



Teachers and Mindful Colouring to Tackle Burnout and Increase Mindfulness, Resiliency and Wellbeing

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Abstract

The number of teachers leaving the profession continues to increase at a worrying rate. Factors contributing to this include burnout, heightened levels of stress, anxiety and depression. The current study tested whether the use of mindful colouring would translate to improvements in wellbeing. Teachers from the UK ($n = 35$) were randomly assigned to a colouring mindfulness-based intervention or waitlist group. Participants completed four scales (burnout, wellbeing, resilience and mindfulness) and participated in a 5-day intervention of daily mindfulness colouring or continued their working week as usual. Results of repeated-measures ANOVA showed statistically significant lower levels of burnout, stress, depressive symptoms and anxiety in the mindfulness colouring condition, as well as increased levels of resilience and mindfulness. Findings from the current study support the use of mindfulness colouring to significantly enhance levels of wellbeing in teachers. The study also presents an inexpensive, highly accessible and effective self-help tool for this targeted non-clinical population.

Keywords Colouring · Mindfulness-based intervention · Mindfulness · Teacher burnout

Introduction

A continued rise in the levels of stress being experienced by teachers poses a serious cause for concern to teacher wellbeing (Beshai et al. 2015). According to UK government data, 9.2% of primary teachers were reported to have left the workforce in 2010–2011 rising to 9.9% in 2016–2017. Whilst in secondary schools, 9.4% had left the workforce in 2010–2011 increasing to 10.4% in 2017 (Worth 2018). Most studies in the field of Education have focused on teachers' levels of stress, factors relating to burnout and the consequential impact this has on health and wellbeing (Gold et al. 2009; Fernet et al. 2012). However, there appears to be a lack of emphasis on implementing interventions that could prevent burnout (Larson et al. 2018).

The lack of evidence base around preventative measures for teacher burnout has led to the proposition that mindfulness-based interventions may provide a means of reducing symptoms associated with burnout and increasing

resilience. The effects of mindfulness-based intervention on stress reduction for teachers has been observed (Taylor et al. 2016; Maricuțoiu et al. 2016; Richardson and Rothstein 2008), but there is no evidence to date of mindfulness-based colouring interventions being used for this population. Therefore, this study utilised this form of intervention in a teaching population and explored mindfulness, resiliency, wellbeing and burnout.

Teacher Burnout

Teaching as an occupation ranks highly in stress-related outcomes, including psychological wellbeing, physical health and job satisfaction (Johnson et al. 2005), thus signifying a need for early intervention. Research has demonstrated the increase in the number of qualified teachers leaving the profession within the state sector. In 2015, 50,140 teachers were reported to have left the profession in comparison to 44,270 in 2011 (Des Claves 2017). Additionally, 73% of newly qualified teachers have considered leaving teaching altogether (Association of Teachers and Lecturers 2015). Teachers experiencing high levels of burnout may have a decreased motivation to teach, resulting in poorer classroom practices (Abós et al. 2018), which could be a contributing factor

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towards other stressful issues that teachers face such as challenging student behaviour (Shen et al. 2015).

Teacher stress refers to the experience of negative feelings associated with an aspect of a teacher's job and encompasses emotions such as anxiety, frustration, depression and/or anger (Kyriacou 2001). This definition highlights the range of issues that many teachers face that are descriptive of wellbeing and are prominent within literature surrounding teacher stress and burnout. Stress amongst the teaching population is well documented as problematic and in need of addressing (Al-Fudail and Mellar 2008; Bertoch et al. 1989; Geving 2007; Kalker 1984). The most common causes of stress and burnout in teachers appear to stem from disruptive student behaviours (Geving 2007; Sandilos et al. 2018), role conflict and ambiguity (Mérida-López et al. 2017), along with time pressures and workload (Alarcon 2011; Avanzi et al. 2018).

In a useful investigation into teachers' views regarding the causes leading to their personal burnout, El Helou et al. (2016) grouped their findings into three main categories. The categories included school-related factors (i.e. relationships with other teachers, power of parents/students), classroom-related factors (i.e. student behaviour, classroom management) and personal factors (i.e. educational level, teaching/workload, support, years of experience etc.). The results from the study portray an interesting insight into teachers' views around what increases their stress levels and how to identify the causes and symptoms of burnout. The findings also allow for further exploration of this topic and hint at areas requiring intervention. While the causes of burnout are well explored within the literature, there are few suggestions for effective interventions to support and enable teachers to avoid reaching burnout. The development of coping strategies, such as the incorporation of mindfulness to increase resiliency, could help to prevent occurrences of burnout.

Resilience

Resilience is said to be affected through personal and/or organisational settings (Greenberg 2006). Moreover, factors that are involved in a person's levels of resilience relate to psychological, behavioural and cognitive functioning as well as emotional regulation (Sutton 2004). In school environments, the extent to which individuals have the capability to be resilient can be based on different factors such as a network of social support with colleagues (Ho 2015), as well as intrinsic motivation to aid overcoming adversity (Reichl et al. 2014).

Research has highlighted that the role of the teacher is becoming more demanding, which supports the need to develop resilience to combat stress and burnout. Richards et al. (2016) observed levels of resilience in relation to burnout and their findings emphasised that teachers who possess higher levels of resilience were less emotionally drained, more satisfied with their work and managed the classroom more

effectively. Therefore, resilience appears to counter some of the issues that are suggested to directly relate to teacher stress and burnout.

The high occupational demands of teaching are well documented and are unlikely to change in the UK. The role of individual characteristics and their association with burnout symptoms has been widely explored (Kokkinos 2007). Espinoza Díaz et al. (2015) showed that high emotional stability reduced the likelihood of burnout. However, Jennings and Greenberg (2009) explained that highly stressful situations experienced by teachers can compromise emotional stability and wellbeing of teachers. Therefore, future recommendations of such studies suggest emotional intelligence training and mindfulness-based interventions as examples of in-service programmes to promote the development of coping and resiliency in teachers.

Mindfulness-Based Intervention

Mindfulness training (MT) could be a method to teach individuals to monitor internal reactions and raise a greater sense of self-awareness (Roeser et al. 2013). It is anticipated that such training could aid in the development of coping strategies and resilience to apply in the teaching environment.

Mindfulness-based interventions (MBIs) have become widely accepted in research and practice, with interest surrounding short-term intervention and practices (see Mantzios and Giannou 2018a for review; Robb et al. 2015). One typical programme is mindfulness-based stress reduction (MBSR) (Kabat-Zinn 1990), which was established as an 8-week programme. Despite its initial development being aimed at clinical populations, the programme also reported positive weekly changes amongst non-clinical samples (Khoury et al. 2015), demonstrating a potential benefit for versatile populations. Several reports investigated the impact of session duration on mindfulness-based programmes as time commitment can be a significant barrier to participation and success. Non-significant differences were found for the success of shorter programs such as 4 instead of 8 weeks (Carmody and Baer 2009). Therefore, this would suggest that interventions could be made shorter whilst remaining valuable to populations who have busy schedules.

Modification of MBIs, in terms of brief MBIs, has been used in a variety of non-clinical populations ranging from medical students (Phang et al. 2015), athletes (Perry et al. 2017) and employees of a call centre (Gregoire and Lachance 2014) to healthy college students (Canby et al. 2014). The findings in these studies have demonstrated psychological benefits, with increased mindfulness being a prominent gain throughout. Unfortunately, there is relatively little research on the use of MBIs with teachers. However, the studies that do exist seem promising (e.g. Hwang et al. 2017a; Flook et al. 2013) demonstrating positive implications of

modified mindfulness-based practices on psychological outcomes for teachers.

There is also promising groundwork for future research to further examine other avenues of modified mindfulness-based programs and interventions, such as activity-specific interventions and online methods of which there is increasing evidence for effectiveness (Mak et al. 2015). Current research exploring online intervention in comparison to traditional face-to-face intervention has found similar effect sizes (Bailey et al. 2018; Morledge et al. 2013). The reasons for the reported success of online MBIs could be due to several factors including cost-effectiveness (Kuyken et al. 2015), accessibility (Zernicke et al. 2013) and practicality (Aikens et al. 2014). Online delivery of interventions could be a method that overcomes many barriers compared to face-to-face interventions when used with populations such as teachers. Teacher stress is reported to be attributed at least in part to struggles with work-life balance (Nilsson et al. 2017; Whitehead 2013); online MBIs could offer a cost-effective, accessible, wide-reaching, practical approach.

Studies conducted by Glück and Maerckere (2011) and Krusche et al. (2012) support the implementation of online brief mindfulness-based interventions to aid a non-clinical population with strategies related to reducing stress. The findings from both studies demonstrated reductions in stress and increased levels of mindfulness. It is also worth noting that both studies appeared to yield similar results to those found in face-to-face mindfulness interventions. Other research emphasises the importance of face-to-face class formats of MBIs stating that the quality of training delivered by mindfulness teachers is a vital component to success (Crane et al. 2010; Mantzios and Giannou 2014). Nevertheless, it presents a promising opportunity to conduct further research with web-based mindfulness interventions within a wide range of populations as a more economical and accessible alternative to attending a face-to-face session.

Colouring and Mindfulness-Based Colouring

Over time, MBIs have been modified for application in a variety of occupational contexts, including teaching (Emerson et al. 2017). The present study aims to make modifications through the integration of colouring into a guided MBI to reduce symptoms of burnout, encourage resilience through promotion of self-awareness and improve levels of wellbeing. Recent findings have indicated that engaging in colouring daily has positive effects on psychological outcomes and has also been identified as cost-effective and accessible for both clinical and non-clinical populations alike (Flett et al. 2017; Rigby and Taubert 2016). In one such study, those participating in a colouring intervention demonstrated significant reductions in levels of depressive symptoms and anxiety after 1 week, compared to participants in a control

group who completed a daily puzzle activity (Flett et al. 2017). The findings highlight the benefits of daily colouring as an activity to reduce certain negative psychological outcomes.

Previous research has made inferences that the notable anxiety-reducing effect is due to a centering effect of the circular shape of the mandala. Jungian theory posits that the mandala has both a calming and centering outcome (Jung 1973), while some criticism in methodologies has been evident at early stages of utilisation of such colouring methods (Slegelis 1987). Nevertheless, the use of mandalas has widely been used for treatment of psychological symptoms (Kim et al. 2009), and several studies have reported significant findings in decreasing various symptoms of psychological distress (Henderson et al. 2007; Kuchta 2008).

Previous studies have also compared the effect of colouring pre-designed mandalas with colouring plaid designs and/or colouring free-form groups. The findings from such studies showed some interesting findings in reducing levels of anxiety (Curry and Kasser 2005; Noor et al. 2017), but other research indicated that findings could not be replicated (Van der Vennet and Serice 2012), potentially explained through non-guided and self-motivated processes of flow (see Mantzios and Giannou 2018b for review). Lee (2018) also concluded that further research is necessary to explore explanatory variables (i.e. distraction, structure and centering) that may have caused mixed results.

Indeed, colouring tasks have been suggested to significantly reduce anxiety, as well as improving mood and perseverance in some studies (Curry and Kasser 2005; Eaton and Tieber 2017; Van der Vennet and Serice 2012), and mindfulness was suggested to be an explanatory variable. Suggestions surrounding guided mindfulness intervention have been offered as a technique which may induce a reflective state that could benefit individuals suffering from psychological distress (Hart et al. 2013). To date, little evidence has been found associating the notion of guided mindfulness colouring with improved levels of wellbeing, despite both the acts of guided MBI and colouring showing reductions in levels of anxiety. It may have been the inconsistencies found in colouring research that led scientists to steer clear from colouring practices, and it was not until the efficacy of guided mindfulness colouring was introduced (Mantzios and Giannou 2018b). Findings suggested that this form of mindfulness-based colouring was more effective in decreasing levels of anxiety when compared to an unguided colouring condition that was inconsistent across different studies in past research, and where the association between mindfulness-based practices and colouring was drawn together to build an alternative technique to meditation.

Studies have demonstrated the efficacy of MBI's on teachers' wellbeing (Benn et al. 2012; Flook et al. 2013), but colouring has not been explored through mindfulness-based

notions and corresponding guidance. The current study aims to employ the use of a circular mandala and mindfulness video (based on future directions from Mantzios and Giannou 2018b) as intervention materials for the target population of teachers. The study aims to answer the research question of whether the use of a mindfulness-based colouring intervention will aid in increasing levels of overall wellbeing. The hypotheses of the study are as follows: (i) participants in the colouring group will have larger decreases in their depressive symptoms, anxiety, stress and burnout scores than those in the waitlist group, and (ii) findings will demonstrate increased levels of mindfulness in the colouring group.

Methods

Participants

A total of 45 participants provided informed consent to the study; however, two of the participants were excluded from the final analyses (further details can be found below). Forty-three female ($n = 33$) and ten male ($n = 10$) current in-service teachers were recruited via online advertisement in the UK. The inclusion criteria specified that participants involved must be above the age of 18 and are currently an in-service teacher working full-time in either primary/secondary schools, further education colleges or universities. This was inclusive of mainstream or specialist education institutions. Two participants were excluded from the final analyses due to not meeting the inclusion criteria and were therefore removed due to either: (i) not in full-time employment or retired or (ii) not currently employed by a primary/secondary school, further education college or university. The age of participants ranged from 19 to 60 years ($M = 33.95$, $SD = 11.06$). The level of teaching distribution was as follows: 32.6% ($n = 14$) of participants worked in primary education, 55.8% ($n = 24$) in secondary education, 2.3% ($n = 1$) in further education, 4.7% ($n = 2$) in higher education and 4.7% ($n = 2$) as other.

Materials

Demographics The participant information form asked for potential participants' age, gender, level of teaching (i.e. primary, secondary, college or university) and type of teaching institution (early years, mainstream, specialist) where they were currently employed.

Copenhagen Burnout Inventory (CBI; Kristensen et al. 2005) The CBI consists of 19 items divided into three subscales; personal burnout (PB; six items), work-related burnout (WRB; seven items) and client-related burnout (CRB; six items), which measure the degree of physical and psychological fatigue (Høigaard et al. 2012; Milfont et al. 2007). The

scale is reported to have high internal reliability as well as good validity (Kristensen et al. 2005). Response categories varied between subscales; PB ranged from always to never/almost never, WRB first three questions ranged from to a very high degree to a very low degree and final four questions ranged from always to never/almost never and CRB first four questions ranged from to a very high degree to a very low degree and final two questions ranged from always to never/almost never.

Connor-Davidson Resilience Scale (CD-RISC 10; Cambell-Sills and Stein 2007) The CD-RISC has been used with both clinical and non-clinical populations alike as a measure of psychological resources, such as resilience (Connor and Davidson 2003). CD-RISC 10 includes 10 items and has reported internal consistency, test-retest reliability and good validity (Irranzo-Bennett et al. 2018; Vaishnavi et al. 2007). Respondents rate on a 5-point Likert scale ranging from 0 (not true at all) to 4 (true nearly all the time). Sample items include "Able to adapt to change" and "Tend to bounce back after illness or hardship", and higher scores indicate higher levels of resilience. The questionnaire is based on the original 25-item version (CD-RISC; Connor and Davidson 2003).

Depression, Anxiety and Stress Scale (DASS-21; Henry and Crawford 2005) The questionnaire includes 21 items divided into three subscales: depression (seven items), anxiety (seven items) and stress (seven items). The questionnaire is based on the original 42-item DASS version (DASS; Lovibond and Lovibond 1995). Reliability and validity have been assessed and shown to be satisfactory across the scales in clinical and non-clinical populations alike (Henry and Crawford 2005; Norton 2007). Items are scored on a 4-point Likert scale ranging from 0 (did not apply to me at all) to 3 (applied to me very much or most of the time). Sample items include "I felt that I was using a lot of nervous energy" and "I couldn't seem to experience any positive feeling at all".

Five Facet Mindfulness Questionnaire (FFMQ-SF; Bohlmeijer et al. 2011) The FFMQ-SF is a 24-item questionnaire which measures five main characteristics of mindfulness. The questionnaire is based on the original 39-item version (FFMQ; Baer et al. 2006), while the 24-item displayed high reliability and validity across different studies (Bohlmeijer et al. 2011; Mantzios et al. 2018). All items are scored on a 5-point Likert scale ranging from 1 (never or rarely true) to 5 (very often or always true). Sample items are "I watch my feelings without getting carried away by them" and "I find it difficult to stay focused on what's happening in the present moment", and higher scores indicate higher levels of mindfulness.

Colouring Intervention Colouring intervention material involved a A4 circular mandala colouring sheet (Freeman

2016), which was the same for all participants involved in the study. Participants were also exposed to a mindfulness colouring video which provided instructions and guided participants on how to colour mindfully. The video made participants aware to direct their full attention to the colouring page and the colouring activity. The instructions acknowledge that minds' may wander, and thus guide participants to acknowledge any thoughts and/or feelings throughout the duration of the activity. After recognising thoughts and/or feelings, participants are guided to return the focus back to the colouring activity (available via contacting the second author).

Procedure and Design

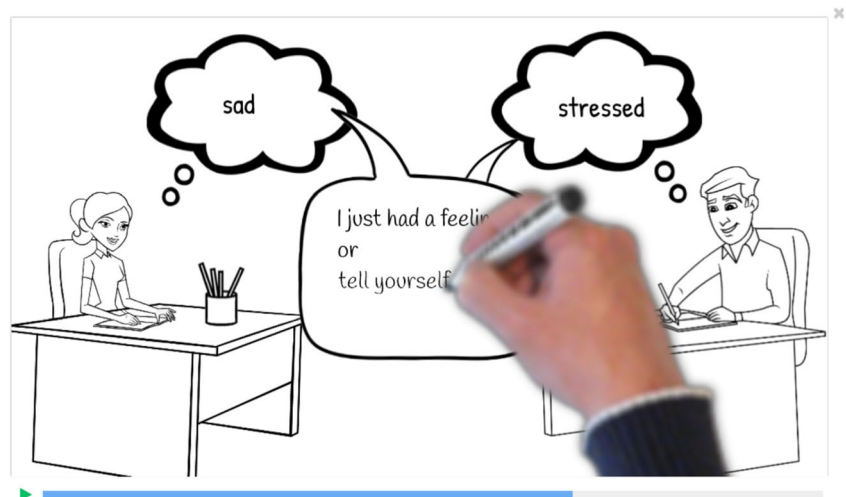
Potential participants responded to an online advertisement and were kept blind to the study through being informed that their voluntary participation was to investigate 'Art and Emotions in Teachers'. Once participants had clicked on the link from the online advertisement, they were taken to a page where they received a participant information form, consent form and the demographics page with the questionnaire (i.e. the four scales). Participants were required to record a random number at the beginning of the study to keep safe and assigned to their questionnaire if they decided to withdraw from the study at any point. This was to ensure anonymity was kept during the procedure. Participants completed the questionnaire which was hosted online through Qualtrics (www.qualtrics.com). Participants who fulfilled the criteria were assigned to one of two different groups as part of a randomised control trial (experimental and waitlist) using block randomisation. After the randomisation procedure, participants in the experimental group received an e-mail providing general instructions regarding the intervention. This included the materials for the mindfulness intervention (i.e. mandala colouring sheet) as well as an instruction video (see Fig. 1) into mindfulness colouring, which they were required

to watch one time before beginning the intervention. Participants were informed to complete the activity over the course of a working week (5 working days: Monday to Friday); materials were sent on a Sunday night to try and ensure that participants had the materials prior to commencement of the intervention on a Monday, attempting to ensure equal conditions concerning weekdays. Participants were asked to use the colouring sheets in their free time when they were feeling either stressed, anxious, depressed or generally low in mood. Participants were informed that they would be allocated to receive the intervention either immediately or after an initial waiting period. Participants in the waitlist group were informed to continue their working week as usual and were sent the colouring intervention the following week to ensure the study remained single-blinded and to prevent participants from becoming aware of either the aims and/or outcome measures of the experiment. At the end of the first working week, all participants completed the same questionnaire (i.e. four scales) for the post-assessment. All participants received reminder e-mails to complete the post-assessment measures at the end of the working week. All participants were debriefed at the end of the study and made aware that their participation was to investigate whether a mindfulness-based colouring intervention aided in improving levels of overall wellbeing in teachers. Ethical approval was granted by the Faculty Ethical Committee at the host University and underwent thorough scrutiny to ensure keeping to the ethical guidelines set by the British Psychological Society.

Data Analysis

Four 2×2 ANOVAs with repeated measures on time were conducted. Multiple 2 (Group: Colouring, Waitlist) \times 2 (Times: Pre-, Post-Measurement) for each resiliency, mindfulness, burnout and wellbeing scales. For wellbeing, an additional three 2×2 ANOVAs with repeated measures was conducted to further in-

Fig. 1 Instructional video for colouring



investigate the three subscales of the wellbeing scale (depression, anxiety and stress). For significant changes in both groups from pre-intervention to post-intervention, paired *t* tests were performed. Effect sizes were calculated using Cohen's *d*. Analyses were conducted using SPSS version 24 (IBM, 2016), and the significance threshold was set at $p < 0.05$.

Results

In order to test the efficacy of a mindfulness-based colouring intervention for a highly stressed teaching population, seven 2 (group type: experimental, waitlist) \times 2 (time: pre-intervention, post-intervention) ANOVAs with repeated measures on the time was conducted on Resilience, Burnout, Wellbeing and Mindfulness scales.

A total of 45 participants provided informed consent and were assessed for eligibility. Two individuals did not meet the requirements specified in the inclusion criteria and were therefore removed from the analysis. Forty-three individuals fully met the conditions of the inclusion criteria, and the demographic characteristics of participants within the study are shown below in Table 1.

The response rate for the study for post-intervention was 81% (waitlist, $n = 17$ and experimental, $n = 18$, making the total of participants $n = 35$). Levene's test for equality of variances was not found to violate any of the analyses, and therefore, homogeneity of variances can be assumed.

Table 1 Baseline demographic characteristics of participants

Variable	Total (Frequency) $n = 43$	Percentage (%)
Age, M (SD)	33.95 (11.056)	
Gender, n (%)		
Female	33	76.7
Male	10	23.3
Level of education taught		
Nursery (early years)	0	0
Primary (4–11)	14	32.6
Secondary (11–18)	24	55.8
Further education (16+)	1	2.3
Higher education (18+)	2	4.7
Other	2	4.7
Type of institution		
Nursery	0	0
Mainstream primary	14	32.6
Mainstream secondary	24	55.8
Mainstream college	0	0
Specialist primary (SEN)	0	0
Specialist secondary (SEN)	2	4.7
Specialist college (SEN)	1	2.3
University	2	4.7

For Resilience, there was no significant main effect of time: $F(1,33) = 2.43$, $p = 0.13$; however, there was a statistically significant interaction between time and group type: $F(1,33) = 34.75$, $p < 0.01$, partial $n^2_p = 0.51$. Post hoc paired sample *t* tests revealed that resilience significantly increased in the experimental intervention group, $t(17) = -8.32$, $p < 0.05$; $d = 1.96$. The waitlist condition observed significant results with the opposite effect, $t(16) = 2.37$, $p = 0.03$; $d = 0.58$. Results indicated that participating in the colouring intervention ($M = 30.94$, $SD = 3.17$) significantly increased resilience over no intervention, which indicated a significant decrease in resilience ($M = 27.00$, $SD = 5.56$).

For Burnout, there was a statistically significant effect of time: $F(1,33) = 5.35$, $p = 0.03$, partial $n^2_p = 0.14$. There was also a statistically significant interaction between time and group type: $F(1,33) = 38.76$, $p < 0.01$, partial $n^2_p = 0.54$. Post hoc paired sample *t* tests revealed that feelings of burnout significantly decreased in the experimental intervention group, $t(17) = 6.57$, $p < 0.05$; $d = 1.55$. However, the opposite effect was observed in the waitlist condition, $t(16) = -2.551$, $p = 0.02$; $d = 0.62$. These results indicate that individuals in the experimental intervention group ($M = 43.83$, $SD = 8.56$) experienced less feelings associated with burnout over the course of the week, than individuals in the waitlist group who demonstrated a significant increase in feelings of burnout ($M = 53.00$, $SD = 12.25$).

For Wellbeing, there was a statistically significant effect of time: $F(1,33) = 8.95$, $p = 0.05$, partial $n^2_p = 0.23$. There was also a statistically significant interaction between time and group type: $F(1,33) = 48.40$, $p < 0.01$, partial $n^2_p = 0.56$. Post hoc paired sample *t* tests revealed that feelings of depression, anxiety and stress significantly decreased in the experimental intervention group, $t(17) = 6.57$, $p < 0.05$; $d = 1.66$. Results also revealed significant findings in the waitlist condition, which feelings of depression, anxiety and stress had increased, $t(16) = -2.551$, $p = 0.02$; $d = 0.65$. These results indicate that individuals in the experimental condition ($M = 18.56$, $SD = 11.62$) experienced less feelings associated with depression, anxiety and stress following the intervention than individuals in the waitlist group who experienced more ($M = 26.01$, $SD = 14.07$).

A further three 2×2 ANOVAs were run to investigate the three subscales within the DASS21 scale. For Depression, there was no significant main effect of time: $F(1,33) = 3.05$, $p = 0.09$; however, there was a statistically significant interaction between Time and Group Type: $F(1,33) = 12.76$, $p < 0.05$, partial $n^2_p = 0.28$. Post hoc paired sample *t* tests revealed that feelings of depression decreased in the experimental intervention group, $t(17) = 5.04$, $p < 0.05$; $d = 1.19$; however, this was not observed in the waitlist group, $t(16) = -1.06$, $p = 0.31$.

For Anxiety, there was a statistically significant effect of time: $F(1,33) = 9.27$, $p = 0.05$, partial $n^2_p = 0.22$. There was also a statistically significant interaction between Time and Group Type: $F(1,33) = 21.22$, $p < 0.05$, partial $n^2_p = 0.39$. Post hoc paired sample *t* tests revealed that feelings of anxiety

decreased in the experimental intervention group, $t(17) = 5.27$, $p < 0.01$; $d = 1.24$; however, this was not observed in the waitlist group, $t(16) = -1.14$, $p = 0.27$.

For Stress, there was a statistically significant effect of time: $F(1,33) = 6.37$, $p = 0.02$, partial $\eta^2_p = 0.16$. There was also a statistically significant interaction between Time and Group Type: $F(1,33) = 45.933$, $p < 0.01$, partial $\eta^2_p = 0.58$. Post hoc paired sample t tests revealed that feelings of stress decreased in the experimental intervention group, $t(17) = 7.23$, $p < 0.01$, $d = 1.71$, whereas the opposite was observed in the waitlist group, $t(16) = -2.76$, $p < 0.05$, $d = 0.66$. Results indicate that out of the three subscales, stress had the largest effect sizes across both the experimental and waitlist groups which respectively portray significant results in levels of stress experienced over the course of a working week.

For Mindfulness, there was no significant main effect of time: $F(1,33) = 2.63$, $p = 0.11$; however, there was a statistically significant interaction between Time and Group Type: $F(1,33) = 33.20$, $p < 0.01$, partial $\eta^2_p = 0.50$. Post hoc paired sample t tests revealed that mindfulness significantly increased in the experimental intervention group, $t(17) = -4.80$, $p < 0.05$; $d = 1.13$, whereas the opposite was observed in the waitlist condition, $t(16) = 3.30$, $p = 0.05$; $d = 0.80$. Results indicate that participating in the colouring intervention ($M = 55.22$, $SD = 8.19$) significantly increased mindfulness over not participating in the colouring intervention which decreased mindfulness over the course of a week ($M = 45.82$, $SD = 5.87$). Table 2 shows means and standard deviations for the experimental ($n = 18$) and waitlist ($n = 17$) groups, pre-and post-intervention.

Discussion

The aim of the current study was to examine the effects of a mindfulness-based colouring intervention on teacher wellbeing. Overall, results indicated that wellbeing significantly improved

Table 2 Means and standard deviations for pre-intervention ($n = 43$) and post-intervention: experimental ($n = 18$) and waitlist ($n = 17$)

Mean (<i>SD</i>)				
	Measures	Pre	Post	Post-Pre
Waitlist	CD-RISC10	30.94(3.91)	27.00 (5.56)	- 3.94
	CBI	46.59(10.81)	53.00 (12.25)	6.41
	DASS21	19.88(10.80)	26.01 (14.07)	6.13
	FFMS	51.65(7.98)	45.82 (5.87)	- 5.83
Experimental	CD-RISC10	24.17(4.16)	30.94 (3.17)	6.77
	CBI	57.83(11.61)	43.83 (8.56)	- 14
	DASS21	34.06(13.21)	18.56 (11.62)	- 15.5
	FFMS	44.83(8.93)	55.22 (8.19)	10.39

in the intervention group, with stress bearing the largest effect size. The findings from the current study showed a consistent pattern of greater improvements in the intervention group compared to the waitlist group. Findings indicated that participants in the intervention group experienced less feelings of depression, anxiety and stress suggesting that mindfulness-based colouring could be used as a self-help tool within this population to aid in improving levels of overall wellbeing.

Findings supported hypothesis 1, which proposed that participants in the colouring group would show larger decreases in psychological distress. Participants completing the colouring activity demonstrated larger decreases in symptoms of burnout, depression, anxiety and stress compared to the waitlist group, who showed significant increases in these measures. Following the 5-working day colouring intervention on teachers' psychological experiences, findings align with previous studies regarding the anxiety-reducing effect of colouring (Curry and Kasser 2005; Eaton and Tieber 2017; Flett et al. 2017; Mantzios and Giannou 2018b; Noor et al. 2017). Increased levels of resilience shown in the colouring group may have aided in improving levels of wellbeing (Richards et al. 2016), possibly through teachers having a greater ability to 'bounce back' after hardships (e.g. disruptive student behaviour) during the school day.

Additionally, other than Mantzios and Giannou's (2018b) study, mindfulness and its association with colouring has not yet been widely explored, which is interesting considering the popularity of adult colouring books claiming to be mindful (Halzack 2016). In terms of mindfulness, findings from the current study suggest that participating in a colouring intervention does increase levels of mindfulness within this population, which supports the second hypothesis of the study. Explanations could be attributed to the guided aspect of the intervention in the mindfulness video, which was sent to participants giving instructions on how to colour mindfully which were watched once before they began the intervention. This allowed for uninterrupted colouring, without distractions, facilitating full immersion and focus on the task, and these are the key components of mindfulness. In addition, the changes noted from pre- to post-intervention in mindfulness scores of intervention participants could be attributed towards improvements in burnout and psychological distress scores (i.e. depression, anxiety and stress). These findings offer support to the speculation that is common in most mindfulness literature, signifying increases in levels of mindfulness are fundamental for observation of positive effects in MBIs (Benn et al. 2012; Flook et al. 2013).

Several important limitations of the current study should be acknowledged when interpreting the results. Firstly, the small sample size and ratio of female to male participants precludes generalising results across a larger, more diverse population and future research could explore any gender differences in colouring and wellbeing. Secondly, no exit interviews were undertaken to investigate participants' experiences of taking

part, specifically asking whether participants liked or disliked the intervention, similar to that used in Mantzios and Giannou's (2018b) study.

Finally, another important limitation that must be taken into consideration is that the current study used a waitlist control design. This meant that it did not allow for evaluation against other similar interventions, for example, colouring a plaid design and/or colouring free form. Therefore, the findings may not be able to represent a general treatment effect, and thus, other possibilities cannot be disregarded. In future research, an active control would be advantageous with this type of study.

Conclusion

The current study is one of few which investigates the effect of mindfulness-based colouring on wellbeing and is unique in exploring this form of intervention with a non-clinical population of teachers. The study combines the concept of mindfulness with a colouring activity, both of which are reported to aid in improving levels of wellbeing. Findings of the current study have implications with regard to both the development and application of mindfulness-based programmes aimed at teachers to increase levels of wellbeing, whether explored in relation to reductions of burnout, anxiety, depression and/or stress, or in increases in resiliency and mindfulness.

The challenges that teachers face in their work, situated in a political climate of austerity resulting in sustained reduction of funding for schools, alongside increasing demands on job roles require that robust support mechanisms be in place for teachers if we are to reduce the levels of burnout and stress. The findings here suggest that mindfulness-based colouring may offer one intervention for supporting teachers, and there is much potential in developing interventions that will benefit both teachers and students, but there is evidently more research and evidence-based support that is needed. For now, the importance rests on teachers in enhancing their own wellbeing, which may indeed be through mindful colouring, but may rest in other practices that are more aligned to their lifestyles and personalities; the importance rests on developing a habit of taking the time for oneself (even 5 min) and practice self-care through any mindfulness practice (see Mantzios and Giannou 2018a for a review). Our proposal is for schools and teachers to collaborate with universities, practitioners and researchers in developing relevant and sustainable interventions to develop a mindful and supportive educational environment that will propose a foundation of healthy teachers and pupils, without removing the responsibility of governments and educational ministries in providing the appropriate care and environments in developing the right practices and policies for prosperous learning, teaching and pedagogical practices.

Data Availability The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to public availability violating the consent that was given by research participants.

Compliance with Ethical Standards

The study was approved by the Ethical Review Board of the University and was in accordance with the ethical standards of the institutional and/or national research committee, and with the 1964 Helsinki Declaration and its later amendments. Informed written consent was obtained prior to the experiment. This article does not contain any studies with animals.

Conflict of Interest The authors declare that they have no conflict of interest.

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Natasha Czerwinski Ms Natasha Czerwinski, currently an Assistant Psychologist, works across two divisions: dementia assessment and diagnosis as well as inpatients. She has strong interests in (a) psychological interventions that can enhance overall wellbeing, particularly across occupations with high burnout rates, and (b) the role of neuropsychology in patients with non-epileptic seizures.

Helen Egan Dr Helen Egan is a Reader in Health Psychology with an interest in the role of mindfulness, compassion and self compassion on health behaviours such as eating and exercise. Her experience is particularly focused on people with chronic health conditions including cystic fibrosis and weight management, and on those working as health care professionals and other professional or vocational roles that demand high levels of compassion.

Amy Cook Dr Amy Cook is the Head of Department in Psychology and her research interest is closely aligned to teaching and practice, with a particular focus on the student experience and the association to learning and wellbeing. She is a key contributor to projects investigating the role of mindfulness in increasing academic performance, and factors that impact on student satisfaction. Her current research is focused on embedding Mental Health First Aid in psychology curriculums and supporting local secondary schools to do this in their curriculum.

Michail Mantzios Dr Michael Mantzios is a Reader in Health Psychology with an interest in the role of mindfulness and self-compassion on eating behaviours, and alternative practices such as mindfulness-based colouring books and mental health. Teacher and student wellbeing have become significant elements of his work in recent years, and Michael supervised Natasha Czerwinski during her post-graduate studies.