Evaluating the REP-S brief resilience intervention for students in higher education: A multi-study mixed-methods programme of research

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Abstract

There is currently an unmet need in higher education for a structured, pre-emptive programme of support to help students enhance their capacity to respond resiliently to stress. Resilience is a complex biopsychosocial construct that subsumes a number of processes and capacities for adapting to stressful events in ways that facilitate continued optimal functioning. This article presents a mixed-methods evaluation of a transferable biopsychosocial resilience intervention for students - the *Resilience Enhancement Programme for Students* (REP-S). In Study 1, a randomised control trial showed that, in a sample of 65 students (36 intervention group, 25 control group), participating in the intervention was associated with significantly decreased perceived stress (p=.002), decreased trait neuroticism (p=.011) and enhanced self-esteem (p=.010) over a period of one month. In Study 2, written qualitative data from 145 students and focus group data from 20 students provided evidence that the intervention led to perceived positive changes, including reports of sleeping better, dealing effectively with assessments and managing interpersonal challenges. Future steps in the delivery and evaluation of the REP-S are discussed.

Keywords: Resilience, intervention, mixed-methods, higher education, students, stress

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For many in higher education, their years at university are times of instability, frequent stress and destabilising changes in identity (Walker, Gleaves & Grey, 2006). Correspondingly, the capacity to respond resiliently to stress has been found to predict positive outcomes in studies based in the USA, UK, India and Norway. These positive outcomes include better student mental health (Hartley, 2011), coping with stress (Stanley & Bhuvaneswari, 2015), retention (Bleasdale & Humphreys, 2018), academic performance (Allan, McKenna & Dominey, 2013; Hartley, 2011), and life satisfaction (Kjeldstadli et al., 2006). Furthermore, it is valued by future employers as one of the most sought-after attributes during graduate recruitment, given its perceived importance in the work environment (Reed & Stoltz, 2013). Thus, to build student resilience is to develop increased potential for attainment, employability and well-being. Developing resilient students is particularly salient at the current time in higher education, given the statistics indicating a crisis of mental health problems in students and a correspondingly excessive demand placed on student counsellors on campus (MacAskill, 2012; Vaughan, 2018).

Approximately 80% of UK students in higher education are aged 18-29 (Higher Education Statistics Agency, 2018) and are therefore within the stage of the lifespan that is widely known as 'emerging adulthood' (Arnett, 2000). Arnett devised the theory of emerging adulthood, and argues that demographic and societal shifts that have taken place over the past half century have meant that this period of the lifespan is now defined by ambiguity of adult status, instability of roles and identity, continued exploration of potential life directions, and the deferral of major life commitments such as marriage and parenthood until later in adulthood than used to be the case (Arnett, 1998; Robinson, 2016).

Research looking at the relationship between stress and age indicates that individuals in this developmental stage may be particularly prone to stress (Stone, Schwartz, Broderick & Deaton, 2010). Corresponding to the generally high level of stress in this age group, students widely report

higher education to be a stressful experience and to need substantive support with their mental wellbeing (Adlaf et al., 2001). Mental health issues among students are indeed a rising concern, with research studies from multiple countries indicating an increasing level of depression, anxiety and stress in the student population (Wintre & Yaffe, 2000; Storrie, Ahern & Tuckett, 2010). Developing resilience has been postulated as a key to pre-empting mental health problems in students, hence the need for validated interventions is paramount (DeRosier, Frank, Schwartz & Leary, 2013). Resilience is also predictive of academic attainment. In a year-long longitudinal study of first year students in higher education, it was found that resilience reported at the beginning of the year predicted academic attainment at the end of the year, but more for female students than male students (Allan, McKenna & Dominey, 2014).

The principal theoretical framework of resilience that informs this study is Richardson's biopsychosocial metatheory of resilience (Richardson, 2002). This theory conceives of resilience as a composite of homeostatic processes that help maintain psychophysical balance and self-regulation when a person is disrupted by life stressors or negative life events (Richardson, 2002). Processes that facilitate resilience are varied, and include mindfulness, planning, assertiveness, social problem-solving, positive reframing and relaxation techniques, which can all be construed as resilience-enhancing skills when developed proactively (Rogers, 2013). Trait resilience refers to the measurable extent to which people are able to employ homeostatic resilience processes to remain physically and mentally calm under conditions of external pressure and stress, and are able to bounce back quickly to their previous, or a better, state of functioning following a stressful event (Dolbier, Jaggars & Steinhardt, 2010; Richardson, 2002).

As well as being a complex yet operationalizable construct, resilience is a flexible conceptual framework for developing applied understandings and protocols for how change programmes can facilitate increased capacity for stress management and adaptive coping over time (Fletcher & Sarkar, 2013). Correspondingly, research suggests that a person's resilience level can be changed over time by targeted interventions that integrate multifaceted strategies

(Leppin et al. 2014). In a recent systematic review and another meta-analysis which have synthesised resilience interventions with adults, it was concluded that such interventions have a consistent yet modest positive effect (Leppin et al. 2014; Vanhoe et al., 2015). Changes to behaviour or affect that occur following interventions may be temporary, as most evaluative data has been gathered over a relatively short timeframe; however, some studies suggest the possibility that change endures over at least three months (Yalcin, Unal, Pirdal, & Karahan, 2015).

Several resilience interventions have now been piloted and evaluated with students in a tertiary education or higher education setting. The Resilience and Coping Intervention (RCI) is a group-based three-week collaborative problem-solving intervention. In each session participants identify a shared challenge or life stressor, and the facilitator then guides the group through a series of steps: (a) describing the stressor, (b) exploring thoughts and feelings related to it, (c) identifying problems that are occurring in life because of it, (d) brainstorming options for change, (e) exploring consequences of changes, and (f) developing individual action plans and group action plans. RCI has been conducted with American undergraduate college students and evaluated in a randomised control trial (Houston et al., 2017) with 124 undergraduates aged 18 to 23 randomly assigned to a control group or to an intervention group. Self-report assessments were solicited at Weeks 1 and 3. Intervention participants reported significantly more hope and significantly less stress and depression from the first to the third week compared to control participants.

A further example of a university-led programme that has a research base and external transferability is Transforming Lives Through Resilience Education (TLRE), developed at the University of Texas, USA. It comprises four modules; transforming stress into resilience, taking responsibility, focusing on empowering interpretations, and creating meaningful connections. It has been evaluated using a small randomised controlled trial with self-report outcomes. The intervention significantly increased self-appraisals of personal growth, including views about

growth in response to a past stressful event, for the experimental group compared with the control group; however, a limitation of the study is that it only evaluated outcomes over a period of a week post intervention (Dolbier, Jaggars & Steinhardt, 2009). In another relevant study, a 5-day Outdoor Adventure (OA) residential intervention for new undergraduate students in sports-based degree programmes, which included team challenges, educational visits, rock climbing and abseiling, ghyll scrambling, bivouacking, mountain-walking, canoeing and kayaking, was found to have a positive effect on resilience among participants as compared with students in a comparison group who did not attend the programme (Allan & McKenna, 2019).

While these programmes are important steps forward as applied solutions to enhancing student resilience, a key limitation of studies is the lack of longer-term follow-up assessments to investigate if the changes endured past the end or shortly after the intervention period. As well as these small-scale randomised control trials, several qualitative evaluative papers have been written on resilience-building programmes in higher education. The aforementioned RCI has been analysed qualitatively, via a process analysis of two RCI sessions as case study vignettes (First, First & Houston, 2018), providing mostly evidence of best practice rather than evaluative evidence. A mixed-methods study is presented by Stallman (2011), who conducted a mixed-methods evaluation of a seminar on the six building blocks of resilience (Realistic Expectations, Balance, Connectedness, Positive Self-talk, Stress Management and Taking Action). Participants provided post-seminar measures of satisfaction and usefulness, and then later completed reflective journal entries. The study shows that the seminar was felt to be a positive inclusion in the curriculum and that it provided techniques to facilitate positive and personally significant change. In sum, the limited research that there is on resilience interventions in higher education suggests that where they are delivered they are perceived to be helpful and bring about positive change. It is equally clear that the research in this area is in its nascent stages and much more work needs to be done.

For the purposes of this study, we devised a face-to-face resilience intervention that was based firstly on a series of interviews with students, in which the most pressing perceived needs to manage stress and boost resilience were explored and thematised (Sebah & Robinson, 2016). The intervention aimed to focus on these, and also drew on existing activities that have been empirically shown to be effective in helping to manage stress in student cohorts, such as mindfulness (Rogers, 2013) and assertiveness (Moon, 2008). A key guiding premise of the intervention is that it should be biopsychosocial in focus, by containing activities that help manage the biological, psychological and social effects of stress (Robinson, 2013). The resilience framework of Richardson (2002) was also formative in structuring the intervention to aid positive homeostatic adjustment following stressful events. The pedagogical ethos of the sessions within the programme was grounded in experiential learning theory, in terms of ensuring a cycle of (a) abstract conceptualization, (b) active experimentation, (c) concrete experiences, and (d) reflective observation (Kolb & Kolb, 2018). The experiential content included role plays, mindfulness and breathing activities, discussion circles, interactive brainstorming exercises using visual stimuli, structured exercises for devising goals and plans, and more. The resulting intervention has been named the Resilience Enhancing Programme for Students (REP-S). REP-S has three sections with corresponding activities: cognitive resilience, psychophysiological resilience and social resilience (see Table 1). To evaluate the intervention, we combined multiple methods to leverage the strength of quantitative and qualitative approaches (Creswell & Plano Clark, 2007): (1) a randomised control trial and (2) a qualitative study focusing on the experience of the workshop and changes experienced in the month following it.

INSERT TABLE 1 HERE

Study 1

Aims and Hypotheses

The aim of the first study was to assess the effectiveness of delivering the REP-S using a randomised control trial with both self-report and physiological data collected before and after the

intervention and practice period, and academic performance data gathered after it. We predicted that students in the experimental group rather than the control group would show a significant pre-post gain in resilience and self-esteem, and a decrease in neuroticism and recent perceived stress. This set of hypotheses was based on the findings from previous literature showing notable reductions in psychological distress, state anxiety and perceived stress following a brief mind/body training (Deckro et al., 2002), as well as research showing a positive correlation between resilience and self-esteem (Dumont & Prevost, 1999), and a negative correlation between neuroticism and resilience (Nakaya, Oshio & Kaneko, 2006). Secondly, it was predicted that the experimental group would show a pre-post decrease in galvanic skin response following exposure to a mild stressor, which would be significantly different from the control group. This hypothesis was informed by previous studies showing galvanic skin response as a robust marker of stress reactivity (Villarejo, Zapirain & Zorrilla, 2012). Finally, it was hypothesised that those in the intervention group would show better overall academic performance at the end of the academic year than those in the control group, given the empirically supported relationship between resilience and academic performance (Ayala & Manzano, 2018).

Method

Design

A two-phase randomised control trial design was employed. The experimental group undertook the intervention, while the wait-list control group did no intervention during the period of study but were offered the option of taking it afterwards. Randomisation to the two groups was achieved by assigning each participant a number and then using a random number generator to assign to each group. All data were collected during in-person assessments in a laboratory, one week prior to the intervention workshop and 4 weeks after it. The workshop element was delivered over the course of a single day. The trainers were the two individuals who designed and devised the intervention.

Participants

The sample comprised 79 first-year Psychology undergraduate students (18 males, 61 females)

aged 18 to 39 recruited through announcements in lectures and emails to students. The male-to-female ratio of approximately 3:1 in the sample matches the proportion of men and women in Psychology undergraduate programmes. All 79 participants completed the pre-intervention assessment, while 65 participants completed the post measures, representing an 11% drop-out rate. The final sample consisted of 36 participants in the experimental group (5 males, 31females) and 29 participants in the control group (8 males, 21 females). Participants were randomly allocated to the experimental or control group, and there was no overlap between groups. All participants received course credits for their participation and a £10 voucher to compensate for their time.

Measures

Connor–Davidson Resilience Scale (CD-RISC). The CD-RISC-25 is a 25-item scale suitable for assessing resilience within various contexts including education (Connor & Davidson, 2003). Each item in the CD-RISC is measured on a 5-point Likert-scale (1-5). The scale ranges from 1 to 125. Cronbach's alpha for the full scale was reported as 0.89 (Connor & Davidson, 2003). We only report the total CD-RISC score rather than subscale scores, as our hypothesis was set for resilience as a composite variable rather than the different facets.

The Big Five Inventory (BFI) Neuroticism Scale. The Big Five Inventory (BFI; John & Srivastava, 1999) is a 44-item inventory that measures a person on the Five Factor Model of personality (Goldberg, 1993). We used the BFI scale for Neuroticism, which assesses the degree to which a person is generally prone to negative emotions and self-cognitions on a 5-point Likert-scale (1-5) from Strongly Disagree to Strongly Agree. The scale ranges from 8 to 40, with higher values indicating more Neuroticism. Cronbach's alpha was .85 for Neuroticism.

Self-Esteem. The 10-item Rosenberg Self-Esteem Scale (RSES; Rosenberg, 1965) was used to measure self-esteem. The extent to which participants agreed with statements such as "I feel I have a number of good qualities" and "I feel I am a person of worth, at least on an equal plane with others" was indicated on a 4-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The scale ranges from 10 to 40. Cronbach's alpha for the RSES was .91.

Perceived Stress Scale (PSS). Extent of perceived life stress was measured by the 10-item version of the Perceived Stress Scale (PSS; Cohen et al., 1983). For each item, participants report how often they have been stressed *during the past month* using a 5-point Likert scale ranging from 0 (never) to 4 (very often). The scale ranges from 0 to 40. Cronbach's alpha for the PSS was .86.

Galvanic Skin Response (GSR): The Mindfield eSense Skin Response was used to measure participants' skin electrical conductance. Participants were first instructed to sit in a relaxed position for one minute, to obtain baseline levels of stress, and were then instructed to count backwards from 100, subtracting 7 each time, in order to induce a mild stress response. This procedure was repeated post-intervention; however, participants were instructed to subtract 9 from 100 in the second phase in order to minimise practice effects.

Personal significance appraisal: To assess the perceived personal significance of taking part in the intervention, two items were included in post-intervention assessment. "Participation in the resilience workshop and practice programme has been a positive learning experience for me" and "Participation in the resilience workshop and practice programme has provided me with tools and techniques that I think will positively affect my development as a person during my time at university". Responses were provided on a 5-point Likert response format from '1 strongly disagree' to '5 strongly agree'.

Procedure: Delivery of the intervention

The intervention was delivered by the two individuals who co-developed the REP-S (Sebah and Robinson), both of whom have teacher training qualifications and extensive experience of working with small groups in training, workshop and research capacities. The location of the interview was a room on campus that is designed for facilitating small groups 'in the round'.

Results

With regards to personally appraised significance of participation, 94% of participants reported that participating in the REP-S had been a positive learning experience for them and 80% reported that

the workshop had helped them further their personal development. The means and standard deviations of the dependent variables (DVs), for the experimental group and control, group before and after the intervention period are presented in Table 2.

Preliminary analyses were conducted to ensure that parametric test assumptions were met. There were no significant outliers in each of the groups and the distributions of the dependent variables were sufficiently normally distributed. Mauchly's Test of Sphericity for a repeated measures analysis of variance indicated that assumptions of sphericity had not been violated.

INSERT TABLE 2 HERE

Due to the number of hypotheses and corresponding tests, we corrected the required *p* value using a Bonferroni correction from $p<.05$ to $p<.017$ for all inferential tests. To test the prediction that resilience would increase in the experimental group than the control group, a two-way mixed-measures analysis of variance was conducted with time (pre-post) as a two-level repeated measures factor and group (experimental/control) as a two-level between-subjects factor. An interaction effect, if in the predicted direction, would be taken as the indicator of a significant improvement in the experimental group relative to the control group. The interaction effect partials out any pre-intervention difference between groups and only analyses the relative change of the two groups over time, hence it is an appropriate test for our hypothesis**.** Partial eta squared values are reported as the effect sizes for the ANOVAs, using recognised benchmarks of small effect size = 0.01, medium effect size = 0.06 and large effect size = 0.14 (Draper, 2020).

For self-reported resilience, there was a significant within-subjects main effect: $F_{(1, 62)} = 7.72$, $p = .007$) $\eta_p^2 = .11$. Examination of the means (Table 1) shows that resilience increased from pre to post intervention for *both* groups. A significant between-subjects effect: $F_{(1, 62)} = 7.72$, $p = .010$) $\eta_p^2 = .101$. shows that the control group had a higher mean at both time points than the experimental group - we interpret this to be the result of randomisation error. However, the interaction effect was not significant: $F_{(1, 62)} = 2.48$, $p = .120$, hence the hypothesis was not supported for this DV.

For perceived stress, there was a significant within-subjects main effect: $F_{(1, 61)} = 7.93$, $p = .007$) $\eta_p^2 = .115$. There was also a significant time*group interaction: $F_{(1,62)} = 10.3$, $p=0.002$. Analysis of the means shows a greater decrease in perceived stress in the intervention group, compared to the control group. Hence the hypothesis was supported for this variable; the intervention was found to reduce perceived stress.

For self-esteem, there was no within-subjects effect or between-subjects main effect; however, the interaction effect was significant: $F_{(1, 62)} = 2.48$, $p = .011$, $\eta_p^2 = .099$. Means show that self-esteem increased in the intervention group relative to the control group.

For neuroticism, there was a highly significant within-subjects main effect: $F_{(1, 63)} = 21.5$, $p = < .001$, $\eta_p^2 = .254$. A significant effect between-subjects was also found: $F_{(1, 63)} = 3.98$, $p = .050$, $\eta_p^2 = .059$. In support of the hypothesis, a significant interaction between pre-post neuroticism and experimental group was found: $F_{(1, 63)} = 6.80$, $p = .01$, $\eta_p^2 = .097$. Descriptive statistics showed a greater decrease in neuroticism in the intervention group over time compared to the control group.

GSR as the within-subjects factor showed no significant within-subjects main effect, no significant between-subjects and no interaction effect. Thus our hypothesis pertaining to this variable was not supported.

Finally, to test the hypothesis that there would be a mean difference in academic scores between the intervention and control group following the intervention, a Mann-Whitney test was conducted since assumptions of homogeneity were violated. The results showed that there was no significant difference between the two groups ($U= 469.5$, $p= 0.746$).

Discussion

In this trial of the REP-S intervention, it was found that, compared with the control group the intervention group decreased in neuroticism and perceived stress, while increasing in self-esteem, over the course of a month. This provided partial support to our hypotheses; however, contrary to what we had anticipated, there was no effect on trait resilience or galvanic skin response following exposure to a mild stressor. Due to logistical constraints that pertained to participant access, the

design of the current study did not involve a follow-up assessment to check for whether changes endured following the post-intervention measurement. This lack of follow-up, along with the relatively small sample size, means that our findings should be considered as no more than a provisional indication of efficacy.

Randomised control trials such as the one deployed in this study are widely viewed as the gold standard of intervention efficacy, but they do have important limitations. Firstly, all RCTs on resilience interventions in higher education conducted prior to this study used only self-report measures as pre-post outcome assessments (Dolbier at al., 2009; Houston et al., 2017). Such measures are open to demand characteristics. In other words, how participants rate themselves before and after the intervention may be influenced by the "good subject effect" – they may increase their scores because they know that to do so is the aim of the intervention (Nichols & Maner, 2008).

In this study, we extended research that evaluates student resilience interventions beyond self-report measures. We GSR as a means of assessing stress using a physiological parameter. The nonsignificant finding may result from the fact that we only conducted a single one-minute-long measurement of GSR during the pre- and post-intervention assessments. GSR responds to a variety of situational or physiological cues, and it may be that more extended measures would provide a better indication of stress levels. Therefore, to assess GSR in the future, we recommend using wearable biometric technology that measures it over the course of a day or two, such as the Empatica E4 wristband. We also recommend that future studies could analyse change at the subscale level on the CD-RISC resilience measure.

Another issue with RCT designs is that if a statistically significant difference is found between experimental and control groups, one cannot infer that the change experienced by the experimental group was perceived as *personally* valuable and helpful (Bothe & Richardson, 2011). That is why we also asked whether participation in the workshop was viewed as personally significant to participants. We found that 94% appraised participation in the workshop

as a positive learning experience and 80% reflected on it being a developmentally formative experience. An RCT alone cannot tell us this, and we explore the personal experiences of the intervention in greater depth in the next study, using qualitative data.

Study 2

Aims

The aim of the second study in this programme of research on the REP-S was to conduct the intervention with larger numbers of students and to gain evaluative qualitative data to explore both the experience of the intervention and suggestions for improvement. Our research questions were: (1) How was the workshop and follow-up practice period experienced? (2) Which elements were most helpful and most utilised? (3) Was meaningful change experienced over the period of study? and (4) In what ways can the intervention be improved in the future? An additional aim was to assess the extent of personally perceived significance of the intervention, as done in the previous study.

Method

Design

The design of the study comprised two qualitative phases; a post-intervention reflective written phase followed by a focus group phase. Four trainers delivered the intervention; the two trainers from Study 1, plus two more who were trained by the first author to deliver the intervention over the course of a day-long training programme. The first author also moderated the focus groups.

Participants

The sample comprised 145 students (125 female, 25 male) who completed the intervention and evaluative assessment. The mean age was 23.8, with a range of 18 to 49. In terms of degree subjects, there were 105 students studying first degree subjects (21 in Psychology, 13 studying Nursing, 6 studying Midwifery, 85 studying Primary Education), plus 20 studying on a Postgraduate Certificate in Education (PGCE). None of the participants from Study 1 participated in Study 2.

Of the 145 students, 20 (17 female, 3 male) participated in three focus groups. The mean age of this group was 22.2, with a range of 18 to 38. The representation of students from various degree programmes was as follows: Psychology (8), Nursing (4), Midwifery (2), Primary Education (4) and PGCE (2).

Both samples were recruited as convenience samples from a range of degree subjects accessible within the ethical and logistical agreements with the university. While it is recognised that a purposive sample would have been preferable for the focus group, we only received 20 respondents willing to participate, and so were not in a position to purposively select a stratified sample.

Measures and qualitative data collection

Personal significance appraisal: See Study 1 for description of items and response scale.

Qualitative vignettes: Participants were instructed to write a paragraph describing their experience of participating in the workshop and another paragraph describing their experience of practising the skills they learnt since the workshop. Responses to these two questions were combined for each person for coding purposes.

Focus groups: Focus groups were conducted in private rooms and were transcribed for analysis purposes. Participants received £10 for participation. A semi-structured approach was taken to the moderation, and the following topics were covered: (1) feedback on Section 1 of the resilience workshop (cognitive resilience), Section 2 of the workshop (social resilience), and Section 3 of the workshop (mind-body resilience); (2) feedback on the follow-up provided after the workshop and whether the workshop provided them with tools for positive change; and (3) creative ideas for improving the workshop.

Analysis of vignettes

Vignettes were analysed with a variant of thematic analysis developed for brief qualitative vignette data (Robinson et al., 2015). The data were initially coded into a set of 6 top-level

themes, which were derived deductively from the aims of the study and the structure of the intervention, and refined following initial analysis by two researchers. They were:

1. *Positive appraisals of workshop aspects*
2. *Negative appraisals of workshop aspects*
3. *Suggestions for workshop improvement*
4. *Reflection on positive personal outcome*
5. *Reflection on negative or neutral outcome*
6. *Specific technique positively used*

Twenty vignettes were independently coded into these themes by two researchers experienced in thematic analysis; the first author and the sixth author. Corroboration of the coding showed a 76% agreement rate. Following a meeting to discuss any interpretive discrepancies, the two researchers again independently coded 20 new vignettes and achieved an 85% agreement rate. Next, they coded using a spreadsheet-based system of allocating codes to vignettes by entering a 1 into the spreadsheet in the code's allocated column, as per the version of thematic analysis for vignettes (Robinson et al. 2015). The first five themes were broken into subthemes by inserting brief descriptions of their content into an adjacent column and devising a set of subthemes to summarise their content.

Analysis of focus groups

Data from the focus groups were also analysed using thematic analysis (Braun & Clarke, 2006). The themes and subthemes developed from the written vignette phase were used, unless there was no fit with the existing coding system. In this case, new themes and subthemes were devised.

Results

With regards to quantitative personal significance ratings, 87.5% of participants reported that the intervention had been a positive learning experience for them, and 84.9% reported that they were of the view that it would positively benefit their development during their time at university. The following themes, subthemes and supporting quotes include data from both the vignettes and the focus groups (see Figure 1). Vignettes, being written by participants, are presented in their original spelling. The focus group was transcribed by a researcher, and quotes are extracts from those transcripts.

Positive appraisals of workshop aspects

Positive reflections about the intervention workshop were provided by 70% of the sample (n=103). They are presented below from the most frequently mentioned to the least often mentioned.

Learning practical and transferable techniques: The most frequently praised feature of the intervention (n=24) was that it was so focused on learning practical techniques in hands-on ways rather than being discursive and theory-based. This was in contrast to other learning activities they had participated in at the university. The following quotes exemplify this:

> "I think the workshop was really good because it was very practical. I enjoyed the role play and discussions."

> "Very helpful, I found the workshop not just informative but also beneficial in helping me to remember simple techniques in helping build resilience."

Engaging, interesting and informative: The second most common positive appraisal (n=23) was that the workshop was full of useful and interesting information, and sustained attention and interest for the duration. For example:

> "I found the whole session informative and well presented…It kept me interested."

Enjoyable, positive and fun: As well as the workshop being interesting, a common appraisal was of a positive emotional experience during the workshop (n=18), including mentions of enjoyment, positive feelings and a sense of fun:

> "I thoroughly enjoyed taking part in the workshop and found it a valuable experience, and would definitely recommend it to other courses…it was fun as well as informative"

Interactive and interpersonal: 11 participants reflected on the benefits of using interactive technology during workshops, and the interpersonal interactivity. For example:

> "It was great to interact with people. This was the most positive aspects of the workshop for me - getting to know a little bit about everyone who took part at the beginning of the session; the role playing; working in small groups to come up with answers and having

each group member talk about their opinions and ideas; the form in which the workshop was presented."

Relevant and valuable for studying: 11 participants made a reference to the direct relevance of the workshop for studying in higher education.

"The skills I have learned have been very useful and I have found myself using the skills at least on a weekly basis…"

"I really enjoyed taking part in this workshop and feel the skills we were being taught would be helpful in the future especially within my degree and my choice of career path."

Negative appraisals of workshop aspects and suggestions for improvement

Themes 2 and 3 are presented together here, as they are both aspects of constructive feedback. 15 participants (10.4%) highlighted issues with the workshop and practice period that they felt were suboptimal, while 21 (14.5%) provided ideas for improving the intervention in the future. Given the small frequencies for this theme, we report here the subthemes that are mentioned more than once. The only criticism of the workshop made was that it was *perceived to be too long* (*n*=8). With regards to suggestions for improvement, there were five ideas mentioned multiple times: *earlier delivery in academic year (n=6), more focus on practising techniques (n=5), provide a reading list (n=3), more follow-up support (n=3), and split into multiple sessions (n=2).*

Reflection on a positive personal outcome

The comments that were coded into this subtheme were those that related to participants' reported experiences of having changed in a positive way over the month of the intervention period. 66% of participants (n=95) provided an explicit reflection on positive personal change, which included mostly appraisals of change experienced through the period in question, while a minority appraised that one or more traits had changed. The subthemes within this theme are as follows:

4a. Used techniques to effectively deal with general stress

The most frequently reported change (n=26) was of having used the techniques to manage stress, without qualifying that in terms of a specific context or stressor. There was no suggestion of

permanent change here; instead the emphasis was on having experienced tangible change during the month of the practice period. For example:

> "I have included quite a few of the exercises into my daily routine so far. I have also used the new understanding of the physical reaction to stress to help me calm down children that I work with."

4b. Coping with exams, assessment and feedback

14 participants referred to how the techniques they had learnt had been useful in the contexts of assessment, for example dealing with the pressure of exams or responding to feedback in a calm and productive manner. For example:

> "I enjoyed participating in the workshop and found it quite useful, especially when dealing with the stress and panic that occurs when I need to complete an assignment and when I receive my grade/feedback…So when receiving my results from a couple of assignments I found myself to be disappointed but I thought back to the workshop, then I began to think about how I can improve and that I've learnt from this how to be more positive about feedback."

4c. Becoming a changed person

This subtheme subsumes all comments (n=10) about appraised trait change at the whole-person level. To qualify for this sub-theme, comments needed to include a trait adjective, or an explicit sense of having stably achieved a new level of positivity or optimism. For example:

> "I feel that the techniques used in this workshop have helped me to become a more resilient person by allowing me to manage stress effectively."

> "I have developed a more positive mind set *(sic)* since and tackle things head on."

4d. Helped with interpersonal challenges

8 students reflected on how since the workshop they had been finding teamwork and potential stressful interpersonal interactions to be easier.

> "I have learnt ways to communicate with others better in a calm manner and have realised when I am dwelling on social situations."

4e. Sleeping better

5 participants discussed how the mind-body relaxation exercises within the workshop had improved their sleep:

> "I have also found the muscle tension and breathing exercise to help me after a stressful day before going to bed, to aid in having better night of sleep."

4f. Helped cope with placement

The nursing and teaching students in the sample all have placements that can be demanding and stressful. 9 students made comments about how they had been using the techniques learnt when on placement, such as this:

> "I have learnt ways to communicate with others better in a calm manner and have realised when I am dwelling on social situations. This has also helped me during my school placement as I am now aware of the body language."

5. Reflections on negative or neutral personal outcomes

8 participants conveyed a view that positive change had not been forthcoming following the workshop. These 8 comments were subsumed under three subthemes: *Forgetting to use the techniques, a lack of opportunity to practise* and *not all techniques found to be helpful*.

5a. Forgetting to use the techniques

This subtheme, mentioned 3 times, includes mentions of forgetting to bring the techniques into real-life situations. This closely relates to the suggestion from participants for more follow-up reminders and support. An example is:

> "I cannot lie it is hard to put the skills learnt into practice. As often personal lives get in the way and we forget to do practices daily."

5b. A lack of opportunity to practise

3 students were negative about not having the opportunity or motivation to practice, which in turn was linked to a lack of follow-up:

> "I would love to have a weekly workshop which I know is not practical. I just wish I was more able to put what I learnt into practice."

5c. Not all techniques found to be helpful

2 participants reflected on how only some of the techniques that were presented were found to be personally useful. For example:

> "A lot of the skills mentioned on the day don't seem to work for me personally but I know of people who have been helped by them. I have however found that the breathing exercises can be quite useful for when you're stressed."

Discussion

We found that the workshop was experienced as enjoyable, interesting, "eye-opening" and highly relevant in terms of skills transferable to studying. Its interactive and interpersonal focus, using group-work and paired activities, was viewed as a particularly positive feature. A small minority of participants pointed to negative experiences, mainly focused on the workshop being perceived as too long. The elements that were most utilised were the breathing and mindfulness techniques. This fits with previous research showing the benefits of mind-body interventions for students (Deckro et al., 2010). All elements were mentioned by some participants as helpful and important inclusions within the workshop structure, reflecting the importance of using a multi-component intervention from which different students can select techniques that correspond to their needs and perceived weaknesses. Moreover, not only did the overwhelming majority of participants reflect on personally significant change, they highlighted specifically that they had experienced benefits in dealing with university assessments, in interpersonally challenging situations, coping with the stressors of placements (nursing/teaching students), and with sleeping better. A small number of students implied changed traits in their reflective appraisals of change, but most

reflected that they felt they had experienced change over the period of study, without making inferences about the future or about stable qualities. This reflects the finding from Study 1 in which we found changes in perceived stress over the month-long intervention period, but no change in trait levels of resilience. Some participants proposed that the workshop could be even more practical in terms of a greater focus on practising skills, be split into multiple sessions, be delivered early in academic year to maximise benefits, and have more follow-up support and reminders during the month-long practice period.

General Discussion

The level of stress reported in students in higher education has repeatedly been reported to be problematically high (Thorley, 2017). A corresponding crisis in campus counselling service is being reported, as demand increases to cope with the increased levels of student distress (Xiao et al., 2017). In this paper we have reported a mixed-methods evaluation of the merits of a brief resilience programme for students, the aim of which is to proactively teach skills that will enhance wellbeing and take the pressure off downstream counselling and wellbeing services. In both studies, we gathered descriptive frequency data on the perceived personal significance of the intervention, and in both 83-94% of participants reported that the intervention had been a positive learning experience, while 80-90% reported that they considered the workshop would positively influence their development while at university. Study 2 provided information on why and how participants arrived at these appraisals, showing a range of positive changes experienced during the period of study, including sleeping better, coping with exams better, handling interpersonal stress effectively, and dealing with the challenges of communication when on placements. From these qualitative accounts, we infer that students are finding the intervention beneficial due to learning one or more new coping strategies and techniques for retaining physiological, psychological and social balance in times of external pressure and imbalance. This is congruent with the resilience framework set out in the introduction (Richardson, 2002). Such appraisals of personal value and personal significance are by no means an alternative to pre-post change

metrics, but they are important as additional sources of data for at least two reasons. Firstly, personal significance is now recognised to be an important complement to statistical significance (Bothe & Richardson, 2011). Secondly, interventions such as the REP-S aim to sow seeds of knowledge and awareness for future developments, as much as leading to measurable outcomes during the period of study. The extent to which such seeds have been sown can be tentatively inferred from students' reports of whether they foresee future utility in having been through an intervention.

With regards to the changes observed in both studies, there were reports of changes in perceived stress over the course of study, but less by way of actual trait change. This reflects two ways that change can validly be achieved for an intervention: through behaviour shifts that may not be permanent and are unlikely to be perceived as personality change, and through changes in traits, which could be new stable qualities of the person that are likely to endure. Both kinds of change are important and valid, and our study shows that it is easier to bring about change in time-limited appraisals such as perceived recent stress, than it is to bring about changes as reported by trait measures that imply relative permanence in the way that items are worded.

In relation to the suggestions that participants made in Study 2, we consider all of these to be viable ideas for future delivery of the workshop. Due to the volume of students doing the intervention, it was necessary to stagger the workshops over the course of the academic year, so some students did it later than others. We agree that having it earlier in the academic year helps the student utilise the skills through the year, and that this is preferable where logistically possible; and also running it in the first year of a degree where possible, so that students can learn resilience skills early. Splitting the workshop into multiple sessions has potential issues for attendance and attrition, but also may prevent information overload. It is our intention to try this delivery option in the future and to compare it with the integrated one-session delivery we have used in this study. There is no limit on the group size for the intervention, hence it can in principle be delivered to large numbers of students simultaneously. We also intend to explore the

use of post-intervention ‘booster sessions’ to remind students of the techniques they have learnt and to help consolidate their learning into habit. This could potentially be facilitated by an app to accompany the programme, the development of which is a medium-term priority for the REP-S. In addition to these changes, our intentions and plans for the REP-S are to provide an administrative foundation for potential rollout of the intervention across multiple degree types and institutions. To this end, we will develop a professionally produced intervention manual, a website and training programme, and aim then to train individuals in different institutions to champion and deliver the programme at their university. We are hopeful that the wide adoption of group-based resilience interventions across HE could help to take the pressure off counselling services and supplement them.

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Table 1 – The components of the REP-S

Section	Activity
1. Psychophysiological (mind-body) Resilience	**3a. Breathing Techniques** • Introduction to the physiology of breathing, the effect of breathing on stress and vice versa • Introduction to the process of diaphragm breathing, including a video and practicing the technique, facilitated by pursed-lips breathing or breathing through a straw • Exercise: 'Square breathing' – instruction is to breathe in for four seconds, hold the breath for four seconds and breathe out for four seconds. Repeat for 2 minutes. **3b. Mindfulness Meditation** • The background and theory of mindfulness is introduced, along with the empirically established benefits of mindfulness meditation • Participants download meditation app (Calm), and talked through how to use the app during the 4-week practice period • Exercise: A 5-minute 'body scan' mindfulness meditation, in which participants place attention on various parts of their body and focus attention on relaxing those body parts
2. Cognitive Resilience	**1a. Positive reframing, including reframing beliefs about failure** • Introduce the ABC technique (Activating Event, Belief, Consequences) to facilitate the questioning of beliefs and cognitions. • The concept of fear of failure is defined and its empirical effects presented. • Exercises: Failure associations – students share the words they associate with failure and share in small groups. • Discussion of how failure can lead to positive change, including evidence presented on how failure can lead to learning. • Repeat failure associations exercise, focusing on positive words that relate to good outcomes that perceived failure can bring. Share in small group. **1b. Goal Setting and planning** • Goal setting theory introduced, including SMART goals (specific, measurable, achievable, realistic, time-bound) and the distinction between performance and mastery goals. • Exercise: Create a list of performance and mastery goals for (a) next assessment, and (b) for their time at university. Share these in small groups. Explore how to respond differently to feedback in relation to their performance and mastery goals. • Planning: Techniques for positive planning introduced, including using written time-linked checklists and linking plans clearly to goals.
3. Social Resilience	**2a. Effective Help-Seeking** • A brief discussion on the various forms of help-seeking behaviour and the paradox of help-seeking (people who need it tend not to reach out for it). • Exercise: Compose a list of people who might be possible sources of help during their time as a student and another list describing the potential barriers to seeking help, and discuss in groups. • Discussion of how social media relates to help-seeking; how it can be a source of social support, but also undermine social support. **2b. Assertiveness** • Theory of assertiveness presented, with examples • Exploration of 5 assertiveness techniques: a) assertive body language, b) empathise, c) "I" statements, d) solution focus and, e) good ways of saying "No".

	• Two scenarios to role-play, with each member of the group responding either assertively, aggressively or passive aggressively and are asked to incorporate some of the assertiveness techniques.
Practice manual	• At the end of the workshop, participants are given a **practice manual** outlining activities recommended during the subsequent 4-week practice period. The manual lists how best to practice all of the above six activities.

Table 2: Means, range (lowest and highest scores), and standard deviations for dependent variables for experimental and control conditions, before and after the intervention

Variable	**Group**	**Pre-test**	**SD**	**Post-test**	
		Mean (range)		**Mean (range)**	**SD**
Resilience	Experimental	83.80 (48-117)	15.78	88.43 (53-115)	15.03
	Control	94.21 (65-111)	11.26	95.48 (67-112)	11.87
Perceived Stress	Experimental	22.91 (5-34)	6.86	18.91 (3-33)	7.10
	Control	19.28 (6-32)	6.11	19.52 (7-35)	6.8
Self-Esteem	Experimental	26.19 (15-40)	5.81	28.38 (16-40)	5.95
	Control	29.83 (18-40)	4.69	29.34 (17-37)	4.46
Neuroticism	Experimental	29.56 (13-39)	5.70	25.86 (8-37)	7.04
	Control	25.24 (12-37)	6.51	24.21 (11-38)	5.95
Galvanic Skin Response	Experimental	4.14 (0.07-17.5)	3.76	3.86 (1.75-11.58)	2.28
	Control	3.86 (1.44-7.40)	2.28	3.19 (1.13-7.53)	0.31

Figure 1 – Diagrammatic Summary of Themes