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Randomized controlled internal pilot trial of a diversion programme for adolescents in police custody who possess illicit substances

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ABSTRACT

Background: Adolescents involved in criminal proceedings are significantly more likely to re-offend than a similar population diverted away from criminal justice. Adolescents who use substances and offend are at higher risk of experiencing negative social, psychological and physical problems that often persist into adulthood. There is some evidence that brief interventions combined with appropriate psychoeducation may be effective in reducing adolescent substance use.

Methods: Prospective two-armed, individually randomized internal pilot randomized controlled trial (RCT) with follow-up at 6 months. Young people across three police forces—Kent, Cornwall and Sefton—arrested in possession of class B or C illicit substances were randomly allocated to receive the ReFrame intervention or business as usual. In total, 102 participants were eligible of whom 76 consented and 73 were followed up at 6 months. Outcomes addressed offending behaviour, frequency of substance use, wellbeing and mental health. The study was conducted between February and December 2022.

Results: All progression criteria were met, 80% of those eligible consented, 96% adhered to their allocated treatment and 88% were followed up at the primary endpoint.

Conclusions: The feasibility of conducting the pilot trial was a success and it will now proceed to a definitive RCT.

Keywords adolescent, brief intervention, diversion, psychoeducation, substance use, youth justice

Introduction

Adolescence is a critical developmental stage where young people make behavioural and lifestyle choices that have the potential to impact their health and wellbeing into adulthood. While risk-taking is important for healthy psychological development, for many, inappropriate risk-taking is significantly associated with health and social harm during adolescence and these harms persist well into adulthood.[1] Young people are much more vulnerable than adults to the adverse effects of substance use due to a range of physical and psychological factors that often interact and the differential impact of substances on the developing brain.[2–4] In addition to an increased risk of accidents and injury,[5] substance use in adolescence is also associated with poor educational performance and exclusion from education. Over the academic year 2015–16, almost 9% of permanent school exclusions in state secondary schools were due to alcohol and substance use.[6] In the longer term, substance use is also associated with increased prevalence of non-communicable diseases, such as cancer, cardiovascular disease and gastrointestinal disorders.[7,8] Six percent of those aged 14 years and 11% aged 15 years reported having used cannabis in the last month and 2% of 14-year-olds and 4% of 15-year-olds reported using

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class A substances, such as cocaine, opiates, ecstasy or LSD, at least once.[5]

While the relationship between criminal activity and substance use is complex, there is clear evidence that the prevalence of substance use is far higher in the youth offending population than the general youth population. Approximately 25% of young people engaged in alcohol and drug treatment are referred from youth justice[9] and data derived from the Youth Offending Team, ASSET+ comprehensive assessment, indicate that most young people in the youth justice system, 76%, use substances and 72% have a mental health need. The Juvenile Cohort Study highlighted that 32% of young offenders score 2 or more on the ASSET+ assessment for substance use, indicating that substance use is at least in part a reason for them engaging in criminal activity, and 12% score 3+, indicating substance use as a major factor in their offending behaviour.[10]

The Youth Justice System in England and Wales works to prevent offending and re-offending by those under the age of 18 years. The latest available data indicate that there were 19 000 arrests of young people in 2019.[11] Of these, boys made up 83% and the average age was 15.3 years. The Crime and Disorders Act 1998 is clear that the principle of youth justice is prevention and diverting young people away from formal processing is a critical part of achieving this goal. An international systematic review and meta-analysis[12] included 22 studies and 7300 young people and found formal processing within youth justice services, rather than diversion from it, appears to increase rather than reduce offending. In the UK, similar effects have been observed. The Edinburgh Study in Youth Transitions and Crime[13] found those brought to court were twice as likely to commit another offence within 12 months than a matched sample not brought to court, and a study in Northamptonshire[14] found prosecution increased the likelihood of re-offending when compared with a similar match sample. Being arrested constitutes opportunistic teachable moment that can act to maximize the effect of a behaviour change intervention aimed at reducing substance use.[15]

A recent meta-analysis of 22 studies[16] synthesized the evidence regarding the use of motivational interventions (MI) for adolescents (age 12–20) who engage in substance use. Results showed that compared with treatment as usual, the use of MI reduces heavy alcohol use days by 0.7 days per month (95% CI: −1.6 to −0.02), substance use days by 1.1 days per month (95% CI: −2.2 to −0.3) and overall substance-related problems by a standardized net mean difference of 0.5 (95% CI: –1.0 to 0). Furthermore, a meta-analysis addressing brief interventions for co-occurring alcohol and illicit substance use among adolescents found a significant benefit if the specific illicit substance use was addressed in addition to alcohol use.[17] Yet, systematic reviews of interventions for substance using offenders to date have not identified a clear, evidence-based intervention strategy,[18–22] but they have highlighted the paucity of good-quality research in the area and the lack of UK-based studies with no scientifically rigorous studies specifically focusing on young offenders.

Brief psychosocial interventions delivered using a motivational interviewing approach within a FRAMES paradigm for behaviour change—providing feedback on substance use, identifying the individual as responsible for change, providing clear advice and a menu of strategies to change in an empathetic manner and enhancing self-efficacy—have shown evidence of potential effect among adolescents[16,23] and offer an opportunity to allow structured reflection on substance use and identify strategies to enhance self-efficacy, manage expectancies and increase motivation to change. Drug education is widely used in drug prevention, health promotion and treatment. A review of best practice[24] identified key elements of effective drug education. These include multi-component programmes that include understanding drugs and drug-related harm as well as skill development in how to manage risk, multiple structured sessions, developmental appropriateness, understanding and communicating risk and dispelling misconceptions. The ReFrame intervention builds on both the FRAMES approach to behaviour change but also best practice in drug education.

Methods

In preparation for the first randomized controlled trial (RCT) of diverting young substance users from police custody to treatment, we conducted a small-scale internal pilot study to explore several key parameters for the design of a larger multicentre RCT.

The objectives of the pilot trial were

- To assess rates of recruitment, eligibility, consent and follow-up at 6 months.
- To assess participant burden and data completeness of outcome measures.
- To assess the acceptability and feasibility of referral pathways from the perspective of the police.
- To assess the acceptability and feasibility of the intervention from the perspective of participants.

Study design

The study was a prospective, individually randomized internal pilot trial with equal probability of being allocated to one of two arms, the ReFrame intervention or business as usual (BAU).

Sample size considerations

In the pilot study, we aimed to recruit 72 participants, 36 in each arm, across three sites: Kent, Cornwall and Sefton. This would allow for exploration of key parameters needed to confirm sample size calculation for a definitive study. It is sufficient to allow estimation of two-sided 95% confidence intervals around the proportions of eligible, consenting, adhering and followed up at Month 6 in each arm of the study with half-widths <0.15. It exceeds the 30 per group recommended by Lancaster *et al*.[25] and the 35 per group recommended by Teare *et al*.[26]

Recruitment

Participants were assessed for initial eligibility by police custody staff. Inclusion criteria included being aged 10–17 years inclusive and being found in possession of class B, such as cannabis, amphetamines or Ketamine, or C, such as GHB or anabolic steroids, illicit substance. Young people were screened in the police station and excluded if they had been arrested for a sexual or serious violent offence, had a history of four or more previous offences or who had a substance severity that required specialist clinical intervention such as detoxification or medically assisted maintenance. All eligible participants were referred to We Are With You (WAWY), a national young person's substance misuse treatment provider, using a secure criminal justice email system.

Staff at WAWY made initial phone contact with the eligible young person and established whether potential participants were interested in participating in the study and if they were they provided a paper or email copy of the information sheet and passed their contact details to the trial research staff. Research staff contacted the young person and checked they understood the information sheet and answered any queries. If the young person was considered Gillick competent, in that they were considered mature enough to make their own decisions about any treatment, full signed consent was taken. If a young person was not considered Gillick competent, signed assent was taken from the young person and formal consent taken from a primary carer.

Immediately after consent, the young person completed the baseline outcome measures and was immediately randomized using a remote, independent secure randomization service to BAU or intervention. WAWY were informed of the allocation and delivered the allocated intervention.

Interventions

The intervention and control components are detailed in Table 1.

ReFrame intervention

The logic model for the ReFrame intervention is presented in Fig. 1. The intervention was developed in collaboration with young people as one part of an intervention to address a broad range of risk-taking behaviours.[27] The intervention consisted of two sessions of Brief Intervention, a short purposeful, personalized, non-confrontation psychosocial conversation, delivered by trained youth substance misuse workers. Each session lasts for ~45 min. In Session 1, they used a Drug Grid to reflect on how the young person's actions had affected their lives, family and wider community. The young person recalled their arrest experience and explained how this impacted them. The worker assisted the young person in critically reflecting on this event and offered support in relation to trauma or consequences they may feel.

The Drug Grid is a drug education exercise that enables the young person to demonstrate current understanding of different substances. As they go through the exercise they learn about these substances, being led by their own experience and building on their knowledge base. The worker can dispel myths and provide information on the effects of each substance, including the risks of poly drug use and overdose.

The second session is the Drug Triangle delivered 1 week after Session 1. Using the Drug Triangle, the young person focussed on the substance, mindset and setting. This holistic harm reduction approach ties in with contextual safeguarding, framing the young person's situation within a wider context. They spend time thinking about how this has affected them, their family and community. The young person is also encouraged to reflect on the impact on those people and communities that produce drugs.

At the end of the two sessions, the young person will have greater clarity about the risks they have taken, the links between substance use, risk-taking behaviour and offending, and the potential for criminal proceedings. The short-term aims are that the young person will have a greater understanding of their personal needs, increase in confidence to reduce substance use, and a positive shift from precontemplation to action and maintenance in the cycle of change.

Control intervention

In BAU, the young person receives one session of advice, information and signposting, including local and national sources of help and support. This is a Tier 1, universal level of support. It is unstructured and is based on a conversation only.

Outcome measures

The primary outcomes in this study were rates of referral, eligibility, consent, adherence and follow-up at Month 6. In

Table 1 Comparison of intervention and control components—TIDieR

Component	*ReFrame*	*Control*
Rational, theory or goal	Two sessions of brief psychosocial intervention	Single session of advice, information and signposting to community resources
Materials	Drugs grid, educational materials exploring knowledge and delivering psychoeducation. Drug triangle materials exploring substance use risks, harm reduction, impact of family and network	Unstructured conversation providing advice and information on local and national sources of support
Procedure	Personalized feedback on substance use and associated risks, provision of detailed advice and enhancing motivation to change	Short discussion regarding relationship between offending and substance use
Interventionist	Trained young person substance misuse worker	Trained youth worker
Delivery mode	Either in person face to face or by Zoom	Either in person face to face or by phone
Location	Substance misuse service or setting chosen by participant	Substance misuse service or setting chosen by participant
Session duration and frequency	Two sessions, each 50 min in duration, 2 weeks apart	One session, 20 min in duration

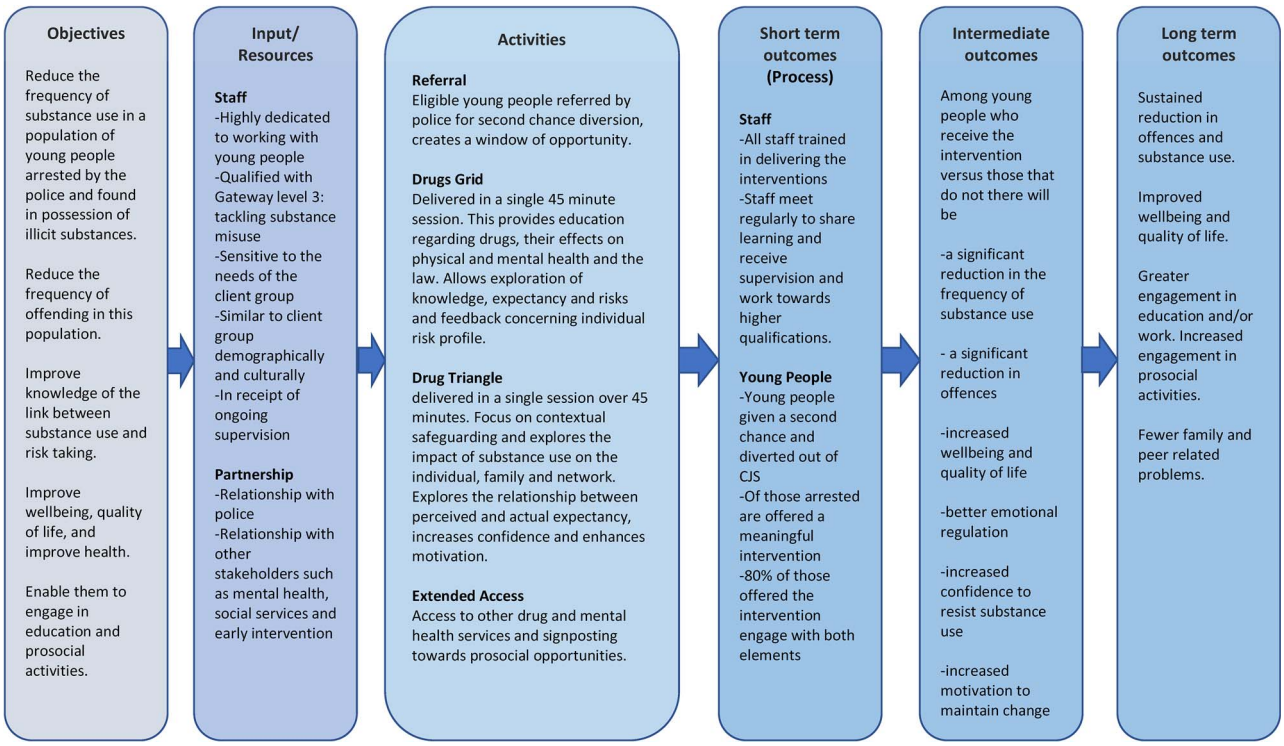

Fig. 1 Logic model indicating the proposed mechanism of action of the intervention.

addition, we aimed to test our outcome battery and assess participant burden and data completeness of primary and secondary outcomes proposed for a definitive trial. The primary quantitative outcome was offences committed in the 6 months post-randomization derived from the Self-Report Delinquency Scale (SRDS[28]). Frequency of substance use was assessed using the Time Line Follow Back 28 day (TLFB28[29]), mental health and wellbeing using the Warwick–Edinburgh Mental Well-being Scale (WEMWBS[30]) and attitudes and behaviour using the Strengths and Difficulties Questionnaire (SDQ[31]). Process measures include a measure of motivation to change, the readiness ruler (RR[32]), self-efficacy assessed

using the short-form situational confidence questionnaire (SCQ-8[33]), and positive and negative expectancies associated with substance use (SUE[34]). We also assessed key prognostic indicators of outcome in addition to key demographics, family relationships using the Brief Family Relationship Scale (BFRS[35]), anxiety using the General Anxiety Disorder Questionnaire (GAD7[36]), depression using the Personal Health Questionnaire for Adolescents (PHQ-A[37]) and adverse childhood events using the Adverse Child Experience Questionnaire (ACE-Q[38]).

The qualitative aspect of the study involved the collection of narrative accounts from a range of individuals using semi-structured interviews conducted over the telephone by the second and fourth authors. These were collected from young people participating, staff involved in the programme delivery and the police. Young people were interviewed within 6 weeks of intervention completion and staff were interviewed approximately half-way through the pilot study. Interviews focussed on eliciting any external or logistical issues impacting referral, intervention delivery or attrition, and any practices that could be amended to increase intervention acceptability.

Results

Recruitment and follow-up

The pilot trial was conducted between February and December 2022. A CONSORT diagram is presented in Fig. 2. Overall, 102 young people were considered potentially eligible during the recruitment period, of whom 95 (93.1%) were eligible and 76 (80.0%) were willing to consent. The most common reasons for non-consent included a lack of interest and an unwillingness to make a commitment to the study. Of those allocated, 38 (50%) were allocated to each group. Adherence was good with all of those allocated to BAU attending and all of those allocated to ReFrame attending the first session and 35 (92.1%) attending both sessions. At 6 months, eight (10.5%) participants were uncontactable, and one participant was deceased; the death was not considered attributable to any involvement in the study. Overall, 88.2% completed the 6-month assessment.

Quantitative findings

Baseline demographic and outcome variables by allocated group are listed in Table 2. The mean age of the sample was 15.8 years, the majority male (84%) and white (88%). On average, participants had committed 11 offences in the past 6 months and been abstinent from illicit substances for 60%, and alcohol for 91% of the previous 28 days. The randomization procedure worked as expected and baseline outcomes were balanced across the groups. The outcomes of interest for this study are presented in Table 3. The proportion eligible was 93% versus a pre-defined target of 70%, consenting 80 versus 70%, attending one session 100 versus 80%, attending both sessions 92 versus 80% and followed up at Month 6, 88 versus 80%. These indicate that the study achieved or exceeded all the stated targets. Changes in key outcome measures were observed across both groups at Month 6 with an increase in percent days abstinent from substances (63 to 72%) and a decrease in offending, 10 offences to 6 offences. Table 4 reports the outcomes for those followed up at Month 6 by allocated group. As an internal pilot study, no inferential analysis between the groups has been undertaken. These clear changes in key outcomes, offences and frequency of substance use, further warrant progression to a definitive trial.

Qualitative findings

The qualitative work sought to explore the feasibility and acceptability of referral pathways and the intervention. Interview length ranged from 16.2 to 45.6 min, young people mean 19.6 min, intervention staff 38.5 and police 29.0. All interviews were recorded and transcribed verbatim by an experienced transcriber and then coded and analysed by the second author using a thematic approach. First, a list of provisional codes was created based on the study aims and theoretical framework of the intervention. Second, in the process of coding, new 'grounded' codes were added to the provisional codes. Finally, following iterative dialogue between the data and codes, the codes were ordered into thematic categories. All data were anonymized, and securely stored and coded in NVivo v.12.

Several issues were identified. These included concern on the part of participants regarding the delay between being identified by the police as being suitable for diversion and being diverted; this was found to be due to the way in which diversion was handled by different police forces. Kent, for example, referred directly whereas Cornwall and Sefton had an intermediary youth justice panel who considered the young person's suitability for diversion. Some police officers raised concerns about how the ReFrame intervention fitted with their priorities; while accepting the importance of addressing young people's substance use, it was found that some officers considered it easier to issue no further action notices to first-time and low-level offenders.

Overall, young people had positive views of the ReFrame intervention. They highlighted how the initial session allowed them to build trust and rapport with the substance use

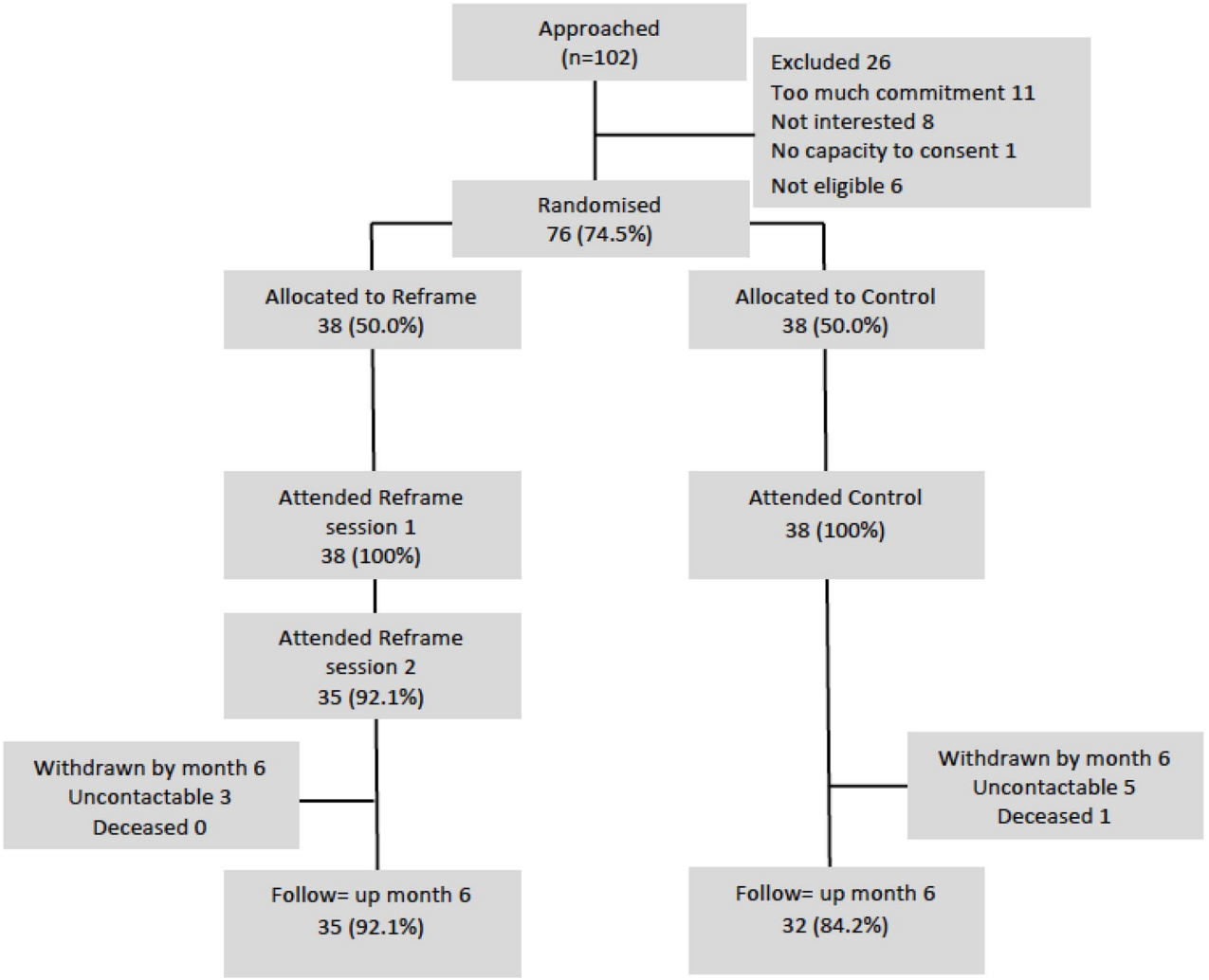

Fig. 2 CONSORT diagram highlighting the numbers eligible, consenting, adhering and followed up at Month 6.

workers and how sessions dispelled myths about substance use and associated risks, and how they developed a more detailed understanding of their substance use and enabled them to make more informed choices.

Interventionists also highlighted the positive relationships with young people but highlighted the need to separate their role from the police when making initial contact with participants.

Discussion

Main findings of this study

The progression criteria set in advance were all achieved or exceeded. From a process perspective recruitment, consent and follow-up rates were all acceptable for progression to a definitive RCT. The burden in completing the outcome assessments was not excessive, averaging 20 min at baseline and 17 min at Month 6, and the amount of incomplete data was low. Adherence to the intervention and control was high, an indication of acceptability on the part of the participants. Qualitative analysis highlighted several areas where the referral process could be improved: direct referral to the intervention provider rather than using a youth panel as an intermediary step. Young people had positive views about the intervention and welcomed the flexibility offered in delivery.

This is the first RCT of a diversion from police custody to intervention services for young people arrested in possession of illicit class B and C substances. Recruitment, consent and follow-up targets can be achieved, and adherence is high. Young people are positive about the intervention. Modifications to the referral pathways would enhance the delivery of the project, and this requires discussion with individual police forces. The progression parameters have been met and the study has progressed to a definitive RCT.

Table 2 Demographics and outcomes for those recruited by trial arm

	ReFrame *n = 38 (50.0%)*	*BAU* *n = 38 (50.0%)*
Mean age in years (SD)	15.76 (1.28)	16.03 (1.26)
Male *n* (%)	32 (84.21)	32 (84.21)
Ethnicity *n* (%)		
White	31 (81.58)	36 (94.74)
Mixed	5 (13.16)	1 (2.63)
Asian	1 (2.63)	1 (2.63)
Other	1 (2.63)	0
Mean % days abstinent substances (SD)	63.82 (37.90)	57.33 (37.96)
Mean % days abstinent alcohol (SD)	91.07 (16.20)	90.98 (15.73)
Mean self-report delinquency (SD)		
Number of offences	3.39 (3.10)	2.63 (2.66)
Quantity of offences	11.13 (11.64)	10.84 (11.64)
Mean police warnings (SD)	0.61 (1.13)	0.35 (0.75)
Mean police charges (SD)	0.69 (0.52)	0.84 (0.99)
Mean PHQ9 score (SD)	9.53 (6.74)	8.34 (5.72)
Mean GAD7 score (SD)	6.49 (5.50)	5.76 (4.84)
Mean family environment (SD)		
Cohesion	2.11 (1.97)	1.86 (2.18)
Expression	1.11 (1.17)	0.86 (1.13)
Conflict	2.51 (1.86)	2.00 (1.97)
Mean SDQ score (SD)		
Emotional regulation	3.13 (2.30)	3.39 (2.53)
Conduct	3.63 (2.41)	3.32 (2.27)
Hyperactivity	5.87 (2.57)	5.97 (2.71)
Peer support	2.63 (2.02)	2.60 (1.67)
Prosocial behaviour	6.66 (2.15)	6.92 (1.86)
Total score	15.26 (6.14)	15.29 (6.83)
Mean WEMWBS score (SD)	20.81 (4.18)	20.94 (4.13)
Mean SCQ score (SD)	70.85 (28.87)	75.23 (21.56)
Mean readiness score (SD)	3.00 (1.58)	4.00 (1.44)
Mean adverse childhood experiences (SD)		
Core	3.15 (2.43)	2.80 (2.68)
Additional	1.86 (1.40)	1.86 (1.56)
Mean expectancy (SD)		
Positive	50.47 (29.22)	45.42 (28.61)
Negative	61.26 (31.52)	61.05 (32.92)

What is already known on this topic?

Young people involved in the criminal justice system are more likely to re-offend than similar young people who are diverted away from formal proceedings. Young people who offend and use substances are significantly more likely to experience a range of negative social, psychological and physical consequences that in some cases last well into adulthood.

What this study adds

This pilot trial demonstrates that it is possible to conduct a RCT of the ReFrame diversion intervention in a population of young offenders who use substances. Young people are willing to consent and adhere to their allocated treatment. Follow-up rates at 6 months were high. The study will progress to the definitive stage and will be the first trial

Table 3 Trial feasibility outcomes

	Target %	*Achieved* %
Proportion referred who were eligible	70	93
Proportion eligible who consented	70	80
Proportion who attended one intervention session	80	100
Proportion who attended both intervention sessions	80	92
Proportion followed up at primary endpoint (Month 6)	80	88
Minimum data completeness—primary outcome	90	100
Minimum data completeness—secondary outcomes	70	99

Table 4 Outcomes by allocated group for those followed up at Month 6

	ReFrame *n = 35 (52.2%)*		*BAU* *n = 32 (47.8%)*	
	Baseline	*Month 6*	*Baseline*	*Month 6*
Mean PDA substances (SD)	62.95 (38.84)	72.35 (38.84)	62.16 (36.03)	71.32 (36.03)
Mean PDA alcohol (SD)	90.41 (16.72)	91.73 (10.60)	91.29 (15.39)	91.52 (11.85)
Mean self-report delinquency (SD)				
Number of offences	3.4 (3.21)	2.68 (2.58)	2.50 (2.65)	1.78 (1.64)
Quantity of offences	11.23 (12.00)	7.28 (7.93)	8.78 (11.14)	5.31 (5.93)
Mean police warnings (SD)	0.51 (1.04)	0.21 (0.70)	0.22 (0.42)	0.12 (0.37)
Mean police charges (SD)	0.73 (0.52)	0.97 (0.39)	0.72 (0.46)	0.94 (0.25)
Mean PHQ9 score (SD)	9.51 (6.93)	8.66 (5.94)	8.34 (5.72)	6.59 (5.52)
Mean GAD7 score (SD)	6.65 (5.43)	6.57 (6.66)	6.09 (5.08)	4.59 (4.42)
Mean SDQ score (SD)				
Emotional regulation	3.08 (2.19)	3.17 (2.57)	3.38 (2.27)	3.19 (2.00)
Conduct	3.60 (2.43)	3.46 (2.29)	3.22 (2.25)	2.59 (1.93)
Hyperactivity	5.88 (2.61)	6.23 (2.88)	5.97 (2.79)	5.91 (2.47)
Peer support	2.54 (2.08)	2.37 (1.39)	2.47 (1.63)	2.41 (1.07)
Prosocial behaviour	6.71 (2.22)	6.91 (1.72)	7.16 (1.90)	7.18 (1.97)
Total score	15.11 (6.03)	15.23 (7.15)	15.03 (6.87)	14.09 (5.28)
Mean WEMWBS score (SD)	20.97 (4.19)	21.21 (4.20)	15.03 (6.87)	22.12 (4.16)
Mean SCQ score (SD)	71.60 (29.39)	72.35 (29.64)	77.41 (20.38)	75.38 (25.11)
Mean readiness score (SD)	3 (1.64)	3 (1.75)	3 (1.47)	3 (1.53)
Mean expectancy (SD)				
Positive	49.91 (30.46)	43.79 (35.76)	48.41 (28.12)	41.94 (25.30)
Negative	61.34 (31.44)	62.86 (33.67)	62.88 (32.83)	63.22 (29.09)

of police diversion for young people who use substances in the UK.

Limitations

During the pilot study, we identified several limitations that we aim to address in a definitive trial.

We observed variation in how different police forces implemented the diversion process. In Kent, young people were referred for diversion directly by police staff; on the other hand, in Sefton and Cornwall, young people were referred first to a youth offending team panel who decided on whether referral for diversion was appropriate. It was noticeable that Kent recruited far more participants than the other sites and the time between arrest and diversion was shorter. We recommend that referral processes in all sites refer directly from police officers.

In our original protocol, we stated that we would derive offence data from the police national computer (PNC). On exploration of this data source, it became clear that youth cautions and youth conditional cautions only remain on the PNC for 3 months before being considered spent. In our definitive trial, we will use the local police database to derive offence data such as cautions, conditional or otherwise, these are held on local records for 5 years.

In the pilot study, we aimed to assess fidelity of intervention delivery by assessing blind a 20% sample of session recordings using the Behaviour Change Counselling Index checklist.[39] Interventionists were initially reluctant to record sessions as they felt it had the potential to breach the relationship they had built up with the young person. We provided additional training about the importance of assessing fidelity and the mechanism by which the young person's consent is taken to record sessions to ensure this outcome is collected in the definitive trial.

Conclusion

In conclusion, the pilot trial met all progression criteria and a few minor issues in the process identified. After minor modification, the study will proceed to a definitive RCT.

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Ethical approval

Ethics was sought prior to embarking on participant recruitment and was provided by an independent ethics committee, University of Kent Social Science Research Ethics Committee Ref SRC0498.

Conflict of interest statement

The authors have no conflict of interest to declare.

Trial registration

The trial was registered ref: ISRCTN133967729 and is available at https://www.isrctn.com/ISRCTN13396729.

Data availability

The data reported are part of an internal pilot study and will be used in the overall analysis of the definitive trial. The data are not available until after all analyses have been completed.

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