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ORIGINAL PAPER

A Non-Randomised Feasibility Trial Assessing the Efficacy of a Mindfulness-Based Intervention for Teachers to Reduce Stress and Improve Well-Being

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Abstract Teacher stress is a serious and endemic concern. Mindfulness-based interventions show promise in reducing stress and increasing well-being by cultivating mindfulness and self-compassion. This feasibility trial evaluated a mindfulness-based programme customised for teachers. A sample of 89 secondary school teachers and staff were recruited and self-selected into the intervention (n=49) or comparison (n=40) conditions. Participants were asked to complete self-reports which measured stress (PSS), well-being (WEMWBS), mindfulness (FFMQ), and self-compassion (SCS; Kindness and Self-Judgement) at baseline and after the completion of the intervention. Results revealed that individuals in the intervention condition reported significant reductions in stress, and significant increases in well-being post-intervention in comparison to their counterparts in the comparison group. There was an observed large effect (η_p^2>.14) for the intervention on all outcome measures, an effect that was maintained when controlling for baseline differences between the intervention and comparison groups. Furthermore, the majority (95 %) of teachers who attended the course found it to be acceptable. These results indicate that a customised mindfulness-based programme for teachers is a promising approach to reducing stress and increasing well-being, mindfulness, and self-compassion among secondary school teachers. However, the results of the current study are preliminary and the next phase of work will involve extending to a larger scale randomised controlled trial.

Keywords Feasibility trial · Mindfulness · Teachers · Stress · Well-being

Introduction

Schools play a vital role in shaping childhood and adolescent development and have great potential to promote health, including mental health (Eccles et al. 1993; Weare 2000; Weare and Markham 2005). Within the school system, teachers are arguably the most important agents for the cultivation and promotion of health. Teachers are an important element in students' lives, with evidence pointing to teacher well-being as indirectly but significantly affecting students' social and emotional health and scholastic performance (Malmberg and Hagger 2009). However, work-related stress among teachers is a serious and endemic problem, and this stress has negative implications on their health and effectiveness (Pithers and Fogarty 1995). Evidence suggests that stress among teachers is often associated with turnover and absenteeism from work, which are believed to be rising with the increasing demands and pressure placed upon teachers (Aud et al. 2011; Montgomery and Rupp 2005). For instance, Sheffield et al. (1994) found that job stress among teachers was correlated with short-term sick leave, but also predictive of other measures of psychological well-being.

Mindfulness-based interventions (MBIs) have shown promise in alleviating stress and promoting well-being (Khoury et al. 2013). A number of randomised controlled trials (RCTs) show moderate effects for mindfulness-based

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programmes in their ability to improve adult mental and physical well-being (Victorson et al. 2015). Given this success, there have been significant initiatives to introduce mindfulness into schools as an acceptable and non-stigmatising approach to reducing stress and improving well-being of both students and teachers (Meiklejohn et al. 2012). Early research efforts that examined the preliminary efficacy of MBIs for teachers have found that MBIs are effective in mitigating stress and fostering coping, positive affect and other facets of well-being (see Meiklejohn et al. 2012, for review). For instance, Mañas et al. (2011) found that teachers who participated in an MBI reported significantly less stress and were less likely to take sick leave than teachers who did not participate in the intervention. Thus, MBIs show promise in providing teachers with the necessary tools to buffer stress and increase well-being.

Given their promising preliminary results, school-based mindfulness programmes that involve teacher education are proliferating throughout the world: the Garrison Institute (2014) recorded 27 mindfulness-based school programmes that either include teachers or target them exclusively as an intervention audience. Overall, these mindfulness-based initiatives are showing some promise. For example, an RCT by Benn et al. (2012) assessed the efficacy of a 5-week mindfulness programme for parents and educators of children with special needs. Participants who took part in the intervention evidenced significant increases in their mindfulness, awareness, patience, empathy, and forgiveness of the self and showed significant diminutions in their stress and anxiety.

In their pilot trial, Jennings et al. (2011) found that their Cultivating Awareness and Resilience in Education (CARE) mindfulness programme was efficacious in improving students' and teachers' well-being. As a result of these improvements, teachers reported a better ability to manage their classrooms and improved relationships with their students. Furthermore, a trial by Jennings et al. (2013) found that a MBI was efficacious in improving teachers' physical and mental well-being and reducing stress and burnout. These improvements were also associated with teachers' qualitative reports of improvements in scholastic outcomes. Finally, results from Roeser et al. (2012) indicated that teachers randomised to a mindfulness-based programme showed significant reductions in stress and burnout and evidenced improvements in working memory capacity and self-compassion at post-treatment and at follow-up.

Reviews suggest that any school-based approach to promoting mental health should start with the mental health of teachers (Weare and Nind 2011). For example, in their review, Jennings and Greenberg (2009) introduce a model of the prosocial classroom, wherein they emphasise the role of teachers' social and emotion competence in promoting improved learning conditions for the student. These authors concluded that new interventions that focus on improving teacher well-being and psychosocial adjustment are in order. Accordingly, it is foundational for any school-based mental programme to ensure that teachers are supported and learn the tools to manage stress and other challenges that are inherent in teaching.

The .b Foundations Course was developed to enable teachers to learn mindfulness and self-compassion as ways to manage stress and enhance well-being. The premise is that to teach mindfulness to young people, it is essential that teachers have a deep familiarity with what they are teaching and that they embody what they are teaching, namely mindfulness. The .b Foundations Course is based on the core principles of Mindfulness-Based Stress Reduction (MBSR) and Mindfulness-Based Cognitive Therapy (MBCT) but has been adapted for accessibility and utility for school teachers and staff using many of the ideas in the book *Mindfulness: Finding Peace in a Frantic World* (Williams and Penman 2011).

This study examined the preliminary efficacy, possible mechanism and acceptability of the mindfulness training customised for teachers and intended to reduce stress and promote well-being in the school system. A sample of secondary school teachers and staff were recruited and non-randomly allocated (i.e. self-selected) to either the intervention condition or the waitlist/comparison condition. We predicted that teachers and staff in the intervention condition, in comparison to teachers and staff in the comparison condition, would report a) decreased levels of stress, and b) increased levels of well-being, post mindfulness training. Further, a set of secondary hypotheses were generated where we predicted that c) teachers in the intervention condition would report significant increases in mindfulness and self-kindness and decrease in self-judgment (all viewed as possible process variables) at post-intervention in comparison to individuals in the comparison group. Finally, we assessed the acceptability of the course for teachers who received the training using two post-course questions about enjoyment and learning.

Method

Participants

Participants for this study were recruited from seven secondary schools which comprised state-comprehensives, grammar, academy and private schools, located in five regions across England. Individuals included in the study were either secondary school teachers, or staff who had direct contact with the students in an educational/pastoral/support role. A total of 108 participants were initially recruited across the seven schools with an average of 9–10 individuals in each group (range of 6–13). Full data were obtained from 89 of these initial 108, representing 82 % of participants initially recruited (49 intervention and 40 comparison arm participants).

All procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national) and with the Helsinki Declaration of 1975, as revised in 2000. Informed consent was obtained from all participants for being included in the study. Participants were not compensated for their participation in this study. The study was approved by the University of Exeter, Department of Psychology Ethics Board (on 18/2/13; reference number 2013/292).

Procedure

All participants were recruited by teachers delivering the interventions (hereafter referred to as MBI teachers) in their respective host schools. An initial open-to-all presentation on mindfulness and the mindfulness training programme, with opportunities for discussion and questions, was offered to all secondary school teachers and staff in order to support their informed consent to participate in the research in either the 'intervention' or 'comparison' condition, or indeed to enrol in the course without taking part in the research. Directly after the initial presentation, attendees who were interested in participating recorded their information and self-selected into either the comparison or intervention condition. After the participants' consent to be part of the research had been obtained, the baseline package of questionnaires was completed. The personalised post-intervention questionnaire packages were sent electronically to all participants a few days prior to the completion of the seven-week course; two additional questions on acceptability and learning were included in the intervention participants' package. All participants were asked to complete their post-intervention questionnaires and return them in a sealed package to their respective MBI teachers. As part of the baseline package, participants were asked to provide information regarding only their ethnicity and gender; no other demographic variables were collected in this study.

The MBI teacher in each school was delegated with the task of collecting and collating completed pre and post-intervention packages for both conditions and posting them back to the researcher as soon as collected. Data collection was completed late in July 2013.

Intervention The intervention condition utilised the pilot programme '.b Foundations Course'; which is one of the three school-based mindfulness training programmes developed by the Mindfulness in Schools Project (MiSP). The programme included nine sessions in total, which comprised a presentation session and eight further sessions that were 75 min in duration. The sessions consisted of modules focusing on attention to body (e.g. body scan), attention to thoughts (e.g. session four, 'Stepping Back from Thoughts & Worries'), and cultivation of self-compassion (e.g. session six, 'From Giving Yourself a Hard Time to Giving Yourself a Beak'). In addition to these staple mindfulness modules, there were a number of other modules that were tailored more specifically for teachers (e.g. module seven, "All Work and No Play?"). Participants of the programme were expected to conduct a 10–40-minute home practice session six days a week. The programme was designed to be delivered weekly (but has also been taught over a shorter timeframe with some 'double sessions'). For this study, four of the courses were taught weekly over the eight weeks. Three courses included two or three 'double sessions' due to practical and time constraints. All courses were taught over an equivalent timeframe and participants were given the same weekly home practice schedules. Only participants who completed at least five of the eight sessions were retained in the study. In accordance with this criterion, only four individuals were dropped from the intervention arm due to low attendance.

The .b Foundations Course is based on the core mindfulness principles of MBSR and MBCT and uses many of the components of *Mindfulness: Finding Peace in a Frantic World* (Williams and Penman 2011) adapted for a non-clinical population and designed to offer relevant and accessible mindfulness training to adults in an educational context. Participants use the CDs from the book *Mindfulness*: *A Practical Guide to Finding Peace in a Frantic World* (Williams and Penman 2011) to support home practice. Like other MBCT courses, it is a group-based intervention designed to be delivered by trained and qualified mindfulness practitioner-teachers. The sessions aim to be clearly structured with partially scripted lesson plans, with the intention of supporting fidelity to the protocol.

Teachers delivering the intervention were required to meet the Guidance for Teaching Mindfulness (U.K. Network of Mindfulness-Based Teacher Trainers 2011), which stipulates that teachers must have an established, regular personal mindfulness meditation practice of three or more years including retreats; are familiar with the population of secondary school teachers and staff; are trained, supervised and experienced MBSR/MBCT teachers, and/or are trained and experienced secondary school teachers; and are additionally trained/experienced in teaching the '.b for Teens' programme and hold a Teach '.b Certificate'.

Seven MBI teachers, two male and five female, were recruited from an original list endorsed by the MiSP programme developers as competent to teach the programme based on their training and supervision of the teachers. In addition to teaching the course, these MBI teachers were responsible for eliciting support from the respective head teachers in the schools hosting the course, recruiting the experimental and comparison cohorts of teachers/staff, management of research components, and management of other administrative duties related to the study. The MBI teachers offered a presentation session and initial course orientation, together with administration of the participant information, consent forms and sets of questionnaires.

Measures

Stress Stress levels were assessed using the 10-item Perceived Stress Scale (PSS; Cohen et al. 1983). The PSS asks respondents how they appraised their lives over the previous month as stressful, unpredictable (e.g. 'In the last month, how often have you been upset because of something that happened unexpectedly?'), uncontrollable, and overloaded (e.g. 'In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?'). Higher scores on the PSS reflect increased levels of stress. The PSS is scored on a five-point scale ('never' to 'very often', 0–4, with four items reverse-scored) summed into a total score (range 0–40). This scale has demonstrated good reliability, validity and sensitivity to change (Hewitt et al. 1992). In the current study, internal consistency for baseline scores on the PSS was α=.89.

Well-Being Well-being was measured using the 14-item Warwick-Edinburgh Mental Well-being Scale (WEMWBS; Stewart-Brown et al. 2011). The WEMWBS is designed to capture a broad representation of well-being including affective-emotional aspects (e.g. 'I've been feeling cheerful'), cognitive-evaluative dimensions (e.g. 'I've been dealing with problems well') and psychological functioning (e.g. 'I've been thinking clearly'). The scale consists of 14 items answered on a five-point scale, ranging from 'none of the time' to 'all of the time' and is scored by summing all the items into a total well-being score (range 14–70). The questionnaire asks participants to score the answer that best describes their experience of each item over the previous 2 weeks. The WEMWBS has been shown to have good validity, internal consistency and test–retest reliability with a large sample of students (N=354) and a general population sample (N=2075; Tennant et al. 2007). In the current study, internal consistency for baseline scores on the WEMWBS was α=.91.

Mindfulness Mindfulness was evaluated by the 39-item Five Facet Mindfulness Questionnaire (FFMQ; Baer et al. 2006) which was developed from a factor analytic study of five independently validated mindfulness questionnaires. The analysis produced five factors representing features of mindfulness as currently conceptualised. The five facets are observing (e.g. 'I watch my feelings without getting lost in them'), describing, acting-with-awareness (e.g. 'When I do things, my mind wanders off and I'm easily distracted'), non-judging of inner experience and non-reactivity to inner experience (e.g. 'When I have distressing thoughts or images, I just notice them and let them go'). The scale is scored on a five-point Likert scale (from 'Never or very rarely true' to 'Very often or always true'). After reversing negatively worded items, higher scores on the FFMQ are indicative of higher mindfulness skills, with scores ranging from 39–195. Baer et al. (2006) found that the scale possessed adequate predictive and construct validity. Cronbach's alpha coefficients for the subscales ranged from .75–.91, evidencing adequate to excellent internal reliability. In the current sample, Cronbach's alpha for baseline scores of this measure was α=.93.

Self-Compassion These self-referential general modes of thinking feeling and behaving were rated by using two of the six subscales: 'self-judgment' and 'self-kindness' from the Neff Self-Compassion Scale (SCS; Neff 2003). Each of the two utilised subscales comprises 10 items, totalling 20 items. These items are scored on a five-point Likert style scale (from 'Never/Almost Never' to 'Always/Almost Always'), with higher total scores indicative of greater self-compassion (after the reversal of negatively-keyed items). For the sake of continuity, we have combined the scores of these subscales into one omnibus score, and hereafter call this construct 'self-compassion'. Total scores for the two combined subscales the SCS ranged from 0 to 80. Neff (2003) found that the subscales of the SCS possessed adequate test–retest and internal reliabilities. In the current study, Cronbach's alpha for baseline scores on this measure was α=.90.

Teachers' Feedback The study included two post-test questions on acceptability of the programme, using a five-point Likert-type scale: 'How much have you enjoyed the course?' and 'How much do you feel you have learned from the course?'.

Data Analyses

After data cleaning, the dependent variables were examined for normality. The gender distribution across conditions was examined using a chi-squared analysis. We examined baseline differences between the intervention and comparison groups on the primary (stress) and secondary (well-being, mindfulness and self-compassion) measures. We also examined baseline differences between genders and based on school affiliation.

To directly examine the predictions relating to change on the primary outcome (stress), secondary outcome (well-being) and secondary measures (mindfulness and self-compassion), we conducted a series of 2 (condition) by 2 (time) repeated measures Analysis of Variance (ANOVA). Where significant interaction effects were found, we conducted a series of paired samples t tests within each of the conditions to elucidate where the interactions lie. As such, two paired t tests were conducted for each of the four outcome measures. To reduce the likelihood of a Type I error, a Bonferroni correction was applied in interpreting results. Last, we examined descriptive statistics relating to teacher's feedback regarding the intervention to gauge its acceptability among those in the intervention group. Aside from the Bonferroni correction applied to interpret the

results of the paired samples *t* test, the alpha level was set at .05 for all other analyses conducted in this study.

When significant baseline differences were found, we conducted a series of sensitivity analyses to see if the results of the main analyses would hold. To this end, a series of Analyses of Covariance (ANCOVAs) were calculated to examine the differences between the intervention and comparison groups on post-intervention scores, while controlling for baseline scores of the same measure. We also conducted a number of other analyses to examine whether gender, school affiliation or number of missed sessions were systematically related to the dependent measures.

The data were first checked for missing values. Missing values were few (less than 1 %), and where appropriate, these values were imputed using item-level means within each group. Initially, we recruited 108 participants to take part in the study. A total of 19 participants dropped out of the study (12 from the comparison condition and seven from the intervention condition). Of the seven excluded participants in the intervention group, only four (8 %) were dropped due to insufficient attendance, which was defined as missing four or more sessions. The mean number of missed sessions in the present study was 0.80 (*SD*=.84), with 20 individuals (40 %) in the intervention group missing 0 sessions, 22 individuals (45 %) missing 1 session, 4 individuals (8 %) missing 2 sessions, and 3 individuals (6 %) missing 3 sessions. After attrition, there was a total *N* of 89 (*n*=49 for the intervention group) for all questionnaires except for the WEMWBS. The WEMWBS was misprinted within five of the questionnaire packages for individuals in the intervention group. Accordingly, data from this measure for these participants were excluded from further analyses (e.g. *n*=44 in the intervention).

In order to examine the normality of the dependent variables, we explored the skewness and kurtosis for all four measures both pre and post intervention. Skewness for all measures ranged from −.34 to .57, all within the suggested range of ±1 for normal distributions (Tabachnick and Fidell 2007). Similarly, all kurtosis statistics for the dependent measures were within the range expected of a normal distribution.

Results

The total sample consisted of 62 females (69.66 %), which is an over-representation of female teachers in secondary schools in England (62 %; Department of Education 2010). A chi-squared analysis revealed that there were significantly more females in the intervention condition (*n*=40) in comparison to those self-selecting into the comparison condition (*n*=22), $\chi^2(1, N=89)=7.39$, $p=.007$. Only one individual in the sample self-identified as 'non-White' in ethnicity.

Given the unequal gender distribution across groups present in this sample, we conducted a series of analyses to examine differences between males and females within and across groups on baseline dependent variables (i.e. four Group by Gender ANOVAs). There was no statistically significant main effect of gender or significant interaction effect on any of the four dependent measures at baseline. Table 1 provides a summary of these analyses as well as means and standard deviations on baseline measures grouped by intervention condition and gender.

Four independent samples *t* tests were conducted to examine differences between the intervention and comparison groups on baseline scores for all outcome measures. The first test examined differences between the groups on baseline scores of the PSS. This analysis revealed a significant difference between the intervention and comparison groups, $t(87)=3.43$, $p<.001$, wherein participants in the intervention group reported significantly higher scores on the PSS than those in the comparison arm.

The second test examined differences between the groups on baseline scores of the WEMWBS. This analysis revealed a significant differences between the groups, $t(87)=-2.99$, $p=.004$, wherein individuals in the intervention group scored

Table 1 Descriptive statistics and summary of analyses of gender differences on baseline measures within and across conditions

Baseline measure	Group				Significance (*P*)		
	Intervention		Comparison				
	Female M (SD)	Male M (SD)	Female M (SD)	Male M (SD)	Group	Gender	Interaction
PSS	19.98 (6.46)	21.33 (4.58)	15.68 (8.13)	14.61 (7.34)	=.002*	=.932	=.474
WEMWBS	47.73 (7.42)	45.22 (6.80)	51.73 (6.53)	51.50 (5.98)	=.003*	=.417	=.499
FFMQ	118.53 (17.24)	111.33 (13.85)	134.32 (18.99)	128.94 (17.11)	<.01*	=.141	=.830
SCS	27.93 (6.81)	27.22 (5.95)	31.04 (6.39)	29.22 (7.73)	=.127	=.450	=.737

PSS Perceived Stress Scale, *WEMWBS* Warwick-Edinburgh Mental Well-being Scale, *FFMQ* Five Facet Mindfulness Questionnaire, *SCS* Self-Compassion Scale

*Significance at the .01 level

significantly lower than those in the comparison group on the WEMWBS at baseline.

The third and fourth *t* tests examined differences on baseline scores of the FFMQ and SCS between individuals in both conditions. These tests revealed a significant difference between the groups on baseline scores of the FFMQ, $t(87)=-3.96$, $p<.001$, where individuals in the intervention group scored significantly less than those in the comparison group on this measure. There were no significant differences between the groups at baseline on scores of the SCS, $t(87)=-1.96$, $p=.096$.

Further, we examined whether teachers' scores on baseline measures differed significantly depending on their school affiliation. Accordingly, we conducted four ANOVAs examining baseline scores of the four dependent measures, with school affiliation acting as the independent variable. It was found that teachers from different schools did not significantly differ on baseline scores of the PSS, $F(6, 82)=.53$, $p=.79$, WEMWBS, $F(6, 82)=1.15$, $p=.34$, and FFMQ $F(6, 82)=1.02$, $p=.42$. There were between-school differences on baseline scores of the SCS, $F(2, 82)=2.28$, $p=.048$, $\eta_p^2=.140$.

Two repeated measures ANOVAs were conducted to examine changes across time between the intervention and comparison condition on measures of stress (primary) and well-being (secondary). Table 2 summarises descriptive statistics of mean scores on pre–post outcome measures, stratified by condition. The analysis revealed a significant interaction between the intervention and time point of assessment on PSS scores, $F(1, 87)=28.93$, $p<.001$, $\eta_p^2=.250$ (see Fig. 1). As planned, two paired samples *t* tests examining pre–post differences in PSS scores were conducted separately for the intervention and comparison conditions. The first analysis revealed a significant effect for the intervention group, wherein individuals in this group scored significantly lower on the PSS at post-intervention in comparison to baseline, $t(48)=6.32$, $p<.001$. No significant difference was found for comparison participants on the PSS at baseline in comparison to post-intervention, $t(39)=-1.29$, $p=.206$. This first analysis also revealed a significant main effect for time on scores of the PSS. The analysis showed that individuals in both conditions (collapsed across intervention group) reported significantly more stress at baseline ($M=17.96$, $SD=7.29$) in comparison to post-intervention ($M=14.92$, $SD=5.92$), $F(1, 87)=13.18$, $p<.001$, $\eta_p^2=.132$.

The second analysis examining differences on the WEMWBS revealed a significant interaction, $F(1, 83)=35.59$ $p<.001$, $\eta_p^2=.300$ (see Fig. 2). Two paired samples *t* tests were conducted. The first of these analyses showed a significant increase in WEMWBS scores at post-intervention in comparison to baseline for the intervention group, $t(44)=-6.17$, $p<.001$. There was no significant difference between baseline and post-intervention scores on the WEMWBS for the comparison group, $t(39)=-1.96$, $p=.057$. Also, the second analysis revealed a significant main effect for time, wherein individuals in both conditions reported significantly lower scores on the WEMWBS at baseline ($M=49.44$, $SD=7.22$) in comparison to post-intervention ($M=52.31$, $SD=6.73$), $F(1, 83)=13.03$, $p<.001$, $\eta_p^2=.136$.

Two additional repeated measures ANOVAs were conducted to examine differences between the intervention and comparison condition across time on the secondary measures (FFMQ and SCS). There was also a significant interaction in the third analysis, $F(1, 87)=71.03$, $p<.001$, $\eta_p^2=.449$. The first paired samples *t* test revealed a significant difference between baseline and post-intervention scores on the FFMQ for individuals in the intervention condition, wherein these participants reported significant increases in their FMMQ scores at post-intervention, $t(48)=-9.31$, $p<.001$. There was no significant difference for comparison group participants between baseline and post-intervention FFMQ scores, $t(39)=1.72$, $p=.094$. The analysis also revealed a significant main effect of time; individuals in both conditions reported significantly lower scores on the FFMQ at baseline ($M=123.81$, $SD=18.36$) compared to post-intervention ($M=134.98$, $SD=18.36$), $F(1, 87)=46.64$, $p<.001$, $\eta_p^2=.349$.

Last, the fourth analysis revealed a significant interaction, $F(1, 87)=34.75$, $p<.001$, $\eta_p^2=.285$ between time and intervention group on scores on the SCS. The first of two paired samples *t* tests revealed significant differences for individuals in the intervention between pre and post-intervention scores

Table 2 Descriptive statistics of treatment and comparison conditions on outcome measures pre and post intervention

	Intervention condition		Comparison condition	
Measure	Baseline M (SD)	Post-intervention M (SD)	Baseline M (SD)	Post-intervention M (SD)
PSS	20.22 (6.14)	13.65 (5.49)	15.20 (7.70)	16.47 (6.13)
WEMWBS	47.51 (7.57)	54.42 (5.91)	51.62 (6.21)	49.92 (6.85)
FFMQ	117.2 (16.77)	139.4 (16.62)	131.9 (18.14)	129.6 (19.12)
SCS	27.79 (6.61)	33.92 (6.39)	30.22 (6.98)	29.30 (5.91)

PSS Perceived Stress Scale, *WEMWBS* Warwick-Edinburgh Mental Well-being Scale, *FFMQ* Five Facet Mindfulness Questionnaire, *SCS* Self-Compassion Scale

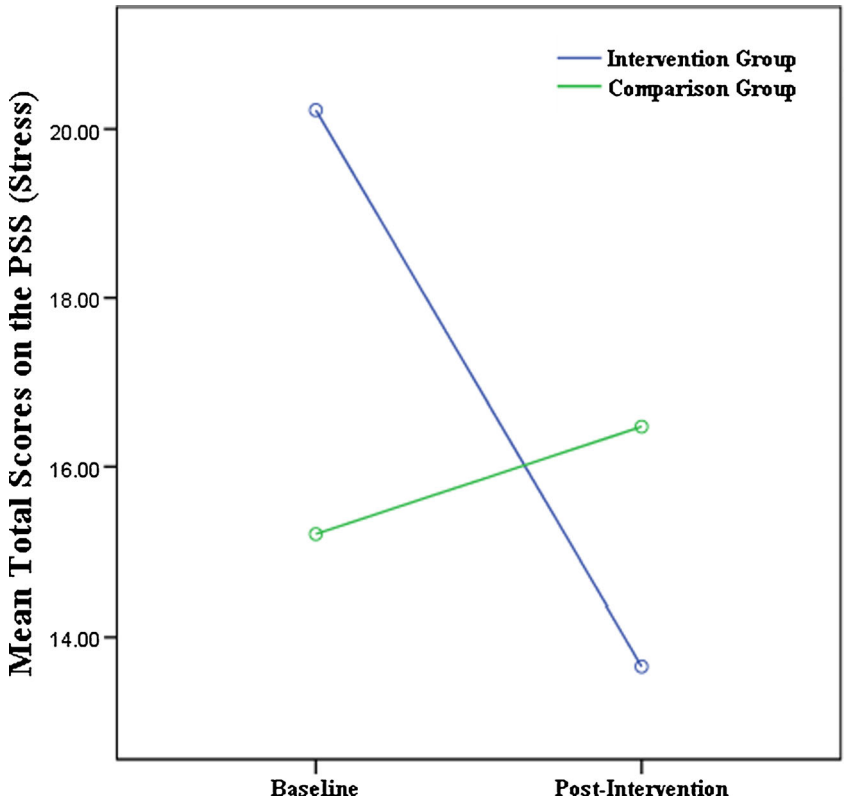

Fig. 1 Differences in reported stress (PSS scores) between the intervention and comparison conditions from baseline to post-intervention

on the SCS, wherein these individuals reported significantly increased scores on the measure post-intervention, $t(48)=-6.48$, $p<.001$. There was no significant difference in pre- and post-intervention SCS scores for individuals in the comparison condition, $t(39)=1.45$, $p=.156$. There was also a significant main effect for time on scores of self-compassion

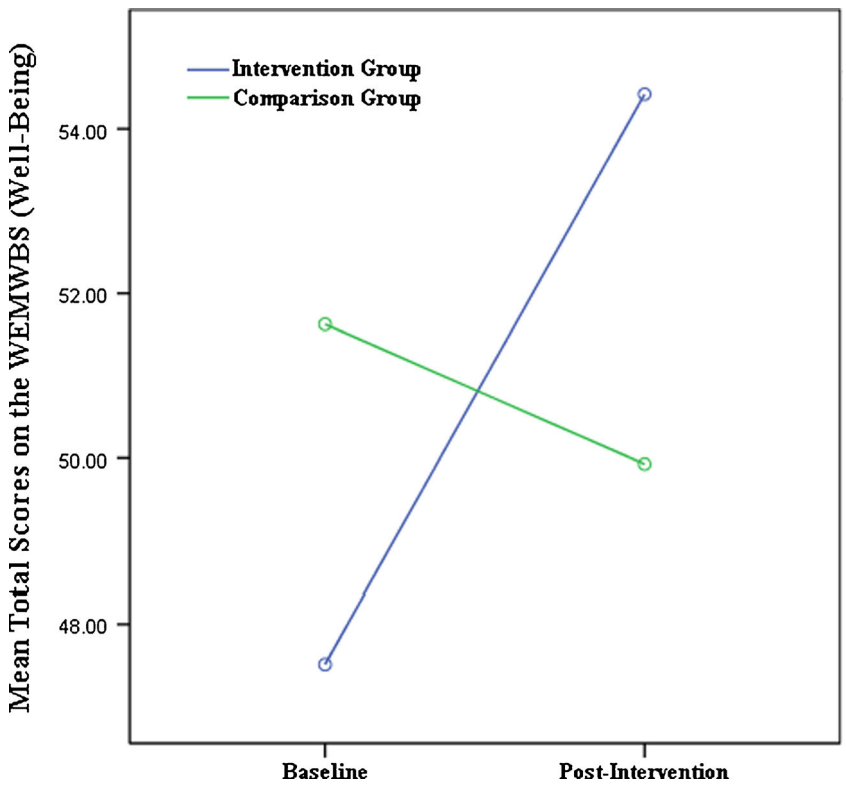

Fig. 2 Differences in well-being (WEMWBS scores) between intervention and comparison conditions from baseline to post-intervention

(SCS), wherein individuals in both conditions endorsed lower self-compassion scores at baseline (M=28.89, SD=6.85) compared to post-intervention (M=31.84, SD=6.57), F(1, 87)=18.90, p<.001, η_p^2=.178.

In light of the preliminary analyses of baseline scores, we conducted a series of three ANCOVAs that examined differences between the groups at post-intervention, while using baseline scores as covariates. These three ANCOVAs examined differences in post-intervention scores on the PSS, WEMWBS and FFMQ, while controlling for baseline scores on these measures.

Even after controlling for baseline PSS scores, the first of these analyses revealed a significant difference between the intervention and comparison groups in post-intervention scores on the PSS, F(1, 86)=14.98, p<.001, η_p^2=.15. The analyses showed that individuals in the intervention condition scored significantly lower on the PSS than those in the comparison group at post-intervention. Similarly for the secondary outcome, a further ANCOVA showed a significant difference between the intervention and comparison groups in post-intervention scores on the WEMWBS, F(1, 86)=26.13, p<.001, η_p^2=.24, even after controlling for baseline scores on the same measure. These analyses revealed that individuals in the intervention arm reported significantly higher WEMWBS scores than those in the comparison arm after the intervention.

A third ANCOVA was conducted to examine differences between the groups on the FFMQ at post-intervention, while controlling for baseline scores of this measure. This analysis showed that there was a statistically significant difference between the groups on the FFMQ at post-intervention, F(1, 86)=47.11, p<.001, η_p^2=.35.

As there was a gender imbalance between the conditions, we conducted repeated measures analyses examining the effects of time, condition and gender on changes of scores on the primary and secondary measures. These analyses found no time by gender nor time by condition by gender effects on any of the four measures (p>.05).

Further, and given baseline differences between teachers of differing school affiliations on the SCS, we conducted a repeated measures ANOVA examining the interaction of school affiliation, intervention and time on post-treatment scores on this measure. Consistent with the main repeated measures ANOVAs described above, this analysis revealed a significant main effect of time, wherein teachers in both treatment conditions and from all schools reported significantly higher scored on the SCS at the post-treatment assessment phase, F(1, 75)=10.82, p=.002, η_p^2=.126. As with the first repeated measures analysis examining this variable, there was a significant interaction between time and intervention condition, wherein individuals receiving the intervention scored significantly higher on the SCS post-treatment than those in the comparison arm, F(1, 75)=20.31, p<.001, η_p^2=.213. There was no significant interactions between time and school affiliation, F(1, 75)=.88, p=.512, and no significant three-way interaction between time, school affiliation and intervention, F(1, 75)=.27, p=.950.

Finally, we conducted a series of ANOVAs to examine differences on post-intervention measures between individuals who have missed 0, 1, 2, and 3 sessions within the intervention arm. A summary of these analyses can be found in Table 3 As can be seen in Table 3, the analyses revealed no significant differences between individuals who had missed 0–3 sessions (and in turn who had attended 5–8 sessions) within the intervention arm. There was a trend suggesting a difference between session attendance on post-intervention SCS, but this was not statistically significant, F(3, 44)=2.60, p=.067.

We examined descriptive statistics of feedback from the teachers in the MBI condition. Overall, 92 % (45) of the acceptability questionnaires were returned. When teachers were asked whether they enjoyed the course, 78 % reported that they enjoyed the course “a lot”, 20 % responded “quite a lot”, and 2 % indicated “not much.” Furthermore, 64 % felt they learned “a lot” from the course, 31 % reported learning “quite a lot”, and 5 % reported “not much”. When asked how much they would like their students to be taught the mindfulness for teens programme, 82 % endorsed “a lot”, 16 % endorsed “quite a lot”, while 40 % indicated that they would also like

Table 3 Descriptive statistics and summary of analyses of differences in post-intervention measures between individuals who have missed 0 to 3 sessions within the intervention arm

Measure	Number of missed sessions				F statistic	Significance (P)
	0 M (SD)	1 M (SD)	2 M (SD)	3 M (SD)		
PSS	12.15 (6.69)	15.05 (5.60)	13.50 (4.80)	14.33 (3.21)	.66	.582
WEMWBS	57.54 (6.17)	53.35 (4.44)	55.50 (6.25)	54.67 (3.06)	1.73	.178
FFMQ	148.23 (11.78)	140.10 (19.04)	129.00 (15.90)	128 (17.78)	2.14	.112
SCS	37.93 (6.58)	33.50 (5.81)	30.75 (6.65)	30.33 (5.77)	2.60	.067

PSS Perceived Stress Scale, *WEMWBS* Warwick-Edinburgh Mental Well-being Scale, *FFMQ* Five Facet Mindfulness Questionnaire, *SCS* Self-Compassion Scale

to learn "a lot" regarding mindfulness in order to teach their students.

Discussion

This feasibility study explored the efficacy and acceptability of a modified mindfulness-based training programme for teachers. A sample of secondary school teachers and staff self-selected into either a comparison condition (no intervention offered) or a mindfulness intervention condition. We predicted that individuals undergoing this modified mindfulness programme would experience reductions in reported stress, and increases in well-being, mindfulness, and self-compassion.

As predicted, teachers and staff in the intervention condition reported significant diminution in their stress at post-intervention compared with individuals in the comparison condition; effects that were seen even when controlling for baseline imbalances between the two groups. This finding was in line with previous research on mindfulness with teachers, which suggested that MBIs can provide teachers with tools to manage stress (Lutz et al. 2008; Lutz et al. 2009; Mañas et al. 2011).

Furthermore, and also as predicted, we found that teachers who underwent the mindfulness training reported significantly higher well-being scores at post-intervention in comparison to those in the comparison condition. This finding is also in accordance with the emerging evidence regarding the effects of mindfulness on the promotion of positivity, coping, and other components of well-being (Flook et al. 2013). In light of the reported stress levels among teachers, and given the unique role of teachers as health promoters within the school system, the findings of this study point to a promising intervention that may be capable of supporting teachers in their work place.

Additionally, and in line with the study predictions, we found significant increases in mindfulness and self-compassion among teachers who took part in the intervention condition in comparison to participants in the comparison arm. There was a trend suggesting a dose–response relationship in the current study with regard to the cultivation of self-compassion, but this trend was not significant and was based on secondary analyses involving a very small number of participants. It is possible that the mindfulness training may have functioned to reduce stress and increase well-being by cultivating basic elements hypothesised to mediate outcomes within MBIs. Participants in MBIs learn mindfulness and self-compassion as ways of recognising thoughts, emotions and bodily states, allowing these to be held in awareness with interest and equanimity and responding adaptively at times of stress. Over time, habitual patterns of thinking and behaviour that exacerbate stress are replaced with more adaptive and resilient responses. MBIs for populations with long-term mental and physical health problems have demonstrated that the cultivation of mindfulness and self-compassion are potentially key mechanisms of change (Feldman and Kuyken 2011; Kuyken et al. 2010), but besides one other study (Flook et al. 2013), this has not been demonstrated with teachers for whom these qualities are key in managing both their own thoughts and feelings, and also the classroom environment. Future research examining mechanisms of change for teachers participating in mindfulness programmes using appropriate designs can address these hypotheses (van der Velden et al. 2015).

Meiklejohn et al. (2012) suggest that prospective mindfulness teachers will be better equipped to teach their students if they have an established personal mindfulness practice from which to teach, and that the field could strengthen its service to schools and benefit both teachers and students with an integrative approach that employs the respective MBI programmes. The .b Foundations Course is a candidate programme through which teachers may learn, and in turn teach their students, about mindfulness.

Strengths and Limitations

This study possessed a number of strengths. First, and as mentioned above, there are only a handful of trials that assess modified MBIs with teachers, and so this study addresses a major scarcity in the field. Second, this trial examined the feasibility of a shortened and adaptable MBI that is designed to fit into the busy schedules of teachers and staff. Third, the promising efficacy as evidenced with large effect sizes on key outcomes suggests a firm basis for further research. In addition, this study employed a comparison condition, which lends confidence to the validity of the effects observed within the intervention condition. A final strength worth noting is the content of the programme itself, which was informed by mindfulness-based cognitive therapy and mainstream adaptations (Williams and Penman 2011) that were woven into the pedagogy of mainstream education.

The study also had several limitations. The sample was relatively homogenous (mostly White and female), suggesting the need to test in future work generalisability to the wider population of teachers. Similarly, we did not collect demographic information beyond ethnicity and gender in a systematic fashion. Therefore, measurements of systematic differences in participant characteristics across conditions, which may have influenced the obtained results, was not possible. Further, and in light of the non-randomised allocation, there may be non-random significant differences between the two groups on key variables at baseline that influenced the findings. However, we conducted a series of covariate analyses that suggested that post-intervention differences between individuals of both conditions were maintained when

controlling for baseline differences. Further, as a feasibility study, the non-randomised nature of this design was necessary to lay the ground work for a more comprehensive, definitive randomised trial on the effects of mindfulness training for school classroom teacher. Finally, this study relied entirely on the use of self-report tools in measuring stress and well-being. However, the study used reliable and valid measures for these constructs, and as subjective constructs, self-report is arguably the most appropriate method of measurement.

Future work should extend the findings of this feasibility study within the context of a randomised controlled trial. Furthermore, future research could employ an active intervention condition, a more heterogeneous sample of teachers, and a variety of methods to assess stress and well-being. For example, future investigations would be enhanced by triangulation with physiological, neuro-scientific and objectively measured behavioural effects. The addition of data from at least one follow-up period after several months would further strengthen future projects, especially given that mindfulness training is intended to bring lasting as well as short-term benefits and that effects have been demonstrated to increase over time (Miller et al. 1995; Orzech et al. 2009).

The preliminary results of this feasibility trial suggest that mindfulness training customised for teachers may be feasible, acceptable and efficacious in helping secondary school teachers and staff to reduce their stress and increase well-being, and in cultivating mindfulness and self-compassion among this group of participants. Additional work is needed to refine the training programme under investigation, mitigate the limitations and undertake a definitive RCT with longer term follow-ups, using both subjective and objective outcome measures. However, the implications for the whole school environment of such training on teachers' levels of stress, stress-related illness and absence on classroom management and teaching outcomes are worthy of further investigation. It follows that it is not only the teachers who stand to gain, as their improved well-being could impact relationships within and beyond school. In recognition of the important role that teachers play, it would be reasonable to invest in teachers' long-term welfare. More widespread availability of school-based mindfulness courses such as the one under investigation could be one of those provisions.

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