

# Benefits of a psychoeducational happiness course on university student mental well-being both before and during a COVID-19 lockdown

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## Abstract

We tested whether a psychoeducational course improved well-being in three cohorts. Study 1 found significantly higher mental well-being in first year undergraduates who took the course compared to a waiting-list control. Study 2 revealed that students taking the course when COVID-19 restrictions began did not experience increases in mental well-being but had significantly higher well-being than a third matched group. In Study 3, an online course increased mental well-being in University students and staff during a COVID-19 lockdown. These findings support the claim that psychoeducational courses are beneficial in both live and online formats and in times of collective uncertainty.

## Keywords

mental health, mental well-being, positive psychology, students, universities

## Introduction

Young people entering higher education across the world are facing what many have called a mental health crisis. In just the last decade, students in the UK have reported a five-fold increase in mental health problems (Thorley, 2017). According to a recent survey of 12,730 students from 14 UK universities, 45% responded that they were currently experiencing mental health problems, with most experiencing symptoms of anxiety and depression (Union Futures Project, 2018). Rates of both suicide and non-suicidal self-harm have been rising in young people in the UK since 2009/2010 (Gunnell et al., 2020; McManus and Gunnell, 2020), and, increasingly, national interest in student mental health is prompting calls for UK Universities to be made safer for students (Clarke et al., 2018). The mental health statistics in US colleges are equally dire. One nationally representative 2017 survey found that among current US college students over 50% report feeling hopeless, over 30% felt too depressed to function, over 60% experiencing overwhelming anxiety and over 10% seriously considered suicide (American College Health Association, 2017). Globally, the World Health Organization (WHO) World Mental Health International College Student Project (Auerbach, 2018) reported that 35%

of first year students from 19 colleges across eight countries screened positive on self-report measures for at least one common DSM-IV anxiety, mood or substance disorder.

What can be done to tackle the growing mental health problems among university students? Counselling and psychotherapy are effective in treating anxiety and depression (Dobson, 1989) but only a small percentage of students (5%) receive treatment either in college counselling programmes or off-site (Macaskill, 2013). Indeed, a study of US college students suggested that up to 84% of college students who need mental health services do not receive them (Eisenberg et al., 2007). One reason that students do not seek professional treatment concerns the persistent stigma associated with mental health issues (Union Futures Project, 2018). Many students choose not to discuss mental

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health problems with university staff because they don't want such problems to appear on their records, or as students put it 'I wouldn't want it on my CV' (Chew-Graham et al., 2003).

Given these challenges, universities must develop novel solutions for promoting mental health on university campuses. One potential solution involves tackling university student mental health problems as an educational intervention issue. Recently, both public and university attention has been drawn to the possibility of improving student mental health by offering courses in the psychology of well-being – a form of psychoeducation. Psychoeducation refers to the approach of teaching students about the underlying causes of mental health problems and evidence-based interventions they can use to treat such issues. Although psychoeducation can be used in a variety of contexts, one novel avenue for using this approach at the university level involves blending psychoeducational training into credit-bearing university courses. In the past few decades, a growing number of colleges and universities around the world have begun teaching psychoeducation as part of classes that focus on the topic of positive psychology – a field of study that examines evidence-based approaches to increasing happiness and flourishing (See Goodmon et al., 2016, Lefevor et al., 2018, Smith et al., 2021, Young et al., 2020). In addition to providing educational benefits, these courses are often intended to raise levels of mental well-being – described by the WHO as *a state in which the individual realises his or her own abilities, can cope with the normal stressors of life, can work productively and fruitfully and is able to make a contribution to his or her community* (World Health Organization, 2004). Among researchers in this field, higher mental well-being is argued to be a protective factor which could reduce the incidence or severity of mental health concerns, particularly anxiety and depression (Duckworth et al., 2005). Thus, in this paper we will refer to mental well-being as the target outcome from this point forwards.

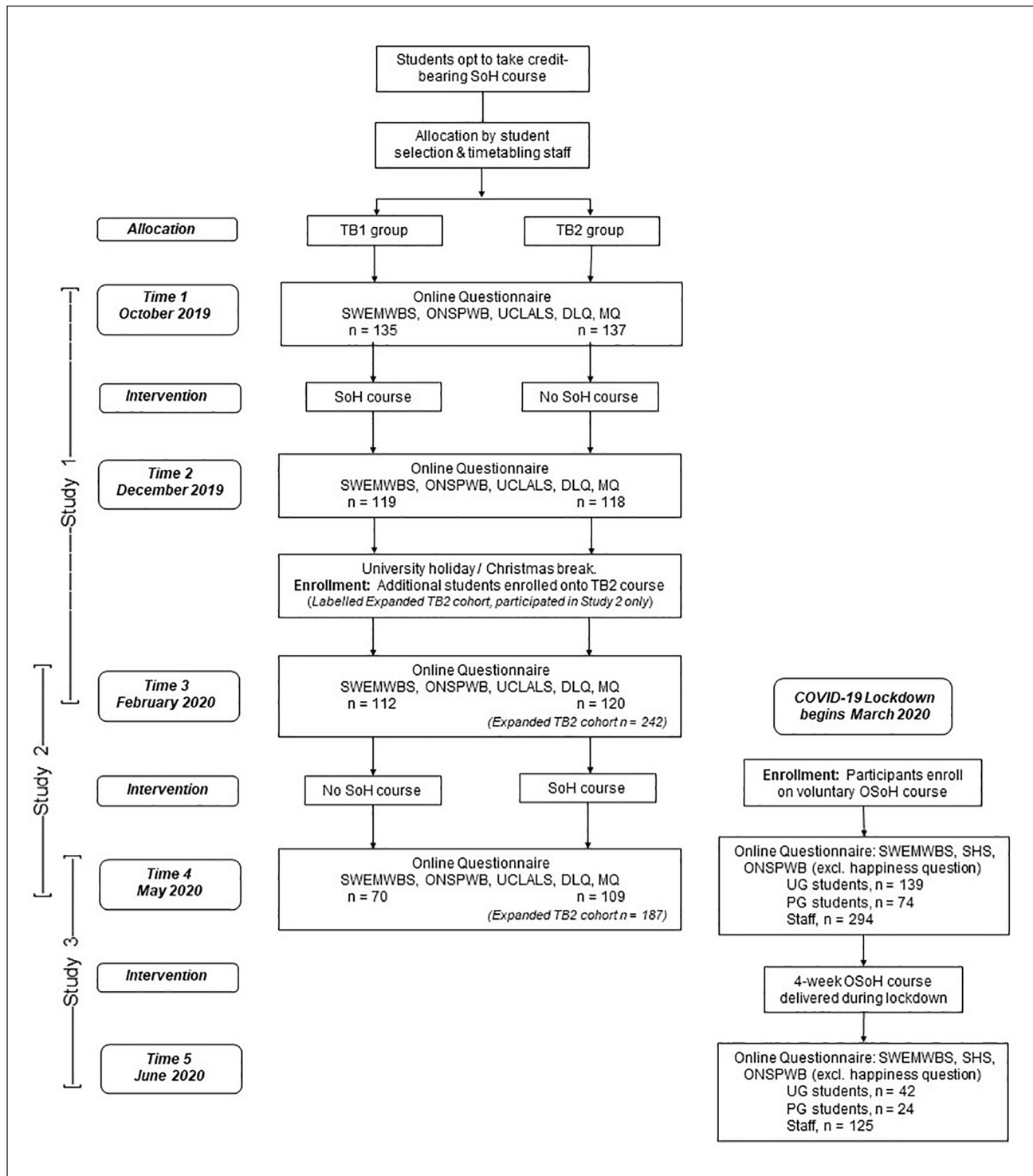
As part of these positive psychology courses, students typically learn about the results of positive psychology interventions (PPIs), short practices that have been shown to increase one's mental well-being (Bolier et al., 2013). Positive psychology researchers have found that PPIs are able to statistically improve mental well-being in a variety of settings and populations; such studies consistently report mild to moderate well-being benefits across a range of different kinds of interventions, as diverse as writing gratitude letters, practicing optimistic thinking, limiting social media use and increased social connection (Fordyce, 1977; Lyubomirsky et al., 2011).

However, the question remains, are psychoeducation academic psychology courses – especially with the inclusion of PPI practices – a useful method for improving mental well-being among university students? One meta-analysis on the effect of such courses reported mild to moderate

positive effects of psychoeducation on reducing stress (van Daele et al., 2012). Unfortunately, one challenge to assessing the benefits of credit-bearing educational courses in a real world setting is that of identifying an appropriate control group, and the majority of studies included in this meta-analysis did not include a randomized control trial (RCT) design, and did not report long-term follow-up data. In addition, most studies of psychoeducation interventions to date involved small, self-selecting samples that were biased towards female students from Western countries who were studying degrees with a strong health/psychology component, an issue that raises questions about the generalizability of the findings (Regehr et al., 2013; Yusufov et al., 2019). For example, one recent Australian study found that psychology students who were initially low in mental well-being and high in valuing happiness benefitted, in particular, from psychoeducational courses, but the question remains whether a similar course would increase mental well-being in university populations more generally (Young et al., 2020).

The goal of the present study was to explore the effectiveness of a specific kind of psychoeducation course – an academic credit-bearing class on the science of happiness – using a design that eliminated some of these problems with generalizability. In Study 1, we evaluate whether a psychoeducational happiness course designed for a general undergraduate student population statistically improved students' well-being from Time 1 (start of the course: October 2019) to Time 2 (end of the course: December 2019, see Figure 1 for a timeline of measurements). The course was an open-unit available to students from a range of academic disciplines, and the content covered multiple perspectives on positive psychology, taking inspiration from the 'Psychology and the Good Life' course delivered at Yale by one of us (LS). Our hypothesis was that students enrolled to take this course in the first teaching block of the academic year (TB1) would have higher levels of mental well-being at the end of term than a waiting list control enrolled to take the course in the teaching block two (TB2) during the second academic term.

In Study 2, we explored whether this psychoeducational course continued to improve student well-being during an even more stressful period: the start of the COVID-19 lockdown in the UK (see Figure 1 for timeline). Specifically, we compared mental well-being change from February 2020 (Time 3) to May 2020 (Time 4) for two groups of students: (1) the original group who completed the course in TB1 (October through December 2019) and (2) the comparison group from Study 1 who then took the SoH course during TB2 (February through May of 2020). Post-treatment scores for both of these groups were also compared to a third group, a cohort of matched undergraduate students who had not yet taken the course but had registered to take a shorter online version of the course starting in May of 2020 which was during the third teaching block (TB3).



**Figure 1.** Participant flow and measurements for studies 1-3.

Study 1 participants were students enrolled on the science of happiness course at the start of the 2019/20 academic year (Time 1). Study 2 participants were the participants from Study 1, plus additional TB2 students who enrolled on the course before Time 3, and a comparison group of undergraduate students enrolled in the OSoH course. Study 3 participants were staff and students enrolled on the OSoH course. SoH = Science of Happiness; OSoH = Online Science of Happiness; TB1 = Teaching block 1; TB2 = Teaching block 2; SWEMWBS = Short Warwick-Edinburgh Mental Well-Being Scale; ONSPWB = Office for National Statistics Personal Well-Being questions; UCLALS = University of California at Los Angeles Loneliness Scale; DLQ = Direct loneliness question; MQ = Motivation question; SHS = Subjective Happiness Scale; UG = undergraduate; PG = postgraduate.

Finally, in Study 3, we report the results of a study examining the impact of a shorter 4 week online version of the course which took place from mid-May to mid-June 2020 during the period of COVID-19 lockdown. This course was delivered in response to the COVID-19 crisis and was made available for both University staff and students, thus we analysed pre- and post-well-being scores for both of these participant groups. We did not have the opportunity to recruit a control group for Study 3, therefore these results should be taken as preliminary findings.

## Study 1: Teaching block 1

### Introduction

In Study 1 we looked at the impact of the psychoeducational course the ‘Science of Happiness’ (SoH) on student mental well-being. While this study was not a full RCT – as group allocation was determined in part by students’ preferences and timetabling restrictions – our design utilized the natural experimental conditions that emerged from running the course twice across the academic year, to assess the effects of the psychoeducational course on a broad sample of the student body. Study 1 was pre-registered on the Open Science Framework (<https://osf.io/ksh5r>).

### Method

**Participants.** Participants were students enrolled on the SoH course at the University of Bristol in the academic year 2019/20. Study 1 tested 272 participants in total. The intervention group who took the course in teaching block 1 (TB1) included 135 participants (Age: mean=19.27 years, range 18–27 years; Gender: 72% female, 27% male, 1% non-binary or undisclosed; Nationality: 79% British; Ethnicity: 67% White, 11% Asian, 2% Black, 4% Multiple ethnic groups, 16% undisclosed) and the comparison group (who would later take the course in teaching block 2, TB2) included 137 participants (Age: mean=19.56 years, range 18–47 years; Gender: 72% female, 27% male, 1% non-binary or undisclosed; Nationality: 89% British; Ethnicity: 74% White, 7% Asian, 2% Black, 4% Multiple ethnic groups; 12% undisclosed). Students came from a wide range of disciplines offered across the university in first year. Participants in both groups were undergraduate students that registered for the SoH open unit. Study 1 was preregistered on the Open Science Framework (<https://osf.io/ksh5r>). This research was approved by the University of Bristol Research Ethics Committee, approval code: (27061987862). Participants provided informed written consent as part of the online assessment.

Participants were assigned to TB1 or TB2 by timetabling staff. This allocation was not random as the assignment was based on student’s preferences to take the course in TB1 or TB2 and whether timetabling enabled them to take the course. The participant flow for this and later studies is shown in Figure 1.

Of the initial 272 participants who completed the Time 1 (October 2019) baseline measures, 119 TB1 and 118 TB2 participants completed the Time 2 (December 2019) measures, representing 88% and 86% of the sample respectively. In the intervention group, seven students had withdrawn from the University by this timepoint and therefore did not provide follow-up data. A further nine students were lost to follow-up for unknown reasons. In the TB2 group, 4 students had withdrawn from the University, 5 students had opted to take a different open unit and 10 did not provide data for unknown reasons.

At the six week follow up in February 2020, 112 TB1 (83%) and TB2 (88%) participants completed the Time 3 survey. Of those that did not provide data, 8 students from the TB1 group had withdrawn from the University, 2 had left due to Study Abroad programmes and 12 students did not provide data for unknown reasons. In the TB2 group, 7 students had withdrawn from the University, 7 had opted to take a different course and 10 students did not provide data for unknown reasons.

**Procedure.** The SoH course included twelve 1 hour weekly lectures. The series of lectures began by defining happiness and mental well-being, provided an overview of the current situation in regard to student mental well-being in higher education and then explored some of the common misconceptions about happiness as well as beliefs about what generates future happiness. The course then looked at various theoretical approaches to mental well-being including psychological, genetic and neuroscience research and perspectives. Thus, the course did not follow a single theory, but introduced students to work conducted by a range of researchers covering topics of gratitude, learned helplessness, PERMA, kindness, mis-wanting, sleep, exercise, social connection, meditation and signature strengths (see Compton and Hoffman, 2019, Seligman and Csikszentmihalyi, 2014), in addition to generic scientific skills used to appraise research in these areas, such as understanding effect sizes and the value of meta-analyses. Throughout, students were instructed to view the course as providing a set of scientifically-validated strategies for living a more satisfying life and were encouraged to put what they had learnt into practice in their own lives.

To facilitate this, in order to earn course credit, students had to participate in weekly ‘happiness hubs’ (maximum of 11 meetings total) which were led by a postgraduate student or senior psychology student mentor. During these ‘happiness hub’ meetings, students were encouraged to discuss the course content and to take part in a series of positive psychology interventions (PPIs). Each hub meeting had no more than eight students who met for an hour at various locations around the campus. The mentors running each hub meeting were provided with an outline of the PPIs in advance and were asked to encourage the students to attempt the various activities. These interventions involved (1) performing acts of kindness (2) forming social connections (3) savouring an



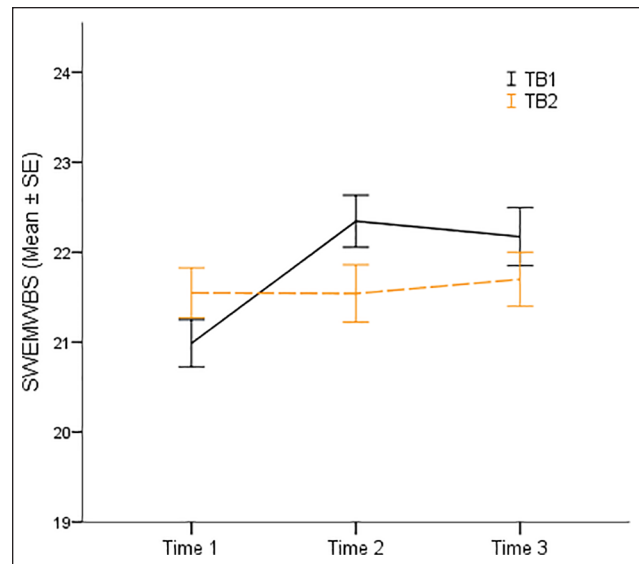
experience, (4) increased exercise, (5) trying to achieve several nights of at least 7 hours sleep, (6) meditation and (7) writing a gratitude letter. These meetings were also an opportunity to reflect on the content of the week's lecture and discuss mental well-being in general. Finally, students were also expected to write entries in an online journal each week, where the journal topic either related to the tasks that they were set or asked students to provide some reflection on their mental well-being over the past week. A minimum level of attendance at happiness hubs and completion of journal entries was required to pass the course.

**Measures.** We used the 7-item short form version of the Warwick Edinburgh Mental Well-Being Scale (SWEMWBS; Shah et al., 2018) as our primary measure of mental well-being. In addition, we collected two measures of loneliness as recommended by the Office for National Statistics (ONS): the University of California at Los Angeles (UCLA) 3-item loneliness scale (Hughes et al., 2004) and a direct question, asking how often the participant feels lonely, answered on a 5-point scale. Participants also completed the ONS Personal Well-being questions from the survey for the public [ONS; Everett, 2015). Finally, as a measure of students' motivations and priorities, participants were also asked about the extent to which they prioritized mental well-being using the question: 'Compared to your other studies, how important do you think engaging in mental well-being is? Answer on a scale from 1 'least important' to 7 'most important''. Each of these measures was administered at Time 1, Time 2 and Time 3.

**Analyses.** Changes in mental well-being were analysed using mixed ANOVAs with group (TB1 or TB2) as a between-subjects factor and time (Time 1 and Time 2) as a within-subjects factor. Significant interactions were explored with post-hoc simple effects analyses with a Bonferroni correction. Where a significant change in an outcome measure was detected, mixed ANOVAs determined whether this effect was maintained at the Time 3 six week follow up (Time 1 vs Time 3). Missing data was handled with available-case analysis (pairwise deletion). Analyses were conducted in SPSS v.24.

## Results

**SWEMWBS.** A repeated measures ANOVA revealed a significant interaction of time and group ( $F(1, 235)=20.74, p<0.001, \eta_p^2=0.08$ ) on participants' SWEMWBS scores, which was maintained at Time 3 ( $F(1, 230)=8.64, p<0.01, \eta_p^2=0.04$ ). Simple effects analysis revealed that the interaction was attributable to the significant increase in mental well-being in the TB1 group only, from Time 1 to Time 2 ( $p<0.001$ ) and Time 1 to Time 3 ( $p<0.001$ ). There was no significant change in the TB2 group SWEMWBS scores across this period (Figure 2, see Table 1 for



**Figure 2.** Changes in mental well-being for Study 1.

SWEMWBS: Short Warwick-Edinburgh Mental Well-being Scale. TB1: Students that took the Science of Happiness course in the first term. TB2: Students waiting to take the course in the second teaching term.

means for all measures).

**Loneliness.** In response to the direct question 'How often do you feel lonely?' there was a significant time  $\times$  group interaction on participants' loneliness scores both at Time 2 ( $F(1, 235)=6.73, p<0.01, \eta_p^2=0.03$ ) and Time 3 ( $F(1, 235)=4.47, p<0.05, \eta_p^2=0.02$ ). Simple effects analysis revealed that the TB1 group only reported feeling significantly less lonely at Time 2 ( $p<0.001$ ) and at Time 3 ( $p=0.008$ ), compared to Time 1. For the indirect measure of loneliness (UCLA 3-item loneliness scale) there was no significant time  $\times$  group interaction, but there was a significant main effect of time at both Time 2 ( $F(1, 235)=10.35, p<0.001, \eta_p^2=0.04$ ) and Time 3 ( $F(1, 230)=7.19, p<0.01, \eta_p^2=0.03$ ). Simple effects analysis revealed the main effect of time was primarily explained by the TB1 group becoming significantly less lonely at Time 2 ( $p=0.003$ ) and Time 3 ( $p=0.004$ ). Among the TB2 group, the reduction in loneliness from Time 1 to the follow-up points was not statistically significant (Time 2,  $p=0.12$ , Time 3,  $p=0.38$ ).

**ONS personal well-being.** Significant time  $\times$  group interactions were detected among two of the four ONS personal well-being measures: 'life satisfaction' ( $F(1, 235)=4.66, p<0.05, \eta_p^2=0.02$ ), and 'the extent to which participants believed the things they did in life were worthwhile' ( $F(1, 234)=4.69, p<0.05, \eta_p^2=0.02$ ). Neither effect was maintained at Time 3. Simple effects analysis of the interaction revealed no significant pairwise comparisons for the measure of life satisfaction. For the ONS 'worthwhile' measure, students in the TB2 group only reported lower scores at the

**Table 1.** Means and standard deviations for Study 1 outcome measures at Time 1, Time 2 and Time 3.

|                         | Time 1 mean (SD) |              | Time 2 mean (SD) |              | Time 3 mean (SD) |              |
|-------------------------|------------------|--------------|------------------|--------------|------------------|--------------|
|                         | TB1              | TB2          | TB1              | TB2          | TB1              | TB2          |
|                         | (n = 135)        | (n = 137)    | (n = 119)        | (n = 118)    | (n = 112)        | (n = 120)    |
| Mental well-being       |                  |              |                  |              |                  |              |
| SWEMWBS                 | 20.91 (2.70)     | 21.35 (2.96) | 22.41*** (3.15)  | 21.46 (3.40) | 22.16*** (3.27)  | 21.74 (3.26) |
| Loneliness measures     |                  |              |                  |              |                  |              |
| Direct question         | 3.37 (0.91)      | 3.16 (0.93)  | 3.05*** (1.05)   | 3.14 (1.02)  | 3.13** (1.03)    | 3.14 (1.02)  |
| UCLA 3-item scale       | 5.40 (1.71)      | 5.19 (1.61)  | 4.89** (1.59)    | 4.94 (1.35)  | 5.01** (1.38)    | 4.98 (1.49)  |
| ONS personal well-being |                  |              |                  |              |                  |              |
| Life satisfaction       | 6.79 (1.60)      | 6.80 (1.73)  | 7.08 (1.49)      | 6.75 (1.81)  | 6.93 (1.59)      | 6.92 (1.67)  |
| Worthwhile              | 6.90 (1.88)      | 6.99 (1.84)  | 7.08 (1.82)      | 6.79* (1.68) | 7.03 (1.65)      | 6.88 (1.65)  |
| Happy yesterday         | 6.33 (2.02)      | 6.36 (1.96)  | 6.82 (2.05)      | 6.40 (1.88)  | 6.52 (2.21)      | 6.53 (1.86)  |
| Anxious yesterday       | 4.89 (2.62)      | 5.35 (2.29)  | 4.57 (2.32)      | 5.28 (2.18)  | 4.54 (4.54)      | 5.18 (2.33)  |

SWEMWBS: Short Warwick Edinburgh Mental Well-Being Scale; UCLA: University of California at Los Angeles; ONS: Office for National Statistics. Asterisks denote scores significantly different from Time 1. Post-hoc simple effects with a Bonferroni correction, \* $p < 0.05$ . \*\* $p < 0.01$ . \*\*\* $p < 0.001$ .

end compared to the start of term ( $p = 0.032$ ), there was no significant difference in scores in the TB1 group across this time period ( $p = 0.37$ ). No observed changes were found using the ONS measure of happiness either between groups or over time. No interaction effect was observed for the ONS measure of anxiety, though a significant main effect of group was detected ( $F(1,235) = 6.47$ ,  $p < 0.05$ ,  $\eta_p^2 = 0.03$ ), simple effects analysis revealed this was explained by the TB1 group displaying significantly lower levels of anxiety than the TB2 group at Time 2 ( $p = 0.016$ ), in addition to a trend towards the TB1 group displaying lower anxiety than the TB2 group at Time 1 ( $p = 0.067$ ). No significant effects on anxiety were detected at Time 3.

**Predictors of change.** In the TB1 group, students' ratings of how important they viewed mental well-being compared to their other studies was not significantly correlated with any of the outcome measures or with the degree of change in outcome measures from Time 1 to Time 2 or Time 3. Thus, this measure was not considered in any further analyses.

## Discussion

The results of Study 1 demonstrate that in comparison to a waiting list control (the TB2 group), students who took the course in the first term of the academic year (TB1) benefited on a number of outcome measures including the SWEMWBS and the direct measure of loneliness. On average, students reported an 1.5 point increase on the SWEMWBS, which is above the minimum threshold for a meaningful change on this scale (Shah et al., 2018). These benefits were sustained at Time 3, six weeks after the TB1 course had ended, before the TB2 group were due to take the course.

There was some evidence that the course preferentially benefited the TB1 group on two of the four ONS measures of personal well-being, including satisfaction with life

and considering things in life worthwhile, though these effects were not sustained by Time 3. In contrast to these measures, the ONS happiness question did not show any group or time effects. One possible reason for this lack of effect is that this question focuses specifically on reporting emotions from the previous day ('Overall, how happy did you feel *yesterday*') whereas others in which we did observe significant effects reported on life in general ('Overall, how satisfied are you with your life *nowadays*?'). Such general life evaluative questions may be less susceptible to transient affect states and thus may be more robust measures of well-being. Interestingly, personal attitudes regarding the relative importance of mental well-being did not predict scores on any measures. This is inconsistent with a recent study that found that valuing happiness predicted psychology students' gains in mental well-being (Young et al., 2020). One reason may be that our sample included non-psychology students who may have been less invested or biased towards the efficacy of positive psychology interventions. Overall, these results supported our hypothesis that a psychoeducational happiness course would increase mental well-being among students, compared to a waiting list control. These data were collected during a typical academic year from students taking varied undergraduate degree subjects. When the unprecedented COVID-19 pandemic and associated lockdown restrictions began in early 2020 we then looked to examine whether the course had a beneficial effect in a time of collective stress and anxiety.

## Study 2: Teaching block 2

### Introduction

In Study 2 we analysed data collected at Time 3 and Time 4 for students who had begun the SoH course in the second

**Table 2.** Study 2 participant information and demographics.

|             | <i>n</i> | Survey period                  |                                 | Demographics                     |          |           |         |
|-------------|----------|--------------------------------|---------------------------------|----------------------------------|----------|-----------|---------|
|             |          | Time 3: February 2020          | Time 4: May 2020                | Age (years)                      | % Female | % British | % White |
| TB1 cohort  | 70       | Post-course (6 week follow-up) | Post-course (5 month follow-up) | M: 19.04, range 18–24            | 73       | 81        | 81      |
| TB2 cohort  | 187      | Pre-course                     | Post-course (immediate)         | M: 19.48, range 18–47            | 73       | 87        | 82      |
| OSoH cohort | 139      | n/a                            | Pre-course                      | 80% 18–21<br>17% 22–25<br>3% >25 | 79       | 78        | 78      |

TB1: teaching block 1; TB2 teaching block 2; OSoH online science of happiness.

teaching block (TB2: February through May of 2020) and compared them to our TB1 group from Study 1. We also compared the Time 4 scores of the TB1 and TB2 groups with a third control group of students who had not taken the course but had registered for a shorter online version of the course during the third teaching block that occurred during lockdown (OSoH, see Figure 1 for details of this timeline and the different groups)

Although we had originally planned to explore how both groups' well-being changed during this next time period, we – of course – did not anticipate that this time period would also be the start of the COVID-19 crisis in the UK, as well as the lockdown and social distancing periods that followed. This unexpected event thus allowed us to explore whether psychoeducation courses still have a positive effect on mental well-being during a pandemic, which has been shown to exacerbate mental health issues as well as feelings of anxiety, loneliness and stress (Daly et al., 2020). This would provide a strong test of the value of such interventions during an unprecedented time of global stress. Note that the COVID-19 crisis and associated lockdown measures started in the UK in late March 2020, and thus right in the middle of the Study 2 time period. This was naturally not expected; therefore, Study 2 was not pre-registered.

## Method

**Participants.** Study 2 tested 396 participants, comprising all students who had taken the SoH courses and completed both the Time 3 and Time 4 assessments (TB1 group  $n=70$ , 47% of enrolled students; TB2 group  $n=187$ , 68% of enrolled students) and a comparison group of undergraduates ( $n=139$ ) who enrolled to take the OSoH course beginning in May 2020, who provided comparison data at Time 4. These groups had similar demographic characteristics as shown in Table 2.

**Procedure.** The SoH course as described in Study 1 was delivered to the TB2 students, with the exception that planned

delivery was disrupted by the COVID-19 pandemic, with lockdown restrictions beginning in the UK in late March 2020. As a result of lockdown, two lectures were provided as pre-recorded videos only, the final three weekly lectures were delivered as live online sessions and the final four happiness hubs were conducted with the same content using video conferencing.

**Measures.** Measures collected were the same as Study 1. Comparison data from the online course (OSoH) cohort was available for the main Time 4 outcome measure of mental well-being SWEMWBS only. We did not collect loneliness scores from the OSoH course as individuals were now in social isolation and the questions were regarded as inappropriate.

**Analysis.** Mixed ANOVAs with student cohort (TB1 or TB2) as a between-subjects factor, and time (Time 3 and Time 4) as a within-subjects factor were used to analyse change in outcome measures across the second term. SWEMWBS scores from the two groups of SoH students collected at Time 4 were compared to the comparison group of undergraduates (OSoH), using a one-way between-subjects ANOVA (groups: TB1, TB2 and OSoH).

## Results

**SWEMWBS.** There was a significant interaction effect of time and group ( $F(1,255)=4.70$ ,  $p<0.05$ ,  $\eta_p^2=0.02$ ) on participants' SWEMWBS scores (see Figure 3). This pattern was explained by the significant decrease ( $T(69)=2.81$ ,  $p<0.01$ ) in well-being among the TB1 cohort from Time 3 to Time 4.

**Loneliness.** No significant effects were revealed on either the UCLA 3-item loneliness scale or the direct question on loneliness (see Table 3).

**ONS personal well-being.** A significant group  $\times$  time interaction was detected on the extent to which participants viewed

the things they do in their lives as worthwhile ( $F(1,254)=7.38$ ,  $p<0.01$ ,  $\eta_p^2=0.03$ ). Simple effects analysis revealed that this pattern was explained by the significant decrease from Time 3 to Time 4 among the TB1 group only ( $p<0.001$ ). There was no significant change in the TB2 group who had just completed the course ( $p=0.41$ ). For the ONS measure of life satisfaction, there was a significant main effect of time ( $F(1,254)=15.36$ ,  $p<0.001$ ,  $\eta_p^2=0.06$ ), but no group  $\times$  time interaction. Both the TB1 cohort ( $p=0.005$ ) and the TB2 cohort ( $p=0.005$ ) reported significant decreases in life

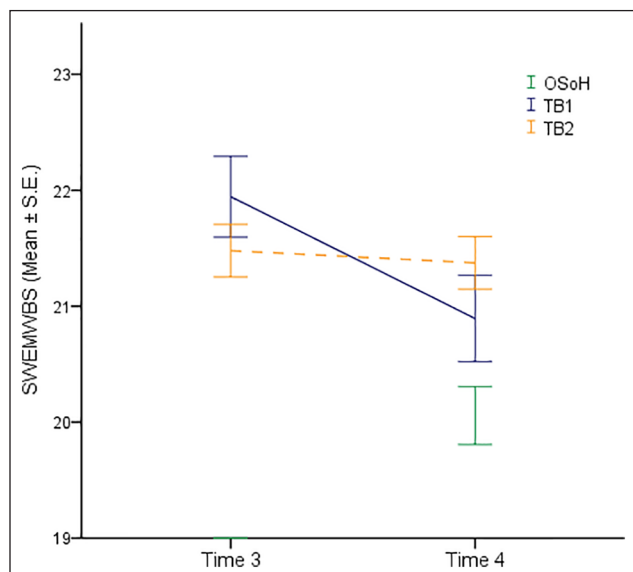
satisfaction from Time 3 to Time 4 (Table 3). There were no observed main or interaction effects on the ONS measures of happiness or anxiety. The means and standard deviations for all measures are presented in Table 3.

**Comparison with OSoH group.** A one-way ANOVA revealed a significant effect of group (TB1, TB2 and OSoH) on participants' SWEMWBS scores collected at Time 4 ( $F(2, 402)=8.29$ ,  $p<0.001$ ,  $\eta_p^2=0.04$ ). Post-hoc t-tests revealed that undergraduates waiting to start the online OSoH course ( $N=137$ , mean=20.06, SD=2.95) had significantly lower SWEMWBS scores than the TB2 cohort ( $T(328)=4.07$ ,  $p<0.001$ ). The TB1 cohort, who had by this timepoint completed the SoH course 5 months earlier, in the first term, did not differ significantly from either TB2 or OSoH participants (Figure 3).

### Discussion

In Study 2 we found that, in contrast to TB1 students from Study 1, we did not observe the same post-course increases in mental and personal well-being measures, nor any reductions in loneliness or stress and anxiety, for students that took the SoH course in the second teaching term (TB2 group). The average SWEMWBS score for the TB2 group at the end of term was 21.37; a decrease of 0.11 points compared to the start of the term, which not significantly difference. Students in the TB2 group did, however, report significantly lower levels of life satisfaction at the end of term compared to the start of term. No other measures were significantly different among this group.

Notably, the significant psychological benefits accrued by the TB1 group from Time 1 to Time 3 (Study 1) underwent a significant reduction over the second term. TB1 students reported significantly lower SWEMWBS scores at



**Figure 3.** Changes in mental well-being and comparison with matched sample for Study 2.

SWEMWBS: Short Warwick-Edinburgh Mental Well-being Scale. TB1: Students that took the course in the first teaching term. TB2: Students that took the course in the second teaching term. OSoH: Students registered to take the online Science of Happiness course.

**Table 3.** Study 2 Means and standard deviations for all measures.

|                         | Time 3 mean (SD)       |                         | Time 4 mean (SD)       |                         |
|-------------------------|------------------------|-------------------------|------------------------|-------------------------|
|                         | TB1 cohort<br>(n = 70) | TB2 cohort<br>(n = 187) | TB1 cohort<br>(n = 70) | TB2 cohort<br>(n = 187) |
| Mental well-being       |                        |                         |                        |                         |
| SWEMWBS                 | 21.95 (2.92)           | 21.48 (3.11)            | 20.89** (3.11)         | 21.37 (3.11)            |
| Loneliness measures     |                        |                         |                        |                         |
| Direct question         | 3.29 (0.98)            | 3.19 (1.00)             | 3.24 (0.94)            | 3.20 (1.01)             |
| UCLA 3-item scale       | 5.03 (1.44)            | 5.16 (1.51)             | 5.11 (1.63)            | 4.93 (1.58)             |
| ONS personal well-being |                        |                         |                        |                         |
| Life satisfaction       | 6.89 (1.45)            | 6.85 (1.61)             | 6.21** (1.75)          | 6.44** (1.76)           |
| Worthwhile              | 6.99 (1.45)            | 6.76 (1.65)             | 6.20*** (1.74)         | 6.65 (1.73)             |
| Happy yesterday         | 6.41 (2.05)            | 6.54 (1.95)             | 6.10 (1.87)            | 6.38 (1.86)             |
| Anxious yesterday       | 4.67 (2.24)            | 5.10 (2.31)             | 4.89 (0.94)            | 4.79 (2.28)             |

TB1: teaching block 1; TB2: teaching block 2; SWEMWBS: Short Warwick Edinburgh Mental Well-Being Scale; UCLA: University of California at Los Angeles; ONS: Office for National Statistics.

Significantly different from Time 3, post-hoc simple effects with a Bonferroni correction, \*\* $p<0.01$ . \*\*\* $p<0.001$ .



Time 4, as well as lower scores on the ONS measures of life satisfaction and the extent to which they viewed activities in their lives as worthwhile. This period however, coincided with the beginning of the Covid-19 pandemic and lockdown in the UK. In line with a survey of UK households (Daly et al., 2020) it is likely that all students were experiencing increased stress, disruption and uncertainty at this time. Under these circumstances, the fact that there was no significant change in mental and personal well-being in the TB2 group – with the exception of life satisfaction – may in fact represent a degree of resilience as a result of taking the SoH course during this period. This interpretation is supported by the comparison with the matched group of undergraduate students who were registered to start the online science of happiness course (OSoH) in May 2020. OSoH students reported significantly lower levels of mental well-being on the SWEMWBs scale at Time 4 than students who had taken the SoH course in TB2. SWEMWBs scores among the TB1 group at Time 4 did not differ significantly from either the TB2 group or the OSoH comparison group.

Overall, these results provide an indication that participation in a psychoeducational happiness course offers some protective effects on mental well-being during a period of collective uncertainty. A final question was whether a course offered and delivered entirely during the Covid-19 pandemic would influence participants' mental well-being.

### Study 3: OSoH during a COVID-19 lockdown

#### Introduction

In Study 3, we sought to investigate whether we could raise staff and student mental well-being with a short online psychoeducational happiness course offered during the COVID-19 pandemic. As part of the university's strategy to maintain levels of mental well-being during the COVID-19 pandemic and associated lockdown in the UK, we delivered a 4 week online version of the SoH course (OSoH) which included content that was deemed to be most relevant and practical for university staff and students during this period of nationwide social isolation. We were required to cap participation on the OSoH course as there was a limit to the number of attendees who could view the online lectures. Over 500 staff, postgraduates and undergraduate students registered for the course and took the self-assessment measures in May (Time 4). The question of interest was whether a short non-credit bearing online psychoeducational course consisting of only four lectures and associated voluntary homework and exercises would produce improvement in mental well-being at the end of the course in June (Time 5). Unlike Study 1 and 2 which involved undergraduate students only, the OSoH course was made available to a broad cross-section of the University; thus, we also sought to evaluate whether staff, postgraduates and undergraduates responded differentially to the course. Unfortunately, this study was not pre-registered as the

lockdown was not anticipated. We were unable to test a control group as it was not deemed a priority to assign individuals to a waiting list group at a time of crisis.

#### Method

**Participants.** A total of 514 members of staff, postgraduate and undergraduate students who enrolled on the OSoH course completed the pre-course well-being survey in May 2020. Participants were automatically emailed a link to the post-course survey 4 weeks after the first survey, which was completed by 192 participants (37.4%). The final sample of 192 participants was 81% female, 78% British and 89% White. It comprised 125 staff members, 24 postgraduates and 42 undergraduates from across the range of academic disciplines and departments offered at the University, including both academic and professional services staff. There was a greater retention rate among staff, with 42% of staff completing both surveys, compared to 32% of postgraduate and 30% of undergraduate students. There was no control group, and survey completion rate was substantially lower than in the face-to-face 12 week credit-bearing SoH course.

**Procedure.** The OSoH course included four 1 hour weekly lectures. The series began by defining happiness and providing an introduction to PPIs associated with improved mental well-being. The remaining lectures focused on dealing with adversity, avoiding negative rumination and how to implement positive plans for the future. There were no virtual happiness hubs though participants were encouraged to undertake voluntary homework exercises related to each of the four lectures. These exercises were: listing 'Three Good Things' each day for 1 week and writing a gratitude letter (Seligman et al., 2005), practicing meditation and goal setting using the WOOP technique which promotes mental contrasting (Oettingen, 2014).

**Measures.** Our outcome measures were the SWEMWBs and three of the ONS personal well-being measures. We did not include the ONS happiness measure; instead we used the 4-item Subjective Happiness Scale (SHS; Lyubomirsky and Lepper, 1999) which has more reflective and comparative measures. We did not include loneliness measures as we did not want to draw attention to the social isolation of lockdown. We also collected post-course feedback at Time 5 (mid-June) about participants' engagement with and enjoyment of the course, including the number of lectures they attended, whether they undertook the homework exercises and whether they had or were planning to implement positive changes in their lives.

**Analysis.** Mixed ANOVAs with participant group (staff, undergraduate student and postgraduate student) as a between-subjects factor, and time (Time 4 and Time 5) as a within-subject factor were used to detect any changes in the outcome measures at the end of the course.

**Table 4.** Change in Study 3 outcome measures from pre- to post-course assessments.

|                            | Time 4       | Time 5       | Change | <i>F</i> | <i>p</i> < | $\eta_p^2$ | <i>n</i> |
|----------------------------|--------------|--------------|--------|----------|------------|------------|----------|
|                            | Mean (SD)    | Mean (SD)    |        |          |            |            |          |
| Mental well-being          |              |              |        |          |            |            |          |
| SWEMWBS                    | 20.50 (2.83) | 22.36 (2.94) | 1.86   | 15.83    | 0.001      | 0.078      | 192      |
| Subjective happiness scale | 17.88 (5.20) | 18.77 (5.00) | 0.89   | 7.18     | 0.01       | 0.044      | 159      |
| ONS personal well-being    |              |              |        |          |            |            |          |
| Life satisfaction          | 6.04 (1.73)  | 6.85 (1.53)  | 0.81   | 43.56    | 0.001      | 0.187      | 192      |
| Worthwhile                 | 6.23 (1.84)  | 6.99 (1.55)  | 0.76   | 31.76    | 0.001      | 0.144      | 192      |
| Anxious yesterday          | 4.92 (2.58)  | 3.97 (2.69)  | -0.95  | 9.5      | 0.01       | 0.048      | 192      |

SWEMWBS: Short Warwick Edinburgh Mental Well-Being Scale; ONS: Office for National Statistics.

## Results

**Course engagement and feedback.** The participants represented in this sample were highly compliant with the OSoH course. Of these 96.4% reported watching 3 or more lectures and 87% watched all 4 lectures and on average they completed 3 of the 4 homework activities (mean: 2.98, standard deviation: 0.95). When asked about their experience, 93.8% Agreed or Strongly agreed that they enjoyed the course, 82.8% Agreed or Strongly Agreed that the course had a positive effect on their well-being and 67.7% Agreed or Strongly Agreed that they had started a new activity or changed something in their life as a result of this course.

**Outcome measures.** A significant main effect of time was found on all outcome measures. There were no interaction effects or main effects of participant group (staff, postgraduate student, undergraduate student) on any measure, thus means and standard deviations are presented for the entire sample (Table 4).

## Discussion

Overall, we found that the 4 week OSoH course produced significant benefits on all of the measures of mental and personal well-being, despite being shorter and delivered entirely online without weekly meet-ups. Participants reported a 1.86 point increase on the SWEMWBS scale (where scores range from 7 to 35) and a 0.89 point increase on the Subjective Happiness Scale (where scores range from 4 to 28). Equally, we observed significant increases on the ONS personal well-being measures of life satisfaction and the extent to which participants considered the activities in their lives as worthwhile, and a corresponding decrease in the extent to which participants reported feeling anxious yesterday.

One limitation of this study was that there was no control group for comparison, thus these results should be taken as preliminary. However, it is notable that the observed pattern of improvement is in contrast with the general decline in mental well-being that has been reported

in other studies examining this time period (Daly et al., 2020). Overall, the findings from Study 3 tentatively indicate that a short online course may be a cost-effective way of increasing mental well-being in large groups in a relatively short period of time during a period of intense crisis and uncertainty.

## General discussion

In line with other studies that show psychoeducational university courses can produce significant improvement in student mental well-being (Regehr et al., 2013; van Daele et al., 2012; Young et al., 2020; Yusufov et al., 2019), here we found similar benefits emerged from this course during both a normal university teaching term and during a term of extreme stress and isolation caused by the COVID-19 pandemic. As far as we are aware, this is the first report looking at the benefits of a psychoeducational course during a pandemic lockdown.

In Study 1, undergraduates who took the SoH course in the first term reported higher mental well-being than the TB2 waiting list control. The benefits we observed in students who took the course during the first teaching block were still in evidence by the start of the second teaching block in February, but Study 2 revealed that levels of mental well-being dropped significantly for this group by the end of the second teaching block in May during the COVID -19 lockdown. There are at least two possible interpretations of this pattern of results. First, the benefits of psychoeducational courses may dissipate over time such that students return to baseline in the absence of continued support (van Daele et al., 2012). A second possibility consistent with the pattern we observed, is that these results were due to the unusual period in which we collected these data; after the UK had moved into COVID-19 lockdown conditions, which occurred during the second teaching block. A review of available studies on the impact of quarantines report mostly negative psychological effects including post-traumatic stress symptoms, confusion and anger (Brooks

et al., 2020). The enormous upheaval arising from the COVID-19 pandemic is thought to greatly impact mental well-being; as such, it is perhaps unsurprising that our TB1 students showed reductions in overall mental well-being during this time.

Study 2 revealed that, in contrast to the first cohort of students, our TB2 group did not experience either a significant increase or decline in our primary measure of mental well-being during the COVID-19 period. Although delivery of the course was disrupted towards the end of the period, we interpret this finding as evidence that students who had taken the course in the second term were protected somewhat from the psychological adversity of the situation. This interpretation is further supported by the fact these students scored significantly higher on our post-treatment mental well-being measures than a matched group of undergraduates who had not taken the course at all but were awaiting to take the online version.

Finally, Study 3 revealed that a short online version of the course administered to a large group of university staff and students produced significant benefits across a range of mental and personal well-being measures even though it only ran over 4 weeks, had no small group meetings and was delivered via video conferencing. This is an important finding as it indicates that online interventions, which can be delivered to large numbers in a cost-effective way, may be effective at raising mental well-being without compromising quarantine or social isolation.

Unfortunately, several procedural aspects of this study indicate that we should treat these results with caution. For studies 1 and 2, the students were not randomly allocated to take the course in either TB1 or TB2. This was due to a number of constraining factors. As an open unit, students could exert a preference over when they wanted to take the course, and allocation was determined by timetabling staff with respect to student preference and timetable restrictions. Additionally, some degree courses (e.g. engineering and medicine) had little flexibility in their timetabling, which limited whether their first year students could take the course. We do not believe that we had a particular sample bias because of these limitations, but it remains a confound in our design that we seek to address in future studies.

The two major limitations in Study 3 were that we did not have a control group and the overall response rate to the post-course survey was only 37% which means that sampling and response biases cannot be ruled out. However, the pattern we observed in Study 3 is generally consistent with the pattern we observed in our other studies, namely that a psychoeducational course with PPI interventions can yield significant positive effects on student mental well-being. Those who completed the post-course survey indicated high levels of engagement, but then that is not too surprising since they were also the ones likely to comply with the requests for self-assessment.

## Conclusion

In conclusion, our studies suggest psychoeducational courses raise levels of mental well-being in a relatively cost-effective way for large groups delivered face to face and possibly online as well. However, such conclusions must remain tentative as the studies were not full randomized control trials, and the samples were predominantly white and female undergraduates, despite our intentions to reach a more diverse range of participants. Also, without longitudinal follow-up, the benefits of such courses may be short lived unless individuals can be motivated to maintain the activities recommended. Future studies should seek to encourage schools and universities to create a culture where, as the economist Richard Layard advocates, mental health issues can be freely discussed (Layard, 2020). In this way, psychoeducational courses could become normalized across disciplines and we would be better equipped to test the generalizability of our findings to a broader, more diverse and representative sample of students. We think that approaching these issues from a science education perspective is not only effective but could be used as a scalable intervention to address mental health issues more broadly.

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