Current Psychology (2025) 44:14083–14096
https://doi.org/10.1007/s12144-025-08162-7

A benchmarking study of mindful self-compassion and acceptance and commitment therapy for Self-compassion and psychological Well-being

Zahra Azadfar[1] · Imke Baetens[1] · K. Styliani Tsantzalou[1] · L. Castiglione[1] · Martijn Van Heel[1] · Peter Theuns[1]

Accepted: 20 June 2025 / Published online: 15 July 2025

Abstract
Mental health and well-being of university students have significantly declined during the COVID-19 pandemic. Emerging research highlights selfcompassion as a promising, modifiable resilience factor in managing stress and uncertainty. Additionally, Acceptance and Commitment Therapy (ACT) has been suggested to enhance self-compassion. This study investigates the effectiveness of group Mindful Self-Compassion (MSC) and ACT interventions in improving selfcompassion and mental health outcomes among university students. We also examined how ACT and MSC group trainings compare in fostering these outcomes. The sample comprised 73 university students (mean age = 26.89, SD = 6.24), 87.5% of whom were female. Participants in the ACT (n = 24) and MSC (n = 49) groups completed eight 90-minute sessions and were assessed with questionnaires after each session. Results showed significant changes in psychological symptoms, self-compassion, emotion dysregulation and life satisfaction in the MSC group and significant changes in compassion towards others in the ACT group. These results suggest that MSC may be particularly effective in enhancing psychological well-being and self-compassion. The implications for clinical practice and future research directions are discussed.

Keywords Mindful self-compassion · Acceptance and commitment therapy · Psychological wellbeing · Self-compassion · University students · Benchmarking study

Introduction

The outbreak of the COVID-19 pandemic has posed unprecedented challenges to mental health care worldwide (Blendermann et al., 2024). The prevalence of mental health problems has increased significantly (for a review, see Wu et al., 2021). In Belgium, the prevalence of depression and anxiety increased from 9.4% to 11.2% in the pre-pandemic period to 17% and 21.6% during the severe restrictions of the pandemic (Bruggeman et al., 2022).

University students seem to be a particularly vulnerable group to the negative psychological consequences of the pandemic (for a review, see Buizza et al., 2022). Students have faced a number of specific challenges, including the abrupt transition to virtual learning, pervasive physical isolation from friends, educators, and the academic environment, financial strains due to losing student jobs, relocation to parental home, and increased worries about future career prospects (Salimi et al., 2023). This confluence of challenges has taken a toll on their mental well-being, as corroborated by several studies (for a review, see Ebrahim et al., 2022). Their heightened vulnerability can be further elucidated by the fact that individuals who were already struggling with elevated levels of psychological distress before the pandemic were particularly susceptible to the impacts of the lockdown measures (Yao et al., 2020), and university students known to be at an elevated risk for developing mental health problems (Kohls et al., 2021).

These findings underscore the significance of identifying effective treatments to prevent the adverse effects of the pandemic and improve the mental health of university students during this challenging time. Several protective factors have

✉ Imke Baetens
imke.baetens@vub.be

[1] Brussels University Consultation Center (BRUCC), Department of Psychology, Faculty of Psychology & Educational Sciences, Vrije Universiteit Brussel (VUB), Brussels, Belgium

been identified that can mitigate the negative impact of the Covid-19 pandemic on students' mental health, including resilience (Versteeg & Kappe, 2021), growth mindset (Mosanya, 2021), mindfulness, perceived social support (Haliwa et al., 2022), and self-compassion (Karakasidou et al., 2023). The protective role of self-compassion against psychological distress during stressful and challenging life situations has been well established in the previous research (e.g., Ewert et al., 2021). Self-compassion is defined as a warm and benevolent attitude toward oneself, based on self-acceptance, especially during difficult times. This involves three key components: (1) Mindfulness, i.e. maintaining mindful awareness of one's difficult experiences without overidentifying with them; (2) Common humanity, i.e. recognizing the universality of suffering rather than feeling isolated in personal struggles; and (3) Self-kindness, i.e. responding to one's suffering with kindness and care, as opposed to a judgmental approach (Neff, 2003a, b). During challenging times like the COVID-19 pandemic, self-compassion could be a valuable skill that can promote better coping strategies and the regulation of negative emotions such as fear of COVID-19, death anxiety, and depression (Lappalainen et al., 2023).

Consequently, several studies have examined and documented the effectiveness of mindfulness- and compassion-based interventions on promoting self-compassion and associated psychological symptoms during the pandemic. For example, González-García et al. (2021) explored the feasibility of a brief online mindfulness and compassion-based intervention to promote self-compassion and reduce stress and anxiety among first-year university students during the Covid-19 pandemic. They reported significant improvements in these symptoms after the intervention with medium effect size. Villalón et al. (2023) also demonstrated the effectiveness of a brief online mindfulness- and compassion-based inter-care intervention in reducing anxiety and depression symptoms among students in a 3-month follow-up during the pandemic. Moreover, the study by Torres Lancheros et al. (2023) evidenced the efficacy of a brief modified version of the Mindful Self-Compassion (MSC) program (in four group sessions) in improving self-compassion, self-efficacy and mindfulness and reducing depression, stress, rumination and worry in university students during the pandemic.

In addition to compassion-based treatments, Acceptance and Commitment Therapy (ACT; Hayes et al., 2006) has also been shown in several studies to be effective in improving wellbeing and self-compassion (Lappalainen et al., 2023; Ravanbakhsh et al., 2023; Yadavaia et al., 2014) and decreasing internalizing symptoms (O'Dell et al., 2020). Rooted in Relational Frame Theory (RFT), ACT is a contextual behavioral therapy approach that has been shown to enhance outcomes for a variety of mental health problems by increasing psychological flexibility and decreasing psychological inflexibility (Bai et al., 2020). In a randomized controlled trial by Yadavaia et al. (2014), ACT was shown to be effective in improving self-compassion, with a large effect size (1.06) which is comparable to that reported by a compassion-based therapy (1.67; Neff & Germer, 2013). In the Covid-19 pandemic context, Lappalainen et al. (2023) showed the positive impact of an ACT-based program on promoting self-compassion in a randomized controlled ACT trial. Additionally, Ravanbakhsh et al. (2023), using a treatment-control pre-post-follow-up (TCPPF) design in a group of medical staff involved in the Covid-19 pandemic, demonstrated a significant increase in self-compassion among participants in the ACT program compared to the control group.

Although self-compassion is not an explicit target of ACT, it appears to function as a mechanism of change in ACT-based interventions (Carvalho et al., 2022). Interestingly, self-compassion was reported as a robust mediator of outcomes in a trial of ACT (Vowles et al., 2014). A large body of studies have supported the strong positive correlation between psychological flexibility as the main mechanism of change in ACT and self-compassion (e.g., Azadfar et al., 2022; Rolffs et al., 2018). As suggested by Hayes (2008), the roots of self-compassion and compassion emerge from six core processes inherent in the ACT model of psychotherapeutic change (i.e., acceptance, present moment awareness, self as context, defusion, values, and committed action, for more details on ACT and the six core components, see Rolffs et al., 2018) and these processes directly impact self-compassion. Neff's concept of self-compassion is theoretically linked to ACT processes in several ways (Neff & Tirch, 2013). Yadavaia et al. (2014) have described how various processes of ACT are related to the key components of self-compassion: (1) Acceptance of one's painful experiences is essential for fostering self-understanding- a coping skill integral to Neff's concept of self-kindness; (2) From an RFT point of view, fostering such self-understanding entails perspective-taking, which is intricately connected to a sense of common humanity, as it enables individuals to recognize that both themselves and others possess a moment-to-moment perspectives capable of witnessing challenging experiences; and finally (3) Neff's concept of self-compassion and ACT share an emphasis on mindfulness.

MSC directly targets self-compassion by cultivating attitudes of kindness, mindfulness, and shared humanity toward oneself. It encourages individuals to recognize their suffering, respond with self-kindness, and connect to a sense of common humanity to reduce isolation (Neff & Germer, 2013). On the other hand, ACT indirectly promotes

self-compassion through the development of psychological flexibility, encouraging individuals to adopt a compassionate stance toward themselves, not by explicitly focusing on self-compassion, but by reducing experiential avoidance and self-criticism. This process involves defusion from self-critical thoughts, acceptance of one's emotions, and connecting to a larger sense of self that is less influenced by negative self-judgments (Hayes, 2008).

The interplay between Neff's conceptualization of self-compassion and ACT processes highlights the need to clarify the efficacy of ACT in improving self-compassion compared to a compassion-based program. A pilot study by Carvalho et al. (2022) compared a modified version of ACT (COMP.ACT; includes some self-compassion exercises) with a pure ACT intervention in a group of women with chronic pain, where most of the participants did not show significant changes in the self-compassion. Moreover, Mousavi et al. (2021) compared the effectiveness of compassion-focused therapy (CFT) and ACT on self-compassion and quality of life in women with systemic lupus erythematosus. Their results showed that CFT has a greater effect on self-compassion and that there are no significant differences in the effect on quality of life. However, to our knowledge, no research has been conducted to examine the non-inferiority of ACT versus a compassion-based program in improving self-compassion among community sample of university students.

In the current study, we compared ACT with MSC (Neff & Germer, 2013) as a compassion-based intervention. Neff and Germer (2013) developed MSC as a combination of mindfulness and compassion training, with mindfulness serving as the foundational element to promote self-compassion. As described by Germer and Neff (2019), being aware of when we are suffering is a prerequisite for a kind perspective to one's own painful experiences. MSC is an 8-week training program to cultivate self-compassion through the incorporation of meditation practices, group discussions, and experiential exercises. In a randomized controlled trial by Neff and Germer (2013), participants in the MSC program showed increased self-compassion, mindfulness, compassion for others and happiness and reduced depression, anxiety, stress and avoidance compared to the control group. The positive outcomes were also maintained in the 6 months and 1 year follow-up. In the context of the Covid-19 pandemic, several studies have supported the effectiveness of MSC in promoting self-compassion and well-being and reducing psychological symptoms during the pandemic in different populations. However, the effectiveness of MSC in promoting positive outcomes and reducing negative outcomes during the Covid-19 pandemic has not yet been examined in community sample of university students.

Therefore, the present benchmarking study aimed to: 1) examine the effectiveness of MSC and ACT interventions in terms of primary (increase in self-compassion skills) and secondary outcomes (psychological symptoms, subjective well-being, and emotion regulation skills), and 2) investigate whether ACT is non-inferior to MSC on these primary and secondary outcomes, as well as on process variables such as working alliance and adequacy of treatment. The non-inferiority trial design- comparing new treatments with standard active controls has become increasingly popular over the past few decades. The primary objective of a non-inferiority trial design is to demonstrate that the new treatment is not significantly worse than, or is 'non-inferior' to, the active control (Head et al., 2012). This approach is particularly useful for evaluating interventions that offer potential advantages, such as enhanced accessibility and reduced costs, while maintaining comparable efficacy. It is especially relevant to this study, as it enables a direct comparison of MSC and ACT to determine whether ACT provides similar benefits to MSC in enhancing self-compassion and related outcomes.

Methodology

Procedure

An announcement was made on the website of the Brussels University Consultation Centre (BRUCC) and the Study Guidance Center (StudieBegeleidingsCentrum; SBC) at the Vrije Universiteit Brussel (VUB) in Belgium informing students of two free of charge group interventions for those suffering from mental health problems. Students who were experiencing stress, anxiety, depression and/or reporting a lack of self-esteem were invited to sign up for one of the MSC or ACT group interventions via the website of the BRUCC. Student psychologists of the BRUCC and SBC also referred students with high psychological distress directly to the intervention. Both interventions were visible for those students who seek out help and the students were free to choose which intervention they want to follow. An intake followed registration. This allowed us to further investigate if the intervention was suitable for the student and the student's motivation was examined. If the student was excluded from the intervention (see exclusion criteria), the student was informed on other available interventions or trainings. In ACT recruitment, there was an emphasis on behavioural activation (and experiencing depressive/anxious complaints), whereas in recruitment for MSC, the emphasis lay in a negative self-evaluation and coping with self-critique. Inclusion criteria entailed students who were studying at VUB in 2021, and exclusion criteria concerned

students with an acute psychiatric state (e.g., acute suicide risk, psychotic symptoms), severe learning disorder and/or hearing problems. Students who were not able to speak and read in Dutch or English were also excluded.

Interventions

Both interventions followed the protocolized manuals as examined in randomized controlled trial (RCT) studies and have been proven effective. Each intervention group included eight group sessions (eight consecutive weeks), with each intervention including 1.5 h training. Training group sessions were given by two clinical psychologists; one is trained in ACT, and one is specialized in mindfulness and self-compassion.

The MSC training group the MSC training (eight group sessions of 90 min, 8–10 participants per group) included different themes such as mindfulness and self-compassion, working with difficult emotions and gratitude. It consisted of specific formal (e.g., a self-compassion body scan) and informal (e.g. soothing touch) practices. Participants were assigned to do at least one formal and one informal practice during the week between classes. The students used the workbook and audio from Neff & Germer which is available in Dutch (Neff & Germer, 2019) and English (Neff & Germer, 2018).

The ACT training group the ACT training uses acceptance and commitment processes to produce greater psychological flexibility (Hayes & Stroshal, 2004), with the aim of being in the present moment with full awareness and openness to experience and to act guided by values. ACT training (eight group sessions of 90 min, 8–10 participants per group) included six core processes of psychological flexibility such as acceptance, mindfulness, cognitive defusion, self-as-context, values and committed action. It consisted of specific formal (e.g. SMART goals) and informal practices (e.g. metaphors). Handouts were provided for the students during the sessions. For both interventions, to support home practice, an email was sent halfway through the week as a reminder. In total, 16 group training sessions were provided in the year 2021 (8 for ACT and 8 for MSC). Online group training sessions were provided using Microsoft Teams and the data were collected using a secure server (QIT online; www.qitonline.be).

Before the first session, students were given the information sheets and consent forms. A total of eight group sessions were held for the participants of each intervention. After each session, participants were asked to complete a series of questionnaires (see Table 1). Socio-demographic data (i.e., age and gender) were also collected after the first session. The research protocol was approved by the Medical Ethics Committee of UZ Brussels.

Participants

A convenience sample of students ($N=73$) participated in this study (ACT: $n=24$, MSC: $n=49$). The students were between 20 and 50 years old (mean age = 26.89, $SD=6.24$), and most of them were female (87.5%). An overview of the list of questionnaires completed by the participants in each session, and the responses rate in each intervention group can be found in Table 1.

Measures

The Self-Compassion Scale (SCS; Neff, 2003a, b) is a 26-item self-report questionnaire to assess different aspects of self-compassion on a 5-point Likert scale ranging from 1 (*Almost never*) to 5 (*Almost always*). The SCS provides a comprehensive assessment of an individual's self-compassion in six different dimensions, including ***Self-Kindness*** (e.g., "*I try to be loving towards myself when I'm feeling emotional pain*"), ***Self-Judgment*** (e.g., "*When times are*

Table 1 An overview on the questionnaires completed in each session and the response rates for MSC and ACT intervention groups

Session 1	Session 2	Session 3	Session 4	Session 5	Session 6	Session 7	Session 8
OQ-45	WAV-12	OQ-45	WAV-12	OQ-45	WAV-12	OQ-45	OQ-45
SCS		SCS		SCS		SCS	SCS
CS		CS		CS		CS	CS
ACSA		ACSA		ACSA		ACSA	ACSA
PWI							PWI
DERS							DERS
SCBCS							SCBCS
							WAV-12
MSC (Response rate)							
$n=44$ (90%)	$n=32$ (65.3%)	$n=27$ (55.1%)	$n=18$ (36.7%)	$n=25$ (51%)	$n=21$ (42.8%)	$n=21$ (42.8%)	$n=19$ (38.8%)
ACT (Response rate)							
$n=24$ (100%)	$n=15$ (62.5%)	$n=15$ (62.5%)	$n=13$ (54.1%)	$n=13$ (54.1%)	$n=13$ (54.1%)	$n=10$ (41.7%)	$n=9$ (37.5%)

really difficult, *I tend to be tough on myself*"), ***Common Humanity*** (e.g., "*When things are going badly for me*, *I see the difficulties as part of life that everyone goes through*"), ***Isolation*** (e.g., "*When I think about my inadequacies*, *it tends to make me feel more separate and cut off from the rest of the world*"), ***Mindfulness*** (e.g., "*When something upsets me I try to keep my emotions in balance*"), and ***Over-Identified*** (e.g., "*When I'm feeling down I tend to obsess and fixate on everything that's wrong.*"). The items in the Self-judgment, Isolation, and Over-identified dimensions are reverse-coded. Higher scores indicate a higher level of self-compassion. Neff (2003a, b) evidenced satisfactory validity and reliability in a series of studies, with Cronbach's alpha ranging from 0.75 to 0.81 for the subscales. Additionally, its factor structure was verified in 20 international samples (Neff et al., 2019). In the current study, a Cronbach's alpha of 0.95 was obtained for the total score and 0.58 to 0.91 for the subscales (at T1).

The Outcome Questionnaire-45 (OQ-45; Lambert et al., 2004) is a 45-item self-report measure designed to track clients' progress in therapy. It is commonly used in mental health settings to track changes in symptoms and functioning over time and has been shown to be sensitive to changes over short periods of time. The OQ-45 consists of 45 items rated on a 5-point Likert scale from 0 (*Never*) to 4 (*Almost always*) and the total score ranges from 0 to 180, with higher scores indicating a higher level of impaired mental health functioning. The items of the OQ-45 comprise three subscales: ***Symptomatic Distress*** (25 items; e.g., "*I feel no interest in things*") measures the severity of symptoms of the most common psychiatric disorders, ***Interpersonal Relationships*** (11 items; e.g., "*I am concerned about family troubles*") assesses the quality of relationships and social interactions), and ***Social Role*** (9 items; e.g., "*I feel that I am not doing well at work/school*") evaluates the individual's ability to fulfill their social roles and responsibilities). In the Dutch version, the Anxiety and Somatic Distress scales are also distinguished. The OQ-45 has an adequate internal consistency (r=.93) and a three-week test-retest reliability (r=.84). A moderate to high correlation (r=.50 to 0.85) with the most used measures in clinical trials has also shown satisfactory concurrent validity (Lambert et al., 2004). In the current study, a Cronbach's alpha of 0.80 obtained for the total score (at T1).

The Difficulties in Emotion Regulation Scale-36 (DERS-36; Gratz & Roemer, 2004) is a self-report questionnaire designed to assess difficulties individuals may have in regulating their emotions. The DERS-36 contains 36 items on a 5-point Likert scale from 1 (*Almost always*) to 5 (*Almost never*), which measures several dimensions of emotion regulation, including (1) ***Nonacceptance of Emotional Responses*** (e.g., "*When I'm upset*, *I become angry with myself for feeling that way*"), (2) ***Difficulties Engaging in Goal-Directed Behavior*** (e.g., "*When I'm upset*, *I have difficulty getting work done*"), (3) ***Impulse Control Difficulties*** (e.g., "*When I'm upset*, *I become out of control*"), (4) ***Lack of Emotional Awareness*** (e.g., "*I pay attention to how I feel*"), (5) ***Limited Access to Emotion Regulation Strategies*** (e.g., "*When I'm upset*, *I believe that I will remain that way for a long time*"), and (6) ***Lack of Emotional Clarity*** (e.g., "*I have no idea how I am feeling*"). The DERS-36 has adequate validity, good test-retest reliability over 4–8 weeks (r=.88), and high internal consistency with Cronbach's alpha of 0.93 for the total score and 0.80 to 0.89 for the subscales (Gratz & Roemer, 2004). Previous studies with adolescents and young adults reported good to excellent internal consistency for the subscales in both the English and Dutch versions (Baetens et al., 2024; Weinberg & Klonsky, 2009). In the current study, Cronbach's alpha of 0.82 was obtained for the total score (at T1).

The Compassion Scale (CS; Pommier et al., 2020) is a 16-item self-reported questionnaire which assesses compassion towards others based on Neff's theoretical model of self-compassion. The items of the CS are rated on a 5-point Likert scale from 1 (*Almost always*) to 5 (*Almost never*) and covers four dimensions of compassion, including ***Kindness*** (e.g., "*I like to be there for others in times of difficulty*"), ***Common Humanity*** (e.g., "*Everyone feels down sometimes, it is part of being human*"), ***Mindfulness*** (e.g., "*I pay careful attention when other people talk to me*"), and ***Indifference*** (e.g., "*I don't concern myself with other people's problems*"). The factor structure of the CS measure was supported by Pommier et al. (2020) in six diverse samples. In addition, CS has shown adequate discriminant and convergent validity and high internal consistency with Cronbach's alpha of 0.77 to 0.90 for the total score across six samples. In the current study, a Cronbach's alpha of 0.83 was obtained for the total score (at T1).

The Santa Clara Brief Compassion Scale (SCBCS; Hwang et al., 2008) is a brief version of Sprecher and Fehr's compassionate love scale (2005) which is designed to measure compassion towards non-intimate others (e.g., estrangers). The SCBCS is comprised of 5 items rated on a 7-point Likert scale ranging from 1 (*not at all true of me*) to 7 (*very true of me*), where a higher value indicates greater level of compassion toward others. It showed strong correlation (r=.96) with the original version and also excellent internal consistency with a Cronbach's alpha of 0.90. In the current study, a Cronbach's alpha of 0.88 was obtained for the total score (at T1).

The Anamnestic Comparative Self-Anchoring Scale (ACSA; Bernheim & Buyse, 1983) is a single item self-anchoring scale for assessing subjective well-being that uses anchor periods in individuals' personal lives (best and

worst periods in life) as reference points for assessing current levels of happiness. ACSA was originally developed by Bernheim and Buyse (1983) for use in cancer patients settings as a measure that is sensitive to objective changes in the condition of pationts over time. ACSA has also been verifed as a useful measure of subjective well-being in the community samples (Baetens et al., 2022).

The Personal Wellbeing Index-Adults (PWI-A; International Wellbeing Group, 2013) is a measure to assess the cognitive-subjective dimensions of quality of life and is often used in social science research and in national surveys to gauge the overall well-being of individuals. PWI is a self-report questionnaire that asks individuals to evaluate different domains of their life and rate their satisfaction with each domain. The domains commonly assessed in the PWI may include Standard of Living, Health, Achievements in Life, Personal Relationships, Personal Safety, Community Connectedness, and Future Security. Respondents typically rate their satisfaction with each domain on a scale, and the scores for each domain are then combined to provide an overall assessment of personal well-being. The PWI is a versatile tool and has been used in various countries and cultures to measure and compare subjective well-being across different populations. The PWI-A has showed good validity and reliability in the previous studies and the Cronbach's alpha coefficients has been reported in the range of 0.70 to 0.85 (International Wellbeing Group, 2013; Sayler et al., 2015). In the current study, a Cronbach's alpha of 0.87 for the total score (at T1).

The Werkalliantievragenlijst (WAV-12; Stinckens et al., 2009) is a short, adapted and translated (from English to Dutch) version of the Working Alliance Inventory (WAI; Hatcher & Gillaspy, 2006). The WAI is based on Bordin's Working Alliance concept (Bordin, 1979) and serves as a self-report instrument to assess the perceived quality of the working relationship between client and therapist. Widely employed in psychotherapy and various medical domains, it stands as one of the most frequently utilized measures for assessing alliance dynamics (Besley et al., 2011). The client version of the WAV-12 has demonstrated good construct reliability and high internal consistency, as shown by the Cronbach's alpha of 0.82 to 0.85 in the study by Stinckens et al. (2009). In the current study, a Cronbach's alpha of 0.87 for the total score (at T2).

Statistical analysis

In a first step, descriptive statistics (means and standard deviations) were calculated in SPSS 29.0 for all variables at all time points. Before analyzing the data, the Shapiro Wilk test was used to assess its normality. The values of all variables in all time-points in both MSC and ACT intervention groups were normally distributed ($p>.05$), except for subjective well-being at T1 and T7 in the MSC intervention group which were normalized using the fractional rank method. A series of latent growth models (LGMs) were then run using a structural equation modeling (SEM) framework in Mplus 8.8 (Muthen & Muthen, 2017) for variables with at least three time-point measurements (i.e., psychological symptoms, self-compassion, compassion towards others, and working alliance). The SEM framework was preferred over the multilevel modeling framework based on the recommendations of Ledermann and Kenny (2017), who suggested that the SEM framework with Full Information Maximum Likelihood (FIML) is more effective in dealing with missing data and direct estimation of path coefficients for the intercept and slopes.

Since we have a relatively small sample size across five time points (<200) for a complex model, each outcome variable was tested with a separate LGM in the SEM framework rather than as multiple outcomes. In all LGMs, session 1 was defined as the baseline assessment. The latent intercepts indicate the initial status, while the latent slopes represent the rate of change over time. Several model fit indices were assessed for each estimated model, with a CFI (Comparative Fit Index) and TLI (Tucker-Lewis Index) greater than 0.90 and a non-significant χ^2 value considered an acceptable model fit. To investigate whether the intercepts and slopes differed between the two intervention groups (i.e. MSC and ACT), we performed a Wald test using the model test in Mplus 8.8.

As LGMs are only suitable for variables with at least three measurements over time, a series of Mixed Models in SPSS were conducted to examine the effect of time and the interaction effect of time and group for the variables with only pre-test and post-test measurements (i.e. emotion dysregulation, life satisfaction and compassion towards strangers). The data for subjective well-being was also analyzed using Mixed models, because this variable did not show a satisfactory model fit in LGMs. Mixed models have several advantages over repeated measures ANOVA, including better handling of missing values and the ability to estimate both fixed and random effects (Fitzmaurice et al., 2012). Statistical significance was set at 0.05 for all analyses.

Results

Preliminary analyses

The descriptive statistics of the primary and secondary outcome variables across all time points are shown in Table 2. The results showed a decreasing trend in psychological symptoms and emotion dysregulation and an increasing

Table 2 Means and standard deviations of the primary and secondary outcomes over time across two groups

		MSC (n = 49)							
		Session 1	Session 2	Session 3	Session 4	Session 5	Session 6	Session 7	Session 8
Primary outcomes	Psychological symptoms	72.21 (18.52)		68.35 (24.36)		63.6 (23.49)		59.24 (26.39)	57.67 (25.01)
	Self-compassion	71.86 (24.56)		81.26 (23.86)		89.28 (25.13)		99.24 (31.09)	104.89 (26.94)
	Compassion toward others	89.39 (11.12)		88.37 (12.84)		88.8 (12.33)		88.25 (16.51)	89.44 (14.71)
	Subjective well-being	5.49 (3.19)		5.69 (1.62)		5.75 (1.42)		6.53 (1.93)	6.72 (1.64)
Secondary outcomes	Emotion Dysregulation	102.29 (23.45)							85.17 (23.99)
	Compassion towards strangers	27.17 (5.3)							23.88 (7.07)
	Life satisfaction	60.42 (13.19)							65.72 (12.96)
	Working alliance		44.66 (7.56)		44.89 (7.62)		45.38 (7.64)		47.5 (6.59)
		ACT (n = 24)							
		Session 1	Session 2	Session 3	Session 4	Session 5	Session 6	Session 7	Session 8
Primary outcomes	Psychological symptoms	71.00 (22.64)		67.67 (27.21)		69.38 (23.52)		66.4 (28.19)	53.88 (21.32)
	Self-compassion	74.22 (26.56)		75.13 (29.82)		89.77 (34.27)		100.2 (38.62)	108.89 (33.16)
	Compassion toward others	82.39 (10.58)		87.33 (11.44)		87.46 (11.66)		90.9 (10.71)	91.88 (7.41)
	Subjective well-being	4.39 (2.92)		7.07 (8.15)		4.46 (1.85)		5.38 (2.67)	4.14 (2.41)
Secondary outcomes	Emotion Dysregulation	98.23 (26.09)							79.33 (16.33)
	Compassion towards strangers	24.87 (6.31)							28.00 (3.5)
	Life satisfaction	55.96 (18.11)							64.88 (19.35)
	Working alliance		42.07 (7.22)		45.77 (4.13)		44.46 (7.04)		45.71 (7.39)

trend in self-compassion, compassion for others, subjective well-being, life satisfaction and working alliance over time in both MSC and ACT groups. An increase in compassion towards strangers was only observed in the ACT intervention group.

Multigroup linear growth models

The effectiveness of MSC and ACT in primary and secondary outcomes

Separate linear LGMs for psychological symptoms, self-compassion, compassion towards others (primary outcomes) and working alliance (secondary outcome) were estimated separately in both the MSC and ACT groups. The goodness-of-fit indices showed satisfactory models fit for all linear LGMs, with CFI and TLI≥0.90 and non-significant χ^2 values.

The results of the linear multigroup LGMs are shown in Table 3. In the MSC intervention group, results showed significant changes in psychological symptoms (slope = −0.92, p<.001) and self-compassion (slope=1.54, p<.001) over time. The slope and intercept were not significantly correlated for either psychological symptoms (r=.04, p=.878) or self-compassion (r=−.11, p=.69), suggesting that baseline status (session 1 assessment) was not related to rate of change. The variance of the intercept showed significant differences in baseline status between participants within the MCS intervention group for both psychological symptoms (intercept=3.85, p<.001) and self-compassion (intercept=3.73, p<.001). Both the intercept variance and the slope variance were statistically significant (p<.01), indicating variations in baseline and rate of change in psychological symptoms and self-compassion. However, the results showed no significant changes in compassion towards others (slope=0.44, p=.457) and working alliance (slope=0.46, p=.236) over time. Intercept values showed significant differences in baseline status between participants within the MCS intervention group for both compassion towards others (intercept=8.81, p<.001) and working alliance (intercept=6.90, p<.001). The slope and intercept were not significantly correlated for either compassion towards others (r=.38,

Table 3 Multigroup Linear LGMs results for changes over time in primary and secondary outcomes in MSC and ACT intervention groups

	MSC Intervention Group			
	Psychological symptoms	Self-compassion	Compassion towards others	Working alliance
Intercept (I)				
M (S.E.)	3.85 (0.43)	3.73 (0.58)	8.81 (1.2)	6.9 (1.16)
t	8.93**	6.38**	7.34**	5.93**
Variances[a] (S.E.)	360.03 (76.23)	386.15 (116.01)	102.87 (27.79)	41.54 (13.82)
t	4.72**	3.33**	3.7**	3.01**
Slope (S)				
M (S.E.)	−0.92 (0.27)	1.54 (0.46)	0.44 (0.59)	0.46 (0.39)
t	−3.43**	3.36**	0.74	1.18
Variances (S.E.)	14.66 (5.59)	20.66 (10.11)	1.51 (2.71)	2.59 (2.5)
t	2.62**	2.04*	0.56	1.03
I-S Covariance	0.04	−0.11	0.38	−0.38
	ACT Intervention Group			
Intercept (I)				
M (S.E.)	3.71 (0.83)	3.19 (0.58)	10.26 (2.39)	10.36 (2.47)
t	4.49**	5.52**	4.29**	4.19**
Variances (S.E.)	354.51 (150.442.36)	563.003 (186.72)	65.69 (30.4)	18.55 (9.02)
t	2.36*	3.01**	2.16*	2.06*
Slope (S)				
M (S.E.)	−0.88 (1.49)	0.16 (0.32)	0.63 (0.21)	0.09 (0.18)
t	−0.59	0.5	3.01**	0.48
Variances (S.E.)	3.14 (9.53)	55.84 (20.56)	9.63 (3.17)	22.25 (12.95)
t	0.33	2.71**	3.03**	1.72
I-S Covariance	0.25	−0.04	−0.70**	−0.59*

Note. ** t-value is significant at the 0.01 level, * t-value is significant at the 0.05 level, [a] = unstandardized variances

p=.597) or working alliance (r=−.38, p=.273), suggesting that baseline status (session 1 assessment) was not related to rate of change.

In the ACT intervention group, significant changes over time were found only for compassion towards others (slope=0.63, p<.01), while changes over time were not significant for psychological symptoms (slope = −0.88, p=.555), self-compassion (slope=0.16, p=.615), and working alliance (slope=0.09, p=.634). The slope variance of compassion towards others was also significant (σ^2=9.63, p<.01). Although the mean slope values for self-compassion showed no significant changes over time (slope=0.16, p=.615), we observed a statistically significant slope variance for this variable (σ^2=55.84, p<.01). The intercept values showed significant differences in baseline status between participants within the ACT intervention group for all variables (p<.001). The intercept variance was also significant for all variables (p<.05). In addition, results showed a significant correlation between slope and intercept for compassion toward others (r=−.70, p<.001) and working alliance (r=−.59, p<05), suggesting that participants' scores at baseline were negatively correlated with their rate of change over time. Participants with lower scores on compassion toward others and working alliance showed higher rates of change over time. The slope and intercept were not significantly correlated for either psychological symptoms (r=.25, p=.832) or self-compassion (r=−.04, p=.849), suggesting that baseline condition was not related to rate of change (See Table 3; Fig. 1).

Group comparison

The results of the Wald test showed no significant differences between the MSC and ACT intervention groups in terms of intercept and slope for psychological symptoms (W=2.86, df=4, p=.582), self-compassion (W=6.66, df=4, p=.155) and working alliance (W=6.85, df=4, p=.144). However, statistically significant differences were found between the MSC and ACT intervention groups in terms of the intercept and the slope of compassion towards others (W=12.44, df=4, p<.05). Participants in the ACT intervention group showed more variation in baseline scores and in changes over time in compassion towards others (See Fig. 1).

Mixed model anova's

The effectiveness of MSC and ACT in emotion dysregulation, life satisfaction and subjective well-being

The results of the mixed models for the effect of time and the interaction effect of time and group for emotion dysregulation, life satisfaction and subjective well-being are presented in Table 4. The results show significant changes over time for emotion dysregulation in the total sample (p<.01). The effect of time for life satisfaction and subjective well-being is also marginally significant (p<.10). However, no significant changes over time were observed for compassion towards strangers (p=.764). Furthermore, the interaction effect of time and group was not significant for all the variables (p>.05), indicating that there are no group differences in the changes over time between participants in the MSC and ACT intervention groups.

To examine the effect of time in each intervention group, a series of mixed models were performed separately for the MSC and ACT intervention groups. In the MSC intervention group, the results showed significant changes in the

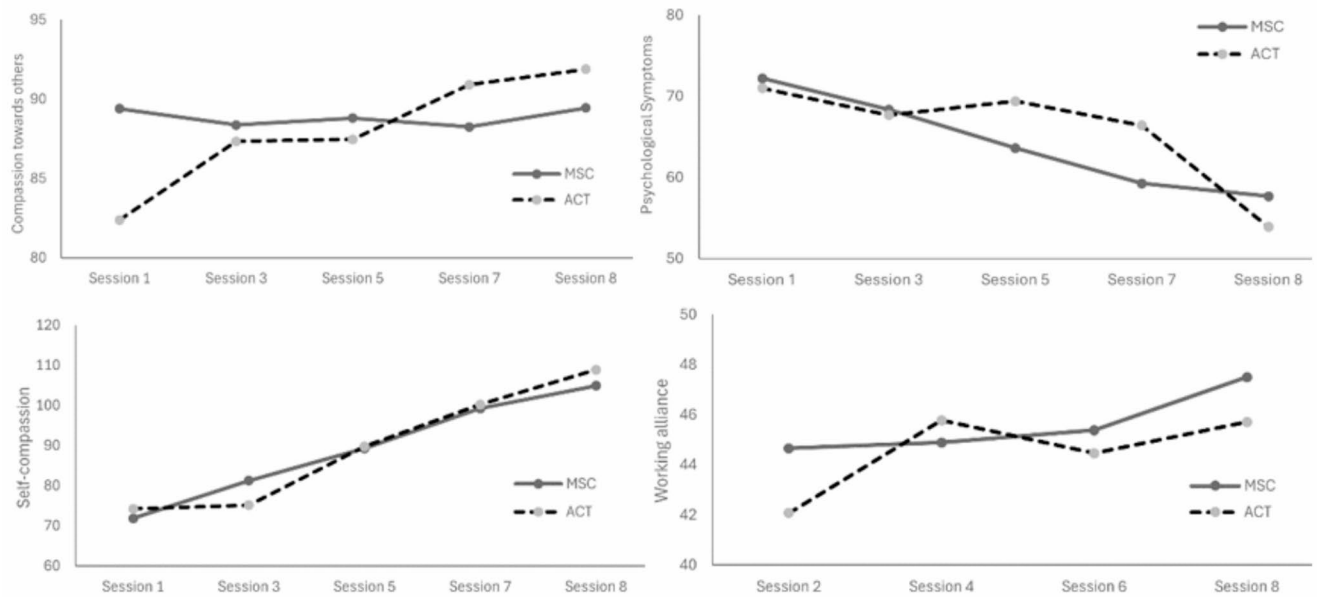

Fig. 1 Changes over time in psychological symptoms, self-compassion, compassion towards others and working alliance in MSC and ACT intervention groups

Table 4 The effect of time and the interaction effect of time and group on emotion dysregulation, compassion towards strangers, life satisfaction and subjective well-being

Source	Emotion dysregulation		Compassion towards strangers		Life satisfaction		Subjective well-being	
	df	F	df	F	df	F	df	F
Intercept	76.81	742.7***	76.28	1096.3***	76.21	912.1***	63.19	326.8***
Therapy	76.81	0.198	76.28	0.166	76.21	2.38	63.19	2.56
Time	33.07	8.69**	29.65	0.092	32.12	3.34	146.5	2.11
Therapy*Time	33.07	0.040	29.65	2.55	32.12	0.465	146.5	2.72

Note. *** significant at the 0.001 level, ** significant at the 0.01 level, * significant at the 0.05 level

mean score of emotion dysregulation ($F=8.73$, $p<.01$) and life satisfaction ($F=8.35$, $p<.01$) but no significant changes in the mean score of compassion towards strangers ($F=2.85$, $p=.106$) and subjective well-being ($F=1.70$, $p=.158$) over time. In the ACT intervention group, no statistically significant effect of time was found for emotion dysregulation ($F=3.81$, $p=104$), life satisfaction ($F=0.445$, $p=.519$), compassion towards strangers ($F=1.75$, $p=.195$) and subjective well-being ($F=1.40$, $p=.248$) (see Fig. 2).

Discussion

This study aimed to compare the effectiveness of two therapeutic interventions (i.e., MSC and ACT) on primary (self-compassion) and secondary outcomes (psychological symptoms, subjective well-being, life satisfactions, emotion regulation and working alliance). The analysis involved LGMs and Mixed Models to assess changes over time in these variables. The results revealed nuanced differences and similarities between the two intervention groups, straighten out their respective therapeutic impacts.

Significant improvements were observed in psychological symptoms and self-compassion within the MSC group over time. The negative slope for psychological symptoms and the positive slope for self-compassion in the MSC group indicate that participants experienced a consistent reduction in psychological symptoms and a marked increase in compassion throughout the intervention. These findings are consistent with previous literature that highlights the effectiveness of MSC in reducing psychological distress and enhancing self-compassion (Neff & Germer, 2013; Baer et al., 2012). In contrast, the ACT intervention did not lead to significant changes in psychological symptoms or self-compassion, suggesting that ACT may not have had the same immediate impact on these variables as MSC. Although ACT has been shown to be effective in improving psychological flexibility and reducing symptoms of depression and anxiety (Hayes et al., 2006), it may require a longer period to manifest noticeable changes in self-compassion and psychological symptoms compared to MSC, which specifically

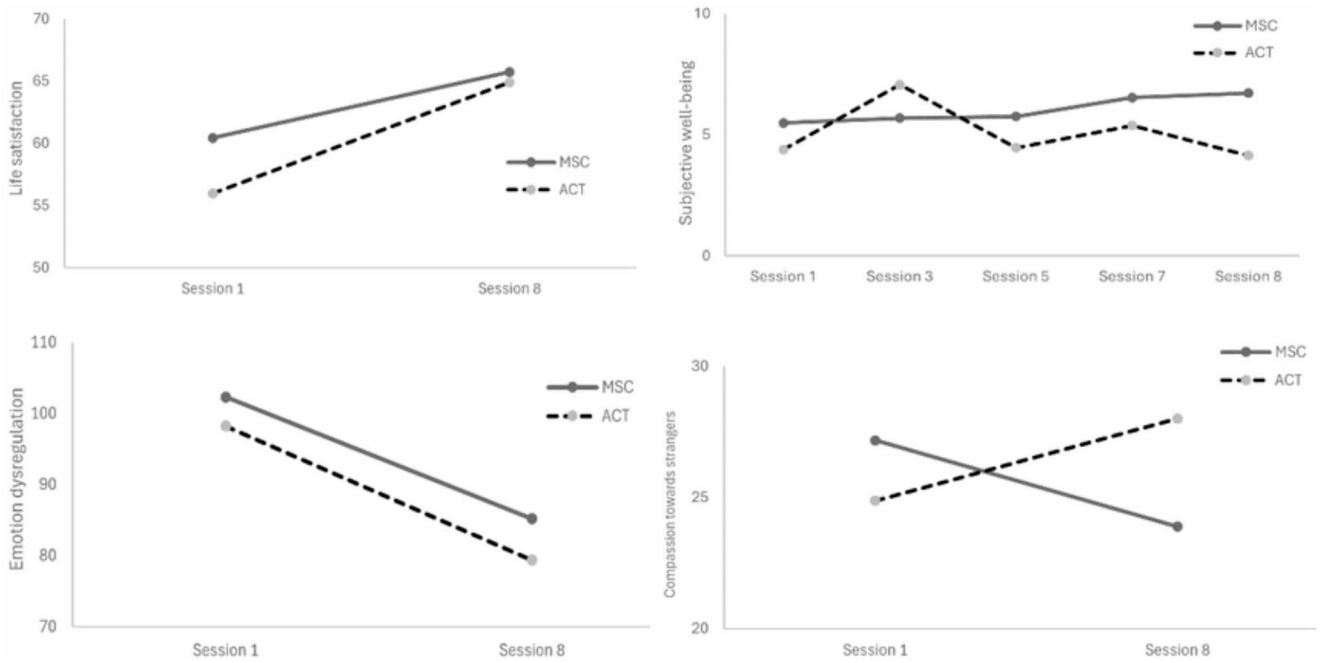

Fig. 2 Changes over time in emotion dysregulation, compassion towards strangers, life satisfaction and subjective well-being

targets self-compassion as a core element of its therapeutic approach.

Interestingly, compassion towards others increased significantly only in the ACT group. This result aligns with the principles of ACT, which emphasize psychological flexibility and a value-driven life, potentially fostering a greater orientation towards prosocial behavior (Hayes et al., 2011). The correlation between the intercept and slope for compassion towards others in the ACT group also suggests that participants with lower baseline levels of compassion exhibited more pronounced improvements over time. This finding could indicate that individuals starting with lower levels of compassion are more receptive to the behavioral activation and values-based orientation encouraged in ACT, leading to a greater capacity to engage in compassionate actions towards others. However, in the MSC group, no significant changes were observed in compassion towards others. This result contrasts with some expectations, as MSC emphasizes compassion both towards oneself and others. However, it is possible that the focus on self-compassion during the intervention may have led participants to prioritize internal emotional regulation over outward expressions of compassion, at least during the time frame of the study. On the other hand, participants in the MSC group demonstrated higher baseline levels of compassion toward others. This is a common trend in MSC training, as individuals who show high compassion for others often seek to cultivate more self-compassion, reflecting a need to direct their compassion inward (Neff & Germer, 2013).

The results revealed improvements in working alliance in both intervention groups, although the changes were not statistically significant over time. This suggests that both MSC and ACT fostered stable therapeutic alliances, which is critical for the success of any therapeutic intervention (Horvath et al., 2011). The lack of significant change in working alliance over time could be attributed to the fact that both interventions emphasize collaborative engagement with the therapist from the beginning, and thus working alliance may reach an optimal level early in the treatment process, with little room for further improvement.

In the MSC group, significant reductions in emotion dysregulation were observed over time. This aligns with the central tenets of MSC, which teaches individuals to manage difficult emotions through mindfulness and self-compassion (Neff & Germer, 2013). The improvement in life satisfaction in the MSC group further supports the efficacy of this intervention in enhancing overall well-being. In contrast, the ACT group did not show significant changes in emotion dysregulation, life satisfaction, or subjective well-being. Although ACT emphasizes acceptance of negative emotions and commitment to personal values, the lack of significant improvements in these areas may suggest that ACT participants required more time to integrate these skills into their everyday routine. Furthermore, the variability in baseline scores for these outcomes in the ACT group, as indicated by the significant intercept variances, might suggest important individual differences that confound potential outcomes of the treatment.

Interestingly, no significant changes over time were observed for compassion towards strangers in either intervention group. Compassion towards strangers may be a more complex and situationally dependent construct, requiring specific interventions that directly target prosocial behavior in novel contexts. Both MSC and ACT primarily focus on the individual's internal processes—self-compassion in the case of MSC and psychological flexibility in ACT—which may explain why changes in compassion towards strangers were minimal.

To examine the benchmarking of MSC with ACT, the results of the Wald test revealed no significant differences between the MSC and ACT groups in terms of intercepts and slopes for psychological symptoms, self-compassion, and working alliance, indicating that both interventions were similarly effective in maintaining these outcomes over time. However, significant group differences were observed in their compassion towards others, with participants in the ACT group showing greater improvements. This reinforces the notion that ACT may be particularly effective in fostering compassion towards others, possibly through its emphasis on behavioral activation and value-driven action.

These findings have important implications for the differential application of MSC and ACT. While MSC may be more effective in improving self-compassion and reducing psychological symptoms, ACT may be more suitable for individuals seeking to enhance their compassion towards others and engage in prosocial behavior. Clinicians may therefore consider tailoring these interventions to the specific needs of their clients, depending on whether the therapeutic goal is more focused on internal emotional regulation or outward behavioral change. The finding that ACT did not show inferior outcomes compared to MSC suggests that ACT can be a viable alternative to MSC, offering similar benefits without any clear disadvantage. This is particularly relevant for clinicians and individuals who may prefer ACT's focus on psychological flexibility and value-based actions. The non-inferiority of ACT implies that it may serve as an equally effective option for those seeking interventions targeting psychological symptoms and self-compassion.

Potential long-term effects of MSC and ACT

While the present study focuses on outcomes within a relatively short-term period (8 weeks), it is important to acknowledge the potential long-term benefits of both interventions. MSC fosters self-kindness and mindfulness, which may lead to sustained improvements in resilience and psychological well-being over time. Although follow-up data in existing research are limited, studies suggest that improvements in self-compassion endure beyond the intervention period, with evidence indicating lasting effects on well-being and reduced depression symptoms (Shapira & Mongrain, 2010; Neff & Germer, 2013). Helping individuals develop a kinder, more self-compassionate response to distress, even in brief interventions, seems to be a skill that can extend to long-term well-being and result in lasting improvements in self-compassion (Ferrari et al., 2019). Neff and Germer's (2013) 8-week MSC program found that well-being benefits persisted for at least one year. Similarly, ACT enhances psychological flexibility, which has been linked to long-term reductions in psychological distress and greater life satisfaction (Ruiz, 2010). These findings support the idea that teaching self-compassion and psychological flexibility can have a lasting impact on mental health.

Study limitations

Several limitations of the study should be acknowledged. First, the sample size was relatively small, particularly for the ACT group. Although the findings may be generalizable to broader populations, particularly in similar demographic groups or contexts, the generalizability could be influenced by factors such as cultural, socioeconomic, and clinical diversity. Future research with larger and more diverse samples would be valuable to validate these findings and examine their applicability across different populations. Second, the study relied on self-report measures, which are subject to social desirability and response biases. Incorporating objective behavioral measures or third-party assessments could provide a more comprehensive understanding of how these interventions influence compassion and well-being. Additionally, the study utilized a convenience sample rather than a random sample, which may limit the generalizability of the findings to broader populations. Lastly, the relatively short time frame of the study may not have been sufficient to capture the long-term effects of both interventions. Longitudinal follow-up studies are needed to assess whether the observed changes in self-compassion, compassion towards others, and psychological symptoms are sustained over time and whether additional improvements emerge as participants continue to apply the skills learned in MSC and ACT.

Conclusion

This study provides valuable insights into the differential effects of MSC and ACT on various psychological outcomes. Although MSC proved more effective in reducing psychological symptoms and increasing self-compassion, ACT demonstrated benefits in promoting compassion toward others. Both interventions contributed to improvements in working alliance, emotion dysregulation, and life satisfaction. These findings underscore the importance of

considering the specific therapeutic targets of each intervention when selecting the most appropriate treatment for individuals seeking to improve their psychological well-being. Future research should aim to replicate these findings and further explore the mechanisms underlying the differential effects of MSC and ACT.

Acknowledgements The research team extends their sincere gratitude to the participants involved in this study. We would also like to thank the college administration and staff for their invaluable support in facilitating the interventions.

Author contributions I.B., L.C., Z.A., and P.T. conceptualized the project. The methodology was developed by I.B., L.C., Z.A., P.T., and M.V.H. Z.A. conducted the formal analysis. The investigation was carried out by I.B. and L.C. Resources were provided by I.B., L.C., and P.T. Z.A. and K.S. curated the data. Z.A. and K.S. wrote the original draft of the manuscript, and all authors—Z.A., K.S., I.B., L.C., M.V.H., and P.T.—contributed to the review and editing. Z.A. prepared the visualizations. I.B., M.V.H., and P.T. supervised the project. Project administration was handled by I.B., Z.A., and L.C.

1. Medical Department, Aristotle University of Thessaloniki (AUTH), Thessaloniki, Greece.

Funding This research received no external funding.

Data availability Data can be made available upon reasonable request to the corresponding author.

Declarations

Conflict of interest No potential conflict of interest was reported by the author(s).

References

Azadfar, Z., Abdollahi, A., Patra, I., Chang, Y. P., Alghazali, T., & Talib, S. G. (2022). *The Iranian form of psychometric properties of the multidimensional psychological flexibility inventory* (Vol. 35, p. 32). Reflexão e Crítica.

Baer, R. A., Lykins, E. L., & Peters, J. R. (2012). Mindfulness and self-compassion as predictors of psychological wellbeing in long-term meditators and matched nonmeditators. *The Journal of Positive Psychology, 7*(3), 230–238. https://doi.org/10.1080/17439760.2012.674548

Baetens, I., Vanderfaeillie, J., Soyez, V., Vantilborgh, T., Van Den Meersschaut, J., Schotte, C., & Theuns, P. (2022). Subjective wellbeing and psychological symptoms of university students during the COVID-19 pandemic: Results of a structured telephone interview in a large sample of university students. *Frontiers in Psychology*, *13*, 889503.

Baetens, I., Van Hove, L., Azadfar, Z., Van Heel, M., & Soyez, V. (2024). The effectivity of a school-based early intervention targeting psychological complaints and non-suicidal self-injury in adolescents. *Journal of Clinical Medicine*, *13*(7), 1852.

Bai, Z., Luo, S., Zhang, L., Wu, S., & Chi, I. (2020). Acceptance and commitment therapy (ACT) to reduce depression: A systematic review and meta-analysis. *Journal of Affective Disorders*, *260*, 728–737.

Bernheim, J. L., & Buyse, M. (1983). The anamnestic comparative self-assessment for measuring the subjective quality of life of cancer patients. *Journal of Psychosocial Oncology*, *1*(4), 25–38.

Besley, J., Kayes, N. M., & McPherson, K. M. (2011). Assessing the measurement properties of two commonly used measures of therapeutic relationship in physiotherapy. *New Zealand Journal of Physiotherapy*, *39*(2). p75

Blendermann, M., Ebalu, T. I., Obisie-Orlu, I. C., Fried, E. I., & Hallion, L. S. (2024). A narrative systematic review of changes in mental health symptoms from before to during the COVID-19 pandemic. *Psychological Medicine, 54*(1), 43–66.

Bordin, E. S. (1979). The generalizability of the psychoanalytic concept of the working alliance. *Psychotherapy: Theory Research & Practice*, *16*(3), 252.

Bruggeman, H., Smith, P., Berete, F., Demarest, S., Hermans, L., Braekman, E., Charafeddine, R., Drieskens, S., De Ridder, K., & Gisle, L. (2022). Anxiety and depression in Belgium during the first 15 months of the COVID-19 pandemic: A longitudinal study. *Behavioral Sciences*, *12*(5), 141.

Buizza, C., Bazzoli, L., & Ghilardi, A. (2022). Changes in college students mental health and lifestyle during the COVID-19 pandemic: A systematic review of longitudinal studies. *Adolescent Research Review*, *7*(4), 537–550.

Carvalho, S. A., Gillanders, D., Forte, T., Trindade, I. A., Pinto-Gouveia, J., Lapa, T., Valentim, A., Santos, E., Paciência, J., & Guiomar, R. (2022). Self-compassion in acceptance and commitment therapy for chronic pain: A pilot study. *Scandinavian Journal of Pain*, *22*(3), 631–638.

Ebrahim, A. H., Dhahi, A., Husain, M. A., & Jahrami, H. (2022). The psychological Well-Being of university students amidst COVID-19 pandemic: Scoping review, systematic review and meta-analysis. *Sultan Qaboos Univ Med J*, *22*(2), 179–197. https://doi.org/10.18295/squmj.6.2021.081

Ewert, C., Vater, A., & Schröder-Abé, M. (2021). Self-compassion and coping: A meta-analysis. *Mindfulness*, *12*, 1063–1077.

Ferrari, M., Hunt, C., Harrysunker, A., Abbott, M. J., Beath, A. P., & Einstein, D. A. (2019). Self-compassion interventions and psychosocial outcomes: A meta-analysis of RCTs. *Mindfulness*, 10, 1455–1473.Fitzmaurice, G. M., Laird, N. M., & Ware, J. H. (2012). Applied longitudinal analysis. John Wiley & Sons.

Fitzmaurice, G. M., Laird, N. M., & Ware, J. H. (2012). *Applied longitudinal analysis*. John Wiley & Sons.

Germer, C., & Neff, K. (2019). Mindful self-compassion (MSC). *Handbook of mindfulness-based programmes: Routledge*, 357–367.

González-García, M., Álvarez, J. C., Pérez, E. Z., Fernandez-Carriba, S., & López, J. G. (2021). Feasibility of a brief online mindfulness and compassion-based intervention to promote mental health among university students during the COVID-19 pandemic. *Mindfulness*, *12*(7), 1685–1695.

Gratz, K. L., & Roemer, L. (2004). Multidimensional assessment of emotion regulation and dysregulation: Development, factor structure, and initial validation of the difficulties in emotion regulation scale. *Journal of Psychopathology and Behavioral Assessment*, *26*, 41–54.

Haliwa, I., Spalding, R., Smith, K., Chappell, A., & Strough, J. (2022). Risk and protective factors for college students' psychological health during the COVID-19 pandemic. *Journal of American College Health*, *70*(8), 2257–2261. https://doi.org/10.1080/07448481.2020.1863413

Hatcher, R. L., & Gillaspy, J. A. (2006). Development and validation of a revised short version of the working alliance inventory. *Psychotherapy Research*, *16*(1), 12–25.

Hayes, S. C. (2008). Climbing our hills: A beginning conversation on the comparison of acceptance and commitment therapy and traditional cognitive behavioral therapy. *Clinical Psychology: Science*

and Practice, *15*(4), 286–295. https://doi.org/10.1111/j.1468-2850.2008.00139.xHayes, S. C.

Hayes, S. C., Strosahl, K. D., & Strosahl, K. (Eds.). (2004). *A practical guide to acceptance and commitment therapy*. Springer Science & Business Media.

Hayes, S. C., Luoma, J. B., Bond, F. W., Masuda, A., & Lillis, J. (2006). Acceptance and commitment therapy: Model, processes and outcomes. *Behaviour Research and Therapy, 44*(1), 1–25. https://doi.org/10.1016/j.brat.2005.06.006

Hayes, S. C., Strosahl, K. D., & Wilson, K. G. (2011). *Acceptance and commitment therapy: The process and practice of mindful change*. Guilford press.

Head, S. J., Kaul, S., Bogers, A. J. J. C., & Kappetein, A. P. (2012). Non-inferiority study design: Lessons to be learned from cardiovascular trials. *European Heart Journal*, *33*(11), 1318–1324. https://doi.org/10.1093/eurheartj/ehs099

Horvath, A. O., Del Re, A. C., Flückiger, C., & Symonds, D. (2011). Alliance in individual psychotherapy. Psychotherapy, 48(1), 9. https://doi.org/10.1037/a0022186

Hwang, J. Y., Plante, T., & Lackey, K. (2008). The development of the Santa Clara brief compassion scale: An abbreviation of sprecher and fehr's compassionate love scale. *Pastoral Psychology*, *56*(4), 421–428. https://doi.org/10.1007/s11089-008-0117-2

International Wellbeing Group (2013). *Personal Wellbeing Index* (5th Edition). Melbourne: Australian Centre on Quality of Life, Deakin University.

Karakasidou, E., Raftopoulou, G., Papadimitriou, A., & Stalikas, A. (2023). Self-compassion and well-being during the COVID-19 pandemic: A study of Greek college students. *International Journal of Environmental Research and Public Health*, *20*(6), 4890.

Kohls, E., Baldofski, S., Moeller, R., Klemm, S. L., & Rummel-Kluge, C. (2021). Mental health, social and emotional well-being, and perceived burdens of university students during COVID-19 pandemic lockdown in Germany. *Frontiers in Psychiatry*, *12*, 643957.

Lambert, M. J., Gregersen, A. T., & Burlingame, G. M. (2004). The Outcome Questionnaire-45. In *The use of psychological testing for treatment planning and outcomes assessment: Instruments for adults, Volume 3, 3rd ed.* (pp. 191–234). Lawrence Erlbaum Associates Publishers.

Lappalainen, P., Lappalainen, R., Keinonen, K., Kaipainen, K., Puolakanaho, A., Muotka, J., & Kiuru, N. (2023). In the shadow of COVID-19: A randomized controlled online ACT trial promoting adolescent psychological flexibility and self-compassion. *Journal of Contextual Behavioral Science*, *27*, 34–44.

Ledermann, T., & Kenny, D. A. (2017). Analyzing dyadic data with multilevel modeling versus structural equation modeling: A Tale of two methods. *Journal of Family Psychology*, *31*(4), 442.

Mosanya, M. (2021). Buffering academic stress during the COVID-19 pandemic related social isolation: Grit and growth mindset as protective factors against the impact of loneliness. *International Journal of Applied Positive Psychology*, *6*(2), 159–174. https://doi.org/10.1007/s41042-020-00043-7

Mousavi, S. M., Khajevand Khoshli, A., Asadi, J., & Abdollahzadeh, H. (2021). Comparison of effectiveness of Compassion-Focused therapy (CFT) and acceptance and commitment therapy (ACT) on Self-Compassion and quality of life in women with systemic lupus erythematosus (SLE). *Health Psychology*, *10*(37), 83–108.

Muthén, L. K., & Muthén, B. O. (1998–2017). *Mplus User's Guide*. Eighth Edition. Los Angeles, CA: Muthén & Muthén.

Neff, K. (2003a). Self-Compassion: An alternative conceptualization of a healthy attitude toward oneself. *Self and Identity*, *2*(2), 85–101. https://doi.org/10.1080/15298860309032

Neff, K. D. (2003b). The development and validation of a scale to measure self-compassion. *Self and Identity*, *2*(3), 223–250.

Neff, K. D., & Germer, C. K. (2013). A pilot study and randomized controlled trial of the mindful self-compassion program. *Journal of Clinical Psychology*, *69*(1), 28–44.

Neff, K., & Tirch, D. (2013). Self-compassion and ACT. *Mindfulness, Acceptance, and Positive Psychology: The Seven Foundations of Well-Being*, 78–106.

Neff, K., & Germer, C. (2018). *The mindful self-compassion workbook: A proven way to accept yourself, build inner strength, and thriveÿ ÿ.* Guilford Publications.

Neff, K. D., Tóth-Király, I., Yarnell, L. M., Arimitsu, K., Castilho, P., Ghorbani, N., Guo, H. X., Hirsch, J. K., Hupfeld, J., & Hutz, C. S. (2019). Examining the factor structure of the Self-Compassion scale in 20 diverse samples: Support for use of a total score and six subscale scores. *Psychological Assessment*, *31*(1), 27.

O'Dell, S. M., Hosterman, S. J., Hostutler, C. A., Nordberg, C., Klinger, T., Petts, R. A., Whitehead, M. R., Faulkner, S. A., Garcia, A., & Massura, C. A. (2020). Retrospective cohort study of a novel acceptance and commitment therapy group intervention for adolescents implemented in integrated primary care. *Journal of Contextual Behavioral Science*, *16*, 109–118. https://doi.org/10.1016/j.jcbs.2020.03.009

Pommier, E., Neff, K. D., & Tóth-Király, I. (2020). The development and validation of the compassion scale. *Assessment*, *27*(1), 21–39. https://doi.org/10.1177/1073191119874108

Ravanbakhsh, L., Ebrahimi, M. I., Haddadi, A., & Yazdi-Ravandi, S. (2023). Effects of the Acceptance and Commitment Therapy on Resiliency, Self-Compassion, and Corona Disease Anxiety on Medical Staff Involved in COVID-19 Pandemic. *Iranian Journal of Psychiatry and Behavioral Sciences*(In Press).

Rolffs, J. L., Rogge, R. D., & Wilson, K. G. (2018). Disentangling components of flexibility via the hexaflex model: Development and validation of the multidimensional psychological flexibility inventory (MPFI). *Assessment*, *25*(4), 458–482.

Ruiz, F. J. (2010). A review of acceptance and commitment therapy (ACT) empirical evidence: Correlational, experimental psychopathology, component and outcome studies. *International Journal of Psychology and Psychological Therapy*, *10*(1), 125–162.

Salimi, N., Gere, B., Talley, W., & Irioogbe, B. (2023). College students mental health challenges: Concerns and considerations in the COVID-19 pandemic. *Journal of College Student Psychotherapy*, *37*(1), 39–51.

Sayler, M. F., Boazman, J., Natesan, P., & Periathiruvadi, S. (2015). Subjective well-being of gifted American college students: An examination of psychometric properties of the PWI-A. *Gifted Child Quarterly*, *59*(4), 236–248.

Shapira, L. B., & Mongrain, M. (2010). The benefits of self-compassion and optimism exercises for individuals vulnerable to depression. *The Journal of Positive Psychology*, *5*(5), 377–389.

Sprecher, S., & Fehr, B. (2005). Compassionate love for close others and humanity. *Journal of Social and Personal Relationships*, *22*(5), 629–651.

Stinckens, N., Ulburghs, A., & Claes, L. (2009). De Werkalliantie Als sleutelelement in Het therapiegebeuren. Meting Met behulp Van De WAV-12: De nederlandse vertaling Van De working alliance inventory. *Tijdschr Klin Psychol*, *39*, 44–60.

Torres Lancheros, J. E., Vargas Nieto, J. C., & Arcila Ibarra, S. (2023). Mindfulness and self-compassion decrease emotional symptoms, self-criticism, rumination and worry in college students: A preliminary study of the effects of group self-compassion-based interventions. *Journal of Evidence-Based Psychotherapies*, *23*(2), 1-24.

Versteeg, M., & Kappe, R. (2021). Resilience and higher education support as protective factors for student academic stress and depression during Covid-19 in the Netherlands. *Frontiers in Public Health*, *9*, 737223.

Villalón, F. J., Moreno, M. I., Rivera, R., Venegas, W., Arancibia, C., Soto, J. V., A., & Pemjean, A. (2023). Brief online Mindfulness- and Compassion-Based Inter-Care program for students during COVID-19 pandemic: A randomized controlled trial. *Mindfulness*, *14*(8), 1918–1929.

Vowles, K. E., Witkiewitz, K., Sowden, G., & Ashworth, J. (2014). Acceptance and commitment therapy for chronic pain: Evidence of mediation and clinically significant change following an abbreviated interdisciplinary program of rehabilitation. *The Journal of Pain*, *15*(1), 101–113.

Weinberg, A., & Klonsky, E. D. (2009). Measurement of emotion dysregulation in adolescents. *Psychological Assessment*, *21*(4), 616.

Wu, T., Jia, X., Shi, H., Niu, J., Yin, X., Xie, J., & Wang, X. (2021). Prevalence of mental health problems during the COVID-19 pandemic: A systematic review and meta-analysis. *Journal of Affective Disorders*, *281*, 91–98. https://doi.org/10.1016/j.jad.2020.11.117

Yadavaia, J. E., Hayes, S. C., & Vilardaga, R. (2014). Using acceptance and commitment therapy to increase self-compassion: A randomized controlled trial. *Journal of Contextual Behavioral Science*, *3*(4), 248–257.

Yao, H., Chen, J. H., & Xu, Y. F. (2020). Patients with mental health disorders in the COVID-19 epidemic. *The Lancet Psychiatry*, *7*(4), e21.