

MASTER THESIS



Marrying Mindfulness and Character Strengths

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A Small-Scale Pilot Trial Examining the Feasibility and Effectiveness of five sessions of  
Mindfulness-Based Strengths Practice (MBSP)

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Mindfulness allows us to stop time,  
it allows us to renew our energies,  
it allows us to recharge our batteries.  
It is to stop doing things in order to start doing things.

Strenghts Gatha of DL1

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<sup>1</sup> Initials were changed according to the wish of the participant.

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### Abstract

Students' mental health issues are a serious and growing public health concern calling for an effective response. Mindfulness-Based Strengths Practice (MBSP), a novel approach that catalyzes the merits of mindfulness and character strengths interventions holds promise in increasing students' well-being. This small-scale study aims at examining the feasibility and effectiveness of five sessions of MBSP among an international sample in higher education. Students were assigned to one of two conditions, i.e., a five-session MBSP intervention or an ACT-based intervention of the same length. Participants (N =12) a) indicated criteria of interventions feasibility (attendance, satisfaction, accomplishment, utility) b) filled in measures of depressive symptomatic, anxiety, stress, well-being, mindfulness, psychological flexibility, psychological inflexibility, and engaged living at pre- and post-test and c) and were interviewed. The main findings are (1) that a five-session version of MBSP is feasible, (2) that both MBSP and ACT led to decreases in anxiety, stress, and psychological inflexibility as well as increases in well-being (3) that neither condition outperformed the other, and (4) that participants reported a range of perceived benefits, amongst others for self-compassion, authenticity, aliveness, and relationship quality. The results suggest that five sessions of MBSP are feasible, non-inferior to an ACT-based intervention, and conducive to a range of beneficial outcomes. As an effective standalone or complementary campus mental well-being strategy, however, MBSP should ideally be kept at its original length to unfold its full potential. Due to methodological limitations, these findings warrant cautious interpretation and further replication.

**Keywords:** MBSP; mindfulness; character strengths; student; well-being; positive psychology intervention.

## Marrying Mindfulness and Character Strengths

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### A Small-Scale Pilot Trial Examining the Feasibility and Effectiveness of five sessions of Mindfulness-Based Strengths Practice (MBSP)

## **1 Introduction**

### **1.1 Background**

Students' mental health is a substantial and growing public health concern (Storrie et al., 2010). Approximately, one in five students has been diagnosed with a clinically relevant disorder (Auerbach et al., 2016). However, due to undiagnosed disorders and subclinical cases, this is likely to underestimate the true scope of the problem (Wingert et al., 2020). Aside from pathology, psychological distress is a widespread experience among students. In fact, rates of psychological distress, i.e., nonspecific symptoms of stress, depression, and anxiety are significantly higher in the student population than in the general population (Stallman, 2010). Both pathology and psychological distress are linked to deteriorating quality of life, diminished social and university-related functioning, low academic achievement, and risk of premature dropout (Alonso et al., 2018; Keyes et al., 2012; Salzer 2012). COVID-crises related restrictions may have further aggravated both problems (Cullen et al., 2020). As university years also coincide with the peak period of onset for many common mental health difficulties including anxiety, mood disorders and substance abuse (Bewick et al., 2010; de Girolamo et al., 2012; Kessler et al., 2007) mental health strategies during this critical period are especially well placed. Some interventions, that may hold great promise in fulfilling the growing demand for university counselling services (Thorley, 2017) and thus, eventually, in the pursuit of helping students realize their potential, cope with and

adapt to normal adversities in life, work productively and contribute to their community (World Health Organization, 2018), will be introduced below.

### **1.1.1 Character Strengths Interventions**

One type of mental health intervention that may help to install more ubiquitous mental health are positive psychology interventions. Positive psychology interventions aim at enhancing positive affect, cognition or functioning (Sin & Lyubomirsky, 2009) and have been shown to alleviate depressive symptomatic and enhance satisfaction with life (e.g., Bolier et al., 2013; Carr et al., 2021; Sin & Lyubomirsky, 2009). One specific variant of positive psychology interventions are character strengths interventions (CSIs), i.e., interventions that aim to identify and cultivate individual strengths to promote well-being (Meyers & van Woerkom, 2017). Character strengths are universally valued positive traits that are expressed in affect, cognition, volition, and behaviour (Niemi, 2013). Since the VIA, a classification of 24 character strengths (Peterson & Seligman, 2004) has been introduced, several different CSIs have been developed and a growing body of literature demonstrates their effectiveness in enhancing well-being and ameliorating depressive symptomatic that is sustained up to six months (Gander et al., 2013; Seligman et al., 2005). Moreover, CSIs have been associated with a wide range of positive outcomes, among others increases in, well-being, work engagement, self-esteem, self-efficacy, positive affect, and life satisfaction (Ghielen et al., 2017; Proyer et al., 2015; Schutte & Malouff, 2019; Yan et al., 2020).

### **1.1.2 Mindfulness-Based Interventions**

Another type of positive mental health intervention which has been implemented in university mental health programmes are mindfulness-based interventions (MBIs). Mindfulness is rooted in Buddhist philosophy and meditation practices and can be described as a purposeful, non-judgmental present moment awareness (Bishop et al., 2004; Kabat-Zinn,

1990). MBIs typically cultivate mindfulness through practices that concentrate and retrieve one's attention to current emotions, thoughts, behaviour, sensations, or surroundings with an orientation of openness, curiosity, and acceptance (Bishop et al., 2004; Kabat-Zinn, 1990; Niemiec 2013). Well-established MBIs such as Mindfulness-Based Stress Reduction (MBSR), Acceptance and Commitment Therapy (ACT), and Mindfulness-Based Cognitive Therapy (MBCT) demonstrate efficiency in alleviating depression (Seshadri et al., 2021), anxiety (Bohlmeijer et al., 2010; Hofmann et al., 2010), stress (Regehr et al., 2013) improving quality of life in cancer survivors (Chang et al., 2021) and enhancing well-being (Eberth & Sedlmeier, 2012). During college years, a transitional life period with considerable challenges related to social role, financial and interpersonal problems as well as academic demands (Amanvermez et al., 2021), the practice of mindfulness may meaningfully contribute to students' well-being as it reduces ruminative thoughts, and induces positive affect (Jain et al., 2007). A recent meta-analysis further substantiates the broad evidence base on MBIs by showing their capacity to improve students' distress, anxiety, depression, rumination, and mindfulness with small to moderate effect sizes (Dawson et al., 2020).

### **1.1.3 Acceptance and Commitment Therapy**

Although a thorough introduction to ACT is beyond the scope of this master thesis, ACT deserves to be specifically mentioned here because an intervention based on its principles served as an active control condition in the present study and ACT process measures have been assessed as outcomes. ACT is a well-established and thoroughly evaluated third wave-therapy that aims at increasing psychological flexibility, i.e., a person's capacity to be in the present moment and display and maintain functional behavioural strategies in accordance with one's chosen values by drawing from mindfulness, acceptance and value clarification (Hayes et al., 2012). As an evidence-based trans-diagnostic treatment



form which is effective for an array of problems in clinical as well as non-clinical samples (Dindo et al., 2017), ACT has been researched and implemented across various settings and found effective in promoting students' mental health. For instance, an RCT found maintained effects on psychological, emotional and social well-being and reduced stress, anxiety and depression at 12-month follow-up (Räsänen et al., 2016). Currently, an ACT-based self-help format is provided as a service to all 15,000 students at the University of Jyväskylä, the site of this trial.

#### **1.1.4 Mindfulness-Based Strengths Practice**

A novel, integrative approach that harnesses character strengths as well as mindfulness and has sparked researchers' interest is the manualized Mindfulness-Based Strengths Practice (MBSP; Niemiec 2013; Whelan-Berry & Niemiec, 2021). While both concepts, i.e., mindfulness and character strengths, seem to offer unique pathways to well-being (Verhaeghen, 2021), intertwining character strengths and mindfulness may mutually enhance the merits of both (Duan & Ho, 2018) and thus give rise to synergetic effects (Pang & Ruch, 2019b). For instance, when clients encounter challenges in being mindful, character strengths, such as self-regulation or perseverance may help to address them (strong mindfulness; Niemiec & Lissing, 2016). Mindfulness in turn allows one to be in contact with the present moment and observe the self in order to express character strengths optimally (mindful strengths use; Niemiec & Lissing, 2016; Pang & Ruch, 2019b). MBSP like other mindfulness-based approaches promotes a purposeful acceptance of all experiences but is yet distinguished from other programmes by amplifying positive traits, i.e., character strengths. A growing body of literature links MBSP to a range of desired outcomes. In a recent study, MBSP has been associated with an increase in awareness of one's signature strengths (Whelan-Berry & Niemiec, 2021), a prerequisite for strengths use (van Woerkom & Meyers,

2019), which in turn has been shown to reduce depressive symptoms (e.g. Seligman et al., 2005). Furthermore, participants of MBSP reported substantial benefits to sense of self, relationship quality, meaning and purpose in life, problem and stress management and accomplishment (Whelan-Berry & Niemiec, 2021). MBSP has found application amongst various populations and a growing body of literature supports its efficacy. In workplace contexts, for instance, MBSP enhanced job satisfaction, task performance, meaning, as well as hedonic and eudemonic well-being of employees (Monzani et al., 2021; Pang & Ruch, 2019a; Prasath & Morris, 2021). In educational settings, an adaptation of MBSP led to increased mindfulness and trend in enhancing achievement, perseverance, love of learning (Güldal & Satan, 2020) and enhanced strengths use, resilience, mindfulness, and self-efficacy (Park, 2020). Similarly, in a recent RCT with students, MBSP significantly enhanced well-being, meaning, engagement, and health (Wingert et al., 2020).

## **1.2 Objective of the Present Study**

The present small-scale study aims at providing initial insights regarding the feasibility and effectiveness of a shortened five-session adaptation of MBSP among international students. Our trial thus makes a precedent in furthering the knowledge of MBSP by examining three novel directions. First, to our knowledge, this is the first trial to offer MBSP specifically to international students, a population that, arguably, is especially vulnerable, due to cultural adjustments and overlooked need for support (Mori, 2000). Second, this is the first study examining the effects of five sessions of MBSP. Even though MBSP is designed as a coherent eight-week programme, earlier evidence suggests that an abridged 6-week adaptation of MBSP may be similarly effective in increasing well-being, resilience, self-esteem, mindfulness, and strengths use (Park, 2020). For university policy makers, intervention length may be important to consider in the light of budgeting plans and

resource commitments. Not only economically but also in terms of participant adherence brevity of interventions might be advantageous, and thus the objective of this trial is to examine whether participating in the first five sessions of MBSP can lead to meaningful changes. Third, while MBSP has been compared to MBSR (Monzani et al., 2021) this is the first study on MBSP to employ an active control condition based on ACT.

Primarily, this small-scale pilot trial aims to evaluate the feasibility of a five-session MBSP-based workshop. The feasibility criteria were defined as  $>50\%$  in the MBSP group completing 4/5 sessions. Additionally, MBSP participants' mean rating scores of indicators of feasibility were defined as  $\geq 3/5$  for perceived utility and accomplishment and mean rating scores of  $\geq 6/10$  for overall satisfaction. The second main aim is to explore the effectiveness of the five-week adaptation of MBSP as a whole in a mixed-methods approach, where including qualitative data provides an enriched understanding of MBSPs' effectiveness. Within the second main question, we concretely aim at empirically examining the hypotheses ( $H_1$ ) that participation in five sessions of MBSP would elicit significant changes in anxiety ( $H_{1a}$ ), depressive symptomatic ( $H_{1b}$ ), stress ( $H_{1c}$ ), well-being ( $H_{1d}$ ), mindfulness ( $H_{1e}$ ), psychological flexibility ( $H_{1f}$ ) and inflexibility ( $H_{1g}$ ), and engaged living ( $H_{1h}$ ) when compared to the active ACT control condition. As a second research hypothesis, a main effect for time independently of the group condition is anticipated for all outcome measures ( $H_{2a-h}$ ).

## **2 Method**

### **2.1 Study Design and Ethics**

To examine the feasibility and effectiveness of five sessions of MBSP in comparison to a five-week ACT-based intervention, a controlled, open-label, parallel-arm trial, with two conditions was employed. The study received approval from the Ethics Committee of the University of Jyväskylä (registration number 14U/2012) and was done following the World Medical Association Declaration of Helsinki (World Medical Association, 2013). The programme was offered free of charge to voluntary participants. Participants provided their written informed consent to participate and were able to withdraw from further participation at any time point.

### **2.2. Recruitment**

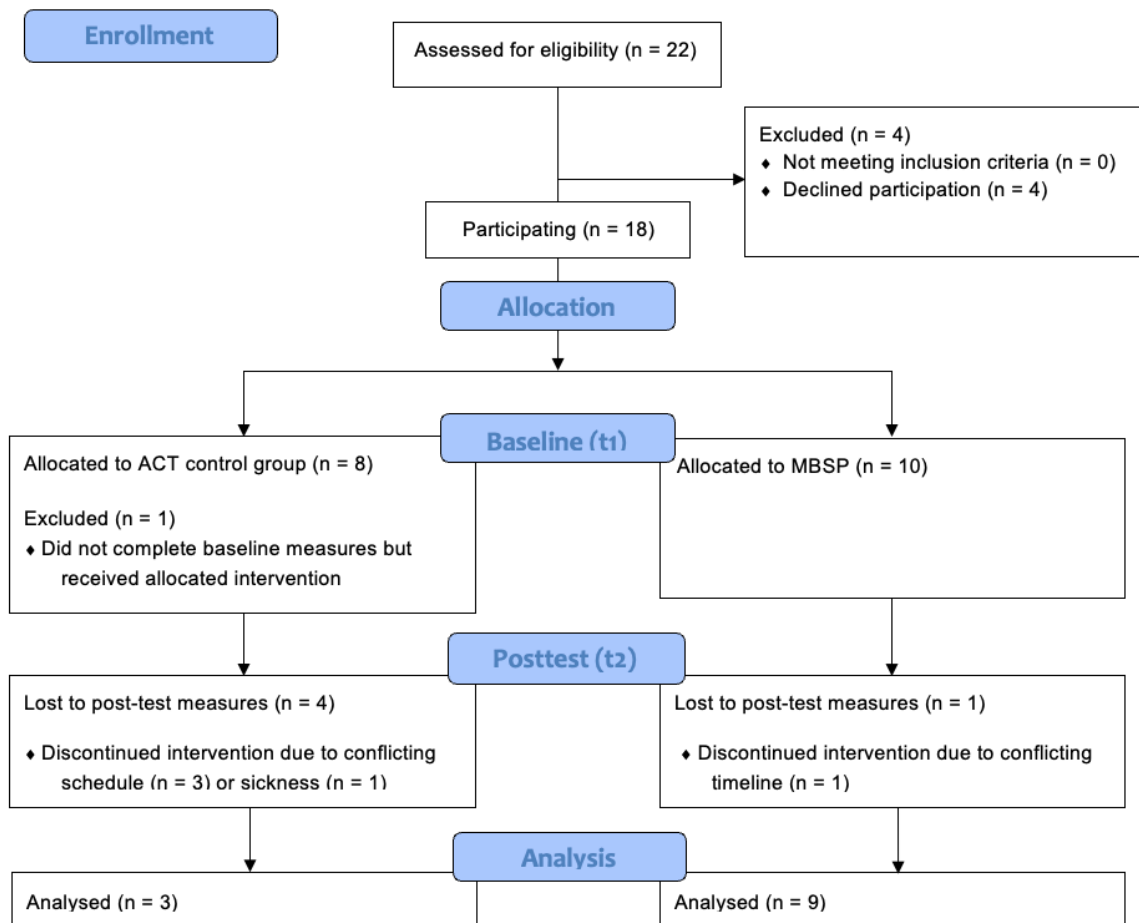
Participants were informed about the opportunity for participation in a well-being workshop by mailing lists, an advertisement on the university's website, and/or by mentors for international students. Only adults were eligible for participation. Exclusion criteria were inability (a) to follow through for a five-week period (i.e., the duration of the intervention) or (b) to meaningfully participate due to the inability to communicate in English. Prior to data collection, eligible participants received information regarding participation in the present study in a conversation that allowed for addressing questions and subsequently signed the informed consent form. Participants were able to withdraw from further participation at any time point.

### **2.3 Participants**

Of the 22 participants who responded to the offer to participate in the well-being programme, 18 were included in the intervention phase and the final sample comprised 12

participants. The participant flow through the study and the reasons for exclusion are outlined in the Flowchart (Fig. 1).

**Figure 1.**  
Flow Chart of participants through the study.



Note. This chart encompasses the flow of participants (N = 12) through assessments of feasibility and effectiveness, of which all but one later agreed to participate in the interviews (n = 11).

## 2.4 Procedure

This study was carried out between March and May 2022 (see trial timeline in appendix) among international students. Participants were enrolled by the main author and

the contextual psychology research group at the University of Jyväskylä. After enrollment, eligible consenting participants were asked to fill in the pretest measures (t1) and were assigned to either of the trial conditions depending on their indicated preference of the weekday. An intended randomization was unfeasible and had to be given up (see discussion). MBSP participants received five weekly 1.5-hour sessions of MBSP in a face-to-face setting (for session content please see Table 1). Whereas the active control group received an ACT-based intervention of the same length and format that had been established earlier in the university setting (Räsänen et al., 2016; Lappalainen, 2014). The topics of the ACT-based intervention were (1) value clarification (2) taking committed action (3) being present (4) defusion and (5) acceptance. In both conditions, participants received suggested homework that aimed at encouraging deepening one's understanding and applying the programs' learning in one's daily life. The intervention facilitators, both graduate-level students with relevant psychoeducation experience, were provided with relevant material and session protocols for conducting the sessions and were further provided with supervision by researchers and clinical psychologists. The main coach involved in MBSP intervention delivery was instructed by the MBSP developer and research director at the VIA Institute on Character, Dr Ryan Niemiec and conducted the intervention according to the programme manual.

**Table 1.**

*MBSP intervention session structure*

Session	Topic	Tasks and Techniques
I	Mindfulness and Autopilot	welcome and positive instructions; raisin exercise; mindfulness and autopilot; body scan
II	Your Signature Strengths	you at your best with strengths-spotting; your signature strengths; mindful breathing
III	Obstacles are Opportunities	strengths and positive outcomes and managing obstacles; statue meditation; leaf meditation
IV	Strong Mindfulness	signature strengths in a flash exercise; walking meditation; mindful living
V	Valuing Your Relationships	valuing your relationships; loving-kindness meditation and strength exploration meditation

*Note.* Structure and content of the MBSP sessions that were offered in this trial.

**2.5 Data Collection and Outcomes**

A mixed-methods approach was employed.

**2.5.1 Quantitative Data and Measures**

Measurements took place at three-time points, of which the initial was a mere demographic questionnaire including information on age, gender, and educational background. At baseline (t1) and at post-test (t2) all participants were asked to complete the eight scales comprising 135 items as measures of the dependent variables. Outcomes were changes in anxiety, depressive symptomatic, stress, well-being, mindfulness, psychological flexibility, psychological inflexibility, and engaged living. The measures are introduced in the corresponding paragraphs below.

*Anxiety.* Anxiety was measured by using the Generalized Anxiety Disorder Assessment (GAD-7; Spitzer et al., 2006), a 7-item questionnaire, where responses indicate

the frequency and presence of symptoms throughout the last two weeks on a 4-point Likert-style scale ranging from 0 (not at all) to 3 (nearly every day). A sample item is “Worrying too much about different things.” A sum score indicates the severity of anxiety with cut-off scores of  $\geq 5$  indicating mild,  $\geq 10$  indicating moderate and  $\geq 15$  indicating severe anxiety. The GAD-7 has demonstrated excellent psychometric properties ( $\alpha = 0.89$ ; Löwe et al., 2008). In the present study, the scale demonstrated acceptable reliability at t1 ( $\alpha = 0.78$ ) and good reliability at t2 ( $\alpha = 0.83$ ).

***Depressive Symptomatic.*** Depressive symptomatic was measured using the Patient Health Questionnaire (PHQ9; Kroenke et al., 2001). The PHQ9 is a nine-item questionnaire, which assesses the presence of each of the DSM-IV criteria for depression on a 4-point Likert-style scale ranging from 0 (not at all) to 3 (nearly every day). A sample item is “Little interest or pleasure in doing things.” A sum score indicates the severity of depression with cut-off points of 1 – 4 indicating minimal depression, 5 – 9 mild depression, 10 - 14 moderate depression, 15 – 19 moderately severe depression, and 20 - 27 severe depression. The PHQ9 has demonstrated excellent psychometric properties ( $\alpha = 0.89$ ; Kroenke et al., 2001). In the present study, the PHQ9 demonstrated acceptable reliability at t1 ( $\alpha = 0.66$ ) and t2 ( $\alpha = 0.74$ ).

***Stress.*** Stress was assessed using the Perceived Stress Scale (PSS; Cohen, 1988). The PSS is a ten-item questionnaire which assesses the perception of stress (unpredictability, uncontrollability, overload) in the last month. Answers are given on a 5-point Likert-style scale ranging from 0 (never) to 4 (very often). A sample item is “In the last month, how often have you found that you could not cope with all the things that you had to do?”. Among university students, the PSS has demonstrated good psychometric properties ( $\alpha = 0.88$ ;



Roberti et al., 2006). In the present study, the scale demonstrated acceptable reliability at t1 ( $\alpha = 0.78$ ) and good reliability at t2 ( $\alpha = 0.87$ ).

**Well-being.** Positive mental health, i.e., well-being, was measured using the Mental Health Continuum – Short Form (MHC-SF; Lamers et al., 2011). The MHC-SF is a 14-item questionnaire, which assesses the frequency with which respondents experience symptoms of positive mental health on the three subscales hedonic well-being, psychological well-being, and social well-being (the latter two combined comprise eudemonic well-being). Responses are given in a 6-point Likert scale ranging from 0 (never) to 5 (every day). A sample item is: “During the past month, how often do you feel that you liked most parts of your personality?”. The MHC-SF has demonstrated excellent psychometric properties ( $\alpha = 0.87$ ; Lamers et al., 2011). In our pre-test data, the scale demonstrated excellent reliability ( $\alpha = 0.91$ ) whereas the observed reliability in our post-test data was acceptable ( $\alpha = 0.74$ ).

**Mindfulness.** The Five Facet Mindfulness Questionnaire (FFMQ; Baer et al., 2006) is a 39-item scale that assesses mindfulness on a 5-point Likert scale ranging from 1 (never or very rarely true) to 5 (very often or almost always true). The FFMQ encompasses five subscales (1) observing (2) describing (3) acting with awareness (4) accepting, non-judgmental, compassionate attitude toward the inner experience (5) non-reactive orientation to the inner experience. A sample item is: “I pay attention to sounds, such as clocks ticking, birds chirping or cars passing.”. The general scale shows adequate psychometric properties ( $\alpha \geq .75$ ) (Baer et al., 2006). In our sample the scale demonstrated excellent reliability both at t1 and t2 ( $\alpha = 0.90$ ;  $\alpha = 0.90$ ).

***Psychological Flexibility.*** Psychological flexibility was assessed using the Comprehensive Assessment of ACT Processes (CompACT; Francis et al., 2016), a 23-item questionnaire encompassing the three subscales openness to experiences (CompACT-OE), behavioural awareness (CompACT-BA), and valued action (CompACT-VA). A sample item is “I can keep going with something when it’s important to me”. Answers are given in a 7-point Likert scale ranging from 0 (strongly disagree) to 6 (strongly agree) with higher scores representing greater psychological flexibility. The CompACT has demonstrated good psychometric properties ( $\alpha = 0.87 - 0.90$ ; Francis et al., 2016). In our data, the scale demonstrated excellent reliability both at t1 and t2 ( $\alpha = 0.91$ ;  $\alpha = 0.91$ ).

***Indicators of Psychological Inflexibility.*** Avoidance and fusion were measured with the Avoidance and Fusion Questionnaire for Youth (AFQ-Y; Greco et al., 2008). The AFQ-Y is a 17-item scale that assesses the extent of participants’ experiential avoidance and their inability to unhook from cognition on a 5-point Likert scale ranging from 0 (not true at all) to 4 (very true). A sample item is “The bad things I think about myself must be true.”. The AFQ-Y shows excellent psychometric properties ( $\alpha = 0.90 - 0.93$ ; Greco et al., 2008). In our data, the scale demonstrated good reliability at pre-test ( $\alpha = 0.89$ ) and the observed reliability at t2 was excellent ( $\alpha = 0.91$ ).

***Engaged Living.*** Engaged living, i.e., values and committed action, was measured with the Engaged Living Scale (ELS; Trompetter et al., 2013). The ELS is a 16-item scale that assesses the extent of participants’ committed action on valued life activities on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). A sample item is “I have values in my life that give my life more meaning.”. The ELS good psychometric properties

( $\alpha = 0.86$ ; Trompetter et al., 2013). In our data, the scale demonstrated excellent reliability both at t1 and t2 respectively ( $\alpha = 0.92$ ;  $\alpha = 0.94$ ).

### **2.5.2 Qualitative Data**

At post-test, a subset of questions evaluating the intervention including session attendance, perceived utility, as well as satisfaction with the workshop, one's accomplishments were assessed. Participants were also asked a set of yes-no questions about perceived benefits. In addition, semi-structured interviews were conducted. An initial set of open questions addressed perceived changes to allow for a free and rich response set. Subsequently, participants were prompted with a number of potential valued outcome domains including relationship to oneself and others, authenticity, and autonomy to encourage participants to elaborate on the perceived effectiveness of the intervention.

## **2.6 Data Analysis**

A combination of quantitative and qualitative methods was harnessed.

### **2.6.1 Statistical Analysis**

All statistical analyses were conducted using SPSS (Version 28.0.1.0). First, frequencies and descriptives were computed to yield the demographical information of the present sample. The sample was investigated with an independent samples t-test for age and  $\chi^2$ -tests for the categorical variable gender to test for pre-existing differences between the two conditions. Due to the small sample size and because the expected cell frequency was lower than 5 in more than 25 % of the cases, a Fisher's exact test was employed. The effectiveness of the intervention was analyzed employing several two-way mixed analyses of variance (ANOVAs) that compared the control group to the intervention group at both time points. To

test the assumptions of the ANOVAs, the data were tested for normal distribution using the Shapiro-Wilk test, outliers were assessed and a Mauchly's sphericity test, as well as the Levene test for equality of variance were performed. For computing the mixed ANOVAs, the continuous dependent variables as well as the categorical within-subjects factor time, i.e., the independent categorical variables t1 and t2 and the categorical between-subjects factor as i.e., the two independent treatment conditions were modelled. Subsequently, main effects and interaction effects were analyzed by performing separate two-way mixed ANOVAs to investigate the effects of the intervention on each of the dependent variables comparing the two time points and the two conditions.

### **2.6.2 Qualitative Analysis**

The interviews were partly audio-recorded and then transcribed verbatim. After creating the transcripts, audio files were deleted. ATLAS.ti was used for coding and analysing emerging de-identified transcripts. The coding was conducted by harnessing a simple form of thematic analysis (Braun & Clarke, 2006). In multiple rounds, codes merged into subcategories. After familiarization with the data, a subsequent open coding analysis was then followed by reviewing emerging themes and finally defining and narrowing the coding. To ensure consistency, the author iteratively read the codes and the transcripts.

### 3 Results

#### 3.1 Statistical Analysis

For an overview of the outcome variable intercorrelations, both for t1 and t2 please see Table 2 and Table 3, respectively. Measures of all dependent variables were normally distributed for all groups, as assessed by the Shapiro-Wilk test ( $p > .05$ ). For t1 engagement with living scores the assumption of the equality of variances, as assessed by Levene's test for equality of variances did not hold at a significance level of  $\alpha = 0.05$  ( $p = .040$ ). For all other outcome measures both at t1 and t2, we found homogeneity of variances as assessed by Levene's test for equality of variances ( $p > .05$ ). There was one extreme outlier present at the beginning of the analyses, as identified with a boxplot assessment. Upon closer inspection of the outliers' data, we had substantial reason to believe that this is a true outlier. Since the outlier was legitimate, it remained in the main analysis. Nevertheless, a separate set of two-way mixed ANOVA analyses of each dependent variable was run to inspect whether removing the outlier would alter the results. Even when the outlier was excluded this did not yield relevant changes regarding the significance of effects, nor did it change the yielding of large main effects, although the magnitude of effects changed marginally.

**Table 2.**

*Nonparametric Correlations (Spearman's rho) for Pre-Measurement Variables*

Variable	1	2	3	4	5	6	7	8
1. well-being	—							
2. stress	-.12	—						
3. anxiety	-.08	.74**	—					
4. depression	-.41	.71**	.74**	—				
5. mindfulness	.17	-.90**	-.80**	-.72**	—			
6. psychological inflexibility	-.42	.66*	.65*	.55	-.70*	—		
7. engaged living	.33	-.61*	-.62*	-.86**	.75**	-.52	—	
8. psychological flexibility	.36	-.78**	-.69*	-.64**	.85**	-.94**	.69*	—

Note. \* $p < .05$ . \*\* $p < .01$ .

**Table 3.**

*Nonparametric Correlations (Spearman's rho) for Post-Measurement Variables*

Variable	1	2	3	4	5	6	7	8
1. well-being	—							
2. stress	.09	—						
3. anxiety	.03	.72**	—					
4. depression	.28	.66*	.47	—				
5. mindfulness	.13	-.38	-.62*	-.59*	—			
6. psychological inflexibility	-.06	.37	.60*	.64*	-.62*	—		
7. engaged living	.16	-.59*	-.39	-.70*	.43	-.68*	—	
8. psychological flexibility	.21	-.50	-.73**	-.39	.57	-.79**	.47	—

Note. \* $p < .05$ . \*\* $p < .01$ .

### 3.2 Demographic Characteristics

The final sample comprised 12 English-speaking international students aged 20 to 32 years ( $M = 23.41$ ;  $SD = 2.93$ ). Participants in the MBSP condition ( $n = 9$ ) were on average 23 years old ( $M = 23.44$ ;  $SD = 3.50$ ) and, similarly, participants in the ACT condition ( $n = 3$ ) were on average 23 years old ( $M = 23.33$ ;  $SD = 1.53$ ). For a detailed overview of the demographic characteristics of the final sample, please inspect Table 4. The table shows that the majority of the participants were female, one-third of the participants were male and one person identified as non-binary. No significant difference between the MBSP and ACT group regarding the demographic characteristics age ( $F(1, 10) = 0.42, p = .532$ ) and gender were observed ( $\chi^2(1, N = 12) = 0.96, e = 1.00$ ).

**Table 4**

*Sociodemographic Characteristics of Participants at Baseline*

Baseline characteristic	MBSP (n = 9)		ACT (n = 3)		Dropout (n = 5)		Final Sample (N = 12)	
	n	%	n	%	n	%	n	%
<b>Gender</b>								
Female	6	66.7	1	33.3	5	100	7	58.3
Male	2	22.2	2	66.7	0	0	4	33.3
Non-Binary	1	11.1	0	0	0	0	1	8.3
<b>Faculty</b>								
Humanities and Social Sciences	1	11.1	2	66.7	0	0	3	25
Business and Economics	3	33.3	0	0	1	20	3	25
Education and Psychology	5	55.6	1	33.3	2	40	6	50
Sports and Health	0	0	0	0	1	20	0	0
Mathematics and Science	0	0	0	0	1	20	0	0
<b>Education</b>								
Degree Student	1	11.1	0	0	2	40	1	8.3
Exchange Student	8	88.8	3	100	3	60	11	91.7

*Note.*  $N = 17$  at Baseline. Participants in the final sample ( $N = 12$ ) were on average 23 years old, and participant age did not significantly differ by condition.

### 3.3 Prevalence of Psychological Distress and Mental Health

At baseline, two-thirds (75 %) of our final sample reported elevated levels of stress ( $n = 6$  for moderate stress i.e., PSS score 14 - 26 and  $n = 3$  high stress PSS-score  $\geq 27$ ). Furthermore, 41 % indicated scores that resemble the presence of mental health problems, here conceptualized as at least moderate anxiety or depression. When comparing pre- to post-test, initially two participants (16.7 %) reported moderate depression as indicated by a PHQ9-score ranging between 10 and 14, whereas at post-test one person (8.3 %) reported moderate depression. At pre-test, three students (25 %) reported at least moderate severity of anxiety ( $n = 1$  moderate anxiety, i.e., GAD-7-scores ranging between 10 and 14;  $n = 2$  severe anxiety i.e., GAD-7-score  $\geq 15$ ). Whereas at post-test two students reported moderate anxiety ( $n = 0$  severe anxiety). Regarding positive mental health, at baseline two-thirds of the final sample (66, 7 %;  $n = 8$ ) reported flourishing mental health, and 8,3 % ( $n = 1$ ) reported languishing mental health, whereas at post-test all participants were flourishing (100 %).

### 3.4 Intervention Feasibility

On average, participants attended 4.7 sessions. In the MBSP group ( $n = 9$ ) 22.2 % reported attending three, 44.5 % attending four, and 33.3 % attending all five sessions and 8.3 % ( $n = 1$ ) dropped out. In the ACT group, of the remaining participants ( $n = 3$ ) 33,3 % attended four and 66,6 % attended all sessions, however throughout the intervention 62.5 % ( $n = 5$ ) dropped out. According to our a priori feasibility criterium for session attendance, this would make MBSP, but not ACT, feasible. Overall satisfaction was rated on a scale from 1 to 10 with 10 indicating the highest satisfaction. In the ACT group, overall satisfaction reported by the remaining participants was slightly higher ( $M = 8.3$ ;  $SD = 2.9$ ) than in the MBSP group ( $M = 7.9$ ;  $SD = 2.6$ ). In a 5-point Likert scale, participants also rated their satisfaction with their accomplishments in the workshop (MBSP:  $M = 4.0$ ;  $SD = 1.2$  & ACT:  $M = 4.7$ ;



$SD = 0.6$ ) and the perceived utility, i.e., helpfulness for the problem that originally motivated them to join the workshop (MBSP:  $M = 4.1$ ;  $SD = 1.7$  & ACT:  $M = 4.3$ ;  $SD = 1.2$ ). Asked about whether participants would recommend the intervention to friends or others 66.7 % in the ACT group would recommend it with some reservations (3) and 33.3 % would highly recommend it (5), whereas in the MBSP group 22.2 % would recommend it with some reservations (3), 22.2 % would recommend it (4) and 55.6 % would highly recommend it (5).

### **3.5 Intervention Effectiveness**

Empirical and qualitative results will be presented in the corresponding sections below.

#### **3.5.1 Empirical Results**

For a first impression of trends, mean scores and effect sizes for both measurement time points in both conditions please see Table 5. The table shows that each outcome parameter changed numerically in the favourable from pre-test to post-test. Failing to reject the null hypotheses  $H_{10a-h}$ , no significant differences were observed when the two interventions were compared. Regarding the anticipated main effect of time ( $H_2$ ) significant changes in anxiety, stress, avoidance and fusion, and well-being were observed which led to rejecting the null hypotheses  $H_{20a; c;d;g}$ . However, changes in depressive symptomatic, mindfulness, psychological flexibility and engaged living were not found, rejecting the null hypotheses  $H_{20b;e;f;h}$ . These findings will be discussed in more detail in the corresponding sections below.

**Table 5**

*Mean and SD of the two conditions at the two time points and main effects.*

Measure	Condition						F(1, 10)	partial $\eta^2$
	Total		MBSP (n = 9)		ACT (n = 3)			
	M	SD	M	SD	M	SD		
Anxiety							8.19*	.45
Pre	7.58	4.62	7.22	5.02	8.67	3.79		
Post	5.08	3.85	5.77	4.15	3.00	2.00		
Depression							0.05	.01
Pre	5.17	3.59	5.56	3.59	4.00	1.73		
Post	4.67	3.34	4.78	3.83	4.33	1.53		
Stress								
Pre	19.42	7.23	19.11	7.88	20.33	6.11	15.50*	.61
Post	13.33	6.65	14.22	7.50	10.67	2.08		
Well-being							9.62*	.49
Pre	46.33	12.81	47.00	10.25	44.33	21.78		
Post	58.83	6.15	58.33	6.96	60.33	3.06		
Mindfulness							3.11	.24
Pre	123.83	25.23	121.89	27.57	129.67	19.86		
Post	134.50	20.61	133.22	23.38	138.33	10.97		
Psychological Flexibility							4.21	.30
Pre	82.50	26.80	84.00	29.74	78.00	19.31		
Post	95.17	25.46	96.89	28.68	90.00	14.93		
Psychological Inflexibility							5.36*	.35
Pre	23.92	13.83	22.11	13.34	29.33	16.80		
Post	17.42	12.63	17.44	14.43	17.33	6.65		
Engaged Living							1.10	.10
Pre	57.25	11.41	55.11	12.57	63.67	1.15		
Post	61.01	13.11	59.78	13.85	65.00	12.12		

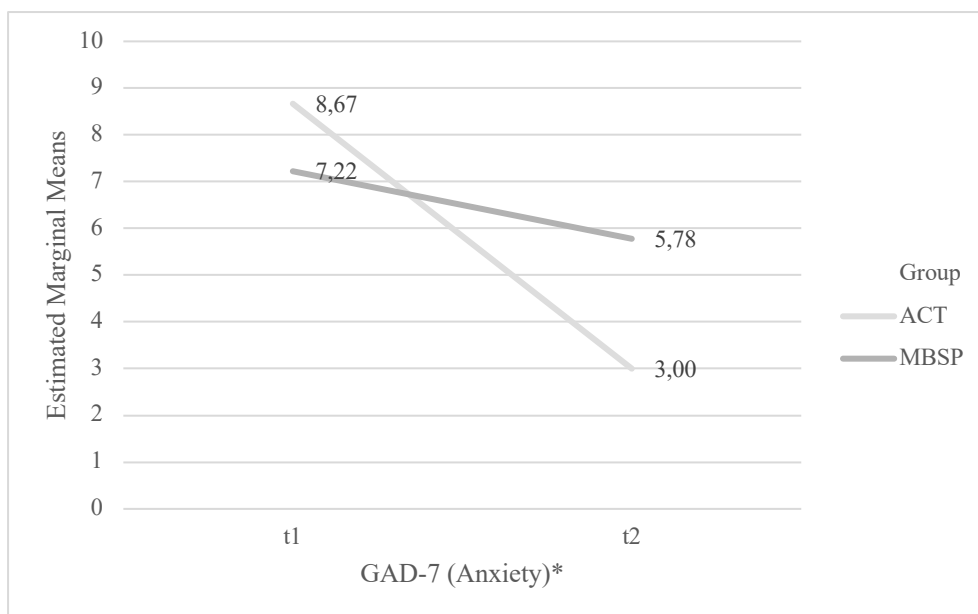
*Note.* \*  $p = .05$  \*\*\*  $p < .01$ . Effect sizes and F-statistics detail the main effect for time.

***Influence of the Intervention on Anxiety***

The results showed that there was no statistically significant interaction between the intervention and time on anxiety, [ $F(1, 10) = 2.89, p = .120, \text{partial } \eta^2 = .22$ ]. No main effect of group [ $F(1, 10) = 0.07, p = .804, \text{partial } \eta^2 = .01$ ] was observed. However, a significant main effect of time on anxiety was observed [ $F(1, 10) = 8.19, p = .017, \text{partial } \eta^2 = .45$ ], which indicates that both the MBSP and ACT condition were effective in decreasing the participants' anxiety levels from t1 to t2.

**Figure 2.**

*Anxiety scores across measurement occasions and treatment conditions*



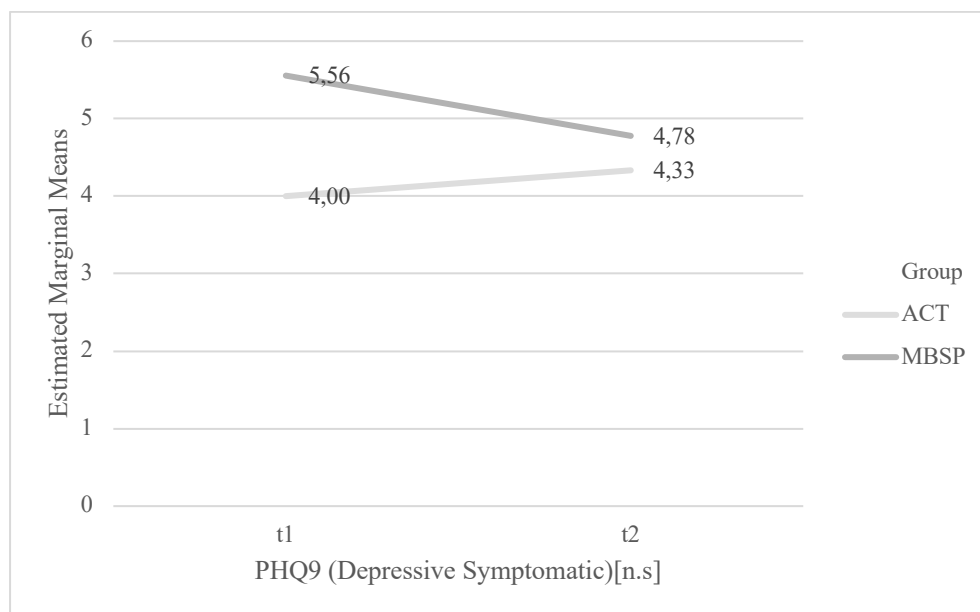
*Note.* n.s = not significant and/or \* $p < .05$  This line chart demonstrates the relationship between time and intervention group on GAD-7 scores. Significance is indicated for the main effect of time on anxiety.

***Influence of the Intervention on Depressive Symptoms***

For depressive symptomatic no significant effects were observed. Neither the interaction [ $F(1, 10) = 0.34, p = .574, \text{partial } \eta^2 = .03$ ] nor the main effects of time [ $F(1, 10) = 0.05, p = .821, \text{partial } \eta^2 = .01$ ] nor the main effect of group [ $F(1, 10) = 0.21, p = .659, \text{partial } \eta^2 = .02$ ] were significant.

**Figure 3.**

*Depression scores across measurement occasions and treatment conditions*



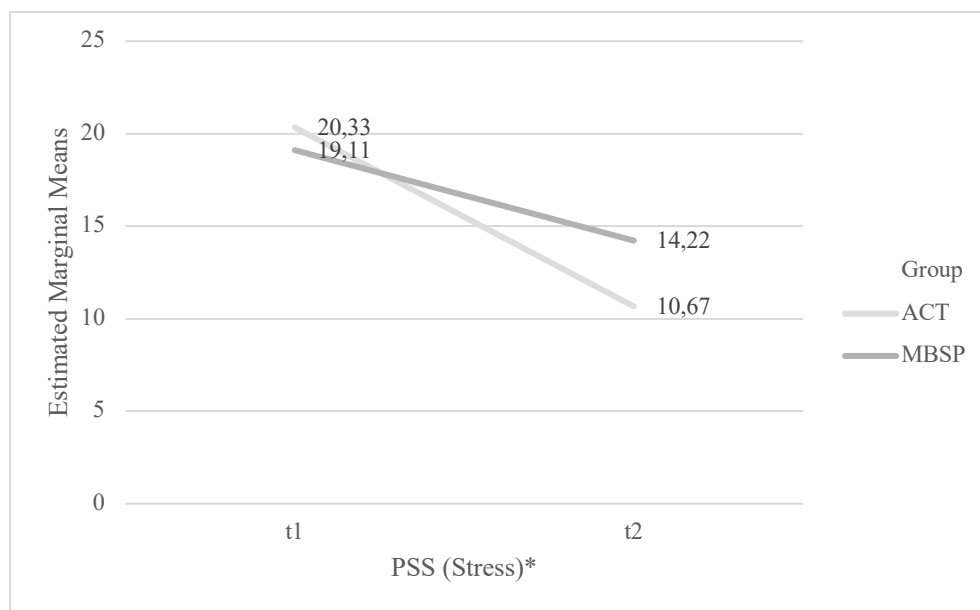
*Note.* n.s = not significant and/or  $*p < .05$  This line chart demonstrates the relationship between time and intervention group on PHQ9 scores. Significance is indicated for the main effect of time on depressive symptomatic.

***Influence of the Intervention on Stress***

No statistically significant interaction between the intervention and time on stress was observed [ $F(1, 10) = 1.67, p = .225, \text{partial } \eta^2 = .14$ ], indicating no significant differences when the two interventions were compared. Also, the main effect of group demonstrated no statistically significant difference in perceived stress scores between intervention groups regardless of time, [ $F(1, 10) = 0.07, p = .797, \text{partial } \eta^2 = .01$ ]. However, a significant main effect of time on stress was observed [ $F(1, 10) = 15.50, p = .003, \text{partial } \eta^2 = .61$ ], which indicates that both the MBSP and ACT condition were effective in decreasing the participants' stress from t1 to t2.

**Figure 4.**

*Stress scores across measurement occasions and treatment conditions*



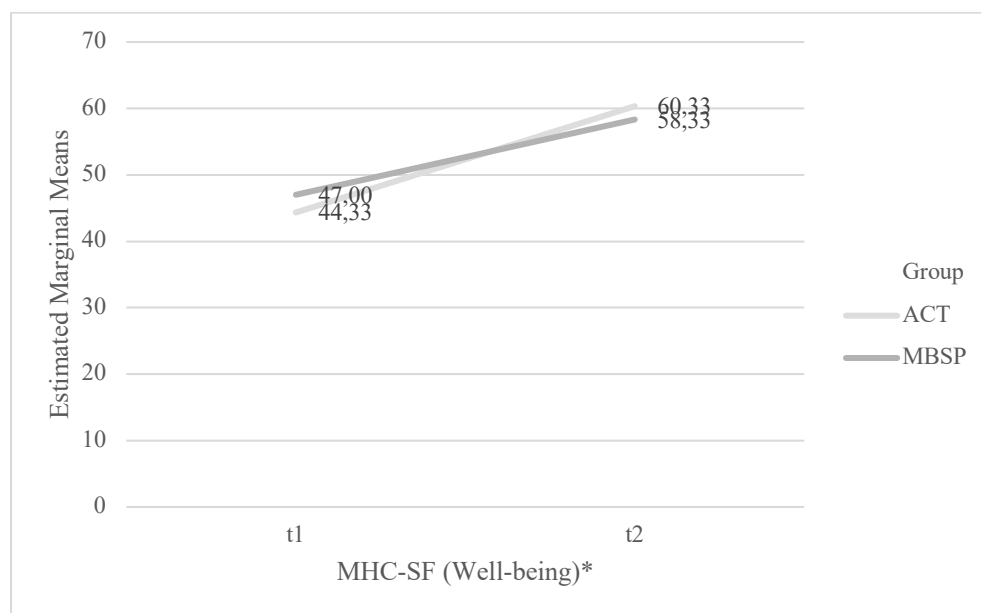
*Note.* n.s = not significant and/or \* $p < .05$  This line chart demonstrates the relationship between time and intervention group on PSS scores. Significance is indicated for the main effect of time on stress.

***Influence of the Intervention on Well-being***

Regarding positive mental health, no significant interaction between intervention group and measurement was observed [ $F(1, 10) = 0.28, p = .608, \text{partial } \eta^2 = .03$ ]. Also, no main effect of group was found [ $F(1, 10) = .004, p = .952, \text{partial } \eta^2 = .00$ ]. A statistically significant effect of time on well-being scores [ $F(1, 10) = 9.62, p = .011, \text{partial } \eta^2 = .49$ ] was observed, which indicates that both MBSP and ACT were effective in increasing participants' well-being across from pre to post test.

**Figure 5.**

*Well-being scores across measurement occasions and treatment conditions*



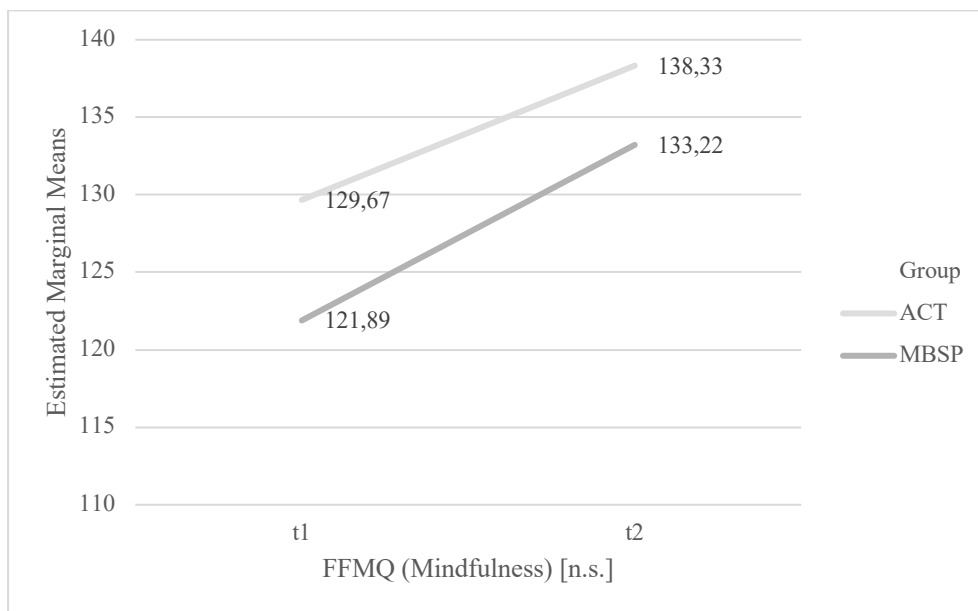
*Note.* n.s = not significant and/or \* $p < .05$  This line chart demonstrates the relationship between time and intervention group on MHC-SF scores. Significance is indicated for the main effect of time on well-being.

***Influence of the Intervention on Mindfulness***

For mindfulness as measured by FFMQ, no interaction effect was observed [ $F(1, 10) = 0.06, p = .819, \text{partial } \eta^2 = .01$ ]. Also, both main effects of group, [ $F(1, 10) = 0.19, p = .675, \text{partial } \eta^2 = .02$ ] and time, [ $F(1, 10) = 3.11, p = .108, \text{partial } \eta^2 = .24$ ] failed to reach significance.

**Figure 6.**

*Mindfulness scores across measurement occasions and treatment conditions*



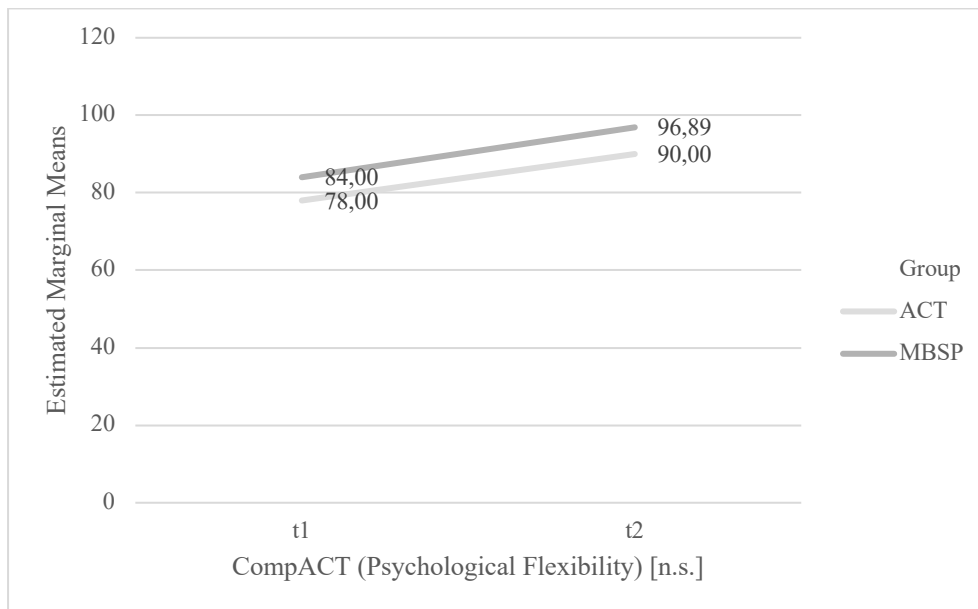
*Note.* n.s = not significant and/or  $*p < .05$  This line chart demonstrates the relationship between time and intervention group on FFMQ scores. Significance is indicated for the main effect of time on mindfulness.

***Influence of the Intervention on Psychological Flexibility***

For psychological flexibility as measured by the CompACT, no statistically relevant interaction effect was found [ $F(1, 10) = 0.01, p = .943, \text{partial } \eta^2 = .0001$ ]. Equally, no significant main effects neither of group, [ $F(1, 10) = 0.14, p = .714, \text{partial } \eta^2 = .01$ ] nor time, [ $F(1, 10) = 4.21, p = .067, \text{partial } \eta^2 = .30$ ] were observed.

**Figure 7.**

*Psychological flexibility scores across measurement occasions and treatment conditions*



*Note.* n.s = not significant and/or  $*p < .05$  This line chart demonstrates the relationship between time and intervention group on CompACT scores. Significance is indicated for the main effect of time on psychological flexibility.

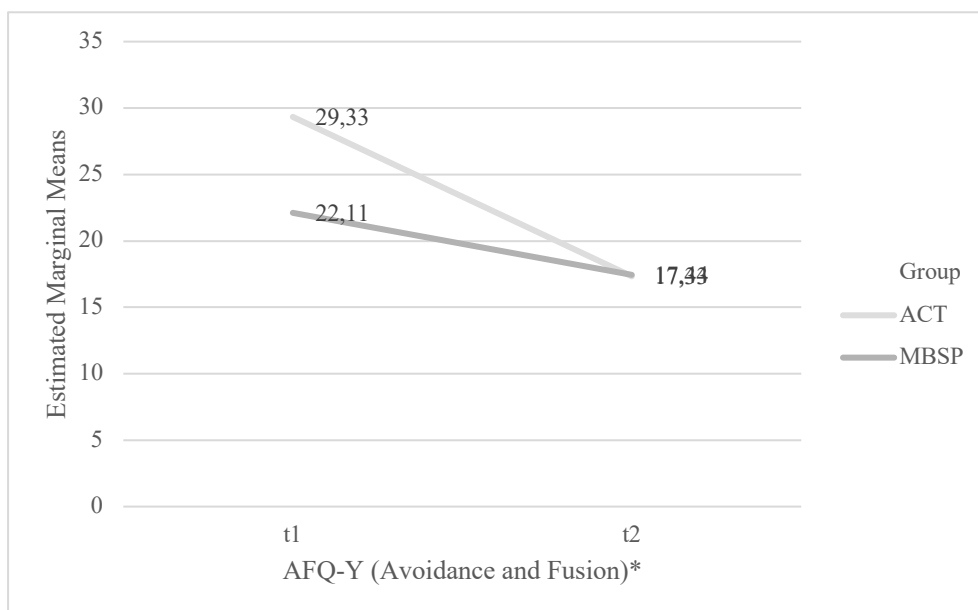


***Influence of the Intervention on Psychological Inflexibility (Avoidance and Fusion)***

For psychological inflexibility, no statistically significant interaction between intervention and time was observed [ $F(1, 10) = 1.04, p = .332, \text{partial } \eta^2 = .09$ ]. The main effect of group demonstrated that there was no significant difference of AFQ-Y scores between intervention groups, [ $F(1, 10) = 0.18, p = .680, \text{partial } \eta^2 = .02$ ]. However, a significant main effect of time on psychological inflexibility was observed, [ $F(1, 10) = 5.36, p = .043, \text{partial } \eta^2 = .35$ ] which indicates that both the MBSP and ACT condition were effective in decreasing the participants' avoidance and fusion from t1 to t2.

**Figure 8.**

*Psychological inflexibility scores across measurement occasions and treatment conditions*



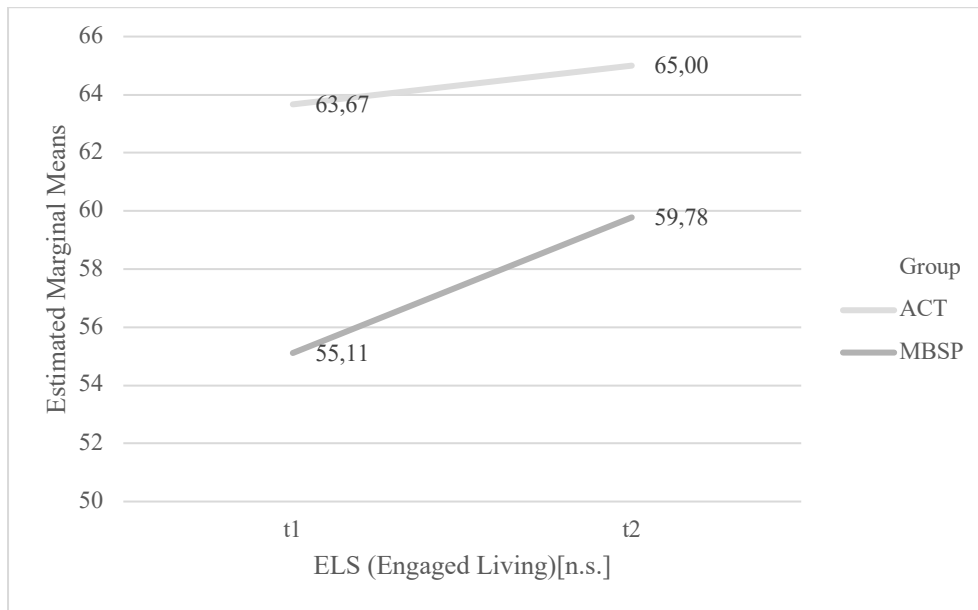
*Note.* n.s = not significant and/or \* $p < .05$  This line chart demonstrates the relationship between time and intervention group on AFQ-Y scores. Significance is indicated for the main effect of time on psychological inflexibility.

***Influence of the Intervention on Engaged Living***

For engaged living, no statistically relevant interaction effect was observed. [ $F(1, 10) = 0.34, p = .573, \text{partial } \eta^2 = .03$ ]. Both main effects of group [ $F(1, 10) = 0.78, p = .397, \text{partial } \eta^2 = .07$ ] and time [ $F(1, 10) = 1.10, p = .318, \text{partial } \eta^2 = .10$ ] did not reach significance.

**Figure 9.**

*Engaged living scores across measurement occasions and treatment conditions*



*Note.* n.s = not significant and/or \* $p < .05$  This line chart demonstrates the relationship between time and intervention group on ELS scores. Significance is indicated for the main effect of time on engaged living.

### 3.5.2 Qualitative Results

Participants (N = 12; MBSP n = 9; ACT n = 3) answered to seven questions about perceived benefits in the yes, no-format. 1) All participants (100%) reported that they had learned one or more strategies to solve or cope with their problems during the intervention. When asked whether they had (2) learned to think more clearly to reduce distressing emotions and behaviours, and (3) strengthened one or more self-management skills, 100 % of the ACT group and 77.8 % of the MBSP group answered with yes. In the ACT group, 66.7 % and 77.8 % in the MBSP group said that they (4) had made an important decision in joining the well-being workshop and (5) that their participation helped to improve their relationship with another person. Improved academic performance (6) was reported by 22 % of MBSP participants and 33.3 % of the ACT participants. Increased self-confidence or self-esteem (7) was reported by 88.9 % of participants in MBSP and 100 % in the ACT group MBSP condition.

All but one participant in the final sample agreed to be interviewed. In the interviews, all participants (N = 11; 100 %) reported at least one perceived benefit (please inspect Table 6). However, not all participants reported perceived changes regarding all of the constructs, no change regarding some outcomes was reported by three (27 %) of our participants. None (0 %) reported negative change or adverse effects, although we did not prompt specifically. While some participants identified the intervention itself as causal to positive change, e.g.:

*“So I felt like that was like I knew that these things exist, but I didn't really like until I experienced it in the workshop, I wouldn't... it was not something that he wanted to implement or that I wanted to spend time on because I didn't like I didn't kind of comprehend the importance, I would say, or like how big of an impact it can have.”*

OK 128

not all participants saw the intervention as solely causal for their positive change. In the ACT control group, two participants attributed their positive change partially to the ERASMUS exchange (n = 1) and psychotherapy (n = 1). In the MBSP group, one participant mentioned that some of the beneficial changes may be not solely caused by participating in the intervention.

Furthermore, unique perceived benefits or different processes were reported in the interviews. For instance, in the ACT group, one participant reported becoming more social, another one more autonomous and the third become more aware of their thoughts as the key insights from the workshop. Similarly, when asked to complete the sentence “Most of all MBSP has helped me to...”, participants’ answers revealed unique and different merits. Four examples are offered:

*“Maybe to really start living. Yes. And find more meaning in life in general.” OK121*

*“live my life.” OK 115*

*“appreciate life.” OK128*

*“have more diverse experience with my body and how to perceive it.” OK125*

Participants in the MBSP group participants reported profiting from mindfulness, e.g.:

*“Maybe make major changes this like thoughts coming up to my mind of being more present in basic activities of my routine.” OK130*

and/or character strengths, e.g.:

*“So we did one of these [questionnaires] and it makes me feel a little bit like empowered. I don't know how to explain that you're happy to see that good things are in me.” OK130*

However, none instantaneously reported the bidirectional endorsement of these two components.

Sporadically, we found self-reported training motivation reported as self-perceived predictor for positive change. An example is offered:

*“Well, I think one thing that needs to be mentioned for sure is that it certainly takes time. So yeah, just definitely time and to be able to work on it at least a couple minutes a day. And unless that dedication is not given, don't I don't think the results are going to be really visible.” OK123*

**Table 6**

*Semi-Structured Interview: Self-reported Benefits of MBSP as compared to ACT*

Dimension	Example Quote(s) MBSP (n = 8)	Example Quote ACT (n = 3)
Authenticity	<p>“I feel like I feel much more in tune with my kind of what I think is my true self. [...] And so I think, like, the workshop helped me kind of get back to myself more.” OK128</p> <p>Maybe I was more my authentic self when I try to express myself instead of like hiding my real thoughts. OK121</p>	<p>“ [...] I understood that I became like, more communicative with people. Mm. I don't know why I thought...I mean...to... I was afraid to come and, like, talk to people. Maybe because they would think of me like badly because they don't know me or they wouldn't talk to me or something.” OK127</p>
Autonomy	<p>“I can be more autonomous and I'm not depending on others.” OK122</p>	<p>It makes me feel really well and capable of doing everything. OK120</p>
Character Strengths	<p>[about one of her signature strengths]</p> <p>“Yeah, I think that that's really helped me and it's been it has increased my happiness a lot. And it was just something that I feel like it has been always in me. I just didn't know about it and I didn't use it. And so this workshop showed me like how. That was great.” OK128</p>	<p>n.a.</p>
Unhooking from Cognition	<p>“That, because the idea you have is not the reality. I mean, it can't change your behaviour.” OK115</p>	<p>“Because I, I because my thoughts tell me this and I know that is something that is not true.” OK117</p>
Life-Management	<p>“I just constantly kept telling myself to take a minute, to breathe, to observe things, and just slowly let them go instead of letting it all rush to my head. And that helped me not only prioritize my day, but also, like, prioritize things in my mind.” OK123</p>	<p>“Maybe when I am stressed out. Hmm. Maybe I thought that the meditation could help me.” OK127</p>
Living Life Fully	<p>“I mean, I learn to live more my life. To be more connected to life.” OK115</p> <p>“More lively, I would say. I would not necessarily say I was dead inside before, but I was...just basically just existing, as I said, and as I've</p>	<p>n.a.</p>

	become more lively, maybe also more attentive.” OK121	
Meaning	“That was the case in the beginning, and then this workshop helped me to like get out of this routine thing. My days were not as monotone as before. I think especially because. I integrated more meaning.” OK121	n.a.
Mindfulness	“Maybe make major changes this like thoughts coming up to my mind of being more present in basic activities of my routine.” OK130	“This was really yes, important for me but also on the exercise of breathing to maybe focus on the...the moment and take a distance from all the thoughts.” Ok120
Relationship to Others	It's definitely increased my appreciation of other people. OK128 “I more observe what is important in another person for me and that I have a stronger relationships with, uh, like strangers again [...].” OK122	“After a month or two, I understood that I became like, more communicative with people.” OK127
Relationship to Self	“In the beginning, I used to. I tend to do things because I hated myself. And I wanted that to change. But change can also come from loving oneself and wanting good for oneself.” OK121	“[...] it helped me to focus on myself and to learn practical, practical skills to to manage my thoughts and to learn about me and to stay in a more aware relationship with myself.”
Self-Actualization	“I develop as a human being.” Ok115	“And yes, it was important because it helped me to focus on myself and to learn practical, practical skills to to manage my thoughts and to learn about me and to stay in a more aware relationship with myself.” Ok120
Self-Care	“And that helped me not only prioritize my day, but also, like, prioritize things in my mind.” OK123	“I am in relation with myself. I'm not in a relation with others. (inaudible). It's important to have a moment to meet with yourself.” OK120
Self-Compassion	“And I just learned to be patient with myself and be kind and gentle with myself constantly.” OK123	“I think so and it helped me with like self-acceptance.” OK127
Self-Worth	“Yeah, I think the more light and maybe more in the present, and	“Will I tell a joke that it's not like funny or stupid or uhm? Yeah. But I

	maybe more proud of myself and more self-confident.” OK115	now, I feel a bit kind of relaxed.” OK127
Sense of Harmony	“Maybe I’m more harmonious” OK121	n.a.
Physical Health	“I have to eat fast because I have to go to do that and then to go to do these and okay, then I understood that that was my moment and also to to feel better physically because if I'm eating so fast, then I have to swallow and all the stomach problem.” OK118	“I think that managing thoughts is really something important because it can change really your life, like the stresses of life and can change you can change your health and also from the thoughts and what you think.” Ok117
Stress	“I was definitely more stressed and probably a bit more worried. Where to go. Now I am not so worried. I would say. Somehow more quiet inside right now.” OK125	“Well, maybe that that makes me calm.” OK127
Well-being	“I feel more responsible for my well-being.” OK122	“Yes, it really helped me a lot during the day because when I yes, I was suffering. Also doing a little things for me really helped me. So I start to searching what to make me feel better.” OK120
Values	“So, it's like having like more value even, or investing the time and energy and reaching out to people.” OK128	And recognize my values and the fact that if I take some decision according to my values, I feel stronger and I feel that I'm doing the right things. Ok120

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Note. For the MBSP condition example quotes are drawn from a broader data set. The small remaining sample size in the ACT control group (n = 3) precludes reliable group comparisons. n.a. = not applicable / not available.



Qualitative data partially substantiated the empirical findings. For an overview of the integrated results please see Table 7.

**Table 7**

*Integrated Results Matrix for the Benefits of the Interventions*

Quantitative Results	Qualitative Results	Example Quote (MBSP)
Reduced stress	Perceived improvements in stress management skills	“And I know that for some classmates or in my group here in the well-being workshop group were stressed in some parts of their daily routines. And that mindfulness changed their life.” OK115
Reduced anxiety	Perceived decreases in worry and anxiety	“And then I was really anxious because I had an exam a presentation at 9. [...] And then I thought: I don't know just sit down and do the meditation. Maybe you know it helps...” OK125
Increased well-being	Perceived increases in well-being and happiness	“Yeah, I think that that's really helped me and it's been it has increased my happiness a lot.” OK128
Decline in depressive symptomatic was not significant	Only one participant specifically mentioned improvements in this domain	“[...] always having a gloomy day. But as the workshop progressed, I think after the second week, as I did look forward to every Wednesday, it was really cool to look forward to that and.” OK123
Changes in engaged, i.e., value-guided living were not significant	Perceived increase in awareness of values	“I feel it's kind of helped me find the courage to like, like a job that I would really like to do and which would make more sense for me to do it.” OK128

Reduced avoidance and fusion (Psychological inflexibility)	Perceived declines in fusion	“That, because the idea you have is not the reality. I mean, it can't change your behaviour.” OK115
No significant changes in mindfulness	Perceived enhancement of mindfulness	“For me, the workshop was really helpful to integrate mindfulness in my everyday life.” OK121
No significant changes in psychological flexibility	Perceived increases in psychological flexibility	“I feel like I could even do like something that would resonate with me more. So I feel it's kind of helped me find the courage to like, like a job that I would really like to do and which would make more sense for me to do it.” OK128

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*Note.* We integrated quantitative data (self-report questionnaires) and qualitative data (interviews with participating students) to provide a more comprehensive description of the perceived effectiveness of the MBSP intervention.

## 4 Discussion

To our knowledge, the present study is the first to empirically compare a five-week adaptation of MBSP to an active ACT-based control group among an international sample in higher education. The present study adds to the existing literature by finding MBSP feasible as a five-session-only adaptation that may be effective in increasing well-being and decreasing stress, anxiety, and psychological inflexibility in international students. In addition, this trial sheds light on a range of perceived benefits for participants of MBSP e.g., authenticity, self-esteem, relationship quality, and self-compassion. In light of the methodological limitations of this trial, it is important to interpret these findings with the outermost caution until they are well-replicated.

### 4.1 Reflection on Feasibility

Our study offers novel insights that five sessions of MBSP are feasible as an intervention when provided to international students. Participants seemed to be overall very satisfied which is reflected in the high ratings, regardless of condition. The criterion of session attendance was only fulfilled by the MBSP intervention because more than 50 % dropped out in the ACT condition. All other feasibility characteristics (overall satisfaction, perceived utility, and satisfaction with accomplishments) were fulfilled by both interventions with marginally higher scores in the ACT group. It should be noted that the overserved mean score differences were slim but consistent. A systematic dropout of dissatisfied students in the ACT group may be an explanation for the observed differences but this could be systematically examined in similar studies.

## **4.2 Reflection on Effectiveness**

In this study, we found empirical evidence that both MBSP and ACT significantly increase well-being and decrease various parameters for mental health problems (stress, anxiety, psychological inflexibility). No significant changes in mindfulness, psychological flexibility, engaged living and depression were observed. We also did not find significant differences in the effectiveness when the MBSP and ACT interventions were compared. As our sample size was small, further investigations with larger sample sizes are essential to unearth potential differences. The unexpected finding of large effect sizes deserves to be discussed in the context of meta-analytic data that establishes small to moderate effect sizes as a reasonable benchmark for MBIs and CSIs (Dawson et al., 2020; Yan et al., 2019). It is therefore likely that the observed large effect sizes are gross overestimates which will rarely be replicated with a large sample (see Funder & Ozer, 2019). Nonetheless, also Monzani and colleagues. (2021) found large effect sizes in an RCT on MBSP. Perhaps, small group sizes allowed for more focused attention on each of the participants or can partially be explained by other contributing factors such as the synergy of the two components of MBSP.

### **4.2.1 Effects on Distress**

In line with a substantial body of evidence demonstrating MBIs' anxiety-decreasing effects (e.g., Dawson et al., 2020; McConville et al., 2017), we observed that both, the MBSP and ACT intervention, reduced anxiety. To our knowledge, this makes our trial the first study associating MBSP with anxiety alleviating effects.

Although MBIs have been argued to be cost-efficient strategies to prevent depressive relapse (Kuyken et al., 2016; Piet & Hougaard, 2011), and MBIs, as well as CBIs, both have been found to alleviate depression (Dawson et al., 2020; Schutte & Malouff, 2019), in the present study we did not observe significant effects on depressive symptomatic. The small

sample size that resulted in low statistical power may explain this disparate finding, however, to date studies examining MBSPs effects on depression are still pending and future research may allow drawing conclusions.

Consistent with the broader evidence base showing the stress alleviating qualities of MBIs (e.g., McConville et al., 2017; Regehr et al., 2013), we observed significant decreases in stress. It is noteworthy, that of all assessed mental health problems, stress was most commonly experienced by participants at baseline and changes in stress scores were most pronounced across the two measurement occasions. We also observed that stress at baseline correlated strongly with indicators of mental health problems (anxiety, depression) and was strongly inversely related to salutogenic variables, i.e., mindfulness, well-being, engaged living, and psychological flexibility. Since it has been previously noted that chronic stress is conducive to the development of mental health problems such as depression, anxiety, eating disorders, substance use, sleeping problems and suicide (Amanvermez et al., 2021), our finding might imply prospective preventative benefits of MBSP.

#### **4.2.2 Salutogenic Effects**

The observed improvement in well-being, align with previous research that found MBSP to increase college student well-being (Wingert et al., 2020) and a recent RCT on MBSP that had shown large effects on both hedonic and eudemonic well-being among employees (Monzani et al., 2021). Transcending the traditional dichotomization of psychopathology and positive mental health, we also observed that both positive mental health and pathology were highly prevalent in our sample, which further supports the two-continua model of mental health (Keyes et al., 2012) i.e., the notion that the absence of mental illness does not equate to the presence of mental well-being (see Ryff & Singer, 1996).

Paradoxically, although arguably the key element of all MBIs may be their mindful, accepting approach (Cavanagh et al., 2014) we did not find significant effects on mindfulness in our empirical analysis. This non-finding, however, is contrasting recent controlled studies that found MBSP increased mindfulness, strengths use, and self-efficacy in students in the UK (Park, 2020) as well as our qualitative data, in which perceived increases in mindfulness were commonly reported.

Interestingly, psychological flexibility and engaged living scores did not change significantly, although psychological inflexibility (avoidance and fusion) decreased significantly. Arguably these concepts might be inversely related, as implied by our correlation matrixes. If so, the change in psychological inflexibility may indicate beneficial effects, because psychological flexibility has been positively associated with greater wellbeing, and found to buffer against anxiety, depression, and COVID-19-related distress (Dawson & Golijani-Moghaddam, 2020).

### **4.3 Reflection on Qualitative Findings**

Our qualitative findings demonstrate that participating in the intervention had perceived benefits for every participant which dovetails with meta-analytic evidence that found MBIs to promote mental health at least 95 per cent of the time, suggesting that for the average student, MBIs are beneficial (Dawson et al., 2020). Furthermore, the vast majority of participants reported participating in MBSP has equipped them with mechanisms and tools to self-soothe, self-manage or manage stress. This is comparable to a recent mixed-methods analysis that found improved stress- and problem management and benefits to well-being (Whelan-Berry & Niemiec, 2021) and a study finding that MBSP participants continued using exercises as tools (Park, 2020). In the present study, all participants reported at least either a more appreciative relationship with themselves or with others. The latter finding

parallels a meta-analysis which found mediative practices to enhance relationship quality (Sedlmeier et al., 2012), as well as the finding that participating in MBSP, led to benefits for sense of identity and self-reported improvements in relationship quality (Whelan-Berry & Niemiec; 2021). The here reported benefits for authenticity are interesting to discuss in light of a review on CSIs that identified authentic self-expression as a mediator for positive change (Ghielen et al., 2017). Furthermore, the vast majority of participants reported increased self-esteem or self-efficacy which has been previously reported as a merit of MBSP as well as CSIs (Park, 2020; Yan et al., 2019). Also, reports on enhanced feelings of purpose and meaning correspond with a recent RCT that found MBSP led to enhanced meaning, well-being, health and engagement among undergraduates (Wingert et al., 2020). That some student participants reported increases in self-compassion is a novel finding in the literature on MBSP, that, currently only, finds support from the broader literature on MBIs (Birnie et al., 2010). Empirical validation of this potential finding in future research on MBSP seems worthwhile. Another interesting question is why in the interviews some participants reported rapid and substantial changes whereas some reported not benefiting as much. One potential explanation could be that more intrinsic motivation for workshop participation might have resulted in an upward spiral of selecting more self-concordant goals, continuous effort and thus higher goal attainment, as it has been pointed out that willingness to actively engage oneself in the practice as a central factor for intervention effectiveness (Whelan-Berry & Niemiec, 2021). Although none of the participants reported adverse effects it is important to note that interviewers did not explicitly prompt for adverse effects or negative change. Thus, systematic exploration should be given to identifying potential counter-indications for participating in MBSP, so that course leaders can provide more attuned support. Lastly, it is interesting that unlike in a larger mixed-methods trial (Whelan-Berry & Niemiec, 2021), MBSP participants in our trial did not spontaneously (unprompted) report benefiting from the

synergy of mindfulness and character strengths, although enhanced mindfulness and strengths use have been separately mentioned. This, however, could be because participants underwent only the first five sessions of MBSP, although the integration of the concepts occurs throughout the entire course with session 6 being about bringing mindfulness to strengths use. This may be an important indicator that MBSP should be kept at the intended length to unfold its full potential.

#### **4.4 Limitations**

Despite the methodological strengths of the mixed methods trial with an active control group along with deliberate efforts to preclude bias, several limitations apply. We did not control for standard care, medication and diagnosis and did not exclude participants who were in ongoing psychotherapy. It is, therefore, possible that we observed carry-over effects. To our knowledge at least two participants reported consulting a therapist while participating in this trial, which may have been a contributing factor to the observed large effect sizes. Furthermore, we cannot exclude random perturbations or possible imitation effects as a result of frequent contact between the intervention and the control group. Information exchange between participants of different groups could not be avoided because they were part of the same exchange student programme, including similar housing areas, shared events and lectures. This is also why it was not possible to blind participants regarding the presence of two conditions. We addressed this concern by asking the participants to fill in the measures truthfully and by informing the participants of the study about the validity-thwarting effects of sharing knowledge and materials of the intervention or imitating the intervention.

Despite our initial effort to make this an RCT, it was not possible to implement the randomization or a matching procedure. Participants' conflicting schedules would have resulted in considerable experimental mortality. Since this trial was embedded within the



campus mental health strategy of the University of Jyväskylä, priority was given to workshop provision of services and accessibility and the randomization was given up. Furthermore, university policies and consideration of resource commitments led to the implementation of a shortened five-session version of MBSP, whereas the ACT-based intervention was kept at the originally intended length. It is therefore important to discuss findings in front of the background of potential noncomparability as MBSP has been developed as an 8-week programme with an optional half-day retreat that follows an inherent logic in which every session and its content is essential. Moreover, since the principal investigator was the leader of the MBSP, social desirability, as well as expectation effects such as the Pygmalion effect and interviewer bias, may have thwarted the construct validity of this trial. Similarly, although the training received by the programme developer was employed to ensure the rigour of the intervention and conducted under supervision by experienced researchers and clinical psychologists, it should be noted, that the researcher implementing the MBSP programme, was a graduate student, with no therapist education. Also, the small sample size may have resulted in not having the necessary statistical power to discover effects and conversely, may have led to overestimated effect sizes.

Despite the deliberate effort to increase adherence and ensure good sample maintenance, a major limitation is a noticeably high dropout in the active control condition. It is possible, that the dropout may have resulted in a selective exit of prognostically unfavourable cases. Relatedly, since participants were informed about the opportunity to participate in this study by means of notices, this may have resulted in the self-selection of favourable and cooperative cases for the trial. Ethical considerations about intervention provision to at-risk populations led to the decision to only allow for a voluntary self-selection procedure for the trial. While harnessing an active control condition typically aims at mitigating concerns of a systematic selection bias, the dropout that occurred specifically in

the active control condition, may have thwarted this potential merit. Finally, regarding the external validity of our study, it is noteworthy that the university setting is a specific environment. Over and beyond this, international students a unique subgroup therein so that findings are faintly generalizable even to other students who may have diverse cultural backgrounds and lifestyles.

#### **4.5 Implications for Practitioners and Future Directions**

Although sporadically, suggestions for future research were discussed at the appropriate points above, the following section serves as a coherent overview. First, within the scope of our resources, we could not conduct this trial with a sufficiently large sample or test whether improvements were maintained. Thus, further large-scale trials, ideally randomized controlled studies that also include a passive control condition and follow-up measures would address these methodological limitations. Also, we employed univariate statistics but future researchers may gain additional precision by harnessing multivariate methods. Second, while MBSP has been adopted and proven effective in the fields of education (Güldal & Satan, 2020; Wingert et al., 2020) and organizations (Monzani et al., 2021; Pang & Ruch, 2019a) as well as in special populations (Khodayarifard et al., 2021; Sharp et al., 2017), research in clinical populations is still pending and thus a promising future direction. Especially in the clinical setting but equally across all institutional domains, active adverse effect monitoring should be incorporated in future study designs. Moreover, systematic exploration could be given to the role of group size in the effectiveness of MBSP and the optimal session duration-response relationship. Another worthwhile research direction would be to explore potential predictors for intervention success as they may lead to enhanced decision-making by practitioners. Third, our sample was predominantly female. To target all groups of students regardless of demographic characteristics, considerations on how

to design advertising of well-being interventions that encourage help-seeking behaviour are worth being explored. Also, in this study, we followed the manual and thus unique social and cultural factors remained largely unaddressed. However, taking those into account may lead to enhanced decision-making and more attuned support. To increase accessibility and enable the more widespread provision, exploring the potential provision of MBSP in a (guided) self-help mode is a worthwhile future direction.

## 5 Conclusion

Taken together, the findings of this trial exemplify that a five-session MBSP intervention is feasible and non-inferior to an ACT-based intervention. Participation in five sessions of MBSP was associated with improvements in anxiety, stress, well-being, and psychological inflexibility for students and MBSP participants reported benefits on a wide range of desired outcomes among them self-worth, self-compassion, authenticity, and relationship quality. Embedded in prior research, the above findings portray MBSP as a low-threshold intervention that helps students to cope with stressors and demands of higher education and is conducive to their mental well-being. Methodological strengths of this trial are the longitudinal design, the active control group, the mixed-methods approach that contributes to a more in depth understanding, and the inclusion of variables that address both dysfunction and positive functioning which leads to a more holistic analysis of the effectiveness of treatments. It is noteworthy that the sample size was low, and the attrition rate was considerably high, especially in the active ACT-control group. These limitations preclude drawing firm conclusions. However, if replicated in larger samples, our research indicates that MBSP may help students to unfold their true potential and thus may play part in moving closer to a society that is composed of thriving members.

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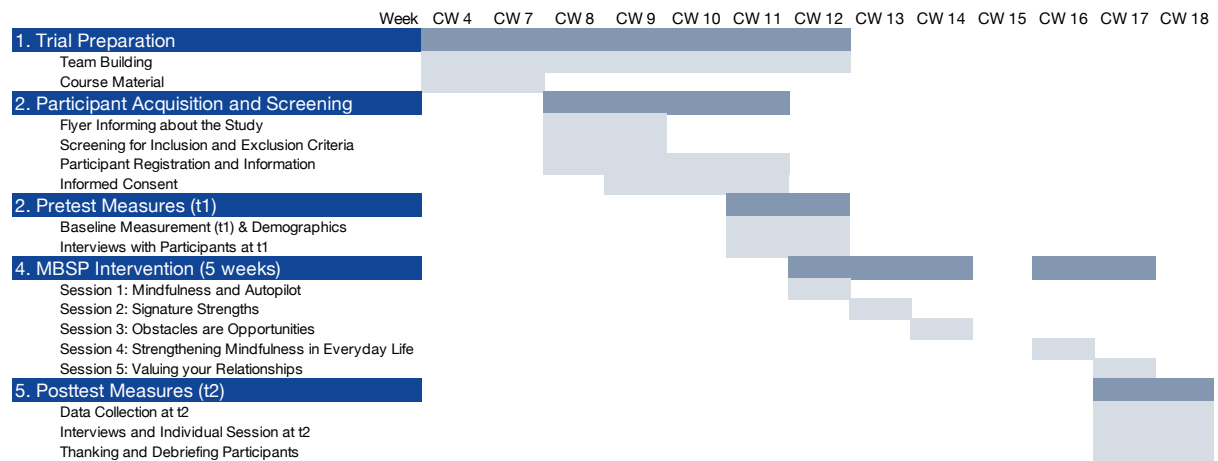
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## 7 Appendix

### Trial Timeline

*Gantt diagram portraying the trial timeline*



*Note.* The abbreviation CW resembles the word calendar week. In CW15 no interventions took place due to the Easter holiday week.

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### **Conflict of Interest and Funding**

None to declare. This thesis was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

### **Declaration of Originality**

I confirm that the submitted thesis is original work and was written by me without further assistance. Appropriate credit has been given where reference has been made to the work of others. The thesis was not examined before, nor has it been published.

### **Example Commendation**

„I think that the workshop gave me many great tools to manage stress (meditations, mindfulness exercises, changing one's perspective etc.). It also helped me realize what are my strengths and how can I use them more effectively which is great! Last but not least, thanks to the workshop, I devoted more time to myself and I think I became more mindful. I am sure I can "work on" on my mindfulness much more and I am eager to explore, but I have already

found a lot of happiness in those little moments. (I would even say that I realized what is happiness thanks to this workshop.) Thank you!“