Evaluation of Mental Effectiveness Training for Undergraduate Students

Draft Report for Guy's & St Thomas' Charity

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September 2016

Executive Summary

Background

There is evidence of an increasing incidence of mental health problems among students. This is manifested in increased stress, more referrals to university counselling services and an increase in suicides among university students. Higher Education Institutions are working hard to reverse these trends, but there are few evidence-based interventions to draw upon. Pilot studies of training delivered by Mindapples to improve mental effectiveness have shown promising findings, but they have not been offered widely to undergraduate students.

Aims

This study aimed to evaluate the outcomes of providing mental effectiveness training to a large cohort of undergraduate students in a London university. In particular, it aimed to evaluate its effectiveness in improving their well-being; self-efficacy; ability to cope with stress; retention and attainment. In addition, it aimed to evaluate the impact of the programme on students' perceived ability to study.

Method

A pre-post study design was used employing within-group analysis. Data were collected using self-complete questionnaires (online or hard copy) at baseline, following the five-session course and six months later. Standardised measures of well-being; self-efficacy and ability to cope with stress were analysed using repeated measures tests. Module attainment data were analysed using chi-squared statistics and t-tests. Qualitative data from free text responses were imported into NVivo qualitative data analysis software and analysed using thematic content analysis with elements of grounded theory.

Results

154 students participated in the study. Only 17 participants (11%) attended all five sessions. Therefore, the sample was divided into two groups for analysis - those who attended two sessions or fewer ('low attenders', n=102, 66%) and those who attended three or more sessions ('high attenders', n=51, 33%). The well-being, self-efficacy and ability to cope with stress of the 'high attenders' improved during the course and the improvements were maintained six months later, though no changes were observed in the 'low attenders' group. There was no difference in module attainment or grades between the two groups. Free-text responses elicited examples of students' use of the training in their study and everyday lives. The course was very positively evaluated with very few negative comments being received.

Discussion

The positive findings of this study are similar to earlier evaluations of Mindapples training. The positive free-text responses supported the statistically significant improvements in the three outcome measures suggesting that a real effect was observed. The difference between the 'high attenders' and 'low attenders' at the end of the course and six-month follow up points cannot be attributed to baseline differences. However, a randomised controlled trial design was not used so unmeasured variables may be associated with both course attendance and outcomes. Also, few students attended all the sessions, suggesting that it may be difficult to make it available to all students in its current form.

Recommendations

For future delivery of the course, Mindapples may wish to consider:

- Offering more flexibility in the timing and availability of sessions to enable more students to attend more sessions.
- Offering activities and resources after the end of the course for participants to refresh and consolidate their learning.
- Targeting first year undergraduate students for the training so participants can gain maximum benefit from it.

Future evaluations of Mindapples training could be improved by:

- Using a randomised controlled trial methodology to control for selection bias and the effect of any potential confounding variables.
- Collecting socio-demographic data and measuring other potential covariates at baseline
- Providing multiple opportunities and methods for the collection of follow-up data, which may improve response rates and the statistical power of future evaluations.
- Providing all of the training sessions as originally planned could help to improve outcomes and strengthen the evaluation.

Acknowledgements

We wish to thank the students who took part in this study. We are very grateful for their participation and for providing their data for analysis, without which the evaluation would not have been possible.

We wish to thank the Mindapples team for delivering the training and co-ordinating the collection of data. In particular the success of this evaluation is largely due to the work of Esther King who has been played a leading role in working closely with London South Bank University to deliver the training and with the University of York to co-ordinate the evaluation.

Finally, we wish to thank Lesley Roberts and her colleagues at London South Bank University for promoting the course to their students, organising the training sessions and supporting the data collection processes. We are also grateful for her work with the University Registry to obtain and anonymise module attainment data for the participants.

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1. Background

1.1 Student mental health

The mental health of students has become a significant concern for higher education institutions in the UK, as the prevalence of mental health problems has risen faster than the availability of resources to respond to them. For example, 78 per cent of respondents to a 2015 National Union of Students survey reported experiencing mental health problems in the previous year (APPG, 2015). In addition, 33 per cent of respondents to this survey reported having had suicidal thoughts, which is considerably higher than its 21 per cent prevalence in the general population (McManus et al, 2015).

Such high rates of mental health problems among students have not been found in other studies (e.g. Priesack & Alcock, 2015; Gale et al, 2015). However, there is recognition that students have difficulties managing competing demands on their time and their academic workload, and a significant minority experience high levels of stress. The Royal College of Psychiatrists (2011) suggests that the mental health and wellbeing of students is increasingly negatively affected by rising workload, financial and social pressures.

International research has found high levels of anxiety and depression among students in countries across the world (e.g. Bayram and Bilgel, 2008; Mackenzie et al, 2011). Studies suggest that interventions to improve stress management may decrease the negative effects of stress, increase resilience, improve subsequent stress management in future careers, and contribute towards greater career longevity (e.g. Bartlett et al, 2015). Interventions for students which aim to promote mental wellbeing may increase their ability to cope with stress (Stein et al, 2012). Students who are able to effectively manage stress report fewer symptoms of depression, making it an important target of early intervention and prevention initiatives (Sawatzky et al, 2012).

1.2 Mindapples Training

Mindapples is a successful independent organisation which promotes mental health and wellbeing. It provides training to individuals and organisations which aims to increase participants' understanding of mental health and self-knowledge so that they are better equipped to maintain positive personal mental health and wellbeing, develop effective stress coping mechanisms, and maximise personal capabilities (Webber et al, 2015).

Mindapples training is usually delivered via an 8-session evidence-based training model supported by a range of purpose-produced training materials and resources. Delivery is interactive, containing practical tasks, group work exercises and discussions which are designed to increase engagement. Key messages are summarised and highlighted during sessions, with extra activities, exercises and homework completed between sessions.

Mindapples training includes the following sessions:

1. Love your mind
2. Master your moods

3. Get motivated
4. Handle pressure
5. Know yourself
6. Make smarter decisions
7. Influence people
8. Think creatively

Previous research (Webber et al, 2015) indicated that an eight-session, weekly-delivered training programme for undergraduate nursing students was successful in increasing their stress management abilities and mental self-knowledge. These changes were sustained three months after the course ended, compared to a control group who did not receive the training. In addition, increased mental wellbeing was indicated at the end of the course, but this increase was not significant at the three-month follow-up point. However, apart from this evaluation, there is little research on interventions aimed at increasing mental resilience among UK Higher Education students.

2. Aims

This study aimed to build upon previous research and evaluate the delivery of the Mindapples training programme *Your Mind: A User's Guide* to a cohort of first year undergraduate students from multiple faculties of a London University. The evaluation aimed to establish:

- The effectiveness of the programme in improving first year undergraduate students' well-being, self-efficacy and ability to cope with stress

- The effect of the programme on retention and attainment of undergraduate students in the first year of their degree course

- The impact of the programme on students' perceived ability to study

3. Method

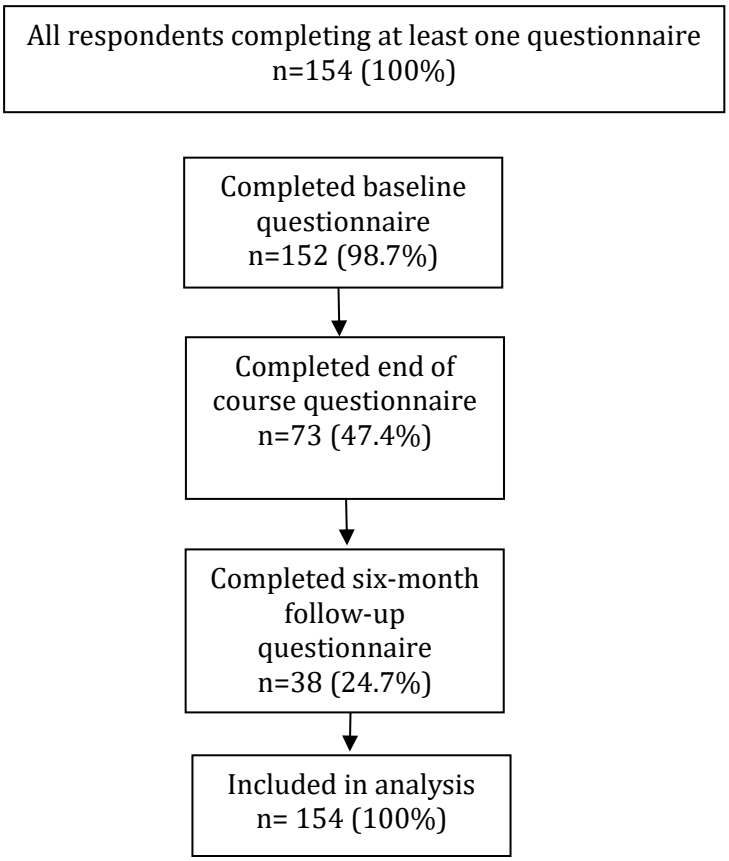
3.1 Design

A pre-post study design was used employing within-group analysis. All student participants completed a baseline questionnaire, either online or in hard copy, before attending the Mindapples course. Students participating in the evaluation were also asked to complete a questionnaire at the end of the course, either online or in hard copy. Six months after the end of the course, all participants were asked to complete a further questionnaire, which was only available online. Missing data within the second and third questionnaires was imputed from data on previous questionnaires.

3.2 Sample and Setting

All undergraduate students at the London university were invited to participate. 154 students chose to participate and completed at least one questionnaire at either baseline (prior to delivery of the Mindapples training), end of the training, or at six-month follow-up. 152 students completed the questionnaire at baseline, 73 at the end of the course, and 38 at six-month follow-up (figure 3.1).

Figure 3.1. Flow of participants through the study



3.3 Mindapples training programme

All participants were offered the Mindapples training programme *Your Mind: A User's Guide* in five weekly 90-minute sessions, starting in Autumn 2015. The programme had been planned as a six-session course, but timetabling and attendance issues meant that one of the modules, 'Train Your Mind', was not delivered.

Although sessions were voluntary, they were added to students' timetables to encourage attendance and ensure that those who wished to attend knew the relevant times and venues. Attendance registers were kept for analysis purposes.

The five-session programme aimed to help participants to understand how their minds work and provided them with tools and techniques to help them stay as mentally effective as possible, including basic wellbeing and resilience topics, and also more cognitive and professional skills such as decision-making and creative problem-solving. Using practical insights from psychology and neuroscience, trainers delivered intensive, high-impact learning sessions engaging participants in playing an active role in keeping themselves mentally resilient and effective. The training was piloted and evaluated in an earlier study (Webber et al, 2015) and minor modifications were made in response to the findings of the pilot.

3.4 Outcome measures

Three outcomes of interest were measured:

a) Mental wellbeing was measured using the Warwick-Edinburgh Mental Wellbeing Scale (Stewart-Brown et al., 2011). This outcome measure has been validated for use in the general population and is responsive to change (Maheswaran et al., 2012). The standard 14-item scale was used and participants could score each question from one to five, giving a total possible score of between 14 and 70. The mean score for the general population in England is 52 (Health and Social Care Information Centre, 2014). Higher scores indicate greater mental wellbeing.

b) The ability to cope with stress was measured using a four-item scale adapted from Sawatzky et al (2012). The four questions included in this scale could be scored from one to four, giving a total possible score of between four and 16. Higher scores indicate greater ability to manage stress.

c) Self-efficacy was measured using the General Self-Efficacy Scale (Schwarzer and Jerusalem, 1995). This was a ten item scale, and participants could score each item from one to four, giving total possible scores of between ten and 40. Higher scores indicate greater self-efficacy.

3.5 Procedures

Information sheets were provided to undergraduate students at the university about the programme and the evaluation. Students who wished to participate in the evaluation were asked to complete consent forms.

The baseline questionnaire comprising the Warwick-Edinburgh Mental Wellbeing Scale (Stewart-Brown et al., 2011), a measure of ability to cope with stress (adapted from Sawatzky et al., 2012) and the General Self-Efficacy Scale (Schwarzer and Jerusalem, 1995) was administered prior to the first training session. A personal identifier was used on each questionnaire to identify respondents to facilitate matching with subsequent responses.

Participants completed the same questionnaire at the end of the final session of the five-week course and again six months after the end of the course.

Additional open-ended questions were included in the end of course questionnaire to obtain feedback on the training, and in the 6-month follow-up questionnaire to obtain feedback on the impact of the training on students' perceptions about their ability to study.

Socio-demographic information was collected for those students who completed the six-month follow up questionnaire.

Additional data on module completion rates and grades was obtained for all participants from the university's Registry to evaluate the effectiveness of the training programme on engagement with a programme of study.

3.6 Analysis

3.6.1 Quantitative Analysis

Missing data was imputed by carrying last known values forward. This method minimised the impact of missing data, and assumed the null hypothesis of no difference between time points.

Tests were undertaken to establish normality and, as the data were not normally distributed, Wilcoxon Signed Ranks test was used to measure differences in scores between time-points in the whole-group and sub-group analyses. Sub-group analysis within each time point was conducted using Mann-Whitney U Tests. Pearson 'r' effect sizes were calculated.

As there is no non-parametric equivalent of the repeated measures tests that permit controlling for potential confounding variables, the parametric repeated measures test was used. The repeated measure test allows for testing across time periods with the addition of covariates, without inflating the potential for type 1 errors which repeated use of other tests might cause. Although the repeated measures test is non-parametric, samples sizes were large enough to justify a parametric test on the basis of central limit theorem (Norman, 2010; Weinberg & Abramowitz, 2002). However, given the arguable

potential inaccuracies of using parametric tests on non-normal data (Larson Hall, 2010), results were also interpreted in tandem with the results of the non-parametric test. Effect sizes were calculated using partial η^2.

Pearson correlation coefficients were calculated to assess the relationship between the three outcome measures at each time point.

Module attainment data were analysed using chi-squared statistics for categorical data and t-test for continuous data, after testing for normality.

Means and standard deviations are presented in the results section to aide interpretation and to facilitate comparison with previous studies, though the analysis was conducted using mean ranks.

All quantitative analysis was undertaken using SPSS v.23 software.

3.6.2 Qualitative Analysis

All qualitative data from free text responses were transcribed or extracted from the online questionnaires responses and imported into NVivo qualitative data analysis software for analysis. Qualitative thematic content analysis (Braun and Clarke, 2006), with elements of grounded theory (Strauss and Corbin, 2008), was undertaken to explore and code the data.

Qualitative data was read and re-read to generate descriptive codes (child nodes) for end of course and six-month follow up responses. After this process was complete, descriptive codes were re-analysed to identify larger themes, and codes were aggregated into larger (parent node) categories according to overarching commonalties, for example, whether the codes were about course content, about the trainer, or whether they were positive or negative.

NVivo allows for child nodes to be aggregated to parent nodes, so it was possible to analyse codes quantitatively, including how many respondents mentioned a particular code, both at the child and parent node levels.

Reporting was made under headings which matched overarching parent node themes, then broken down into the major sub-categories.

3.7 Ethical Approval

Ethical approval for the study was gained from the Department of Social Policy and Social Work Ethics Committee at the University of York.

4. Results

154 students completed a questionnaire on at least one of the three time points. 152 students (98.7%) completed the baseline questionnaire, 73 (47.4%) went on to complete the end of course questionnaire, and 38 (24.7%) completed the six-month follow-up questionnaire. All 154 responses were included in the analysis, with missing data being imputed where possible from the last known value. However, due to missing attendance and socio-demographic data for some respondents, the actual number of participants included in each statistical test varied.

4.1 Participant socio-demographic characteristics

Socio-demographic data were only available for those who completed the 6-month follow-up questionnaire (n=38, 24.7%) as it was not collected earlier in the study (table 4.1).

The mean age of this sample was almost 31 years, making it considerably older than most undergraduate cohorts (typically under the age of 22). It is possible that older undergraduates chose to undertake the training or that a higher response were obtained from this group at six-month follow-up.

A similarly high proportion of females completed the six-month follow-up questionnaire as participated in the earlier study in the same university (Webber et al, 2015). Similarly, the ethnic diversity of the sample was representative of the university's student population. Almost two-thirds of the students provided their living status as 'single' (table 4.1).

Table 4.1. Socio-demographic characteristics

	n=38	%
Gender		
Female	31	81.6
Male	7	18.4
Age		
Mean (s.d.)	30.7 (8.8)	
Ethnicity		
Bangladeshi	2	5.3
Black African	11	28.9
Black Caribbean	3	7.9
Indian	2	5.3
Mixed parentage	2	5.3
Other (unspecified)	8	21.1
Pakistani	1	2.6
White British	9	23.7
Living status		
Divorced	1	2.6
Single	23	63.2
Married or cohabiting	13	34.2

4.2 Quantitative evaluation

4.2.1 Attendance

Attendance data were available for 153 participants (table 4.2). Only 17 participants (11.0%) attended all five sessions with most (n=96, 62.3%) attending just one or two sessions. The mean number of sessions attended was two.

Table 4.2. Attendance

Number of sessions attended	n=154	%
0	6	3.9
1	67	43.5
2	29	18.8
3	18	11.7
4	16	10.4
5	17	11.0
Not known	1	0.6

4.2.2 Whole group analysis

At all three time points, mental wellbeing, ability to cope with stress and general self-efficacy were positively correlated (tables 4.3, 4.4, 4.5). However, the shared variance did not rise above 47% indicating that they are measuring distinct constructs.

Table 4.3 Correlation matrix for outcome measures at baseline

	WEMWBS	Ability to cope with stress	General self-efficacy scale
WEMWBS	1	0.54**	0.56**
Ability to cope with stress	0.54**	1	0.64**
General self-efficacy scale	0.56**	0.64**	1

**p<0.01

Table 4.4 Correlation matrix for outcome measures at the end of the course

	WEMWBS	Ability to cope with stress	General self-efficacy scale
WEMWBS	1	0.63**	0.67**
Ability to cope with stress	0.63**	1	0.70**
General self-efficacy scale	0.67**	0.70**	1

**p<0.01

Table 4.5 Correlation matrix for outcome measures at six-month follow-up

	WEMWBS	Ability to cope with stress	General self-efficacy scale
WEMWBS	1	0.61**	0.63**
Ability to cope with stress	0.61**	1	0.70**
General self-efficacy scale	0.63**	0.70**	1

**p<0.01

In the sample as a whole there were statistically significant increases on all three outcome measures from baseline to the end of course and from baseline to six-month follow-up (table 4.6). For all outcome measures the effect sizes (r) were moderate, though were low-moderate for self-efficacy and ability to cope with stress at six-month follow-up.

There were no statistically significant differences between the end of the course and six-month follow-up, indicating that improvements were maintained over time.

Table 4.6 Change in outcome measures over time (whole sample)

	Baseline mean (s.d.)	**End of course** mean (s.d.)	**Six-month follow-up** mean (s.d.)
Mental wellbeing (WEMWBS)	46.63 (8.82) n=143	48.65 (9.47)*** n=148 r=0.35	48.33 (9.42)*** n=149 r=0.31
Ability to cope with stress	10.98 (2.24) n=152	11.37 (2.27)*** n=153 r=0.28	11.31 (2.28)** n=154 r=0.25
General self-efficacy	29.44 (4.55) n=147	30.19 (5.01)*** n=151 r=0.29	30.11 (4.93)** n=152 r=0.25
Differences from baseline: *p<.0.05, **p<0.01, ***p<0.001			

4.2.3 Sub-group analysis by attendance

There were insufficient numbers of non-attenders (n=6, 3.9%) to conduct a meaningful comparison between those who did not attend at all and those who attended at least one session. Instead, the sample was split between those who attended two sessions or fewer (n=102, 66.2%) - 'low attenders' - and those who attended three or more sessions (n=51, 33.1%) - 'high attenders'.

At baseline, there were no significant differences between the 'low attenders' and the 'high attenders' on any of the outcome measures (table 4.7).

In comparison with baseline, at the end of the course and at six-month follow-up there were no significant differences in scores for the 'low attenders' (table 4.8). However, there were significant increases in scores on each of the outcome measures at the end of the course and at six-month follow-up for the 'high attenders'. Effect sizes (r) were large at the end of the course and moderate to large at six-month follow-up (table 4.8).

Table 4.7 Outcome measures at baseline by attendance

	'Low attenders' mean (s.d.)	**'High attenders'** mean (s.d.)	Test statistics
Mental wellbeing (WEMWBS)	46.91 (9.18)	46.02 (8.20)	U=2103, z=-0.562, p=0.574
Ability to cope with stress	11.12 (2.22)	10.77(2.28)	U=2364, z=-0.741, p=0.459
General self-efficacy	29.83 (4.72)	28.63(4.16)	U=2025.5, z=-1.364, p=0.173

Table 4.8 Change in outcome measures over time (by attendance)

	Baseline mean (s.d.)	**End of course** mean (s.d.)	**Six-month follow-up** mean (s.d.)
'Low attenders'			
Mental wellbeing	46.92 (9.14)	47.49 (9.13)	47.61 (9.10)
Ability to cope with stress	11.09 (2.23)	11.15 (2.25)	11.18 (2.30)
General self-efficacy	29.84 (4.70)	29.95 (5.12)	29.90 (4.99)
'High attenders'			
Mental wellbeing	46.02 (8.20)	50.93 (9.80)*** r=0.57	49.74 (9.95)*** r= 0.50
Ability to cope with stress	10.77 (2.28)	11.82 (2.26)*** r=0.50	11.57 (2.25)** r=0.44
General self-efficacy	28.63 (4.16)	30.67 (4.80)*** r=0.51	30.53 (4.84)** r=0.44
Differences from baseline: *p<0.05, **p<0.01, *** p<0.001			

4.2.4 Multivariate analysis

A repeated measures test was run for the whole sample at all three time points, using attendance as a covariate (table 4.9). Higher attendance had a statistically significant effect on scores on all three outcome measures, with medium effect sizes across time points.

Table 4.9 Interaction effects (attendance)

	Variables	**df**	**Mean square**	**F**	**p**	**Partial η^2**
Mental wellbeing (WEMWBS)	Time	1.5	10.3	0.4	0.6	0.003
	Time x attendance	1.5	241.5	9.3	0.001	0.062
Ability to cope with stress	Time	1.4	1.9	0.9	0.4	0.006
	Time x attendance	1.4	18.3	8.9	0.001	0.056
General self-efficacy	Time	1.6	4.1	0.8	0.4	0.006
	Time x attendance	1.6	44.7	8.9	0.001	0.058

When the test was re-run adding age as a further covariant, the dataset was restricted to the 36 cases in which the participant's age was given. In this instance, the only near-significant effect was that of attendance on mental wellbeing scores, with a moderate effect size (table 4.10). Age does not appear to have a significant effect on scores, but this could be a consequence of the small sample size used for this analysis. Due to limited socio-demographic data being available, age was the only potential confounding variable included in the analysis.

Table 4.10 Interaction effects (age and attendance)

	Variables	df	Mean square	F	p	Partial η^2
Mental wellbeing (WEMWBS)	Time	2	50.7	1.9	0.2	0.055
	Time x age	2	28.8	1.1	0.3	0.032
	Time x attendance	2	82.5	3.1	0.051	0.086
Ability to cope with stress	Time	2	2.7	1.3	0.3	0.038
	Time x age	2	3.8	1.9	0.2	0.053
	Time x attendance	2	4.0	1.9	0.2	0.055
General Self-Efficacy	Time	2	14.4	1.9	0.2	0.055
	Time x age	2	14.8	2.0	0.1	0.056
	Time x attendance	2	14.0	1.9	0.2	0.054

4.2.5 Attendance and module attainment

Module attainment data for 2015-16 were available for 133 (86.4%) participants. 80% (n=16) of the 20 participants who did not complete any modules during 2015-16 were 'low attenders' of the Mindapples training sessions in contrast to 64.7% (n=86) of those who completed at least one module. However, this difference did not reach statistical significance (χ^2=1.84, df=1, p=0.18).

Participants completed modules at levels 3 (foundation); 4, 5 and 6 (undergraduate) and 7 (postgraduate) in 2015-16. For those who completed modules at more than one level, we only analysed data from the highest level they attained. There was no statistically significant difference in mean grades attained by the 'high attenders' (mean=63.1, s.d.=9.2) and the 'low attenders' (mean=60.8, s.d.=10.9) (t=1.25, df=131, p=0.21). When analysed within each module level, there were also no statistically significant differences in mean grades between high and low attenders.

4.2.5 Summary of findings

The univariate analyses found increased scores across all outcome measures from baseline to the end of the course, and six-month follow-up, with moderate to large effect

sizes. These analyses run the risk of making a type 1 error because of the number of tests made. However, they are consistent with the repeated measures test controlling for attendance, which compensates for such errors. This found that attendance is significantly associated with higher scores with a medium effect size. The difference in effect size between the repeated measures test and the Wilcoxon signed ranks test is attributable to the former using the whole group and controlling for attendance, while the latter compared mean ranks within 'low attenders' and 'high attenders'.

Attendance at Mindapples training sessions is not associated with module completion or grades attained by participants in this sample.

4.3 Qualitative evaluation

4.3.1 Qualitative responses at the end of the course

Students were asked two free text questions in the end of course questionnaire. The first asked them to describe any helpful aspects of the course, the second asked for suggestions for future improvement. A further question invited additional comments about the course. Content analysis using NVivo revealed overwhelmingly positive comments and very few negative comments, though there were also a significant number of suggested improvements.

4.3.1.1. Helpful aspects of the course

173 positive statements were given by 57 participants. They can approximately be divided into five general categories which, in order of frequency, related to personal outcomes; course content; general positive statements about the course experience; course delivery; and course structure. These are described in more detail below.

4.3.1.1.1 Personal outcomes

The most frequent personal outcomes were related to increased knowledge and understanding about managing stress better; improving coping mechanisms; increasing motivation and confidence; and being better able to look after general wellbeing. For example:

> *"I have learnt to manage stress more effectively…"*
>
> *"I was hard on myself now I think I can deal things easier and stop beating myself up."*

Participants said they were able to put what they had learned into practice in their everyday lives, either as an aspirational future activity or one that they had managed to apply already. For example:

> *"The training has improved my self-awareness. I feel equipped to improve my resources and deal with the pressures of life. I feel confident of the future."*
>
> *"I now accept and understand myself better, I'm happier. Learning about moods and emotions has helped ease the erratic and exhausting falling in and out of depressive episodes."*

Several participants felt that the course had helped them to achieve personal goals. For example:

> *"Motivation and stress management was very helpful for me because at this time of my life (being a student and mother of 2) was the right thing I needed to reach my goal getting my degree."*

4.3.1.1.2 Course content

The most frequent positive statements about the content of the course were in relation to the physical resources supplied, variously described as books, brochures, user guides, handouts, leaflets, and workbooks. In particular, some participants said these resources were helpful as reminder and recap tools, and because they enabled participants to share their learning with others. Participants also felt that the content of the course was relevant to their needs; was pitched at an appropriate level; and was evidence-based. For example:

> *"The programme covered lots of the areas I found difficult to manage (e.g. stress, motivation)."*
>
> *"I found the structure of the sessions to be very useful and projected at a good level. The length and content were exactly right for me."*
>
> *"It's great to see so many references to support the content."*

Participants stated that the motivation, stress management and personality sessions were most useful. However, they also valued sessions that covered: knowing / loving / mastering your mind; moods and emotions; neuroticism; and the 'star exercise'.

4.3.1.1.3 General positive statements

Many participants expressed non-specific positive statements about the course which capture their enthusiasm for it. For example:

> *"I really enjoyed the Mindapples sessions and would recommend them to others."*
>
> *"Excellent course. Thank you. Come back again."*

4.3.1.1.4 Course delivery

Participants praised the trainers, stating that they were clear; informative; skilled; knowledgeable; approachable; engaging; answered questions; and presented information well so that it was understandable. A few participants said that the interactive elements of the course were useful, and mentioned the skill of the trainers in being able to facilitate useful group activities. Some comments about the way in which the course was delivered included, for example:

> *"Course leader was exceptional - wealth of knowledge and engaging with very stressed out students!"*
>
> *"The speakers are very skilled at taking what we try to say & making is clearer & understandable."*

"I really enjoyed the sessions as the tutor was really approachable and was able to make people talk and feel relaxed."

4.3.1.1.5 Course structure

Participants valued the way that the course was structured, citing between-session exercises; reminder emails; the structure of individual sessions; the mix of teaching and exercises; and weekly delivery as helpful.

4.3.1.2 Unhelpful aspects of the course

Three participants provided negative statements about the course. One felt that they already had the skills being taught due to their professional role, but that they would still recommend this course to others who did not have such knowledge and experience.

A second participant gave more forthright and negative views, suggesting that the course was too basic. However, s/he acknowledged that this may not have been the case for others in the group. In addition, s/he felt that the credibility of the course was undermined because the people delivering it were neither "a psychologist or a scientist"; that is was built on limited reading and research, relying heavily on popular psychology literature; and that it had been "throw[n] together". S/he also questioned the ethics of the course and whether it will help people as opposed to not actively harming them, and also questioned the motivation for the course as a money-making public relations exercise for Mindapples.

The third participant who gave negative feedback felt that the course was over-taught and disappointing, and suggested various ways it might be improved (see section 4.3.1.3).

4.3.1.3 Suggestions for Improvement

When invited to offer suggestions for future improvements, 15 participants said that none were necessary. However, 35 did make some suggestions. The most common of these were related to time, flexibility and planning. Some participants wanted alternative times and dates for sessions; repeated running of sessions for those who could not make them; and future iterations of the course for those who could not attend. Several comments related to when the sessions were run including making them "closer to the end of the seminars", though others wanted them to start later in the afternoon. Room allocation and communication were also raised as areas for future improvement.

The second most frequently suggested improvement was a request for greater depth and detail, by providing additional resources or longer sessions. Several participants also suggested that greater opportunity for participation, either through written exercises or activities, or through group work and discussion, would be advantageous. For example:

"More interaction with the others attending the sessions - group activities and games to engage more fully with the learning."

"I loved the sheets we fill out during the session - more of that would have been great."

Some participants suggested that resources could be provided at the beginning of classes to help understanding of the topics discussed. Others suggested that a greater range of resources such as lecture slides, online resources or apps, may also help. One participant suggested that more content on "how grief plays a part in all this" would be useful.

Other suggested improvements included greater publicity and advertising for the course; more stories and real life experiences from outside and within the group; and the provision of further opportunity for students to explore issues raised. For example:

"These type of courses can be a bit of a 'pandora's box' and I wonder if there could be additional support for students if they like to explore what they have discovered about themselves."

The participant who was particularly critical suggested that the course would benefit from being more interactive; less formally taught; more succinct in imparting information; and having more time to participate in discussions and to process information. S/he also suggested that tutors could use students' experiences as active case studies to discuss in the group and collaboratively suggest potential solutions.

4.3.2 Qualitative responses at six-month follow-up

The six-month follow-up questionnaire asked participants about the extent to which they were or were not able to apply the learning from the Mindapples course to their work or life, including providing some examples of this. This questionnaire was only completed by a quarter of participants (n=38, 24.7%), so it may be difficult to assess the full impact of the course from these findings. However, they are indicative of participants' application of the learning from the course to their lives.

We firstly explore successes which participants noted, followed by barriers they experienced. Finally, further suggestions for improvement are provided.

4.3.2.1 Applying learning in own life: successes

33 participants mentioned some degree of success in implementing the learning in their everyday lives, with several saying the course had also helped them with their studies. The following participant is typical of those who were able to implement learning from the course:

"…after taking part in the programme I came to realize that forcing my mind to work for hours without any break was not helpful at all. In fact it only made me more stressed because I used to feel very tired. I then decided to change this habit and allow myself breaks in between my hours of study and using this time to do something enjoyable or simply resting. This strategy allowed me to have more motivation which in turn lead me to work more effectively."

Positive effects also included a reduced need for medication for depression or sleep problems; reduced pain from stress-induced headaches; improved confidence; improved ability to cope with the dynamics and stresses of dealing with other people;

accessing greater support from other people in their networks; reduced exam stress; greater motivation; having some practical tools and techniques they could use; greater understanding of the difference between reality and emotions; greater ability to manage stress; improved knowledge and self-knowledge; and better time management. The most common of these positive effects are explored below.

4.3.2.1.1 Knowledge, understanding, and self-knowledge

25 participants mentioned that they felt their knowledge and self-knowledge had increased as a result of the course, and that this had helped them in their lives. For example:

> *"Now that I'm aware of my personality type, I would say I'm more open to reading and understanding ways to improve on things with regards to my personality."*

> *"... Mindapple [sic] training raised my awareness on many subjects, mood, subconscious and conscious thoughts and awareness of my self and that of others. I always go back to the resources and the book 'mind for business' when I need a refreshers. By far one of the best training I have been to in regards to mental health/illness issues."*

4.3.2.1.2 Stress management

20 participants cited the positive effect that the course had on their ability to manage stress and anxiety, both at work and home. For example:

> *"I probably manage stress better meaning that if I notice that I'm feeling more stressed I'm able to make the link between a lack of well-being activities being practised."*

> *"Also, helps me to cope with some personal issues and at work as I am under pressure."*

4.3.2.1.3 Practical tools and techniques

18 participants said that they felt better equipped to deal with issues in their lives through increased knowledge of tools and techniques. These included being able to "identify triggers" and "internal and external factors" that affect them; recognising stress that may otherwise have gone unacknowledged; staying calm and dealing with issues constructively; making lists of things that help their motivation and mental health; taking time out and learning to relax; balancing competing demands through increased skills and strategies to cope and stay focused; and knowing about the negative effects computer screens can have. Some participants noted that they were able to invest in supportive resources such as other people; be more realistic about setting goals, and were able to make use of the booklets and physical resources supplied on the course. For example:

> *"The training I received was second to none, I enjoyed the sessions and putting them into practice knowing they work. My confidence level has been noticed by my colleagues and family, I carry my little booklets with me referring to them every now and then to ensure myself that I am on track."*

4.3.2.1.4 Dealing with exam stress

Many participants stated that the course helped them to manage anxiety and stress. Twelve said that they were better able to deal with the stress they experience as a result of studying and exams. For example:

> *"It has helped me recognise stressful situations and how to deal with them. To be more accepting of situations for example I know I will have deadlines for my coursework and rather than worry or stress about it to try and be realistic in my approach and work with my strengths and weaknesses."*

4.3.2.1.5 Motivation

Eight participants indicated an increase in motivation, which helped them to work towards their goals. In several cases this was related to their studies. For example:

> *"When revising for exams I think back to what energises me: walking my dog, taking a shower etc. And I do one of those things."*

> *"As a student it has helped me stay focus and do not give up."*

4.3.2.2 Applying learning in own life: barriers to success

As with qualitative responses at the end of the course, comments were mainly of a positive nature, with relatively few negative comments. However, there were more negative comments at this stage than at the end of the course, with 12 participants referring to barriers preventing implementation of their learning in their everyday lives.

Most comments acknowledged some positive effects, but stated that the impact of the training was limited because the techniques were only useful for moderate rather than severe stress; because more practice was needed; or because competing demands and pressures on participants' lives prevented them from applying their learning. For example:

> *"I don't think it had a great influence on how effective as a student I am mainly because I haven't come back to the training materials since it finished as the demands of the accelerated course and life pressures felt too much."*

Some students highlighted the need to attend more sessions and to take part in group activities and complete given tasks, in order to make best use of learning:

> *"I did apply some techniques at first and during the course and they were somewhat helpful but then forgot about it all. I only attended 2 lessons and think I would have benefited if I had attended them all, it probably would have made a difference that lasted longer."*

> *"Some of the attendees were perhaps shy and it effected [sic] the flow of the session because it was about sharing experiences and ideas. I think to gain the most from the classes you had to complete the diaries and I did not."*

Other participants highlighted the need to return to the materials and practise learned techniques in order to implement them effectively in their lives, an activity that they struggled to find time for. For example:

> *"I have been able to take certain things I've learnt from the course into how I live my life. However, some things I learn from the course, cannot be implemented into day to day like just because of one course. It is something I would say, needs to worked upon constantly."*

> *"It has assisted in learning more about myself and others and how to deal with different things. I would like to have a review session every few months or something to keep on track as when a number of stressful situations arise at once it can be difficult to maintain what has been learned from the earlier sessions."*

4.3.2.3 Suggestions for Improvement

Participants made additional suggestions about future improvements in the follow-up questionnaire even though this was not specifically requested of them. Pursuing the theme of requiring more support with implementing the learning from the course, participants suggested that follow-up and review sessions might be useful to help retain and apply learning. For example:

> *"I would like to have a review session every few months or something to keep on track as when a number of stressful situations arise at once it can be difficult to maintain what has been learned from the earlier sessions."*

Participants also felt that offering the course more widely would enable other students to benefit too. For example:

> *"I wish this training could be made more available to all students regularly or as part of the general course(s) as the difference it makes to my levels of understanding & studying is amazing."*

> *"I would wish you manage to invite a bigger group of student from all levels as they all have issues which they need help."*

In addition to refresher or repeat courses, one participant also suggested that similar effects might be achieved through improved resources, such as a consolidated book:

> *"What I retained in the training is what I used. A consolidated manual at the end of the course would make the training more valuable as the little books get lost pretty quickly. Course is meant for people trying to keep things together, adding several little books doesn't help."*

5. Discussion

5.1 Main findings

This was a modest pre-post study with no control group. Unlike our previous evaluation of Mindapples training with university students (Webber et al, 2015), we had no control group of students who did not receive the training. Instead, we compared 'low attenders' (those who attended none, one or two sessions) with 'high attenders' (those who attended three, four or five sessions) to explore if attending more sessions was associated with improved outcomes.

We found that the mental wellbeing, self-efficacy and ability to deal with stress of the 'high attenders' improved on all three outcomes at both time points. By contrast, the 'low attenders' did not improve by the end of the course or at the six-month follow-up point. The additional multivariate analysis, taking all time points into account, found the same pattern even when age was entered as a covariate.

There were no discernible differences between the groups at baseline which could explain these findings. The only alternative explanation to the effect being due to attending the Mindapples training is that there were unmeasured psychosocial variables such as resilience which could explain both why some attended more sessions and that their outcomes improved over time. Future research needs to identify and measure more potential confounding variables so that their effect can be controlled for in the analysis. In addition, a randomised controlled trial design needs to be used to ensure these potential confounding variables are distributed equally between an intervention and control group.

There is evidence to suggest that the improvements could be attributed to the training. Firstly, the qualitative data supports this finding. Participants supplied many examples of how they had implemented the training in their work and everyday life, and were overwhelmingly positive in their feedback. In particular, they stated that they were better able to recognise and manage stress, and cope with competing demands on their time. This helped them in their personal lives (managing and dealing with others), academic lives (exam stress and demands of the course), and working lives (coping with stress and demands in clinical practice). It may be possible that some participants supplied positive examples as that was what they perceived the evaluators wanted to see. However, it is unlikely that the large number of positive examples were generated by a response bias, particularly as they had an equal opportunity to say that the training had no effect.

Secondly, the findings are similar to the previous evaluation of the Mindapples training with students (Webber et al, 2015). As in the previous study, the low attenders - used as a proxy for a control group - did not show an increase on any of the outcome measures. Also, the improvements in outcomes observed at the end of the course persisted, though in this study the differences were found at six months after the end of the training rather than three which suggests that the effects can be longer-lasting than previously observed. The only other difference from the previous evaluation with students is that this study found an increase in mental wellbeing at follow-up whereas previously this was just found at the end of the course.

Thirdly, the pattern of a significant increase in outcomes from baseline to the end of the course, followed by a small decline six-months later, is expected. This slight decline would be due to the passage of time since the training. However, this decrease was not statistically significant, and the scores were still higher than they were at baseline, with all results being significant and effect sizes moderate. This suggests that the positive change on outcome measures was associated with attending the training rather than being attributed to chance.

It could be argued that the 'low attenders' were less interested in the training or lacked confidence, though our findings did not suggest this. Instead, some participants cited practical difficulties which may have impacted on their ability to attend. For example, the 30 end of course respondents who were in the 'low attenders' group made only two negative statements about the training and these were related to competing demands on their time, rather than course content or relevance.

Our findings support previous research which found that some students struggle with managing stress levels and competing demands on their time (Gale et al, 2015), and that psychological interventions can help to reduce students' stress levels and improve their wellbeing (Song & Lindquist 2015; Chen et al, 2013; Van de Riet et al, 2015). In addition, this evaluation had similar findings to Priesack & Alcock's (2015) study, which used the same General Self-Efficacy Scale (Schwarzer and Jerusalem, 1995). It also lends support to their findings that there is a correlation between wellbeing and self-efficacy.

As attendance on the course was associated with increased mental wellbeing, ability to cope with stress, and general self-efficacy, it would be useful to find ways to increase attendance so its benefits could be more fully experienced by participants. They suggested repeating sessions or improving timetabling may help to make it easier for students to attend. In addition, follow-up activities, refresher sessions, and resources to help them to embed their learning were also cited as potentially useful beyond the course.

Finally, the relative paucity of negative feedback about the training mirrors our previous evaluation (Webber et al 2015), suggesting that the content is relevant and delivered effectively by skilled trainers. Three did not find the course useful, but of these one said that they could see how it might be useful for others. Many more students cited the evidence-base underpinning the course, and trainer knowledge and expertise, as positive and noteworthy aspects of the course.

5.2 Limitations

This was a modest study with no control group. Using 'low attenders' as a comparison group is not as robust as recruiting controls who received no training. In addition, there may be unobserved variables which were associated with both attendance and the outcome measures. A better design would be a randomised controlled trial which would equally distribute potential confounding variables between groups and reduce any potential selection bias.

Socio-demographic data was not collected for participants at baseline and only limited data was collected at follow-up. This restricted the number of potential confounding variables that could be used in the multivariate tests. When age was included in the multivariate analysis, for example, the statistical power was reduced to such an extent that it was difficult to detect any effect. Our analysis will benefit from inclusion of other socio-demographic variables such as gender, ethnicity or socio-economic status.

In addition, as discussed above, the evaluation could be improved by measurement of other potential confounding variables such as resilience. It is possible that some innate characteristics of the participants were associated with both attendance at the training course and the outcomes we measured. Measuring these variables would have enabled us to control for their potential confounding effect.

The training course was made available to first year undergraduate students at the participating London university. Only a small number of participants attended all five sessions of the Mindapples course. It appeared that practical difficulties prevented many from attending all sessions, which possibly limited the benefit they derived from it. This may suggest that difficulties may be encountered in rolling the course out more widely. For example, it may not be feasible to deliver it in six sessions, as was originally planned.

In addition, the module attainment data included students working at many different academic levels suggesting that many were not first year undergraduates. The training was targeted at first year undergraduates as it was hypothesised that it would have the greatest effect early in their degree programme. Although not reported above, post-hoc analysis found that change in outcomes between baseline and the end of the course and follow-up were not significantly different according to level of study. This suggests that students benefitted from it irrespective of the academic level they were studying. However, it could be more effective if used with a more homogenous group of students who may be more willing to share personal experiences which could enhance the group's learning experience.

Data were collected using self-complete questionnaires. Although valid and reliable measures were used, it is possible that more extensive data could have been collected using interviews. However, interviews were not possible due to limited resources available for the evaluation. Further, they may have actually produced less data than self-complete questionnaires as interviews often impose a greater burden on participants, discouraging people from staying engaged in longitudinal studies.

5.3 Recommendations

5.3.1 Recommendations for Mindapples

The course was very positively received but some recommendations arise from this evaluation which Mindapples may wish to consider for future versions of the course. Future delivery might usefully:

(a) Offer more flexibility in the timing and availability of sessions to enable more students to attend more sessions. This could include timing sessions for immediately after students' other lectures, providing sessions more than once on different days and at

different times. Although this has clear resource implications, it is important for the efficacy of the training as attending more sessions is associated with greater improvements in mental wellbeing, self-efficacy and ability to cope with stress.

(b) Offer activities and resources after the end of the course for participants to refresh and consolidate their learning. This might include the development of apps, running follow-up group sessions, or using web-based resources. Engaging students with these activities and resources could be as challenging as finding a way to increase their attendance on the initial course. However, the frequency with which it was mentioned by participants suggests that it is worthwhile exploring further.

(c) Target first year undergraduate students for the training so participants can gain maximum benefit from it. It is possible that students may respond more readily to the training at the start of their university programmes and help them to manage their stress more effectively when assignments or examinations are due. Given the finding that improvements in mental wellbeing, self-efficacy and ability to cope with stress are enduring at six months, it is possible that the benefits of the Mindapples course may extend throughout a degree programme if these early improvements are maintained.

5.3.2 Recommendations for further research and evaluation

Future evaluations of Mindapples training could be improved by considering the following:

(a) Using a randomised controlled trial methodology may more effectively control for selection bias and the effect of any potential confounding variables.

(b) Collecting socio-demographic data and measuring other potential covariates at baseline will help to more fully control for confounding variables in multivariate analysis.

(c) Providing multiple opportunities and methods (e.g. self-complete, online, postal, interviews) for the collection of follow-up data may improve response rates and the statistical power of future evaluations.

(d) Providing all of the training sessions as originally planned could help to improve outcomes and strengthen the evaluation. Delivering the full number of training sessions and the full content as faithful to the original plan will aide with the replication of the training and evaluation. Although indicative, the findings of this evaluation may not be generalizable to the six-session course. To discover the full effect of the six-session course, it will be necessary to implement the training in full and implement the above methodological recommendations to make the evaluation as robust as possible.

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