonferroni method was used to adjust the threshold of significance for multiple comparisons performed in the analyses of these data. The magnitude of these differences was assessed via standardised mean differences (i.e. Cohen's d).

For continuous measures with partially completed responses ($\geq$80% complete), we either followed guidance provided by the questionnaire manual or imputed missing items using mean imputation to enable calculation of total scores. All analyses were conducted using Stata (version 17).

The sample size was based on analyses planned for a 2-year follow-up. It was initially estimated that 638 participants would be recruited, with the aim of 510 being retained for follow-up after allowing for attrition. Full details are provided in the study protocol.[3]

Results

Sample demographics, social transition and endocrine treatment

Demographic data are provided in Table 1. Social transition is also reported here, which refers to the extent to which participants are living as their identified gender. Participants who have partially transitioned may express their gender via their appearance, pronouns or name, whereas those who have fully transitioned will typically express their gender via all three. Endocrine treatment data were also collected for young people.

Sample characteristics

Height and weight data were collected from 382 parents about their child. Given that height and weight are highly sensitive to changes in age, these data were adjusted for differences in sex and age (i.e. body mass index-standardised deviation score (BMI-SDS)). Compared with the population ($M = 0$, s.d. = 1.0), our sample's mean BMI-SDS was 0.3 (s.d. = 1.2).

Data were also obtained from 615 parents regarding whether their child had shown signs of puberty; based on these data, 480 children had shown signs of puberty (77 birth-registered males, 403 birth-registered females).

Finally, Table 2 presents information pertaining to neuro-developmental and mental health conditions.

Gender identity

At the time of recruitment, all children and young people in our cohort were on the waiting list for the gender service. However, during the data collection phase, four parents (0.8%) reported that their child was no longer on the waiting list, either because their child was accepted for assessment ($n = 2$) or because they decided to leave the waiting list ($n = 2$). These four participants were excluded from the analyses.

At the time of data acquisition, the cohort had been on the service waiting list for a median of 1 year (interquartile range (IQR) 0.6–1.6). Parents also indicated that the median age of referral to the clinic was 12 years (IQR 10–13 years; birth-registered males 10 years (IQR 7–13 years), birth-registered females 13 years (IQR 11–14) years), and that gender incongruence emerged around the age of 11 years (IQR 5–12 years; birth-registered males 6 years (IQR 3–11 years), birth-registered females 11 years (IQR 8–13 years)).

Health and service use data collected from 607 parents showed that, in the past 6 months, 9 respondents (1.5%) had attended a National Health Service (NHS) gender clinic and 6 (1.0%) had visited a private gender clinic. In addition, 4 respondents (0.7%) had visited an NHS endocrine clinic and one person (0.2%) had attended a private endocrine clinic.

A quarter (25.5%) were in contact with child and adolescent mental health services for gender identity-related reasons.

Table 1 Demographic information about children, young people and parent participants. Social transition status of children and young people and endocrine treatment status of young people

Demographic information	Birth-registered sex of child/young person		
	Male	Female	Total
Children			
n	88	65	153
Mean age, years (s.d.)	8.2 (1.7)	9.1 (1.8)	8.6 (1.8)
Gender identity, *n* (%) (*n* = 152)			
Mainly a boy	3 (3)	55 (86)	58 (38)
Mainly a girl	64 (73)	3 (5)	67 (44)
Something in between	17 (19)	4 (6)	21 (14)
Neither	4 (5)	2 (3)	6 (1)
Social transition, *n* (%) (*n* = 153)			
None	0 (0)	1 (2)	1 (1)
Partial	15 (17)	6 (9)	21 (14)
Full	70 (80)	57 (88)	127 (83)
Don't Know	3 (3)	1 (2)	4 (3)
Young people			
n	66	346	412
Mean age, years (s.d.)	13.8 (1.3)	14.2 (1.3)	14.1 (1.3)
Gender identity, *n* (%) (*n* = 408)			
Same as birth sex	1 (2)	4 (1)	5 (1)
Transgender	14 (22)	72 (21)	86 (21)
Binary	38 (58)	209 (61)	247 (61)
Non-binary	10 (15)	32 (9)	42 (10)
Agender	0 (0)	3 (1)	3 (1)
Other/multiple/questioning	2 (3)	23 (7)	25 (6)
Social transition, *n* (%) (*n* = 392)			
None	5 (8)	5 (2)	10 (3)
Partial	21 (33)	82 (25)	103 (26)
Full	37 (59)	242 (74)	279 (71)
Current treatment stage, *n* (%) (*n* = 393)			
None	55 (87)	315 (95)	370 (94)
Hormone blockers	5 (8)	2 (1)	7 (2)
Cross-sex hormones	3 (5)	13 (4)	16 (4)
Parents			
n	175	442	617
Mean age, years (s.d.)	41.8 (7.0)	45.1 (6.6)	44.2 (6.9)
Gender, *n* (%) (*n* = 616)			
Male	8 (5)	35 (8)	43 (7)
Female	166 (95)	404 (92)	570 (93)
Non-binary	1 (1)	2 (0.4)	3 (0.4)
Relationship to child, *n* (%) (*n* = 617)			
Birth parent	169 (97)	430 (97)	599 (97)
Non-birth parent	6 (3)	12 (3)	18 (3)
Ethnicity, *n* (%) (*n* = 617)			
White	161 (92)	431 (98)	592 (96)
Mixed	6 (3)	6 (1)	12 (2)
Other	8 (5)	5 (1)	13 (2)
Sexual orientation, *n* (%) (*n* = 617)			
Heterosexual	153 (87)	383 (87)	536 (87)
Non-heterosexual	21 (12)	58 (13)	79 (13)
Prefer not to say	1 (1)	1 (0.2)	2 (0.3)
Highest level of education, *n* (%) (*n* = 616)			
Higher degree	38 (22)	75 (17)	113 (18)
Degree	48 (28)	120 (27)	168 (27)
A-level	23 (13)	59 (13)	82 (13)
GCSE	30 (17)	71 (16)	101 (16)
Other	32 (18)	104 (24)	136 (22)
No qualification	3 (2)	13 (3)	16 (3)

GCSE, General Certificate of Secondary Education.

Gender dysphoria

Based on self-report, 91.2% of young people (374/410; 318 birth-registered females, 56 birth-registered males) met the DSM-5 criteria for gender dysphoria.

Table 2 Number of parents whose child was awaiting assessment or diagnosed with a neurodevelopmental condition, eating disorder, PTSD, OCD, depression or anxiety

Parameters	<12 years	12+ years	Total
Total N	170	447	617
Autism spectrum disorder, n (%)			
Awaiting assessment	20 (12)	80 (18)	100 (16)
Diagnosed	29 (17)	82 (18)	111 (18)
Attention-deficit hyperactivity disorder, n (%)			
Awaiting assessment	14 (8)	35 (8)	49 (8)
Diagnosed	12 (7)	26 (6)	38 (6)
Eating disorder, n (%)			
Awaiting assessment	3 (2)	13 (3)	16 (3)
Diagnosed	2 (1)	15 (3)	17 (3)
PTSD, n (%)			
Awaiting assessment	2 (1)	10 (2)	12 (2)
Diagnosed	1 (1)	13 (3)	14 (2)
OCD, n (%)			
Awaiting assessment	3 (2)	10 (2)	13 (2)
Diagnosed	2 (1)	17 (4)	19 (3)
Depression, n (%)			
Awaiting assessment	9 (5)	51 (11)	60 (10)
Diagnosed	4 (2)	79 (18)	83 (13)
Anxiety, n (%)			
Awaiting assessment	17 (10)	69 (15)	86 (14)
Diagnosed	19 (11)	134 (30)	153 (25)
Number of co-occurring diagnoses, n (%)			
1	14 (8)	88 (20)	102 (17)
2	13 (8)	53 (12)	66 (11)
3+	8 (5)	43 (10)	51 (8)
No psychiatric diagnosis reported, n (%)	104 (61)	167 (37)	271 (44)

PTSD, post-traumatic stress disorder; OCD, obsessive–compulsive disorder.

Examination of parental responses revealed that 42.1% of children (96/228; 35 birth-registered males, 51 birth-registered females) met these criteria, as well as 64.5% of young people (247/383 participants; 35 birth-registered males, 212 birth-registered females).

Of the young people who fulfilled the criteria based on self-report, 66.8% also met them based on parent report (kappa 0.10, 95% CI 0.038–0.168), suggesting low agreement between self- and parent reports.

Quality of life

Children's and young people's quality of life was examined via self-completed KIDSCREEN-52. Mean subscale scores are plotted in Fig. 1 in relation to the standard range based on population scores ($M = 50$, s.d. $= 10$), and show that adolescents fall outside of the standard range on 6 out of 10 subscales, whereas children were within standard population parameters on all subscales.

Self-harm

Self-injurious and suicidal behaviour was measured via the CBCL items 18 and 91.[a] For children aged 12 years and younger ($n = 224$), 29% of parents indicated that their child had engaged in self-harm in the past 6 months and 28% indicated that their child had talked about killing themselves. For adolescents ($n = 380$), 42% of parents indicted that their child had self-harmed in the

past 6 months and 33% indicated that their child had talked about killing themselves.

The corresponding items on the self-reported YSR[b] ($n = 399$) indicated that 46% of adolescents had self-harmed in the past 6 months, and 59% had thought about killing themselves.

Finally, a stand-alone self-harm item[c] employed for children aged 11+ years indicated that 59% of respondents (258/434) had deliberately self-harmed in the past year.

Examination of threshold scores

The percentages of respondents who exceeded cut-off thresholds on the various measures are shown in Fig. 2. These data show that 232 (53.3%) young people who completed the SDQ exceeded the cut-off score for 'very high' difficulties, and 265 (61.2%) exceeded a score of 12 on the sMFQ, indicating possible depression. In addition, 283 respondents (69.9%) scored below 42 on the WEMWBS, placing them in the bottom 15% of the UK population for mental well-being, and 263 respondents (66.2%) met or exceeded the clinical threshold of 64 on the YSR.

Data provided by parents are also plotted in Fig. 2. Examined separately by age group, this revealed that 158 (35.7%) young people and 44 (26.2%) children were in the 'very high' band for the SDQ, characterised by scores of ≥ 20. Similar trends were also observed on the CBCL, for which 71 out of 158 children (44.9%) met or exceeded the clinical threshold of 64, as well as 225 out of 410 young people (58.0%).

See the supplementary material for full descriptive statistics of each measure, subcomponents and composite scores.

Comparison with population norms

Cross-population comparisons are presented in Table 3, showing that our cohort deviates significantly from normative scores on measures of psychological and behavioural functioning (i.e. SDQ), quality of life (i.e. KIDSCREEN-52) and autism traits (i.e. Autism Spectrum Quotient). However, the differences of greatest magnitude were reflected in the 'emotional problems' subscale of the SDQ and the 'psychological well-being' and 'self-perception' subscales of the KIDSCREEN-52.

Conversely, the smallest effects were observed on the 'conduct problems' subscale of the SDQ, the 'financial resources' subscale of the KIDSCREEN-52 and the adolescent version of the Autism Spectrum Quotient.

Discussion

The current paper describes the health, well-being and quality of life of a cohort of children and young people on the waiting list for the UK national specialist gender service, for whom data were obtained between 2019 and 2021. Many participants were younger than 12 years, thereby providing a unique opportunity to understand gender identity and development as young people move through puberty, adolescence and early adulthood.

Recent trends have shown more birth-registered female than birth-registered male referrals at gender clinics, with the former presenting at an older age.[29,30] Here, a similar pattern was noted. While children aged 11 years and younger were relatively balanced in terms of sex ratio, our sample of young people featured more birth-registered females, with an approximate ratio of 5:1. It has been speculated that sex differences in referral age to gender clinics are linked to differences in stigma surrounding gender

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a. Item 18: deliberately harms self or attempts suicide; item 91: talks about killing self.

b. Item 18: I deliberately try to hurt or kill myself; item 91: I think about killing myself.
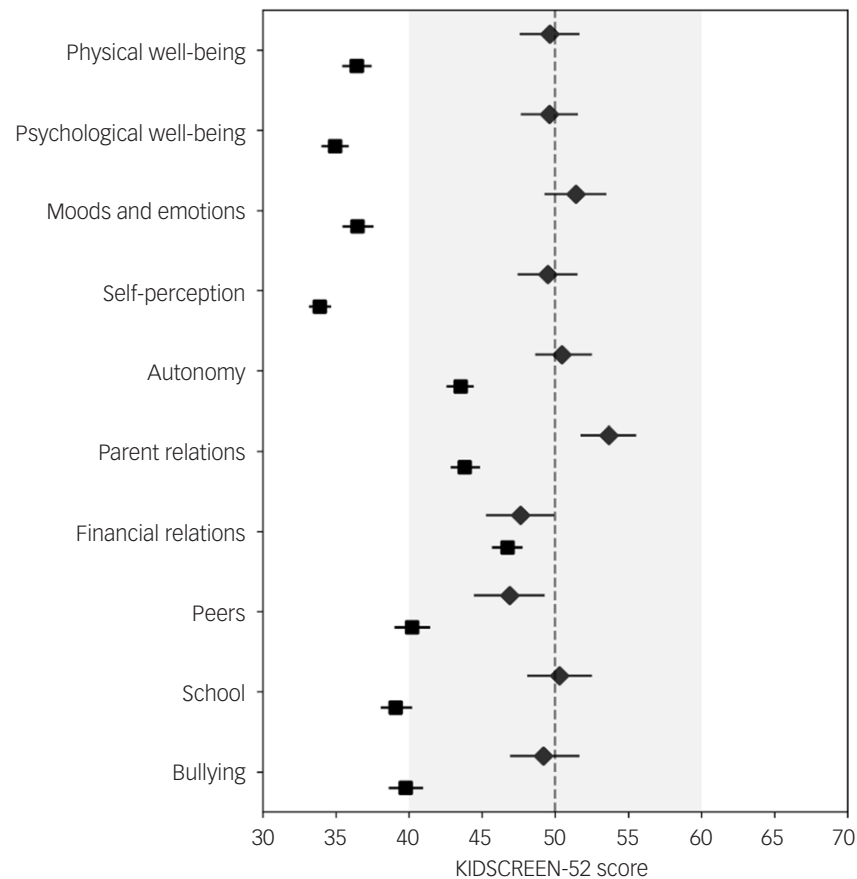c. In the past year have you hurt yourself on purpose in any way?

Fig. 1 Mean scores for each of the KIDSCREEN-52 subscales. KIDSCREEN-52 data represent Rasch-scored *t*-values, with a normalised population mean of 50 and a standard deviation of ±10, denoted by the dotted line and shaded segment, respectively. Scores outside of the shaded area indicate deviation from population norms. Diamond markers denote child respondents and square markers denote young person respondents. Error bars represent 95% CI.
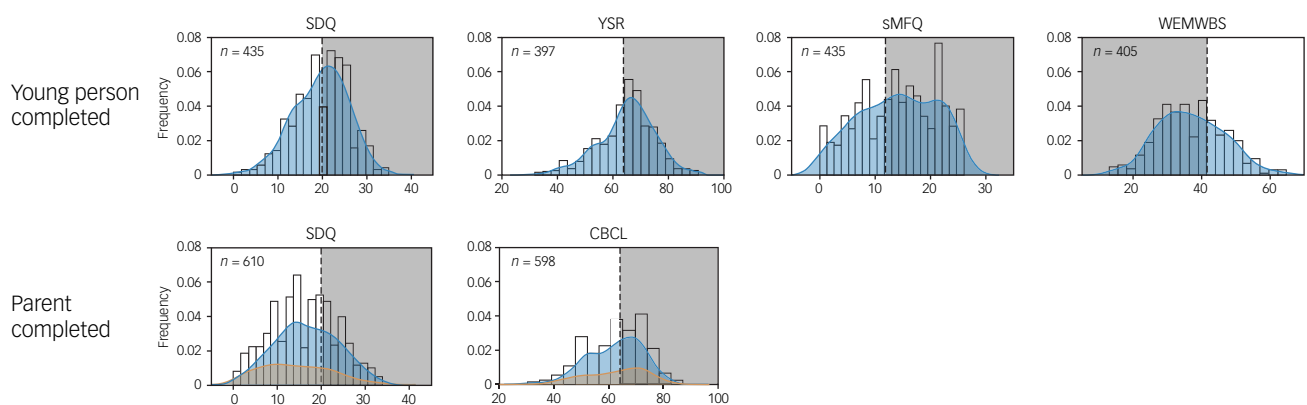

Fig. 2 Distribution of scores completed by young people (top) and parents about their children (bottom). The shaded portions of each scale represent scores that exceed the threshold (note that, except for WEMWBS, higher scores denote poorer functioning). On the parent-completed scales, orange and blue distributions denote children and young people, respectively. SDQ, Strengths and Difficulties Questionnaire; YSR, Youth Self-Report; sMFQ, short-form Mood and Feelings Questionnaire; WEMWBS, Warwick–Edinburgh Mental Wellbeing Scale; CBCL, Child Behavior Checklist.

nonconformity in birth-registered males and females, with less stigma surrounding masculinised behaviours in birth-registered females, and greater visibility of femininised behaviours in younger birth-registered males.[4] For this reason, it might also be easier for teenage birth-registered females to access care, resulting in an imbalance of referrals at this age and stage.

Sex differences in the onset of puberty represent another potential contributing factor. Because puberty typically occurs earlier in birth-registered females, it is also conceivable that the emergence of physical changes amplifies the incongruence between sex and experienced gender, resulting in more referrals in the final years of childhood – a pattern that continues into adolescence.

Table 3 Comparisons between our cohort and reference population means for the various measures

Parameters	N	Mean (s.d.)	Population, N	Population mean, μ	Mean difference (95% CI)	Cohen's d (95% CI)
Parent-reported						
SDQ						
Conduct problems	610	2.17 (1.91)	2704	1.5[a] (2.65)	0.67 (0.52, 0.82)	0.35 (0.27, 0.43)
Hyperactivity	610	4.90 (2.89)	2704	3.7[a] (2.65)	1.20 (0.97, 1.42)	0.41 (0.33, 0.50)
Emotional problems	610	5.36 (2.83)	2704	2.3[a] (2.65)	3.06 (2.84, 3.29)	1.08 (0.98, 1.18)
Peer problems	610	3.55 (2.34)	2704	1.8[a] (2.65)	1.75 (1.56, 1.94)	0.75 (0.66, 0.84)
Pro-social	610	7.10 (2.38)	2704	8.2[a] (2.65)	−1.1 (−1.29, −0.92)	0.46 (0.38, 0.55)
Total	610	15.98 (7.41)	2704	9.3[a] (7.96)	6.68 (6.09, 7.27)	0.90 (0.81, 1.00)
Autism Spectrum Quotient						
Child version[e]	123	49.91 (16.91)	1225	41.7[c] (18.6)	8.21 (5.19, 11.23)	0.49 (0.30, 0.67)
Adolescent version[e]	273	19.58 (8.12)	50	17.7[d] (5.7)	1.88 (0.91, 2.85)	0.23 (0.11, 0.35)
Child, Adolescent-reported						
KIDSCREEN-52						
Physical well-being	509	39.16 (11.38)	22 296	50[b] (10)	−10.8 (−11.83, −9.85)	0.95 (0.85, 1.06)
Psychological well-being	512	37.95 (10.80)	22 296	50[b] (10)	−12.05 (−12.99, −11.11)	1.12 (1.00, 1.23)
Moods and emotions	511	39.51 (11.71)	22 296	50[b] (10)	−10.5 (−11.51, −9.47)	0.90 (079, 1.00)
Self-perception	508	37.06 (10.06)	22 296	50[b] (10)	−12.9 (−13.82, −12.06)	1.29 (1.17, 1.40)
Autonomy	509	44.98 (9.32)	22 296	50[b] (10)	−5.0 (−5.83, −4.21)	0.54 (0.45, 0.63)
Parent relations	511	45.84 (10.48)	22 296	50[b] (10)	−4.2 (−5.07, −3.25)	0.40 (0.31, 0.49)
Financial resources	494	46.96 (10.42)	22 296	50[b] (10)	−3.0 (−3.96, −2.11)	0.29 (0.20, 0.38)
Peers	505	41.62 (12.05)	22 296	50[b] (10)	−8.4 (−9.43, −7.33)	0.70 (0.60, 0.79)
School	482	41.22 (10.86)	22 296	50[b] (10)	−8.8 (−9.75, −7.81)	0.81 (0.70, 0.91)
Bullying	507	41.68 (12.29)	22 296	50[b] (10)	−8.3 (−9.39, −7.24)	0.68 (0.58, 0.77)

SDQ, Strengths and Difficulties Questionnaire.
a. Population mean obtained from the 2020 Wave of the National Health Service Mental Health of Children and Young People, ages 6–16 years.[27]
b. Population mean based on the KIDSCREEN-52 norm of 50.[13]
c. Population mean based on control scores in the child version of the Autism Spectrum Quotient.[28]
d. Population mean based on control scores in the adolescent version of the Autism Spectrum Quotient.[20]
e. Children and adolescents with a diagnosis of autism spectrum disorder (ASD), or who were awaiting assessment for ASD, were excluded from this comparison.
Note that all effects were significant ($P < 0.001$) after correction for multiple comparisons using the Bonferroni correction method; $\alpha = 0.0028$ (i.e. 0.05/18).

Aligning with this possibility, our data show that referral age, as well as recalled age at which gender incongruence emerged, was later for birth-registered females than for males, a trend that has also been reported elsewhere.[30]

A higher percentage (i.e. 19 *v.* 6%) of male- than female-birth-registered children considered themselves as 'in between' a boy and a girl. This distinction remained present, albeit diminished, among adolescents, with 15% of birth-registered males identifying as non-binary versus 9% of birth-registered females. Non-binary individuals are increasingly presenting at gender clinics[31] and report their own unique challenges regarding gender identity.[31,32] As a result, we anticipate that close observance of the trajectories of non-binary children and young people in subsequent waves of the LOGIC study will be important in enhancing understanding of their needs.

Relative to an estimated prevalence of 2.1% among the broader population of children and young people in the UK,[33] 13% of our cohort had received a diagnosis of depression and a further 10% were awaiting assessment. Similarly, 25% of children and young people were diagnosed with anxiety and 14% were awaiting assessment. Collapsed across those who were diagnosed and awaiting assessment, these prevalence rates of depression and anxiety characterise 23 and 39% of our cohort, respectively. These were observed in addition to a range of other psychiatric diagnoses, with high co-occurrence rates (see Table 2). In addition, 59% of respondents aged 11+ years reported deliberately self-harming within the past year. This proportion aligns with recent findings from the Millennium Cohort Study, in which sexual minority 14-year-old participants were presented with the same item, among whom 54% also reported that they had attempted to harm themselves on purpose within the past year, versus 14% of heterosexual adolescents who endorsed this item.[34]

Mental well-being across the cohort was generally poor, with many children and young people exceeding established thresholds across several indices of emotional well-being, including the clinical cut-off on the CBCL/YSR and validated risk thresholds on both the SDQ and the sMFQ.

However, across multiple indices, children exhibited better overall well-being than adolescents. This was particularly evident based on quality-of-life data obtained via the KIDSCREEN-52: while children were within one standard deviation of the population mean across all subscales, data obtained from adolescents suggested markedly reduced quality of life on six of ten subscales, with self-perception and psychological well-being reflecting the greatest impairment. Likewise, pronounced differences between younger and older children were observed in SDQ and CBCL scores, gender dysphoria and indices of self-harm.

It is conceivable that the differences between age groups are in part driven by the onset of puberty, given the elevated psychological distress that may be promoted by the associated physical changes.[35] While the onset of puberty varies according to individual differences in gender, weight and sex, this typically commences around the age of 11–13 years.

Discrepancies between parents and adolescents were observed on measures for which both parent and self-report data were obtained. Consistently, parent data overestimated the well-being of adolescents in terms of gender dysphoria, self-harm and emotional and behavioural functioning. On the SDQ, for example, parent data indicated that 36% of adolescents exceeded the measure's maximum threshold, compared with 54% based on self-report. Discrepancies between parents and their children on the SDQ have been widely reported elsewhere,[36,37] with some studies suggesting that high levels of parent education and low parent psychological distress contribute to parents overestimating their child's emotional and behavioural well-being,[36] and that parent–child agreement is also affected by factors such as the strength of the parent–child relationship[38] and the gender of the child.[36,39] Nonetheless, observing a discrepancy in the current study is perhaps surprising

when considering that parent–child dyads tend to show stronger agreement in clinical rather than community settings.[40]

It is also noteworthy that a large proportion of the cohort were either diagnosed with autism spectrum disorder (ASD) (18%) or undergoing assessment for ASD (16%), accounting for 34% of children and young people. There is a growing interest in the intersection of autism and gender diversity, with recent evidence suggesting that around 11% of gender-diverse people are also autistic,[41] despite an estimated prevalence of 1–2% in the general population.[42] Currently the nature of this intersection is unknown, although one theory is that gender diversity promotes traits and behaviours that resemble autism but which are not caused by autism.[43] Elsewhere, it has been suggested that certain aspects of ASD, such as communication difficulties, restricted behaviours and interests, and limited cognitive flexibility, may contribute to the emergence of gender incongruence.[44,45] While the developmental origins of this intersection remain an open question, it seems reasonable to expect that the answer is likely to be complex and multifaceted.[44]

While children and adolescents without an autism diagnosis scored lower on the Autism Spectrum Quotient than those who were diagnosed or under assessment, these participants also exceeded control group scores obtained elsewhere.[20,28] In addition, while the effect sizes of these differences were small for adolescents and small to medium for children, these data provide further evidence for the intersection of autism and gender identity, which will be explored throughout the LOGIC study's subsequent time points. It is also worth noting that the consistently observed sex difference in Autism Spectrum Quotient scores among the general population – with males typically scoring higher than females[19,20,28] – was not found in our sample.

At the time of data collection, our cohort had been on the waiting list for 1.2 years on average, and almost all had either fully (406 (74%)) or partially (124 (33%)) socially transitioned. Less than 1% had received medical intervention in the form of hormone blockers and/or cross-sex hormones. Qualitative work with the same cohort highlights the fact that, for some young people, puberty is experienced as a 'ticking time-bomb'.[35] Given recent policy changes in the UK, such as the indefinite ban on the prescription of puberty blockers for under-18s with gender dysphoria,[46] as well as the closure of the national specialist clinic in 2024 and long waiting list times, it is likely that the onset and subsequent progression of puberty for this cohort will pose significant challenges for clinicians, families and young people themselves to navigate.

Our sample represented only 25% of those eligible for study participation. While this level of recruitment is not atypical in studies involving children and adolescents referred to clinical services,[47] it nonetheless represents a limitation because the relationship between the propensity to participate and the variables measured is unknown and may be meaningful. As is well documented, a range of social and socioeconomic factors can influence both healthcare utilisation and the likelihood of participation in research studies.[48] Conclusions drawn from these data must therefore be considered with this in mind.

The use of a range of measures that are also employed in UK population cohort studies and surveys represents a key strength of the LOGIC study. Uniquely, this offers scope for cross-cohort comparisons, thus enabling contextualisation of the data presented here, as well as across subsequent waves of data collection. Importantly, the LOGIC study is also well placed to observe and monitor changes in psychosocial characteristics as puberty progresses in this cohort. From the outset, the study committed to following participants regardless of their engagement with specialist gender services – including those who remained on the waiting list, those who chose to leave it and those who pursued private care. This approach ensures that, despite the recent reorganisation of gender services in the UK, the study continues to generate unique and important data regarding trajectories and outcomes for young people. We anticipate that the findings from subsequent waves of data collection will be valuable in informing service development and clinical practice to better meet the needs of children, young people and their families.

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Supplementary material

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Data availability

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References

1 Chen M, Fuqua J, Eugster EA. Characteristics of referrals for gender dysphoria over a 13-year period. *J Adolesc Health* 2016; **58**: 369–71.

2 Kaltiala R, Bergman H, Carmichael P, de Graaf NM, Egebjerg Rischel K, Frisén L, et al. Time trends in referrals to child and adolescent gender identity services: a study in four Nordic countries and in the UK. *Nord J Psychiatry* 2020; **74**: 40–4.

3 Kennedy E, Spinner L, Lane C, Stynes H, Ranieri V, Carmichael P, et al. Longitudinal Outcomes of Gender Identity in Children (LOGIC): protocol for a prospective longitudinal cohort study of children referred to the UK gender identity development service. *BMJ Open* 2021; **11**: e045628.

4 de Graaf NM, Giovanardi G, Zitz C, Carmichael P. Sex ratio in children and adolescents referred to the Gender Identity Development Service in the UK (2009–2016). *Arch Sex Behav* 2018; **47**: 1301–4.

5 Cass H. Review of gender identity services for children and young people. *BMJ* 2022; **376**: o629.

6 NHS England. *Children and Young People's Gender Services: Implementing the Cass Review Recommendations*. NHS England, 2024.

7 Fox A. *Rise in Children's Gender Care Waiting List across England and Wales*. The Independent 2025 (https://www.independent.co.uk/news/uk/home-news/nhs-british-psychological-society-wales-england-wes-streeting-b2751243.html).

8 Stynes H, Lane C, Pearson B, Wright T, Ranieri V, Masic U, et al. Gender identity development in children and young people: a systematic review of longitudinal studies. *Clin Child Psychol Psychiatry* 2021; **26**: 706–19.

9 Olson-Kennedy J, Chan Y-M, Rosenthal S, Hidalgo MA, Chen D, Clark L, et al. Creating the Trans Youth Research Network: a collaborative research endeavor. *Transgend Health* 2019; **4**: 304–12.

10 Tollit MA, Pace CC, Telfer M, Hoq M, Bryson J, Fulkoski N, et al. What are the health outcomes of trans and gender diverse young people in Australia? Study protocol for the Trans20 longitudinal cohort study. *BMJ Open* 2019; **9**: e032151.

11 Bauer GR, Pacaud D, Couch R, Metzger DL, Gale L, Gotovac S, et al. Transgender youth referred to clinics for gender-affirming medical care in Canada. *Pediatrics* 2021; **148**: e2020047266.

12 Taylor J, Hall R, Langton T, Fraser L, Hewitt CE. Characteristics of children and adolescents referred to specialist gender services: a systematic review. *Arch Dis Child* 2024; **109**: s3–11.

13 Ravens-Sieberer U, Gosch A, Rajmil L, Erhart M, Bruil J, Duer W, et al. KIDSCREEN-52 quality-of-life measure for children and adolescents. *Expert Rev Pharmacoecon Outcomes Res* 2005; **5**: 353–64.

14 Goodman R. Psychometric properties of the Strengths and Difficulties Questionnaire. *J Am Acad Child Adolesc Psychiatry* 2001; **40**: 1337–45.

15 Angold A, Costello EJ, Messer SC, Pickles A. Development of a short questionnaire for use in epidemiological studies of depression in children and adolescents. *Int J Methods Psychiatr Res* 1995; **5**: 237–49.

16 Tennant R, Hiller L, Fishwick R, Platt S, Joseph S, Weich S, et al. The Warwick-Edinburgh Mental Well-being Scale (WEMWBS): development and UK validation. *Health Qual Life Outcomes* 2007; **5**: 63.

17 Achenbach T. *The Achenbach System of Empirically Based Assessment (ASEBA): Development, Findings, Theory, and Applications*. University of Vermont, Research Center for Children, Youth, & Families, 2009.

18 American Psychiatric Association. *Diagnostic and Statistical Manual of Mental Disorders (DSM-5-TR)* 5th ed. APA, 2022.

19 Baron-Cohen S, Wheelwright S, Skinner R, Martin, J, Clubley E. The autism-spectrum quotient (AQ): evidence from Asperger Syndrome/high-functioning autism, males and females, scientists and mathematicians. *J Autism Dev Disord* 2001; **31**: 5–17.

20 Baron-Cohen S, Hoekstra RA, Knickmeyer R, Wheelwright S. The autism-spectrum quotient (AQ)—adolescent version. *J Autism Dev Disord* 2006; **36**: 343–50.

21 Byford S, Harrington R, Torgerson D, Kerfoot M, Dyer E, Harrington V, et al. Cost-effectiveness analysis of a home-based social work intervention for children and adolescents who have deliberately poisoned themselves. *Br J Psychiatry* 1999; **174**: 56–62.

22 Steensma TD, Kreukels BPC, Jürgensen M, Thyen U, de Vries A, Cohen-Kettenis P. The Utrecht Gender Dysphoria Scale: a validation study. In *From Gender Variance to Gender Dysphoria: Psychosexual Development of Gender Atypical Children and Adolescents* (ed TD Steensma): 41–56. Ridderprint, 2013.

23 Timmins L, Rimes KA, Rahman Q. Minority stressors and psychological distress in transgender individuals. *Psychol Sex Orientat Gend Divers* 2017; **4**: 328–40.

24 Stevens K. Assessing the performance of a new generic measure of health-related quality of life for children and refining it for use in health state valuation. *Appl Health Econ Health Policy* 2011; **9**: 157–69.

25 Liebenberg L, Ungar M, LeBlanc JC. The CYRM-12: a brief measure of resilience. *Can J Public Health* 2013; **104**: e131–5.

26 Warrens MJ. Five ways to look at Cohen's Kappa. *J Psychol Psychother* 2015; **05**: e197.

27 NHS Digital. *Mental Health of Children and Young in England, 2020: Wave 1 Up to the 2017 Survey*. NHS Digital, 2020.

28 Auyeung B, Baron-Cohen S, Wheelwright S, Allison C. The autism spectrum quotient: children's version (AQ-Child). *J Autism Dev Disord* 2008; **38**: 1230–40.

29 Arnoldussen M, Steensma TD, Popma A, van der Miesen AIR, Twisk JWR, de Vries ALC. Re-evaluation of the Dutch approach: are recently referred transgender youth different compared to earlier referrals? *Eur Child Adolesc Psychiatry* 2020; **29**: 803–11.

30 Tollit MA, May T, Maloof T, Telfer MM, Chew D, Engel M, et al. The clinical profile of patients attending a large, Australian pediatric gender service: a 10-year review. *Int J Transgend Health* 2023; **24**: 59–69.

31 Taylor J, Zalewska A, Gates JJ, Millon G. An exploration of the lived experiences of non-binary individuals who have presented at a gender identity clinic in the United Kingdom. *Int J Transgend* 2019; **20**: 195–204.

32 Chew D, Tollit MA, Poulakis Z, Zwickl S, Cheung AS, Pang KC. Youths with a non-binary gender identity: a review of their sociodemographic and clinical profile. *Lancet Child Adolesc Health* 2020; **4**: 322–30.

33 Sadler K, Vizard T, Ford T, Goodman A, Goodman R, McManus S. *Mental Health of Children and Young People in England, 2017: Trends and Characteristics*. NHS England Digital, 2018.

34 Amos R, Manalastas EJ, White R, Bos H, Patalay P. Mental health, social adversity, and health-related outcomes in sexual minority adolescents: a contemporary national cohort study. *Lancet Child Adolesc Health* 2020; **4**: 36–45.

35 McKay K, Kennedy E, Wright T, Young B. Thinking time, shifting goalposts and ticking time bombs: experiences of waiting on the Gender Identity Development Service waiting list. *Int J Environ Res Public Health* 2022; **19**: 13883.

36 Booth C, Moreno-Agostino D, Fitzsimons E. Parent-adolescent informant discrepancy on the Strengths and Difficulties Questionnaire in the UK Millennium Cohort Study. *Child Adolesc Psychiatry Ment Health* 2023; **17**: 57.

37 Cantwell DP, Lewinsohn PM, Rohde P, Seeley JR. Correspondence between adolescent report and parent report of psychiatric diagnostic data. *J Am Acad Child Adolesc Psychiatry* 1997; **36**: 610–9.

38 Lohaus A, Rueth J-E, Vierhaus M. Cross-informant discrepancies and their association with maternal depression, maternal parenting stress, and mother-child relationship. *J Child Fam Stud* 2020; **29**: 867–79.

39 Gray EJ, Scott JG, Lawrence DM, Thomas HJ. Concordance between adolescents and parents on the Strengths and Difficulties Questionnaire: analysis of an Australian nationally representative sample. *Austr N Z J Psychiatry* 2021; **55**: 1058–70.

40 Cleridou K, Patalay P, Martin P. Does parent-child agreement vary based on presenting problems? Results from a UK clinical sample. *Child Adolesc Psychiatry Ment Health* 2017; **11**: 22.

41 Kallitsounaki A, Williams DM. Autism spectrum disorder and gender dysphoria/incongruence. A systematic literature review and meta-analysis. *J Autism Dev Disord* 2023; **53**: 3103–17.

42 Baron-Cohen S, Scott FJ, Allison C, Williams J, Bolton P, Matthews FE, et al. Prevalence of autism-spectrum conditions: UK school-based population study. *Br J Psychiatry* 2009; **194**: 500–9.

43 Turban JL. Potentially reversible social deficits among transgender youth. *J Autism Dev Disord* 2018; **48**: 4007–9.

44 George R, Stokes MA. 'Gender is not on my agenda!': gender dysphoria and autism spectrum disorder. In *Psychiatric Symptoms and Comorbidities in Autism Spectrum Disorder* (eds L Mazzone, B Vitiello): 139–50. Springer International Publishing, 2016.

45 Strang JF, Chen D, Nelson E, Leibowitz SF, Nahata L, Anthony LG, et al. Transgender youth executive functioning: relationships with anxiety symptoms, autism spectrum disorder, and gender-affirming medical treatment status. *Child Psychiatry Hum Dev* 2022; **53**: 1252–65.

46 Dyer C. Puberty blockers: UK bans drugs indefinitely after safety advice. *BMJ* 2024; **387**: q2814.

47 Sayal K, Wyatt L, Partlett C, Ewart C, Bhardwaj A, Dubicka B, et al. The clinical and cost effectiveness of a STAndardised DIagnostic Assessment for children and adolescents with emotional difficulties: the STADIA multi-centre randomised controlled trial. *J Child Psychol Psychiatry* 2025; **66**: 805–20.

48 NHS England. *Increasing Diversity in Research Participation: A Good Practice Guide for Engaging with Underrepresented Groups*. NHS England, 2023.