

An Enhanced Psychological Mindset Intervention to Promote Adolescent Wellbeing within Educational Settings: A Feasibility Randomized Controlled Trial

Amorette M. Perkins^a, Gemma Bowers^b, Joseph Cassidy^a, Richard Meiser-Stedman^a & Laura Pass^a

^aDepartment of Clinical Psychology and Psychological Therapies, University of East Anglia, Norwich Research Park, Norwich, Norfolk, NR4 7TJ, United Kingdom

^bNorfolk and Suffolk NHS Foundation Trust, Mary Chapman House, Hotblack Road, Norwich, Norfolk, NR2 4HN, United Kingdom

Correspondence to: Amorette Perkins (ORCID: 0000-0001-6033-6444)

amorette.perkins@nsft.nhs.uk

Laura Pass

l.pass@uea.ac.uk

+44 (0)1603 456 161

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Abstract

Objective: This randomized controlled trial feasibility study aimed to investigate a single-session mindset intervention, incorporating third wave constructs, within educational settings as a universal tool to promote emotional wellbeing. **Method:** Eighty adolescents (M age=16.63) were randomized to the 30-minute computer intervention or a usual curriculum waitlist. Outcome measures were administered at baseline, post-treatment, 4-week, and 8-week follow-ups. **Results:** Student feedback about the intervention and trial procedure was mainly positive. Participants' engaged with the intervention content and data were suggestive of possible small-large intervention effects for targeted mechanisms of personality mindset and psychological flexibility. Between-group differences over time across wellbeing outcomes of self-compassion, self-esteem, low mood, and anxiety also yielded some promising results, though assessments of reliable change were less clear. No harms were reported. **Conclusions:** The intervention and study design were deemed feasible, though areas for improvement were noted. A full-scale trial to determine effectiveness is warranted.

Introduction

The emotional wellbeing of children and adolescents has immediate and long-term personal, social, and economic implications (World Health Organization [WHO], 2003). Up to 20% of young people worldwide have a clinically significant mental health condition and an even greater proportion experience subclinical symptoms and/or are exposed to risk factors for developing difficulties (WHO, 2003; Public Health England [PHE] & Children and Young People's Mental Health Coalition, 2015). Evidence suggests that most mental health conditions in adult life develop during childhood or adolescence (Kessler et al., 2005). Consequently, there is a global agenda to protect and promote young people's mental health, to prevent conditions from developing in the first instance, and to engender positive emotional wellbeing among future generations (WHO, 2013). In the UK, government agencies propose adopting a "whole-school approach" to promote emotional health of the general public using universally-applicable interventions (PHE & CYPMHC, 2015; PHE, 2019).

As yet there is limited research of universal resources and evidence-based tools that could be used within educational settings (White, Lea, Gibb & Street, 2017; PHE, 2019). Lengthy interventions are costly, difficult to incorporate within the curriculum, and have a high risk of dropout. A recent meta-analysis suggested that mental health interventions delivered in a single-session are effective for youth, offering more accessible and cost-efficient alternatives (Schleider & Weisz, 2017). The review included self-administered interventions, which further decrease costs and enhance accessibility, as they could be overseen by teachers without a therapist present. There is growing evidence to support self-administered web-based interventions in particular (Davies, Morriss & Glazebrook, 2014).

The promise of brief mindset interventions

A recent study by Schleider and Weisz (2016; 2018) recruited youths aged 12-15 years old experiencing anxiety and/or depression from clinical and community samples in the United States. Participants took part in a single-session, self-administered, computer-based personality mindset intervention. A mindset can be broadly defined as “the fundamental, core beliefs that individuals hold about the nature and malleability of various aspects of the human condition” (Ryan & Mercer, 2012, p.74). Earlier research suggested that youth who hold a “fixed” mindset, believing personal traits are unmalleable, are more likely to experience mental health problems than those with a “growth” mindset, who believe personal traits have the potential to change (e.g. Schleider, Abel & Weisz, 2015). Thus, the psychoeducational intervention designed by Schleider and Weisz (2016) taught that personality is malleable, drawing upon evidence of neuroplasticity. Those who received the intervention reported greater improvements in perceived control at post-treatment and reduced depression and anxiety at a 9-month follow-up compared to an active control.

Whilst Schleider and Weisz (2016; 2018) conducted the intervention in a laboratory environment with select participants, mindset interventions also have potential as universal approaches to promote mental health within schools. Mindsets about self-characteristics are applicable to all, and concepts such as growth versus fixed mindsets are arguably easy to grasp and therefore accessible to young people. Indeed, these concepts were initially applied within educational settings, where the mindset literature arose two decades ago and focused on young people’s beliefs about intelligence to improve learning, as opposed to their psychological beliefs to improve mental health (Dweck & Leggett, 1988; Dweck, Chiu & Hong, 1995).

In a study by Miu and Yeager (2015), school children who completed a psychoeducational intervention positing that traits relating to bullying were malleable not fixed had a reduced risk of developing depressive symptoms throughout the academic year. Other research has suggested that teaching high school students that socially-relevant personality

characteristics are malleable, rather than fixed, may improve their ability to cope with stress (Yeager, Lee & Jamieson, 2016). Whilst having a limited scope (i.e. on bullying/socially-relevant traits), this highlights the potential of mindset interventions as universal tools to promote mental health within educational settings. A recent meta-analysis suggests that the link between mindsets and psychological distress is of similar magnitude among diagnosed and undiagnosed samples (Burnette, Knouse, Vavra, O'Boyle, & Brooks, 2020). Mindset interventions might be used to prevent a range of rigid and maladaptive self-beliefs from developing (e.g. about skills, self-worth, and character-traits), which have long been linked to the onset of mental health difficulties in leading psychological theories (e.g. Beck, 2011).

Beyond personality mindsets

Mindsets relating to emotion are equally or more highly correlated with mental health outcomes than personality mindsets (Schroder, Dawood, Yalch, Donnellan & Moser, 2015; 2016; Burnette et al., 2020). Individuals believing that emotions are fixed are found to have slow recovery from stressors and poor coping strategies (Tamir, John, Srivastava & Gross, 2007; Schroder et al, 2015). School children and college students who believe that emotions are malleable have been found to experience greater improvements in wellbeing, greater social adjustment, less loneliness, and fewer depressive symptoms over time compared to those endorsing a more fixed mindset of emotion (Tamir et al., 2007; Romero, Master, Paunesku, Dweck & Gross, 2014). Research suggests that beliefs relating to other transient psychological experiences, such as thoughts or behavioral urges, also predict mental health (e.g. Wells & Papageorgiou, 1998; Hayes, Luoma, Bond, Masuda & Lillis, 2006). Therefore, addressing mindsets relating to a broad range of transient psychological attributes in an intervention, alongside a broad range of trait-like or personality factors, may produce better outcomes than having a narrow focus on one type of mindset alone. Moreover, transient and trait-like mindsets

could be relatively easy to incorporate within a single intervention, given the common theme of encouraging a view of psychological growth or flexibility.

Initial findings are promising for a school-based intervention incorporating a broad range of mindsets, namely regarding intelligence, self-control, and personality, developed by Schleider and colleagues whilst the current study was underway (Schleider, Burnette, Widman, Hoyt & Prinstein, 2019). They found that their single-session intervention reduced depression over time for female adolescents from rural areas of the US. Whilst their intervention briefly mentioned the malleability of thoughts and feelings, this was not explored in depth. Moreover, the content about personality mindsets focused on self-confidence and social anxiety. Thus, there is still scope for further investigation of broader mindset interventions. Further, it is important to investigate the use of such interventions in other countries and populations.

Incorporating self-compassion and other “third wave” constructs to enhance effectiveness and mitigate potential costs

It is important to note that whilst some studies offer promising results, findings for mindset interventions have varied; for example, a large-scale randomized trial and recent meta-analysis found overall effects on educational achievement were non-significant (Sisk, Burgoyne, Sun, Butler & Macnamara, 2018; Foliano, Rolfe, Buzzeo, Runge, & Wilkinson, 2019). Whilst these studies focused on academic constructs, it is important to consider issues for implementation and ways to strengthen mindset interventions when extending them to health. It has been suggested that the absence of effect on attainment may be because a growth mindset theory of learning is naturally widespread and thus control comparisons are invalid (Foliano et al., 2019). Mindsets related to mental health may nonetheless be more varied among the population, given the comparative novelty of this area and that they have not been addressed within national educational curricula. However, another possible explanation for variation in

effect is that there are potential costs as well as benefits to holding growth or malleability mindsets, so ways to mitigate these need to be considered.

If individuals believe personality traits are malleable but are not aware of their limitations, it could potentially lead to perfectionistic striving and a sense of failure (Dweck, Chiu & Hong, 1995; Tamir et al., 2007). Similarly, believing that emotions are malleable can decrease acceptance (Kneeland, Nolen-Hoeksema, Dovidio & Gruber, 2016). It was recently highlighted that whilst malleability beliefs may have beneficial effects for self-efficacy, mindset interventions may offer a double-edged sword by simultaneously increasing self-blame (Hoyt & Burnette, 2020). Ideas of psychological growth and flexibility could challenge genetic or disease-based beliefs of mental illness; whilst this may reduce pessimism and helplessness, it could also lead to a sense of being at fault (Hoyt & Burnette, 2020). There is growing consensus in the psychological community that we cannot entirely control our transient psychological experiences, and that those who believe we can are at greater risk of experiencing mental health difficulties (Harris, 2006).

In line with this, it was highlighted in a recent review that whilst mindsets related to emotions may be beneficial to target within interventions, it is important to recognize that positing direct control over “in-the-moment” experiences (e.g. bodily anxiety) might increase psychological distress, whereas targeting trait-based emotions or emotional disorders may be effective (Burnette et al., 2020). Recent work from mindset interventions focused on obesity and addiction indicates that offering “compensatory” messages may also offset potential stigma or blame whilst upholding self-regulatory benefits (Burnette, Hoyt, Dweck & Auster-Gussman, 2017; Burnette, Forsyth, Desmarais & Hoyt, 2019). It has been suggested that researchers develop compensatory mindset interventions focused on emotion and mental health to avoid blame whilst increasing motivation for change (Burnette et al., 2020).

Incorporating self-compassion within mindset interventions could therefore be beneficial. A growth mindset about trait-like factors could be promoted alongside self-kindness and acknowledgement of human imperfection or limitation. A compassionate mindset of transient factors might encourage the acceptance of difficult psychological experiences, alongside recognition that - whilst we cannot entirely control the in-the-moment experiences themselves - we can instead choose how to respond to them, which can impact our life and experiences in the long-term (e.g. Harris, 2006; Gilbert, 2010; Neff & Tirsch, 2013).

Notions of self-compassion and acceptance are pertinent within third wave therapies, which have been promoted for being transdiagnostic, applicable across the spectrum of ill-health to flourishing, and accordingly, potentially useful within schools (Burckhardt, Manicavasagar, Batterham & Hadzi-Pavlovic, 2016; Hayes & Hofmann, 2017). Third wave interventions are also shown to be effective when brief and delivered remotely via the internet (e.g. Puolakanaho et al., 2019). Nonetheless, the possibility of integrating such constructs within mindset interventions is yet to be explored.

Present study

This research study aimed to explore the feasibility of a novel mindset intervention as a universal mental health tool for schools. The specific objectives were: 1) to explore whether a psychological mindset intervention incorporating transient and trait-like factors, that integrated third wave constructs including acceptance and self-compassion, was a feasible and acceptable tool to promote mental health within UK educational settings; 2) to determine whether the proposed randomized controlled trial design for this intervention was feasible and acceptable; and 3) to investigate whether outcomes were indicative of positive change.

Method

Design

This was a feasibility study of a randomized controlled trial, with parallel groups and an intended allocation ratio of 1:1. As this was a feasibility study, the trial was not pre-registered.

Participants

Students aged 16-18 years within the UK education system were recruited. The age group was chosen given it encompasses a unique developmental period characterized by extensive change. It can be beneficial to offer interventions during times of transition (Durlak & Wells, 1997). Moreover, this is an age where a clearer sense of personal identity develops, alongside complex affective and cognitive skills (Christie & Viner, 2005).

Recruitment

To increase generalizability, multiple publicly- and privately-funded institutions were approached across two counties in England. Participant eligibility criteria were broad, considering the study's primary aim to assess the feasibility of an intervention that could be delivered using a whole-school approach. Mental health symptomatology and diagnosis did not serve as selection criteria. Exclusion criteria were lack of capacity and being involved in other school-based mental health research. The recruitment target was 50 participants minimum (Cocks & Torgerson, 2013).

Teachers and other educational staff advertised the study to a range of classes and on their institutions' online learning portal. Students who gave consent to be contacted were provided with detailed study information and an opportunity to meet individually with the researchers to complete the consent process.

Randomization

Consenting participants were randomly allocated to either the control (usual school activities waitlist) or intervention using a block approach (Suresh, 2011). Participants were randomized individually rather than allocated by class or school. A person external to the research team generated an allocation sequence list using an online randomizer (www.sealedenvelope.com). Thus, neither the researchers nor participants were aware of group allocation until after enrollment.

Intervention

The intervention was a single, 30-minute self-administered session, delivered via the internet. Participants completed it at their educational institution within a standard classroom setting during usual learning hours. They were excused from their normal timetabled activities, in which the control group remained. Whilst delivered in a class setting, participants worked individually at a computer. The intervention began with a 10-minute psychoeducational animation followed by five minutes of videos depicting stories from fictional young people describing how they used the content of the animation in their everyday lives or to cope with difficulties. Participants then completed three multiple choice questions, which aimed to assess their understanding of the content and their ability to apply it to familiar, “real-world” situations. Respondents were given automated feedback following each question, which reiterated the animation content. To finish, participants were asked to type a “letter of advice” to a fictional younger student experiencing anxiety and shyness, based on what they had learnt in the session. Participants were given approximately 15 minutes to complete the multiple-choice questions and written task.

The authors developed the intervention called *An Enhanced Psychological Mindset Session for Adolescents* with support from learning technologists, animators, and actors.

Having obtained permission from Schleider and Weisz, it followed a similar format to their personality mindset intervention (2016; 2018), but with adapted and additional content, to reflect a broader focus on transient and trait-like psychological mindsets. In addition, the intervention aimed to balance ideas about change (i.e. growth mindsets), with ideas based in psychological models of acceptance and self-compassion (e.g. acknowledging human limitation, promoting non-judgement by recognizing difficult psychological experiences as resulting from learnt responses and/or common across humanity, etc.). It differentiated between in-the-moment psychological experiences such as thoughts and feelings (where the emphasis was on fluidity rather than malleability and choosing how we *react* to these experiences mindfully with acceptance, compassion and in a values-directed way, rather than directly controlling the experience itself), and the potential for change over time (including for patterns of thoughts/feelings and personality, which is partly dependent on our responses but also sometimes limited by circumstances outside our control). Box 1 contains a more detailed description of the intervention content.

The intervention can therefore be understood to blend models. It contained information about brain activity and neuroplasticity, which was based on neurological science (Kays et al., 2012). This was supplemented with psychological theory from “first wave” and “second wave” cognitive behavioral therapies; for example, learning principles and using behavior modification to change psychological experiences (e.g. Beck, 2011; Eysenck, 2013). Content from third wave cognitive behavioral approaches was also integrated; for example, self-compassion, acceptance, values-based action in the presence of psychological discomfort, and some more specific techniques such as cognitive defusion (e.g. Hayes et al., 2006; Gilbert, 2009).

The intervention was identical for all participants and was not personalized to individuals. There were no modifications throughout the course of the study. Two therapists

(Trainee Clinical Psychologists) were present during the intervention to manage research procedures only; they provided no additional therapeutic support.

Ethics

Ethical approval for the study was granted by [IDENTIFYING INFORMATION REMOVED FOR PEER REVIEW]. All participants provided written informed consent. There were no gift/monetary incentives for participation. To ensure all participants could access the intervention, the control group were given an opportunity to complete it at the end of the study.

Data collection

Participant feedback and intervention responses

A structured feedback questionnaire using a 10-point Likert-type scale elicited participants' views and experiences of the intervention and trial procedure. This was created based on questionnaires from comparable trials (e.g. Meiser-Stedman et al., 2017). Participants' responses to the multiple-choice questions and written task within the intervention were recorded to further explore engagement and evaluate the mindset tool.

Outcomes

Mechanisms of action included personality mindset and psychological flexibility, which were measured at baseline, immediately post-treatment, then at 4-week and 8-week follow-ups. Mental health and wellbeing outcome measures were administered at baseline and follow-ups only, capturing self-compassion, self-esteem, low mood, and anxiety.

Personality mindset. Three items from the Implicit Personality Theory Questionnaire (IPTQ) were used to assess respondents' views on personality as fixed or malleable (Yeager, Miu, Powers & Dweck, 2013), which was a key target of the intervention. These self-report items were used by Schleider and Weisz (2016) to assess their mindset intervention. They were:

“You have a certain personality, and it is something that you can’t do much about”, “Your personality is something about you that you can’t change very much”, and “Either you have a good personality or you don’t, and there is really very little you can do about it”. Items are rated on a Likert-type scale from 1 (really disagree) to 6 (really agree), with higher scores suggesting more fixed mindsets. In Schleider and Weisz’s (2016) adolescent sample, reliability for these items was reported at an average of $\alpha=0.82$. Reliability was calculated as $\alpha=0.78$ within the current sample.

Psychological flexibility. The Acceptance and Fusion Questionnaire for Youth-Short Form (AFQ-Y8; Greco, Lambert & Baer, 2008) was used to assess psychological flexibility, which captures third wave constructs such as acceptance and values-accordant behavior. The AFQ-Y8 is an 8-item self-report measure, rated using a Likert-type scale from 0 (not at all true) to 5 (very true). The measure does not have a clinical cut-off score. Lower total scores indicate greater psychological flexibility. The AFQ-Y8 is validated for use with adolescent populations (Greco, Lambert & Baer, 2008; Szemenyei et al., 2018). Reliability has been previously reported as $\alpha=0.83$ (Greco, Lambert & Baer, 2008). No existing measure explicitly captured the transient psychological mindsets promoted in this intervention; whilst there was the Implicit Theories of Emotion Scale (Tamir et al., 2007), it was unsuitable as it valued control of in-the-moment psychological experiences. The AFQ-Y8 contained items phrased as attitudes or beliefs (e.g. “I am afraid of my feelings”) which could better assess mindsets promoted in this intervention, hence its use at all timepoints as a potential mechanism of change. The AFQ-Y8 is predictive of emotional instability, externalizing, and internalizing problems among youth, which further warranted its use (Szemenyei et al., 2018).

Self-compassion. The Self-Compassion Scale–Short Form is a 12-item self-report measure using a Likert-type scale ranging from 1 (almost never) to 5 (almost always) (SCS-SF; Raes, Pommier, Neff & Van Gucht, 2011). There is no cut-off score; higher total scores

indicate higher self-compassion. The 26-item version (Neff, 2003) is a valid and reliable measure among adolescents (Cunha, Xavier & Castilho, 2016). The SCS-SF is more time-efficient and has a near-perfect correlation with the 26-item version (Raes et al., 2011). Reliability has been reported as $\alpha=0.86$ in a student sample (Raes et al., 2011). Self-compassion was included as an outcome given mindset interventions have been described as a potential double-edged sword, increasing self-blame alongside self-efficacy (Hoyt & Burnette, 2020).

Self-esteem. The Rosenberg Self-Esteem Scale (RSES; Rosenberg, 1965) is a 10-item self-report measure using a Likert scale ranging from 1 (strongly agree) to 4 (strongly disagree). A higher total score indicates higher self-esteem. The scale is validated for use with adolescents (Blascovich & Tomaka, 1991). Amongst British 16-18 year olds, reliability has been reported to average $\alpha=0.86$ (Bagley & Mallick, 2001). The RSES was similarly included to capture positive and negative feelings about the self, including in response to failure. The primary aim of this intervention was not to improve efficacy and performance but promote emotional wellbeing; the RSES was included given scores predict mental health over time (Trzesniewski et al., 2006).

Low mood and anxiety. The Revised Children's Anxiety and Depression Scale-Short Version (RCADS-25; Ebesutani et al., 2012) was used to assess low mood and anxiety. This is a 25-item self-report measure using a Likert-type scale from 0 (Never) to 3 (Always). Higher scores are suggestive of higher symptoms. Cut-off scores are provided to indicate clinically-significant levels of symptomatology. The measure is validated for ages 8-18 years and has good psychometric properties (Ebesutani et al., 2012). Reliability has been previously reported as $\alpha=0.86$ for 16-18 year olds (Piqueras, Martin-Vivar, Sandin, San Luis & Pineda, 2017). The RCADS-25 was included to assess the intervention as a promotive mental health tool.

Analysis

Feasibility and acceptability

Feasibility indicators such as recruitment and retention rates, reasons for drop-out, and completion of the intervention were recorded. The percentage of missing data and its randomness (indicated by the distribution of missing values) were measured. Correlations amongst outcome measures at baseline were assessed. Feedback questionnaire responses were analyzed descriptively.

The percentage of correct answers to the multiple-choice questions in the intervention were calculated. Participants' responses to the written task were subject to content analysis as described by Erlingsson and Brysiewicz (2017), whereby raw data was condensed into meaning units, which were then assigned codes and grouped into categories reflecting manifest content. Next, themes that connected categories together and captured more abstract or latent meanings were identified. When the control group completed the intervention at the end of the study, their responses to the multiple choice and written tasks were pooled with those of the intervention group to increase the data sample.

Outcome data

Null-hypothesis significance-testing is inappropriate for feasibility studies as they are insufficiently powered (Orsmond & Cohn, 2015). Therefore, to explore potential intervention effects within the mechanisms of action and determine the suitability and sensitivity of outcome measures, means and standard deviations were calculated alongside effect sizes for between-group differences across time points. Effect sizes of 0.2, 0.5, and 0.8 were interpreted as small, moderate, and large, respectively (Fritz, Morris & Richler, 2012). Participants were analyzed according to the group they were originally assigned including if they dropped out, using multiple imputation to estimate missing data. Treatment condition and baseline scores were used as predictors within this intention-to-treat method; a total of five datasets were generated then pooled means and standard deviations were used to calculate Hedges' *g* with 95%

confidence intervals. Where there was missing data ($\leq 20\%$) on items within questionnaires, person mean imputation was used (Downey & King, 1998).

For each measure, mean index of reliable change alongside the percentage of participants demonstrating reliable improvement or deterioration per treatment arm (i.e. where change indexes \geq the ± 1.96 statistical threshold) were also computed (Jacobson & Truax, 1991). For calculations of reliable change, only those who completed measures were included per timepoint.

Results

Sample characteristics

Eighty students consented to participate (84% female). Most were White British (81%); 9% reported mixed ethnicity, 6% were European, and 4% were Asian. The mean age of participants at entry was 16.63 years ($SD=0.56$). At baseline, 23% of participants scored above clinical threshold for the total RCADS-25 scale, whereas 10% scored above threshold for the anxiety-subscale specifically, and 26% scored above threshold for the depression-subscale. Sample characteristics per treatment arm are provided in Table 1.

Feasibility

Recruitment, retention, and timescales

Participants were recruited from two, state-funded sixth form colleges attached to high schools, with one located in a city and the other in a rural market town. Recruitment commenced in May 2019 and ended in October 2019 (pausing mid-July to August for the school holiday) when minimum participant numbers were reached. The host sites advertised the study to students for approximately two weeks. One-hundred and twenty-eight young people agreed to be contacted by the researchers. After reading the participant information sheets, 80 students (63%) remained interested in taking part and gave consent (Figure 1).

All participants provided baseline data. Attrition rates accumulated to 3% at post-treatment, 11% at the 4-week follow-up, then 48% at 8-weeks. One participant reported that they dropped out because they simply did not want to continue. The remaining participants did not attend follow-up but gave no reason for this. Nonetheless, 90% of the participants lost at the 8-week follow-up were from one institution; educational staff reported that this follow-up fell during the final week of teaching before the summer holiday, and that many students finished earlier than expected for work experience or were attending a career event.

The whole research process (including consent procedures, delivery of the intervention, and follow-up data collection) took participants approximately 2-3 hours.

Intervention engagement and completion

All participants in the treatment arm ($n=40$), and those remaining in the study at 8-weeks from the control arm ($n=21$), completed the full intervention. The researchers observed that all participants appeared focused and engaged whilst on the computer. Most finished the intervention within 20 to 30 minutes; whilst participants completed all components of the programme, time spent on the multiple choice and letter task ranged from 5 to 20 minutes. There were no reports of distress or harm to participants.

Missing data

All the students who attended the final follow-up completed feedback questionnaires ($n=42$). Responses to the multiple-choice questions and the letter task within the intervention were available for 58 and 59 participants out of the 61 who completed the intervention, respectively; three participants had technical issues meaning they were unable to save some or all of their answers. With regard to outcome measures, data missing due to reasons other than sample attrition was less than 1% of total responses across time points and appeared randomly distributed.

Correlations amongst constructs

There was no evidence of redundancy (i.e. no correlations greater than .8), though some outcomes were strongly correlated, including the SCS and RSES (see supplementary material).

Participant feedback

Average scores for items related to the intervention in the feasibility questionnaire were as follows on a scale from 1 (definitely do not agree) to 10 (definitely agree): “The mindset session made sense to me” ($M=7.76$, $SD=1.46$), “The mindset session was hard to complete on the computer” ($M=3.00$, $SD=2.01$), “I think the mindset session has been (or will be) helpful for me” ($M=6.31$, $SD=1.81$), “I would recommend the mindset session to a friend or family member” ($M=6.79$, $SD=1.83$), and “I found the mindset session boring” ($M=3.86$, $SD=2.03$). For research-related items, average scores were: “I understood what the questionnaires were asking me” ($M=7.86$, $SD=1.70$), “The questionnaires took too long to complete” ($M=4.00$, $SD=2.14$), “I did not like being put in different groups at random” ($M=2.74$, $SD=2.07$), and “I enjoyed taking part in this research study” ($M=7.98$, $SD=1.49$).

Comprehension checks

The large majority (97%) of responses to the multiple-choice questions were correct. With regard to the writing task, the most prominent themes among participants’ letters of advice were: 1) acceptance of thoughts and feelings; 2) self-determination and control; 3) change is possible; 4) doing something different is key to change; and 5) the importance of self-compassion and other people. Table 2 provides a descriptive summary of each theme with its percentage prevalence within students’ letters and illustrative quotes. Themes were closely aligned with the content of the animation. Participants also wrote about novel but related ideas. For example, that we are not “defined by” - but more than – our thoughts and feelings. Differences in comprehension between the control and intervention groups appeared minimal.

Outcomes

Table 3 presents group means at baseline, post-treatment, and follow-up, alongside effect size estimations (with 95% confidence intervals) of between-group differences. The mean index of reliable change for treatment arm alongside percentage of participants demonstrating improvement or deterioration between baseline and post-treatment/follow-ups, are displayed (Table 4).

Mechanisms of action

Small effect size differences favoring the intervention group were apparent at baseline for personality mindset (IPTQ; $g=-0.22$, 95%CI -0.66 to 0.22) and psychological flexibility (AFQ-Y8; $g=-0.25$, 95%CI -0.69 to 0.19). At post-treatment, between-group effects on the IPTQ ($g=-1.64$, 95%CI -2.14 to -1.13) and AFQ-Y8 ($g=-0.67$, 95%CI -1.12 to -0.22) were estimated to be moderate-large in effect size, favoring the intervention group. At the 4-week follow-up, results continued to favor the intervention, finding a moderate effect size difference for the IPTQ ($g=-0.74$, 95%CI -1.19 to -0.29) and AOF-Y8 ($g=-0.54$, 95%CI -0.99 to -0.10). By 8-weeks, the IPTQ ($g=-0.62$, 95%CI -1.07 to -0.17) yielded a moderate effect size group difference alongside a small effect size difference for the AFQ-Y8 ($g=-0.42$, 95%CI -0.86 to 0.03) in favor of the intervention.

Mean indexes of reliable change favoured the intervention group for both the IPTQ and AFQ-Y8 (Table 4). A large proportion (43.6%) of the intervention group experienced reliable improvement (i.e. change indexes ≥ 1.96) in their personality mindset (i.e. becoming less fixed) immediately post-intervention, with a considerable minority continuing to experience this mindset shift at follow-up (26.3-38.1%). A similar pattern was observed for psychological flexibility, though with fewer cases showing a reliable improvement (7.9-20.5%). A few cases showed some decline (0-9.5%). For the control condition few cases showed significant improvement or deterioration with either outcome (0-9.5%), though 19.1% demonstrated decline in psychological flexibility at the 8-week follow-up.

Mental health and wellbeing outcomes

Small differences were apparent at baseline for total anxiety and depression score (RCADS-25; $g=-0.26$, 95%CI -0.70 to 0.18) and the RCADS-25 anxiety-subscale specifically ($g=-0.28$, 95%CI -0.72 to 0.16), which favored the intervention group. The other variables yielded negligible effect sizes. At the 4-week follow-up, between-group differences with small effect sizes were found favoring the intervention across all mental health and wellbeing outcomes, including self-compassion (SCS-SF; $g=0.41$, 95%CI -0.04 to 0.85), self-esteem (RSES; $g=0.33$, 95%CI -0.11 to 0.77), total RCADS-25 score ($g=-0.45$, 95%CI -0.89 to 0.00), as well as the RCADS-25 anxiety subscale ($g=-0.37$, 95%CI -0.81 to 0.07) and depression subscale ($g=-0.32$, 95%CI -0.76 to 0.12) specifically. At the 8-week follow-up, moderate differences favoring the intervention group were found for the RCADS-25 anxiety subscale ($g=-0.57$, 95%CI -1.02 to -0.13), alongside small differences on the RSES ($g=0.39$, 95%CI -0.06 to 0.83), the RCADS-25 total score ($g=-0.35$, 95%CI -0.79 to 0.10), and the depression subscale ($g=-0.23$, 95%CI -0.67 to 0.21). Differences on the SCS-SF became negligible at 8-weeks ($g=0.05$, 95%CI -0.39 to 0.49).

Overall, mean indexes of reliable change favoured the intervention group for all mental health and wellbeing outcomes at both follow-ups, though many differences between groups appeared minimal (Table 4). For self-compassion, 18.4% of youth in the intervention arm experienced a reliable improvement (i.e. greater self-compassion) at the 4-week follow-up, increasing to 33.3% at 8-weeks. At 8-weeks, 14.3% of the intervention group experienced reliable improvement in depression and anxiety. For other outcomes, however, small numbers of cases experienced a reliable improvement or deterioration in both arms at either follow-up point (0-9.5%).

Discussion

Feasibility

The findings of the current feasibility trial suggest that a single-session psychological mindset intervention that incorporates transient and trait-like factors, while emphasizing third wave constructs such as acceptance and self-compassion, could be a feasible and acceptable tool for whole-school implementation to promote mental health. All participants in the treatment arm successfully completed the online session. Students' feedback about the intervention was largely positive. Participants correctly responded to the multiple-choice questions of the intervention, suggesting that the content was understood. Moreover, themes identified in the participants' letters of advice closely reflected the mindset constructs promoted in the intervention ; the most prevalent were acceptance of in-the-moment psychological experiences followed by self-determination and control, which were two factors that the intervention aimed to balance. Participants re-phrased content and included novel ideas, suggesting some depth of information processing (Craik & Lockhart, 1972).

The evaluation design was also feasible and acceptable. The minimum recruitment target was exceeded in a relatively short amount of time. Attrition rates for randomized trials are expected but bias may occur when rates exceed 20% (Marcellus, 2004). Attrition at the 4-week follow-up totaled 11%. Whilst this increased to 48% at 8-weeks, most participants were lost due to an unexpected scheduling conflict at one educational institution, which could be avoided in any future trials. For participants who were retained, missing data was negligible. This was consistent with findings on the student feedback form, suggesting that most understood how to complete the outcome measures. Students suggested that they were happy with randomization. There were no reports of harm and participants expressed that they enjoyed taking part in the research.

Possible intervention effects

Significance testing was inappropriate so results are indeterminate. Nonetheless, outcome data suggested positive changes in the targeted mechanisms. At post-treatment, a large superiority effect favoring the intervention group was found for personality mindset, alongside a moderate superiority effect for psychological flexibility. Differences favoring the treatment arm appeared to remain for both mechanisms of action at follow-ups, estimated to be small-moderate in effect size at 8-weeks. Although baseline differences existed in favor of the intervention group, these were smaller in magnitude than the differences observed between groups at post-treatment and both follow-ups. Moreover, assessment of reliable change, which accounted for baseline scores, also appeared to favor the treatment arm for personality mindset at all time points, as well as psychological flexibility at least at post-treatment.

Findings for the mental health and wellbeing outcomes were also promising. Whilst group differences for self-compassion, self-esteem, and low mood were negligible at baseline, small effects favoring the intervention group were apparent for all these variables at both the 4-week and 8-week follow-ups, except for self-compassion which yielded a negligible difference at 8-weeks. For anxiety, small baseline differences existed in favor of the intervention group; at 4-weeks, differences grew in magnitude but were still categorized as small, yet were moderate in effect size at 8-weeks. Nonetheless, whilst assessment of improvement as calculated by reliable change indexes appeared to favor the intervention group for self-compassion, other findings for improvement and/or deterioration from baseline to follow-up for mental health and wellbeing outcomes were similarly small across treatment conditions.

Implications and limitations

Overall findings suggested that the intervention and trial design were feasible. Outcome data were promising, especially for personality mindset, which was a key targeted mechanism

of action, though group differences seemed to decrease from large to moderate over time. Findings for psychological flexibility were also somewhat encouraging. Only a minority of participants experienced change as assessed by reliable change indexes, particularly as length of time since the intervention increased. This could indicate that effect size differences are not clinically meaningful and/or maintained over time. It has been suggested, however, that the use of reliable change indexes to assess preventative or promotive interventions in non-clinical samples can be problematic; for example, because a smaller degree of change is likely given there is limited scope for improvement as opposed to within clinical samples (Hawley, 1995).

Small effects might be expected for brief universal interventions to promote mental health and wellbeing, but even slight changes could have wide-reaching consequences at a population-level. This intervention was extremely brief and resource- and cost-effective, yet promising group differences were observed on several measures over time, including growth mindset and compassion. A properly-powered randomized controlled trial is therefore warranted. This is further important because attrition increased the risk of bias and made it difficult to draw conclusions about potential effects and their durability; despite applying intention-to-treat methods, data should be interpreted cautiously, particularly at the 8-week follow-up considering almost 50% of participants were lost by the end of the study. As a result, it is unclear, for example, whether the reduction in effect sizes from post-treatment to final follow-up for mindset and psychological flexibility were due to sampling or were indicative of meaningful changes.

There are potential barriers to overcome for future trials. Some populations were underrepresented and it may be beneficial to think about outreach strategies for male students and minority ethnic groups. Alternatively, cluster-randomization could be used to increase sample generalizability, whereby the intervention is delivered to a whole class in place of a lesson, excluding only students who opt out and do not consent to data collection. It is also

important to note that it remains unclear whether the intervention and study design are applicable across a wider age group. It is possible that earlier delivery may be beneficial, perhaps if mindsets become engrained over time. The academic abilities and socioeconomic status of the participants were unknown, which may be useful additional data to collect. Given that participation was voluntary, this sample may have been particularly motivated to understand and use the intervention for their benefit. Thus, estimated effects may be larger than expected in a general school population (Ng et al., 2012). It is possible that the intervention would have been most beneficial for at-risk students, or perhaps those with fixed mindsets at pre-treatment. Future trials with a broader sample and sufficient power to test moderation could consider possible heterogeneity in effects (Miller, 2019).

Students stated that completing measures was time-consuming. A reduction in burden would come from the removal of the feasibility questionnaire, and potentially some outcome measures, such as those which may be less sensitive to intervention effects or which were highly correlated with other scales. Mediators of change are important to investigate in future trials. It could be helpful to develop a reliable measure of mindsets related to transient psychological factors. In the current study, evaluation for this key outcome relied on a measure of psychological flexibility as no alternative existed, but it should be noted that the measure was designed to assess third wave, and not mindset, interventions.

This was the first mindset intervention to balance ideas about growth and change with self-compassion and acceptance. Whilst this meant that the research offered an important and unique contribution to the literature with regard to exploration of a novel, assimilative approach, the applicability of existing measures may have been consequently reduced. For instance, the personality mindset questionnaire focused on growth and change only. For future trials, measures of both transient and trait-like psychological factors should be designed to capture the balanced mindsets promoted.

This is important given recent movements encouraging clinicians to move away from being constrained to a single intervention model, to draw on multiple interventions or “waves” of therapy, in an attempt to most effectively meet need (Hayes & Hofmann, 2017). This includes assimilation of approaches which have been traditionally positioned against one another, causing polarisation, such as those promoting notions of change versus acceptance (Hayes & Hofmann, 2017). Incorporating such notions may be particularly appropriate to provide well-rounded support to children and young people, who are still developing but can feel pressured to strive towards happiness and self-actualisation.

Currently, it is thought that many clinicians feel apprehensive to use integrative approaches (Hayes & Hofmann, 2017), perhaps because of limited research or published examples. Nonetheless, this paper illustrates the possibility of balancing models, even when they may at first seem very different (i.e. change and acceptance). As evidence of this, feedback suggested that the intervention content made sense to participants, and acceptance alongside self-determination were the two most prevalent themes in participants’ letters. Moreover, outcome measures of change and acceptance (i.e. the IPTQ and AFQ-Y8/SCS) seemed to simultaneously demonstrate improvement in the direction intended, suggesting that whilst these constructs appear conceptually distinct, they may not be discordant but can complement one another. Whilst it requires further investigation, this finding suggests that incorporating elements from third wave approaches, such as acceptance and self-compassion, may serve as a compensatory method to avoid potential costs of mindset interventions that have been previously described as a “double-edged sword” (Hoyt & Burnette, 2020).

Including more interactive components and/or a break between the animation and stories from young people could improve the intervention, as 15-minutes of psychoeducation requires prolonged concentration and feedback suggested that participants may have become bored. It may also help to involve teachers, equipping them to facilitate a full lesson around the

30-minute intervention, so that students have space to further discuss the content. Evidence suggests that mindsets may be shaped through day-to-day interactions over time (Mueller & Dweck, 1998), and that students internalize the mindsets of their teachers (Rattan, Good & Dweck, 2012); thus, the inclusion of educational staff could be important. Additional “top-up” intervention sessions could also be beneficial, with results suggesting that positive effects may potentially diminish over time.

This could also be important considering ratings for helpfulness of the intervention and recommendation to friends/family were only slightly higher than average. A recent realist review suggested that web-based psychological interventions for adolescents combining features such as in-person guidance or personal therapeutic support, self-monitoring, and use of incremental sessions rather than a one-off event may improve engagement, satisfaction and outcome (Wozney et al., 2017). However, this review focused on treatment programs for depression where motivational considerations may be greater, and so more research is clearly required. It is also important to consider that this intervention was largely psychoeducational, focused on changing mindsets, rather than teaching specific strategies to manage difficult psychological experiences. Emerging evidence for online interventions, including those adopting third wave approaches, suggests that learning new tools may be related to satisfaction and thus incorporating this within a mindset programme could be beneficial (e.g. Scott, Chilcot, Guildford, Daly-Eichenhardt, & McCracken, 2018).

Nonetheless, any adaption or extension to the intervention would need careful consideration as one of its most appealing qualities was its brevity, alongside the possibility of implementation within schools without additional training for or extensive involvement required from teachers. This intervention also lends itself incredibly well to remote learning, with young people accessing it at a time where they can contact their teacher for reflection or support if necessary, which has become of rising interest in the current climate of a global

pandemic. It could potentially support creative flexibility and growth at a time of forced change, difficult circumstance and restriction. Moreover, single-session mental health interventions have yielded significant effects for young people in previous research (Schleider & Weisz, 2017) and initial results were promising for the current study.

Conclusion

This study explored a novel single-session mindset intervention delivered via the internet to 16-18 year old students within UK educational settings. The intervention and research design appeared feasible and acceptable to participants, though areas for improvement were noted. Given this was a feasibility evaluation, firm conclusions cannot be drawn about intervention effects, however, outcome data were promising. Explorative post-treatment analyses were indicative of favorable differences between the intervention and control group for targeted mechanisms of action capturing personality mindset and psychological flexibility. Mental health and wellbeing outcomes of self-compassion, self-esteem, low mood, and anxiety also yielded some encouraging results. Whilst there were potential sources of bias (e.g. sample attrition), and a relatively small number of participants seemed to demonstrate improvement as assessed by reliable change indexes, the intervention can be delivered within 30 minutes, has minimal cost, requires limited resource, and is potentially beneficial for implementation as a universal tool to promote mental health. Therefore, it is worth learning from the observations and feedback gained during this feasibility trial and pursuing a full-scale evaluation to determine effectiveness of an upgraded version of the intervention.

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Table 1

Baseline characteristics by treatment arm

| | Intervention (<i>n</i> = 40) | Control (<i>n</i> = 40) |
|------------------------------------|----------------------------------|-----------------------------|
| Mean child age (SD) | 16.6 (0.6) | 16.7 (0.6) |
| Ethnicity - n (%) White British | 30 (75.0) | 35 (87.5) |
| Sex - n (%) female | 34 (85.0) | 33 (82.5) |
| % scoring above clinical threshold | | |
| Total RCADS-25 | 20.5 | 25.6 |
| Anxiety-subscale | 5.1 | 15.4 |
| Depression-subscale | 25.6 | 28.2 |

RCADS-25 = Revised Children's Anxiety and Depression Scale–Short Version

Table 2

Themes identified within participants' responses to the writing task (including percentage prevalence amongst 59 total responses)

| Theme | Description | Examples |
|--|---|---|
| Acceptance of thoughts and feelings (94.9%) | <ul style="list-style-type: none"> - Difficult thoughts/feelings are normal, common across humanity, and not shameful - Thoughts/feelings are not always accurate or helpful - We cannot control the thoughts/feelings that arise - Difficult thoughts/feelings are influenced by our past experiences and are our brain's way of protecting us | <ul style="list-style-type: none"> - "Feeling nervous or anxious is a natural response to new situations..." - "Your brain is being an overprotective friend that doesn't want you to get hurt" - "Listen to your brain's input, but don't take its word as the gospel truth." - "Don't feel ashamed about being nervous... there is nothing wrong with you..." |
| Self-determination and control (76.3%) | <ul style="list-style-type: none"> - We are not defined by our thoughts/feelings - We can decide who we are and what we do in life - We do not have to listen to difficult thoughts/feelings but can choose how to respond - Do what you value in life despite difficult thoughts/feelings - Seize opportunities | <ul style="list-style-type: none"> - "It is important to acknowledge these feelings, but you shouldn't let them define you" - "You – as a person – are more than negative emotions" - "You cannot control how your brain feels... but you CAN control the response you give towards this feeling" - "Do the things that are important to you... Life's too short" |
| Change is possible (57.6%) | <ul style="list-style-type: none"> - Thoughts/feelings/urges are not fixed but fleeting - Patterns and personality can change over time - We can grow - The brain is like a muscle and changes | <ul style="list-style-type: none"> - "Thoughts, emotions and urges come and go..." - "... we are all constantly growing and evolving" - "You can be whoever you want to be... the opportunity to recreate yourself" - "... new, stronger connections are formed between the neurons in your brain" |
| Doing something different is key to change (50.8%) | <ul style="list-style-type: none"> - Changing how we respond to difficult thoughts/feelings can change these thoughts/feelings over time - Doing new things can bring about personal growth | <ul style="list-style-type: none"> - "...sometimes the way we grow is by doing exactly what we are scared to do" - "... don't let the thoughts or feelings stop you as it is the way in which you react to them that determines how your life continues" - "Shyness and nervousness may be strong now but if you face them head on you will surely get better with time" |
| The importance of self-compassion and other people (55.9%) | <ul style="list-style-type: none"> - Doing different is not easy and requires us to step outside our comfort zone - Change takes time and should be approached step-by-step - Life can be hard - Change is not always possible and humans are imperfect - Seeking support from others can be helpful - It is okay to be different - You are important and worthy | <ul style="list-style-type: none"> - "It [change] will be slow and laborious." - "... your brain will adapt, it will take time, and maybe sometimes it won't work..." - "Don't push yourself too hard and always be kind to yourself" - "Seek help when needed and don't be afraid to talk about it" - "You are worth it and deserve good things." |

Table 3

Between-group mean differences at baseline, post-treatment, and follow-ups

| | | Average score (SD) | | ES of between-group difference (95% CI) |
|---|----------|----------------------------------|-----------------------------|---|
| | | Intervention (<i>n</i> = 40) | Control (<i>n</i> = 40) | |
| Personality mindset (IPTQ) | Baseline | 9.35 (2.33) | 9.97 (3.21) | -0.22 (-0.66 to 0.22) |
| | Post-Trt | 5.62 (2.09) | 9.94 (3.05) | -1.64 (-2.14 to -1.13) |
| | 4-wk FU | 7.62 (2.68) | 9.79 (3.13) | -0.74 (-1.19 to -0.29) |
| | 8-wk FU | 7.45 (3.20) | 9.43 (3.10) | -0.62 (-1.07 to -0.17) |
| Psychological flexibility (AFQ-Y8) | Baseline | 11.68 (5.49) | 13.18 (6.41) | -0.25 (-0.69 to 0.19) |
| | Post-Trt | 8.39 (5.10) | 12.40 (6.64) | -0.67 (-1.12 to -0.22) |
| | 4-wk FU | 10.32 (4.82) | 13.56 (6.85) | -0.54 (-0.99 to -0.10) |
| | 8-wk FU | 10.60 (5.65) | 13.23 (6.82) | -0.42 (-0.86 to 0.03) |
| Self-compassion (SCS-SF)* | Baseline | 33.03 (7.48) | 32.78 (8.45) | 0.03 (-0.41 to 0.47) |
| | 4-wk FU | 35.78 (7.07) | 32.98 (6.56) | 0.41 (-0.04 to 0.85) |
| | 8-wk FU | 33.67 (6.64) | 33.31 (7.36) | 0.05 (-0.39 to 0.49) |
| Self-esteem (RSES)* | Baseline | 25.49 (4.37) | 24.85 (5.25) | 0.13 (-0.31 to 0.57) |
| | 4-wk FU | 26.07 (4.00) | 24.68 (4.38) | 0.33 (-0.11 to 0.77) |
| | 8-wk FU | 27.03 (4.88) | 25.11 (4.94) | 0.39 (-0.06 to 0.83) |
| Total Anxiety & Depression (RCADS-25) | Baseline | 24.43 (10.90) | 27.26 (10.81) | -0.26 (-0.70 to 0.18) |
| | 4-wk FU | 22.28 (9.39) | 26.78 (10.44) | -0.45 (-0.89 to 0.00) |
| | 8-wk FU | 23.89 (10.25) | 27.51 (10.42) | -0.35 (-0.79 to 0.10) |
| Anxiety | Baseline | 12.50 (6.06) | 14.31 (6.53) | -0.28 (-0.72 to 0.16) |
| | 4-wk FU | 11.00 (5.29) | 13.23 (6.60) | -0.37 (-0.81 to 0.07) |
| | 8-wk FU | 10.99 (5.61) | 14.58 (6.70) | -0.57 (-1.02 to -0.13) |
| Depression | Baseline | 11.93 (6.02) | 12.95 (5.44) | -0.18 (-0.62 to 0.26) |
| | 4-wk FU | 11.45 (5.70) | 13.28 (5.54) | -0.32 (-0.76 to 0.12) |
| | 8-wk FU | 12.08 (5.92) | 13.38 (5.41) | -0.23 (-0.67 to 0.21) |

Note: Post-Trt = post-treatment; wk = week; FU = follow-up; ES = effect size (Hedge's *g*); CI = confidence interval. Small-large effect sizes are denoted in bold. For measures marked with an asterisk, a positive ES is favorable. For all other measures, a negative ES is favorable. Measures: IPTQ = Implicit Personality Theory Questionnaire; AFQ-Y8 = Acceptance and Fusion Questionnaire for Youth–Short Form; SCS-SF = Self-Compassion Scale–Short Form; RSES = Rosenberg Self-Esteem Scale; RCADS-25 = Revised Children's Anxiety and Depression Scale–Short Version; Anxiety = RCADS-25 Anxiety-Subscale; Depression = RCADS-25 Depression-Subscale

Table 4

Mean index of reliable change per treatment arm with percentage of participants demonstrating improvement and deterioration

| | | Post-trt | | | 4-weeks | | | 8-weeks | | |
|---------------------------------------|---|----------|------|-----|----------|------|-----|----------|------|------|
| | | <i>M</i> | % + | % - | <i>M</i> | % + | % - | <i>M</i> | % + | % - |
| Personality mindset (IPTQ) | I | -2.19 | 43.6 | 0.0 | -0.96 | 26.3 | 2.6 | -0.95 | 38.1 | 4.8 |
| | C | -0.14 | 0.0 | 0.0 | -0.17 | 3.0 | 3.0 | -0.15 | 4.8 | 4.8 |
| Psychological flexibility (AFQ-Y8) | I | -0.94 | 20.5 | 0.0 | -0.38 | 7.9 | 2.6 | -0.42 | 19.1 | 9.5 |
| | C | -0.23 | 2.6 | 0.0 | 0.06 | 6.1 | 6.1 | 0.08 | 9.5 | 19.1 |
| Self-compassion (SCS-SF) | I | | | | 0.65 | 18.4 | 0.0 | 0.22 | 33.3 | 4.8 |
| | C | | | | 0.04 | 6.1 | 6.1 | 0.12 | 4.8 | 4.8 |
| Self-esteem (RSES) | I | | | | 0.18 | 0.0 | 0.0 | 0.47 | 4.8 | 4.8 |
| | C | | | | -0.04 | 3.0 | 3.0 | 0.18 | 9.5 | 4.8 |
| Total Anxiety & Depression (RCADS-25) | I | | | | -0.35 | 7.9 | 2.6 | -0.38 | 9.5 | 9.5 |
| | C | | | | -0.09 | 6.1 | 0.0 | 0.02 | 9.5 | 0.0 |
| Anxiety | I | | | | -0.46 | 5.3 | 5.3 | -0.56 | 14.3 | 0.0 |
| | C | | | | -0.27 | 3.0 | 3.0 | 0.03 | 9.5 | 4.8 |
| Depression | I | | | | -0.13 | 5.3 | 5.3 | -0.09 | 14.3 | 4.8 |
| | C | | | | 0.11 | 6.1 | 0.0 | 0.01 | 4.8 | 0.0 |

Note: I = intervention group; C = control group; *M* = mean index of reliable change; % + = % of participants demonstrating positive change/improvement; % - = % of participants demonstrating negative change/deterioration. Data represents the completer sample per timepoint (i.e. total *n* post-trt=78; 4-weeks=71; 8-weeks=42).

Measures: IPTQ = Implicit Personality Theory Questionnaire; AFQ-Y8 = Acceptance and Fusion Questionnaire for Youth–Short Form; SCS-SF = Self-Compassion Scale–Short Form; RSES = Rosenberg Self-Esteem Scale; RCADS-25 = Revised Children’s Anxiety and Depression Scale–Short Version; Anxiety = RCADS-25 Anxiety-Subscale; Depression = RCADS-25 Depression-Subscale

Figure 1: Consort diagram

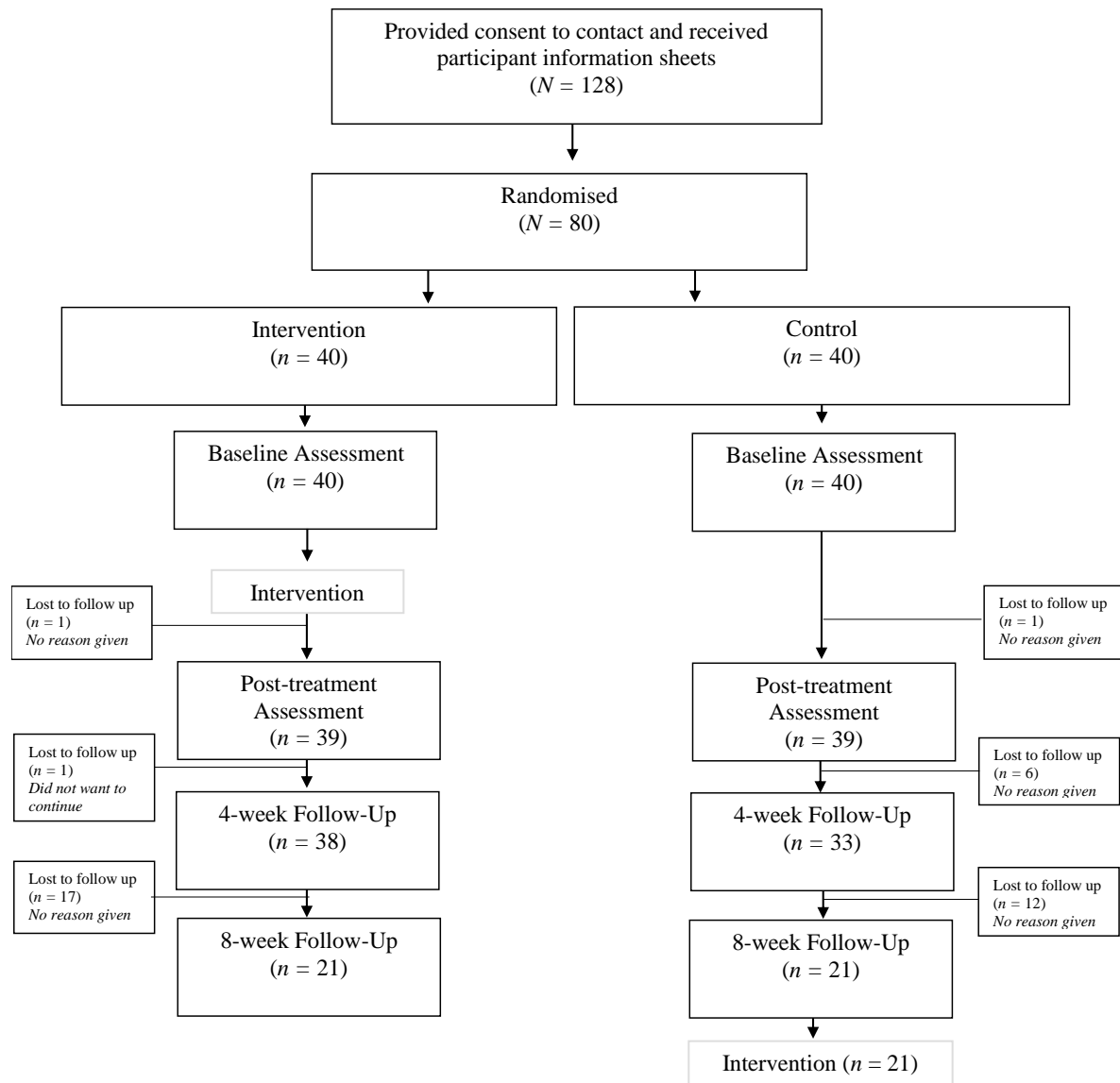


Figure 1. Flowchart (CONSORT) of participants

Box 1: Detailed description of intervention content

The intervention explained in simple terms that: 1) thoughts, feelings, and behavioral urges result from activity between neurons; 2) there are links between thoughts, feelings, and behaviors (as well as bodily responses) that are neurologically-based; 3) neuronal activity is transient rather than fixed, and thus so are psychological experiences; 4) given neuronal activity is rapid and extensive, in-the-moment experiences are not entirely controllable; 5) we can allow and be compassionate towards difficult psychological experiences, which are evolved or learnt responses intended to protect us, are universal, and inherently harmless; 6) we may observe patterns of the same thoughts, feelings, and behaviors, which have developed over time (long-standing patterns can be construed as aspects of personality); 7) psychological experiences (including familiar patterns of these) can be biased and urge us to behave in ways that are unhelpful for us in the long-term, but we can avoid becoming fused with them and/or change our *response* to them; and 8) changing our responses can change our psychological experiences, personality, and neurobiology over time (given behavior-body-thoughts-feelings links and neuroplasticity); 9) every human is different, imperfect, and has limitations, meaning some changes in relation to our psychological experiences and personality are not possible; 10) behavioral change nevertheless remains achievable and we can seek to ensure we still live in accordance to our values on these occasions.