A digitally embedded intervention to enhance psychological decentering and reduce depression severity in at-risk adolescents: a randomised controlled trial of the 'One Step Back' programme

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Summary

Background Adolescence is a critical period for early mental health interventions. Scalable, evidence-based interventions for at-risk adolescents without severe symptoms are limited. We developed a low-intensity, digital programme to train psychological decentering (the ability to disengage from unwanted thoughts, feelings, and memories) as a core psychotherapeutic process for improving mental health.

Methods A two-arm randomised controlled trial compared a 5-week psychological decentering training ('One Step Back': OSB) programme with an active control (CTL) comprising physical and cognitive exercises (May 2021 to November 2022; ISRCTN14329613). Adolescents at-risk of depression were recruited through UK secondary schools, then randomised into trial arms (n = 114, 84% female; *M* age = 16.8 years, *SD* = 0.79). The primary outcome was self-reported decentering post-intervention measured using the Experiences Questionnaire. Secondary outcomes included symptoms of depression, anxiety, anger, and socio-emotional functioning, measured using standardised inventories. Analysis of covariance models were calculated, adjusting for baseline scores with an intention-to-treat approach.

Findings OSB was associated with improvements in self-reported decentering scores at post-intervention compared with CTL (M difference = 4.16 [95% CI 1.85–6.51]; p = 0.002; Cohen's d = 0.61). OSB participants reported decreased depression (M difference = −5.54 [95% CI −9.14 to −1.93]; p = 0.003, d = −0.60) and increased well-being (M difference = 4.53 [95% CI 1.21–7.86]; p < 0.001, d = 0.76).

Interpretation Psychological decentering was selectively trained in at-risk adolescents through a brief digital intervention. Training resulted in significant reductions in depression severity. Findings support this low-intensity approach to support adolescents before symptoms worsen.

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Keywords: Prevention; Digital mental health; Adolescence; Depression and anxiety; Psychological decentering

Research in context

Evidence before this study

There have been increasing calls for early-stage solutions to stem the rising rates of youth mental health problems, including the recent Lancet Psychiatry Commission for Youth Mental Health. However, effective early-stage psychology interventions are limited. Gold-standard approaches, such as Cognitive Behaviour Therapy and Mindfulness, can be too intense and inaccessible for pre-clinical adolescent samples. A promising alternative is to selectively target foundational skills that form part of extant evidence-based interventions. One such skill is psychological decentering—the self-reflective ability to separate oneself from challenging mental experiences and process them from a different (more objective) perspective. Before the registration of this trial, we conducted a systematic review of the literature via Web of Science. Using search terms such as 'decentering', 'defusion', 'self-distancing', and 'meta-awareness', 151 studies were identified for data synthesised. Findings suggest that psychological decentering is a skill that improves in the initial phases of several evidence-based psychological interventions, and it is associated with later reductions in depression and anxiety. No studies have directly investigated the benefits of selectively training decentering in at-risk adolescents.

Added value of this study

We developed a targeted, early-stage psychological intervention for school-based adolescents at increased risk of depression. The One Step Back programme works by teaching psychological decentring through short-form (~15-min), near-daily (5 days per week) exercises. This intervention is self-directed and delivered over 5 weeks through popular streaming services, thereby optimising scalability and accessibility for young people. In this RCT, decentering training was associated with significant reductions in depression severity and improvements in mental well-being (compared to an active control). These changes were also clinically relevant, with participants in the decentering groups being three times more likely to experience meaningful reductions in depression symptoms.

Implications of all the available evidence

Our findings show that a low-cost and highly scalable digital psychological intervention decreased symptoms in young people at risk of depression. This suggests decentering training is efficacious as a targeted early-stage intervention. Overall, these findings support a shift in healthcare policy and service provision—from reactive models focussing on the treatment of clinically severe presentations—to more early-stage interventions that mitigate clinical risk before symptoms escalate.

Introduction

Adolescence is a critical period for the emergence of mental ill-health symptoms that persist across development and grow in complexity and severity. Almost half of psychiatric disorders related to mood and emotion begin by age 14.[1] These early-stage concerns are usually characterised by symptoms falling below the established thresholds of clinical severity.[2] However, emergent mental health needs frequently go unmet since the formal criteria for a psychiatric diagnosis are not yet met. Once diagnostic thresholds are reached and care is sought, obstacles remain. Gold-standard psychological treatments offered by mental health services, and endorsed by clinical guidelines, are often inaccessible.[3] When care is accessed, positive outcomes typically require high-intensity, high-cost psychotherapeutic supports. Even then, around two-thirds of recipients respond to behavioural and cognitive therapies,[4] and one-third of these individuals will likely relapse in the future.[5] Early interventions that address subthreshold symptoms and counter the progression towards clinically severe presentations are, in principle, a more effective healthcare solution. Indeed, the 2024 Lancet Psychiatry Commission for Youth Mental Health emphasised the urgent need for scalable prevention approaches that can be disseminated globally to stem rising incidents of youth mental ill-health.[6]

Evidence for the effectiveness of early-stage primary prevention in reducing depression and improving well-being is mixed.[7] Our recent UK-wide cluster randomised controlled trial, including more than 8000 young people, found no support for the universal delivery (i.e., to all young people in the class, irrespective of their mental health status) of school-based mindfulness training either in preventing mental health problems or improving well-being.[8] Instead, findings suggest low adherence to and engagement with the intervention, reflecting poor acceptability among young people.[9] Psychological interventions such as mindfulness training or cognitive behaviour therapy are intensive and resource-intensive. They typically involve weekly, 1-h sessions supplemented with home-based exercises. Adolescents without current mental health challenges can struggle to find them relevant. Low-intensity,

indicated interventions targeting adolescents with emergent symptoms may therefore be a more acceptable and effective early-stage approach.[10]

A key means of reducing the intensity of early-stage interventions is to simplify protocols and focus on core psychotherapeutic components that drive change.[11] One core component of psychological intervention centres on techniques to help individuals separate themselves from their thoughts by observing mental struggles from a detached and dispassionate perspective. This self-reflective activity is a feature of many evidence-based psychological interventions, including Cognitive Behaviour Therapy, Mindfulness Training, Acceptance and Commitment Therapy, and analytical approaches.[12] Several terms have been used to describe this activity,[13] and we refer to it as 'psychological decentering'. In studies that have isolated this therapeutic component, brief psychological decentering exercises that increase the flexibility of one's self-perspective can reduce distress caused by challenging mental experiences (e.g., unpleasant and unwanted thoughts, feelings or memories).[14] Furthermore, the ability to adopt a decentred perspective was associated with higher mental well-being and lower levels of anxiety and depression in adolescents.[15]

We embedded strategies targeting psychological decentering within a novel low-intensity intervention programme for online self-guided delivery (the 'One Step Back' programme). Intervention materials were available remotely via podcasting and music streaming platforms. This format facilitated high accessibility at a relatively low cost and, at the same time, accommodated young people's preferences and social tendencies. We then evaluated its capacity to deliver positive mental health outcomes for vulnerable adolescents within a randomised controlled trial (RCT). A school-based sample of adolescents aged between 16 and 19 years with elevated depression symptoms, but not currently accessing mental health services, completed either a five-week psychological decentering training via the 'One Step Back' programme (OSB) or an active control (CTL) intervention. This control consisted of a combination of physical and cognitive exercises. Intervention content was delivered via podcast-style episodes, available on streaming platforms, along with an accompanying workbook. Full details are presented in the published protocol.[16] Our preregistered hypotheses were that the OSB group relative to the CTL group would (i) improve in their ability to use psychological decentering to manage distressing mental experiences, and (ii) experience better mental health and well-being outcomes.

Methods

Study design

The design was a two-arm, participant-level RCT comparing the 5-week OSB programme to a 5-week CTL condition comprising physical and cognitive exercises. The RCT was conducted by the University of Cambridge between May 2021 and November 2022. OSB and CTL were delivered remotely via streaming platforms (iTunes, YouTube, Spotify). The study was approved by The University of Cambridge Psychology Research Ethics Committee (PRE.2019.109). Informed consent was obtained from all participants online, prior to screening and again prior to trial participation (following a full briefing). The RCT was pre-registered (ISRCTN14329613). A full protocol was published,[16] and a detailed analysis plan was pre-registered online (https://osf.io/6eq5v).

Participants

Power analysis

Power analysis indicated that a sample of n = 90 (45 per trial arm) would provide 80% power to detect a between-group difference (OSB vs. CTL) on the Experiences Questionnaire (EQ) total score measured at post-intervention (primary outcome) using an ANCOVA adjusting for baseline EQ scores, assuming a medium effect size (f = 0.30) and a two-tailed alpha of 0.05. We anticipated approximately 20% attrition, resulting in a required sample size of N = 114 (57 per arm).

Recruitment and participant flow

Adolescents (16–19 years) were recruited from six secondary schools and sixth-form colleges within the UK and Ireland. Schools were selected based on existing research collaborations to maximise geographical spread. Within participating schools, the trial was advertised to Head Teachers, Mental Health Leads, and Special Educational Needs Coordinators who forwarded details to their pupils. The flow of participants is presented in Fig. 1. Interested adolescents volunteered to participate in the screening stage. Screening questionnaires were completed remotely by accessing a Qualtrics™ link shared by the school contact. Participants completed this questionnaire remotely, with no additional support from the research team. Gender was self-rated as either male, female, non-binary, 'other' (with an open text box), or 'prefer not to say'.

Inclusion criteria were: aged 16–19 years; attending secondary or further education; fluent English; and scoring >16 on the Centre for Epidemiological Studies–Depression Scale (CES-D).[17] A CES-D score $\geq$16 indicates that participants were at risk for depression. Eligible participants were invited to complete a tele-appointment to assess additional inclusion and exclusion criteria. Exclusion criteria were: a recent mental health diagnosis (within the past 6 months) including anxiety disorders, mood disorders, or a traumatic stress disorder; current or recent (within the past 6 months) treatment for a mental health condition; currently taking part in a regular (1-or-more per week)

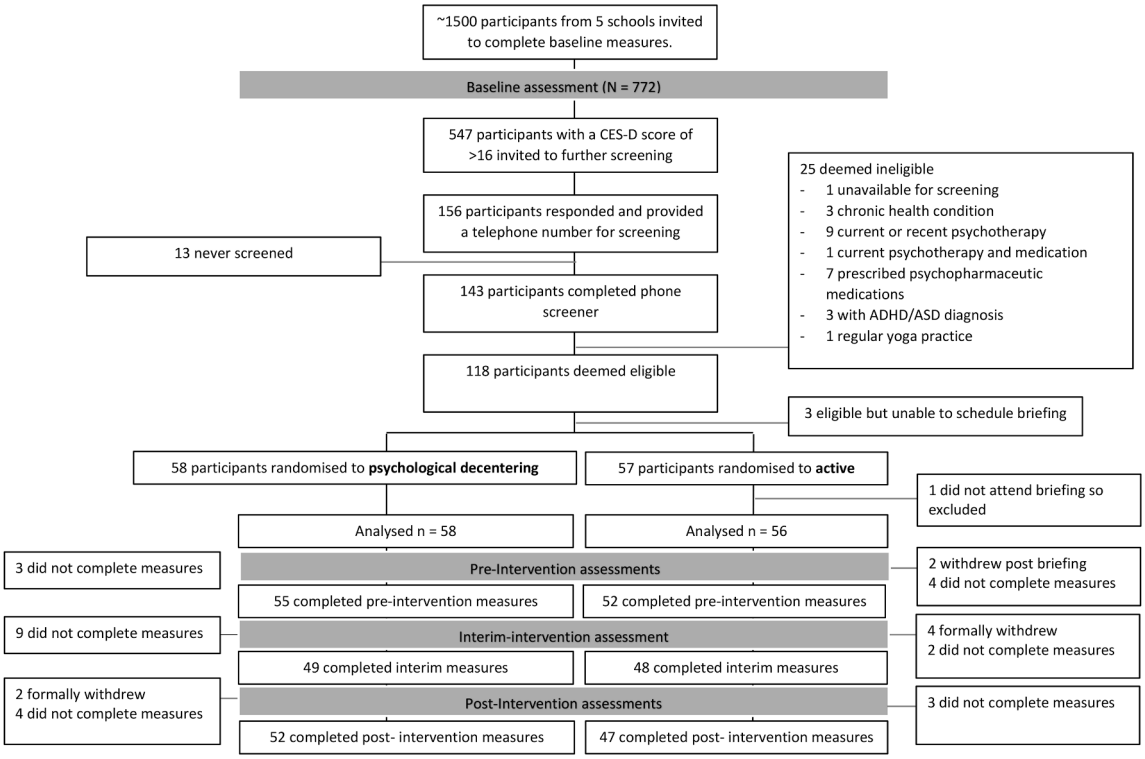

Fig. 1: **CONSORT flow diagram**.

yoga and/or mindfulness class/workshop; prior participation in formal meditation training and/or a mindfulness-based stress reduction course; current or recent access (within the past 6 months) to mental health supports such as psycho-pharmacological intervention, talk-therapies and/or counselling; currently experiencing chronic physical illness that would preclude participation in the control intervention involving physical stretching (e.g., epilepsy, chronic pain, cancer); a diagnosis of a neurodevelopmental condition such as autism or attention deficit/hyperactivity disorder.

Inclusion/exclusion criteria were reviewed with each eligible participant during a structured telephone screening appointment hosted by a trained member of the research team. Participants were not provided with individual CES-D scores. However, a safeguarding protocol was in place: if participants indicated elevated distress or risk during screening or subsequent contact, a distress management procedure was implemented, including signposting to appropriate support services.

Eligible participants were invited to take part in the trial. Participants who verbally consented were invited to a 30-min video-call briefing. Before the video call, participants were randomly assigned to either OSB or CTL. After the video call, written consent and pre-intervention measures were collected.

Randomisation and blinding

Eligible, consenting participants were allocated to CTL and OSB using a minimisation procedure, stratified by depression severity, by the trial statistician, who was blind to group membership. Two strata were used for depression severity: CES-D scores between 16 and 26 (at-risk), and CES-D scores of 27 or more (probable caseness) [24]. As with trials of psychological interventions, participants could not be blinded to intervention allocation.

Interventions

During the briefing, participants were informed that they were in a study on how skills training impacts mental well-being. To improve the plausibility of the CTL condition, participants were informed that they were participating in a skills training programme involving light physical exercise and 'brain training' to assess the program's impact on mental well-being. The safety protocol and information on public patient involvement in the development of this intervention are outlined in the Methods Supplement (Supplementary Materials).

Psychological decentering training

The OSB group completed the 5-week 'One Step Back' programme, delivered remotely via podcast-style audio

recordings and an accompanying digital workbook. Audio recordings were between 10 and 15 min long and were available on streaming platforms (e.g., Spotify, iTunes, Apple Podcasts). Intervention materials are available online (https://osf.io/f9u45/).

Adolescents used these recordings to guide their practice of one intervention exercise per day, Monday to Friday, each week. Two recordings a week focused on mindfulness-based exercises that encouraged participants to monitor their mental experiences, including thoughts, feelings, and emotions. Three recordings a week featured a psychological decentering exercise that encouraged participants to learn concrete ways to adopt an objective, or distanced, self-perspective in response to challenging feelings, thoughts, and/or memories.

The One Step Back programme was theory-informed and guided by a recent model of self-distancing.[18] It suggests that a shift in self-perspective can be achieved by introducing a person to new spatial, hypothetical, temporal, or objective information. Week 1, therefore, introduced spatial distancing. Participants were taught to reimagine negative memories from a physically distant perspective (e.g., 'replay the memory but as if you're a fly on the wall'). Week 2 introduced verbal distancing. Participants were taught to create distance by rephrasing negative self-relevant thoughts (e.g., 'replace first-person pronouns with one's name'). Week 3 introduced temporal distancing. Participants were taught to reconsider specific worries from a temporally distant future (e.g., 'how would this seem in 5 years?'). Week 4 introduced objective distancing. Participants were taught to adopt a third-person perspective towards negative memories (e.g., 'What would a passer-by have noticed?). Week 5 was a revision week, and participants could practice any of the above.

The intervention was designed as a brief, low-intensity approach that optimises accessibility and relevance for adolescents with early-stage symptoms. Using 4 exercise types over 5 weeks allowed us to support the different ways challenging mental events can manifest, including difficult memories, negative self-referential thoughts, and distressing worries. Repeating each exercise for short daily periods (10–15 min) over five consecutive days was intended to maximise skill acquisition and consolidation while limiting participant burden, and was informed by discussions with experienced clinicians and our PPI advisors. The digital, streaming-based delivery format was chosen to build on adolescents' existing media engagement patterns and to facilitate future dissemination.

Control training

The CTL group completed a programme designed to match the OSB group as an attention placebo control. In place of the mindfulness-based exercises, participants completed guided 10–15 min physical movement routines available via a video hosted on YouTube. In place of psychological decentering exercises, participants completed a gamified version of standard cognitive tasks (each lasting 10–15 min) with no content designed to develop decentering skills. These were available through a web-based app [2]. Intervention materials are available online (https://osf.io/f9u45/).[k]

Adherence

Adherence and engagement to OSB and CTL were monitored through an end-of-day questionnaire. Participants were asked to report on the completion of intervention components and to evaluate their experience. Phone call check-ins were also completed at the end of week 3 to encourage adherence. Individual adherence data, including participant-specific video and audio downloads, were not accessible. All participants completed a post-intervention debriefing phone call and had the opportunity to ask further questions.

Trial outcomes

Outcome measures were completed electronically at screening (pre-randomisation baseline), immediately post-briefing (pre-intervention), the end of week 3 of the interventions (interim), and at the primary end point (post-intervention) (Fig. 2).

Primary outcome

Our primary outcome was the ability to use psychological decentering, measured at post-intervention using the EQ[19] – a self-rated inventory that estimates the ability to characterise thoughts and feelings as mental experiences, rather than as accurate reflections of reality, and to remain mentally-distanced from them. An example item is '*I can observe unpleasant feelings without being drawn into them*'. Items are answered using a 5-point Likert scale ranging from 1 = 'Never' to 5 = 'All the time'. Higher sum scores reflect greater psychological decentering. This is the most widely used inventory in psychological decentering research and possesses good psychometric properties.[14,19] The

[k]Experience sampling methods (ESM) were included in the trial. The aim was to examine participants' ability to use psychological decentering in response to everyday triggers such as difficult thoughts and feelings. The full list of ESM items can be found in Supplemental Materials. However, adherence was low and due to the volume of missing data, the sample size was insufficient for analysis. ESM data are therefore not reported here (Table S1). A battery of performance-based cognitive tasks were also included as part of this study, at baseline and post-intervention. These tasks were completed online and were used to estimate affective cognitive control and self-referential processing abilities for each participant. These tasks were included as part of an investigation into the cognitive correlates of psychological decentering and will be described in a separate manuscript. Details are reported in our pre-registered protocol.

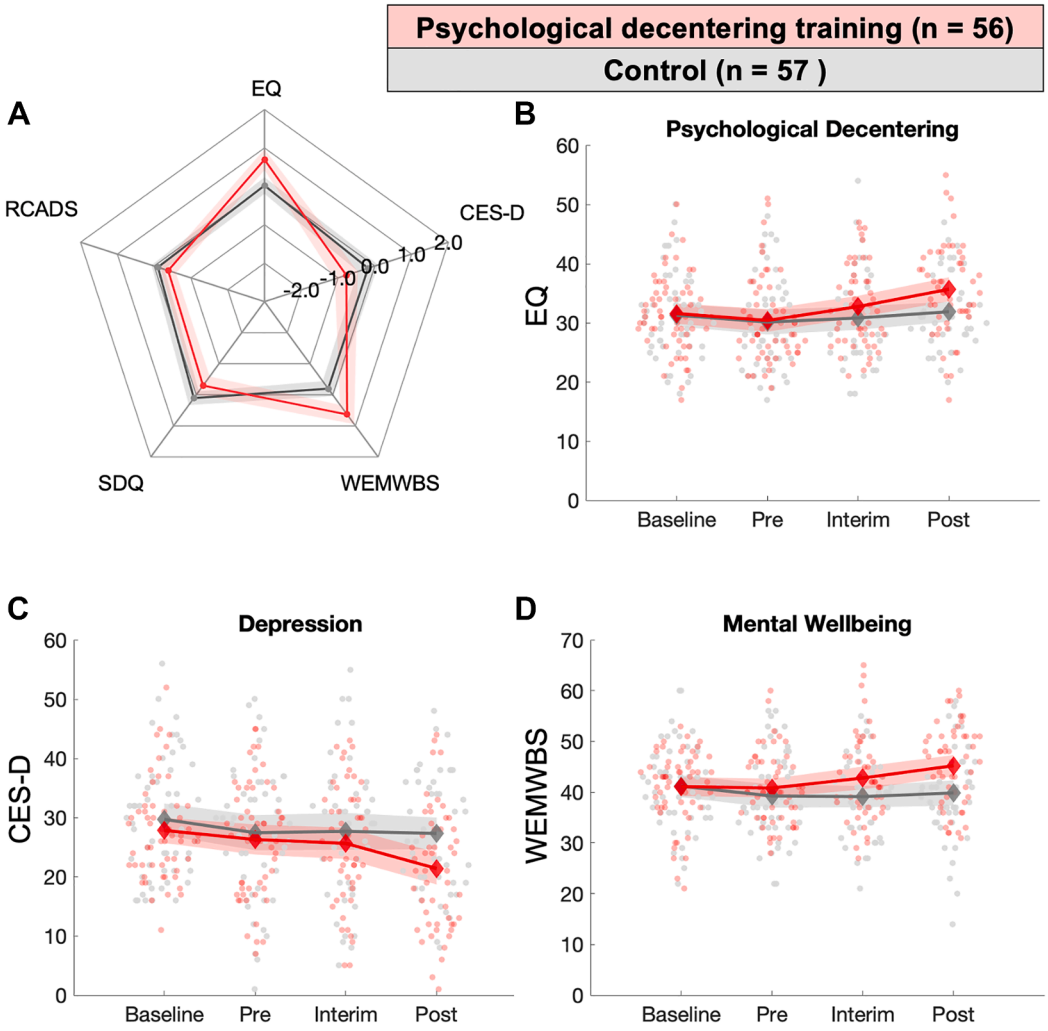

Fig. 2: **Primary and Secondary Outcomes. (A) A Spider plot** was created to illustrate mean change in each outcome measure, from baseline to post-intervention. Baseline and post-intervention scores for each participant point were z-transformed using baseline M and SD values for the total trial sample (n = 113). For illustration, each participant's baseline score was then subtracted from the post-intervention score to give a z-score change, and means were calculated for each trial arm. EQ = Experiences Questionnaire (M ± SD = 31.4 ± 6.8; n = 113); CES-D = Centre for Epidemiological Studies–Depression Scale (M ± SD = 28.9 ± 9; n = 113); WEMWBS = Warwick Edinburgh Mental Well-being (M ± SD = 41.1 ± 7.5; n = 113); SDQ = Strengths and Difficulties Questionnaire (M ± SD = 19.5 ± 4; n = 113); RCADS = Revised Child and Adolescent Depression Scale (M ± SD = 17.7 ± 7.8; n = 113) (raw scores reported). **(B) Psychological decentering** was measured using the EQ (primary outcome) and scores increased more for adolescents in the psychological decentering training ('One Step Back' Programme; OSB) group, relative to controls (CTL) at post-intervention (adjusting for Baseline ability and Baseline CES-D scores). **(C) Depression symptom severity** was measured using the CESD. At post-intervention, depression severity reduced for adolescents who completed OSB relative to CTL participants (adjusting for Baseline CES-D scores). **(D) Mental wellbeing** was measured using the WEMEBS. At post-intervention, mental wellbeing scores on the WEMWBS increased for adolescents who completed OSB relative to CTL (adjusting for Baseline WEMWBS scores). For each panel, the shaded area in colour around the trend lines illustrates 95% Confidence Intervals (CI).

internal consistency of the EQ was estimated by using baseline data to calculate Cronbach's alpha. Reliability of the questionnaire was good (α = 0.88).

Secondary outcomes

Secondary outcomes were depression and anxiety symptom severity, mental well-being, and socio-emotional strengths and difficulties using inventories validated for mental health research in school-based samples.[9]

Depression was estimated using the Centre for Epidemiology Depression Scale (CES-D).[17] This 20-item self-report scale measures symptoms over the past week. Cronbach's alpha was calculated using baseline

data, and the internal consistency was good (α = 0.88). The CES-D includes cut-offs for being deemed at risk and of 'probable caseness'. Scoring above the at-risk' cut-off was an inclusion criterion for the trial.

Anxiety was estimated using the Revised Child Anxiety and Depression Scale-Short Version (RCADS-15).[20] This 15-item scale includes sub-scales for separation anxiety disorder, social phobia, generalised anxiety disorder, panic disorder, obsessive compulsive disorder, and low mood. Cronbach's alpha was calculated using baseline data, and the internal consistency of the RCADS-15 was good (α = 0.84).

Mental well-being was evaluated using the Warwick–Edinburgh Mental Well-being Scale (WEMWBS)[21]—a 14-item scale investigating positive mental health, including positive affect, functioning, and inter-personal relationships. Cronbach's alpha was calculated using baseline WEMWBS data, and the internal consistency was good (α = 0.87).

Anger was measured using the State-Trait Anger Expression Inventory-2 Child and Adolescent version (STAXI), which is a 35-item self-report inventory.[22] Cronbach's alpha was calculated using baseline STAXI data, and the internal consistency was acceptable (α = 0.78).

Finally, the Self-Report Strengths and Difficulties Questionnaire (SDQ) measures socio-emotional functioning with subscales assessing Emotional, Conduct, Hyperactive, and Peer problems as well as prosocial strengths.[23] Cronbach's alpha was calculated using baseline SDQ data, and the internal consistency was acceptable (α = 0.75).

Adherence monitoring, acceptability, and other measures

Adherence and acceptability were monitored using daily electronic diaries, which were emailed to participants throughout the intervention. Each participant was asked to complete 33 diary entries: eight during the pre-intervention baseline phase (focussing on mood and coping), and 25 during the five-week intervention (five diaries per week). During the intervention, participants could self-report exercise completion and provide ratings of each exercise's difficulty, relevance, applicability, and effortfulness, using a 7-point Likert scale (where 1 = "not at all", 3 = "somewhat", and 7 = "extremely").

The socio-economic context for each participant was estimated through self-reported eligibility for free school meals and the Family Affluence Scale.[24] Participants completed a feedback questionnaire post-intervention. Questions focused on the acceptability of the intervention, issues related to engagement, and whether participants had feedback or comments for the researchers. As reported in our protocol, measures on emotional regulation, mindfulness, and COVID-19-related anxiety were also collected to address other research questions unrelated to this trial.[16]

Statistical analysis

The analysis plan was preregistered.[16] Data processing and analysis were completed using RStudio (V1.3.1093), MATLAB (R2018a 9.4.0.813654), and SPSS (28.0.0.0). Data were analysed using the principle of intention-to-treat by the trial statistician (PW), who was blind to intervention allocation. Missing data were assumed to be missing-at-random and were multiply imputed within SPSS using an MICE algorithm (See Supplemental Materials). Twelve imputed datasets were generated. As per our published protocol, primary and secondary outcomes were analysed using analyses of covariance (ANCOVA). These calculated the effect of group (OSB vs. CTL) after adjusting for baseline scores and our stratification variable of baseline depression severity. Baseline values were defined using participant intake scores collected before randomisation, rather than pre-intervention scores collected around the briefing stage (Fig. 1). The results remained consistent when adjusting for either time point (see Table 2 and Table S2).

Role of the funding source

The funders had no role in the study design, collection, management, analysis, interpretation of data, or manuscript preparation and publication.

Results

The CONSORT diagram of participant flow through the trial is shown in Fig. 1. A total of 118 adolescents met the eligibility criteria. Three declined to continue before randomisation, leaving 115 who were randomised into intervention arms (OSB, n = 58; CTL, n = 57). One participant in the CTL group did not attend the briefing and withdrew before the intervention. A total of 114 participants completed pre-intervention measures (OSB, n = 58; CTL, n = 56).

Table 1 shows the Baseline characteristics of the sample. Of the participants recruited to the trial, 87.71% provided data on the primary outcome at post-intervention (91.37% in the OSB arm and 83.92% in the CTL arm). Self-reported eligibility for free school meals was 5.36% of the OSB group and 3.51% of the CTL group. These values fall below UK norms (around 24%; see Table 1). Mean scores on the Family Affluence scale placed participants in the higher-affluence range. Table 2 and Fig. 2 provide an overview of the analyses of the primary and secondary outcomes.

For the primary outcome of psychological decentering at post-intervention, ANCOVA indicated a main effect of condition after adjusting for baseline EQ values (adjusted *M difference* = 4.16 [95% CI 1.85–6.51];

	CTL group (n = 56)		OSB group (n = 58)	
Sex	n	%	n	%
Male	7	12.5	11	19
Female	44	78.6	38	65.5
Other	1	1.79	6	10.3
Eligible for free school meals	3	5.36	2	3.45
	Mean	SD	Mean	SD
Age (range 16–18)	16.87	0.79	16.67	0.79
Family affluence scale	7.55	2.66	8	2.55
Primary outcome				
EQ	31.29	7.06	31.57	6.5
Secondary outcome				
CES-D	29.7	9.97	27.83	8.1
RCADS				
GAD	4.18	2.04	4.24	2.19
OCD	1.79	2.47	2.03	2.45
PD	2.73	2.26	2.86	2.33
SAD	1.88	1.72	2.6	1.86
SOC	6.29	2.3	6.59	2.16
Total	16.86	7.25	18.33	8.23
SDQ				
Emotional symptoms	6.14	2.01	6.26	2.31
Conduct problems	3	1.78	3.19	1.62
Hyperactivity	5.27	1.68	5.53	1.65
Peer problems	4.66	1.5	4.88	1.23
Prosocial behaviour	7.57	1.92	7.47	1.96
Total	19.07	3.95	19.86	4.06
STAXI[a]	11.31	2.73	11.44	2.37
WEMWBS	41.18	8.01	41.1	7.09
Other measures				
CAMM	23.43	6.32	23.53	6.1
CAS	6	5.48	7.11	6.03
CERQ	102.4	17.2	98.64	16.5
DERS	110.7	21.7	108.3	23.61

These data were collected from eligible adolescents who attended the initial briefing and so do not include one participant randomised to CTL who did not attend. UK Norms: 24.6% of secondary school children in the UK are eligible for school meals (Department of Education, 2024). Family Affluence Scale: 0–6 – Low Affluence. 7–9 – Medium Affluence. 10–13 – High Affluence (Torsheim et al., 2016). CTL = Control group. OSB = 'One Step Back' programme for psychological decentering training. CAMM = Child and Adolescent Mindfulness Measure, CAS = Covid Anxiety Scale, CERQ = Cognitive Emotion Regulation Questionnaire, CES-D = Centre for Epidemiological Studies–Depression, DERS = Difficulties in Emotion Regulation Scale, EQ = Experiences Questionnaire, RCADS = Revised Child Anxiety and Depression Scale, GAD = Generalised Anxiety Disorder Subscale, OCD = Obsessive Compulsive Disorder Subscale, PD = Panic Disorder Subscale, SAD = Separation Anxiety Disorder Subscale, SOC = Social Anxiety Subscale, SDQ = Strengths and Difficulties Questionnaire, STAXI = State-Trait Anger Expression Inventory, WEMWBS = Warwick Edinburgh Mental Wellbeing Subscale. [a]This scale was first administered at the pre-intervention (and note baseline) time point; pre-intervention is here considered as baseline for the STAXI only.

Table 1: **Demographic and characteristics of adolescents at baseline.**

$t(111) = 3.05$, p = 0.002, d = 0.61). As hypothesised, the OSB group reported higher adjusted EQ scores at post-intervention compared to the CTL group (Fig. 2B).

For the secondary mental health outcomes at post-intervention, ANCOVA indicated a main effect of condition on depression severity adjusted for baseline CES-D scores (adjusted *M difference* = −5.54 [95% CI −9.14 to −1.93]; $t(111) = 3.01$, p = 0.003, d = −0.60). The OSB group reported lower CES-D scores compared to the CTL group (Fig. 2C).

ANCOVA also revealed a main effect of group on well-being scores after adjusting for baseline WEMWBS scores (adjusted *M difference* = 4.53 [95% CI 1.21–7.86]; $t(111) = 3.84$, p < 0.001, d = 0.76). The OSB group reported higher adjusted WEMWBS scores compared to the CTL group (Fig. 2D).

There were no significant effects of psychological decentering training on RCADS, SDQ, or STAXI scores (Table 2). Importantly, changes in depression and well-being scores were statistically significant after Bonferroni adjustment of the alpha level for multiple secondary outcomes. Bonferroni corrected alpha = 0.01 (i.e., 0.5/5 secondary outcomes).

Change in primary and secondary outcomes up to the interim-intervention assessment timepoint was also investigated (Table S3). ANCOVAs adjusting for baseline scores yielded a moderate increase in WEMWBS ratings in the OSB group when compared to the CTL group (adjusted *M difference* = 3.88 [95% CI −6.64 to −1.50], $t(98) = 2.74$, p < 0.006, d = 0.55) that survived Bonferroni correction. This suggests that changes in well-being emerged early in the intervention. There were no significant effects of condition on any other outcome at mid-intervention.

As per our protocol, Reliable Change Indices (RCI) were calculated for CES-D scores at post-intervention relative to Baseline using the Leeds Reliable Change Indicator.[25] This analysis assessed whether the change in scores significantly exceeded that expected from normal measurement variability; the conventional threshold for reliability is RCI >1.96. Both the OSB and CTL groups exceeded this threshold (CTL = 10.56; OSB = 8.89), suggesting significant symptom improvements across both arms of the trial.

Clinically Significant Change (CSC) was also investigated to determine the proportion of participants whose CES-D depression scores improved reliably and fell below the clinical cut-off (CES-D < 16). All participants were above this cut-off at trial entry. Post-intervention, 17 participants from the OSB group (29.31%) and 5 participants from the CTL group (8.77%) met the criterion for CSC. The difference was statistically significant ($\chi^{21} = 5.73$, p < 0.05). Adolescents in the OSB group were 3.3 times more likely to show meaningful improvements in depression severity.

An intake error resulted in the inclusion of one participant in the OSB group whose CES-D score fell below the clinical cut-off for trial eligibility. A sensitivity analysis was conducted, excluding this ineligible participant, to assess the robustness of the findings. Results remained consistent with the primary analyses. ANCOVA indicated significant group effects on

	CTL group (n = 47)			OSB group (n = 53)			Pooled parameter estimates		
	Mean	SE	95% CI	Mean	SE	95% CI	T	P	d
EQ	31.87	0.91	30.17–33.65	35.66	1.02	33.69–37.56	−3.05	0.002**	0.61
CESD	27.32	1.44	24.49–30.02	21.4	0.83	18.48–24.19	3.01	0.003**	0.6
RCADS	15.89	1.08	13.88–18.14	16.04	1	14.05–17.90	1.24	0.22	0.25
SDQ	19.34	0.65	18.04–20.64	18.91	0.39	17.76–20.06	1.45	0.14	0.29
STAXI	11.68	0.34	11.04–12.36	11.15	0.26	10.63–11.66	1.5	0.13	0.3
WEMWBS	39.85	1.39	37.10–42.32	45.75	1.07	43.13–47.27	−3.84	<0.001***	0.76

Descriptive statistics (means, n-values standard errors) are based on observed data and 95% confidence intervals were generated using 1000 bootstrapped samples. ANCOVA models were calculated using baseline scores as covariates. Missing data were addressed using multiple imputation, with 12 imputed datasets generated. Models were run separately on each imputed dataset, and results were pooled to produce the summary estimates reported here. CTL = Control group. OSB = One Step Back programme (psychological decentering training). EQ = Experiences Questionnaire, CES-D = Centre for Epidemiological Studies - Depression, RCADS = Revised Child Anxiety and Depression Scale, SDQ = Strengths and Difficulties Questionnaire, STAXI = State Trait Anger Expression Inventory, WEMWBS = Warwick Edinburgh Wellbeing Scale. df = 110, * = p < 0.05, ** = p < 0.01, *** = p < 0.001.

***Table 2*: Post-intervention scores, and ANCOVA outcomes comparing groups at post-intervention.**

psychological decentering (t(110) = 3.34, p < 0.001, d = 0.63), depression severity (t(110) = −2.98, p = 0.003, d = −0.56), and well-being (t(110) = 3.99, p < 0.001, d = 0.75). Full results are presented in Table S4 (Supplemental Materials).

As an additional sensitivity analysis, primary and secondary outcomes were analysed using complete cases only (n = 99; 86.1% of the total sample). This included 52 of 58 participants (89.7%) in the OSB group and 47 of 57 participants (82.5%) in the CTL group. Findings were consistent with the primary analysis based on multiply imputed data: all significant effects were replicated in direction, magnitude, and statistical significance (see Table S5 in the Supplemental Materials).

Mediation analysis was used to explore whether early change in psychological decentering predicted subsequent changes in mental health outcomes in the OSB compared to the CTL group (see Supplemental Materials). Findings did not support an indirect effect of psychological decentering on mental health outcomes. However, the analysis was underpowered and should be interpreted with caution.

Adherence and acceptability data were gathered using electronic daily diaries. Findings are shown in Supplemental Materials (Table S6 and S7). When diaries were submitted, participants reported completing the scheduled exercises 85% of the time. Adherence was nearly identical between groups (OSB: 86%; CTL: 86%). However, diary completion was limited, with participants submitting 56% of diaries (OSB: 57%; CTL: 56%). Considering all scheduled exercises—regardless of whether the diary was submitted - participants reported completing 66.65% of exercises (OSB: 66%; CTL: 68%). This means, depending on how adherence is calculated, participants completed between 66 and 85% of exercises.

Discussion

In this RCT, we compared a novel self-guided online psychological decentering training (OSB) programme to a control intervention (CTL) for vulnerable adolescents at risk of depression to evaluate effects on the ability to psychologically decenter as well as on mental health and well-being. The psychological decentering training ('One Step Back') programme was informed and guided by a recent model of self-distancing,[18] suggesting that a change in self-perspective can be achieved by introducing a person to new spatial, hypothetical, temporal, or objective information. A set of exercises was selected from elements of cognitive-behavioural therapy, acceptance and commitment therapy, mindfulness-based therapy, and compassion-focused therapy.[14] Exercises were adapted for brief, self-guided, and age-appropriate administration through piloting and PPI involvement. OSB, therefore, taught adolescents a new way to reflect on challenging mental experiences: one that reduces emotional distress by shifting awareness from immersion in the thematic content of thoughts and memories to observation of the process of generating them. Repeating daily, short exercises was intended to support the acquisition and consolidation of this self-reflective skill. Rehearsing exercises in daily life, via streaming services, and with self-generated thoughts, worries, and memories, was intended to support generalisation to everyday contexts. We therefore expected this learning process to be captured by changes in a self-reported measure of how people use psychological decentering to view their thoughts, as indexed by the Experiences Questionnaire (EQ).

The OSB group reported improvements in the ability to use psychological decentering at post-intervention (the primary outcome; EQ scores), relative to the CTL group, with a medium effect size. The OSB group also reported a significant decrease in depression severity and a significant increase in mental well-being relative to the CTL group, with medium effect sizes. These findings support our hypotheses on the benefits of psychological decentering. We found no difference between groups for the additional mental health outcomes of anxiety or emotional and behavioural

difficulties. Additionally, RCI showed significant symptom improvement in the CTL group and OBT, indicating that elevated depression may have decreased over time and with support from brief, structured interventions.[26]

Through the 5-week One Step Back programme, adolescents with elevated depression symptoms, such that they were deemed to be at risk, were able to learn to use psychological decentering to cope with difficult mental experiences. This included everyday distressing and unpleasant self-referential thoughts, memories, and feelings. Our online psychological decentering intervention was also associated with clinically beneficial changes in depression and well-being, but not self-reported anxiety or socio-emotional functioning. The intervention content may therefore be more relevant to the symptoms and experiences of depression, with exercises focused on shifting perspective away from negative self-referential thoughts and memories. Future versions could therefore incorporate ways of approaching distressing feelings, sensations, and cognitions that are typical of anxiety; this includes intense fearfulness, dread, and breathlessness, as well as distorted cognitions such as catastrophizing and threat generalisation.

In a recent systematic review of the literature, we synthesised evidence that psychological decentering is a core component across multiple psychological therapy paradigms for the alleviation of mood and anxiety disorder symptoms during adolescence.[14] Our findings suggested that decentering skills may improve during different behavioural and cognitive therapies, and this improvement facilitates downstream reductions in symptom severity.[12,27] The current study extends these findings by showing that techniques for psychological decentering can be compiled into an acceptable, accessible online intervention programme that effectively trains adolescents in psychological decentering. Furthermore, this training delivers benefits in symptoms of depression and well-being, indicating that it represents a viable early-stage mental health prevention for vulnerable adolescents. Psychological decentering training may therefore provide a low-cost, scalable solution for healthcare services while being highly acceptable for adolescents due to its low intensity and digitally embedded content.

The relationship between psychological decentering and mental health symptoms remains unclear. One cognitive model suggests that meta-awareness helps individuals to separate themselves from the content of challenging mental experiences.[13] This process of disidentification may alleviate everyday struggles that otherwise inflate depression and anxiety risk in vulnerable individuals.[13–15] Previous research suggests that changes in psychological decentering occur before clinical outcomes,[27] but these findings were not replicated in the current study. Here, depression was stable from baseline to interim-intervention, whilst a moderately sized increase in psychological decentering was observed in the OSB group. Future research should therefore explore the precise mechanisms of change using fully powered process-outcome designs.

A critical feature of this intervention is that materials were digitally embedded and made available through existing streaming platforms already popular with young people. This approach offers several benefits. First, it results in an intervention that requires minimal input from trained healthcare professionals. This outcome is particularly advantageous for healthcare systems struggling with strained resources and challenges in providing accessible and equitable clinical services. Indeed, evidence indicates that psychological intervention approaches that leverage social media platforms can offer a low-cost, scalable solution to promote youth mental health and reduce symptom severity.[28] Second, the intervention aims to maximise acceptability by delivering short, daily online sessions that teach a core skill to help manage everyday psychological challenges. Clinically meaningful symptom reductions were found following ~15 min of daily exercises, five days per week, over five weeks, in a self-directed intervention delivered for free using widely available platforms. This outcome is promising and consistent with existing evidence supporting the efficacy of self-directed, short-form interventions targeting psychotherapeutic processes.[26] Overall, this intervention approach has the potential to provide long-term benefits to health services through its targeted preventive approach to at-risk youths. Equipping these young people with an essential therapeutic skill at an early stage of psychological distress may reduce the long-term number of patients experiencing clinically severe symptoms of depression, all while placing modest demands on healthcare resources.

Limitations warrant consideration. Regarding generalisability, schools from an existing collaboration network were recruited, and participants were required to actively opt in after screening. Furthermore, those with additional learning needs and developmental difficulties were excluded because the intervention materials had not yet been adapted for these groups. These factors may have biased our sample, for example, towards adolescents inclined to seek mental health support. The sample was predominantly female and relatively more socio-economically advantaged compared to UK norms. Future research will improve sample representativeness to evaluate whether the One Step Back programme is accessible to diverse, community samples of adolescents. Second, the study lacked a follow-up time point, and so the longevity of clinical outcomes is unclear. Although studies in adult samples suggest sustained increases in decentering over extended periods following mindfulness-based and cognitive interventions,[29] it is unclear whether similar

patterns would be observed in adolescents. Third, adherence monitoring posed a practical challenge. Engagement was assessed using self-rated diaries, of which just over half were completed. Estimates of exercise completion also varied, ranging from 66% to 85%. This level of missing data precluded a robust evaluation of the relationship between engagement and trial outcomes. Reliable and valid adherence metrics must be identified in the future. Notwithstanding, the intervention was repetitive, with each week focussing on five exercises of the same type. There were multiple exposures to each therapeutic strategy, such that even with imperfect adherence, there were still opportunities to acquire, consolidate, and generalise the strategies in the trial materials.

This study addresses an important clinical challenge: a lack of evidence-based, low-intensity, and accessible psychological interventions that promote youth mental health. We demonstrated that a core component of many high-intensity psychological interventions (psychological decentering) can be selectively trained through a brief, self-guided, digitally delivered programme and lead to positive mental health outcomes. The One Step Back programme taught a new way to reflect on everyday unpleasant thoughts and memories that can otherwise increase long-term mental health risks. This programme reflects an early-stage, low-dose intervention that could be delivered prior to, rather than replace, traditional psychotherapies. These findings can guide the creation of scalable interventions for young people with subclinical distress, such as including One Step Back into school wellbeing programs or as low-intensity support while awaiting primary care psychological services.

Contributors

MB, TD, and RK were responsible for study conceptualisation, method development, trial management, data verification, data preprocessing and collation, and manuscript preparation. These authors are also responsible for the final decision to submit the manuscript. Project administration was additionally supported and supervised by TF, SJB, and WK. TD, SJBTF, and WK secured funding for the study. MB, RK, ESD, DD, BL, TS, and MV led software design for data collection and management. MB, RK, DD, GF, GW, HC, and AS managed recruitment and data collection. PW conducted the formal analysis, with additional analyses by MB and RK. All authors contributed to the reviewing and editing of the manuscript. All authors had full access to the data in the study and had final responsibility for the decision to submit for publication. MB and TD are joint senior authors and contributed equally to the study. All authors read and approved the final version of the manuscript.

Data sharing statement

The data that support the findings of this study are available from the corresponding author upon reasonable request. Following completion of additional exploratory analyses by the authors, the dataset will be made publicly available on the Open Science Framework (https://osf.io/6eq5v).

Declaration of interests

TF research group received funding as a research methods consultant to Place2Be, a third-sector organisation that provides mental health training and interventions to UK schools. S-JB is the author of two books on the brain, education, and learning, for which she receives royalties. S-JB gives talks in schools and in the public and private sectors, as well as at education conferences and for education organisations and other public, private, and third-sector organisations (some talks are remunerated). S-JB serves as an expert witness for UK charities and legal organisations. S-JB receives support for attending meetings and/or travel from grants, charities, or nonprofit organisations. S-JB Professor Blakemore was a member of the Singapore Government National Research Foundation Scientific Advisory Board and is a member of the Singapore Government Human Potential Scientific Advisory Board. She is a member of various grant/fellowship panels and committees at Brain, the Royal Society, the Academy of Medical Sciences, and the British Academy. The other authors declare that they have no competing interests.

Appendix A. Supplementary data

Supplementary data related to this article can be found at https://doi.org/10.1016/j.eclinm.2026.103971.

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