
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

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Abstract

The present study aimed to evaluate the effect of a brief protocol that consisted in 4 sessions based on the Mindful Self-Compassion (MSC) program administered as a group intervention in an online format, on indicators of self-compassion, self-efficacy, self-criticism, depression, anxiety, stress, mindfulness, rumination and worry. A pretest-posttest experimental design was used with a wait-list control group with random assignment. The sample consisted of university students (N= 35) who received the modified MSC program. Results suggest that the program increased indicators of self-compassion (d= 1.603), self-efficacy (d= 0.655) and mindfulness (rB = 0.954), and reduced levels of depression (rB= 0.980), stress (d= 1.050), rumination (d = 0.626) and worry (d= 1.077). The implications of brief self-compassion-based interventions as an effective strategy for addressing emotional issues in college students are discussed.

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The Covid-19 pandemic has generated an increase in symptoms of anxiety and depression in the world's population, as well as a decrease in happiness and quality of life (Cao et al., 2020; Gritsenko et al., 2020; Li et al., 2020; Rajkumar, 2020). These alterations could be more representative in populations with higher vulnerability to stressful events, such as university students (Amézquita Medina et al., 2003; Ramírez, 2012; Tosevski et al., 2010).

Preliminarily, research in Colombia does not provide an extensive evaluation of the student population in the context of the COVID-19 pandemic, however, some results of studies conducted in educational settings suggest that changes derived from restrictions related to the pandemic lockdown, and adaptation to the remote teaching model generated an impact on the mental health of university; for example, in the research conducted by Gamboa et al. (2020), it was found that out of a sample of 100 teachers and 394 university students, 14% of the respondents showed mild depressive symptoms, 6% scored at a moderate level and 3% reached a severe score, characterized mainly by indicators such as feelings of sadness, loss of interest in activities, feelings of tension or motor agitation and feelings of guilt consequent to the implementation of measures of confinement and social distancing. Another relevant study was developed by García-Espinosa et al. (2021), in which in a sample of 1149 universities, a prevalence of 47.08% y 27.06% was found for symptoms of depression and anxiety respectively. These results indicate that the COVID-19 pandemic could be a trigger that worsens preexisting mental health conditions in college students, generating a higher level of impairment at the academic, social, and family levels, as well as a greater deterioration in the overall functioning of this vulnerable population (Chang et al., 2021; Deng et al., 2021).

A range of psychological interventions have shown efficacy in the treatment of emotional problems as those mentioned above such as Behavioral Activation (Hopko et al., 2003; Parra et al., 2019), Cognitive Behavioral Therapy (Zhang et al., 2019), Acceptance and Commitment Therapy (Luciano et al., 2014; Ruiz, Flórez, et al., 2018), Mindfulness-Based Therapies (Sass et al., 2019) and Compassion-Focused Therapy (Kirby et al., 2017). Regarding the efficacy of mindfulness and compassion-based interventions applied via the Internet, evidence has been found related to the reduction of indicators of emotional symptoms and an increase in indicators of subjective perception of quality of life in clinical and non-clinical populations (Sevilla-Llewellyn-Jones et al., 2018; Spijkerman et al., 2016). Likewise, low-intensity interventions adapted to a virtual/digital format show promising results related to the positive impact on mental health indicators during

the Covid pandemic (Matiz et al., 2020; Mercado, 2020; Sammons et al., 2020; Wei et al., 2020)

Multiple studies have linked self-compassion with different positive psychological effects, among which stand out, lower levels of anxiety and depression (Neff & Germer, 2013), lower indicators of rumination, perfectionism and fear of failure (Neff, 2003a; Neff et al., 2005), lower tendency to suppress negative thoughts or emotions (Leary et al., 2007), greater ability to effectively cope with stressful life situations or events (Costa & Pinto-Gouveia, 2011; Sbarra et al., 2012; Vettese et al., 2011) higher level of functioning in interpersonal relationships (Neff & Beretvas, 2013), as well as an increase in self-care behaviors (Adams & Leary, 2007; Kelly et al., 2010; Terry & Leary, 2011).

According to Neff (2003a, 2016), self-compassion can be defined as a type of self-to-self relationship that represents a compassionate attitude towards one's self (experiencer) when faced with personal suffering and constitutes a process where the individual seeks to recognize and be moved by one's suffering without avoiding or ignoring it, which generates the desire to alleviate such suffering by having a self-dealing based on understanding.

Self-compassion comprises 3 interacting components: 1) self-kindness; 2) a sense of common humanity; and 3) mindfulness, which refers to noticing one's own painful experiences in a balanced way without ignoring or amplifying unpleasant aspects of oneself and one's life (Neff, 2003b). The Mindful Self-Compassion program (Germer & Neff, 2019) is a training congruent with this line of interventions, which was designed to promote the development of mindfulness and self-compassion skills to favor effective coping with negative situations or life events (Allen & Leary, 2010).

Although preliminary evidence has been found on the effectiveness of MSC training in different populations, it is still unknown whether such effects are replicable in populations vulnerable to suffering from different types of emotional problems, such as graduate or undergraduate professionals (Germer & Neff, 2019). Likewise, an absence of literature has been recognized regarding the effect of interventions based on self-compassion in the Latin American population (Naismith et al., 2020).

Consistent with this, other transdiagnostic mechanisms have been pointed to as possible maintainers of psychological distress. For example, self-criticism, which refers to a form of negative self-evaluation about different aspects and may generate feelings of inferiority, failure, and guilt (Gilbert, 2007); repetitive negative thinking styles such as rumination, a type of perseverative thinking whose content is focused on past or present events, and worry, whose content is mainly focused on future events (Fresco et al., 2002; Nolen-Hoeksema et al., 2008). Both maintain prolonged states of negative affect and psychological problems in the presence of stressful life events and have a negative relationship concerning processes such as self-

compassion, mindfulness, and self-efficacy (Raes, 2010; Samaie & Farahani, 2011; Smeets et al., 2014).

Therefore, the main objective of the present study was to evaluate the application of a brief MSC protocol administered online in university students who reported elevated indicators of anxiety and depressive symptomatology. Our hypotheses were as follows: (1) the experimental group will show significant improvement differences in measures of self-compassion, self-efficacy and mindfulness skills compared to the waiting list (2) the experimental group will show significant decreases in self-criticism, emotional symptoms, rumination, and worry compared to the waiting list (3) based on previous findings on mindfulness and self-compassion interventions we expect small to moderate effect sizes in the measures obtained in the experimental group receiving the mindfulness and self-compassion-based protocol intervention compared to the waitlist control group.

Method

Design

The present study had a two-arm pilot study design. Participants were randomly assigned by blocks to experimental conditions or waitlist group. The implementation of pilot studies allows the collection of preliminary data on the performance of the interventions and can therefore increase the efficiency and validity of the treatments through the performance of subsequent studies with greater control of variables such as randomized clinical trials, and can therefore be considered as essential precursors of high-quality clinical trials (Kistin & Silverstein, 2015).

Participants

The sample of this study consisted of 35 subjects, experimental group $n = 18$ ($M = 23.10$, $SD = 3.73$; 55.55% undergraduate students and 44.44% graduate students) and a control group (waiting list) $n = 17$ ($M = 23.40$, $SD = 2.89$; 82.35% of undergraduate students and 17.64% graduate students).

Inclusion criteria: (a) Subjects over 18 years of age, who were enrolled in undergraduate or graduate studies in higher education institutions, (b) who presented clinically significant indicators of emotional symptoms measured through the Depression, Anxiety and Stress Scale - 21 (DASS 21, cut-off points depression 5-6, anxiety 4, stress 8-9).

Exclusion criteria were: (a) participants who were receiving some type of psychological, psychiatric or pharmacological treatment, (b) having received a

previous clinical diagnosis, or (c) presented elevated indicators of suicidal ideation in the Suicide Risk section of the International Neuropsychiatric Interview (MINI).

Treatment

Brief protocol based on the Mindfulness and Self-Compassion program (MSC).

This program was designed with the aim of training mindfulness and self-compassion skills through psychoeducation, teaching formal and informal meditation strategies, experiential exercises to promote the use of a compassionate voice and the handling of intense emotions and interpersonal interaction (Germer & Neff, 2019; Neff & Germer, 2013). The protocol for the present study was an adapted version of the original MSC to be implemented in an online group format with a duration of 4 sessions of approximately 2 hours, once a week via the Google Meet platform.

In session 1, self-compassion and mindfulness were conceptualized; in session 2, practices of loving-kindness and compassionate voice were developed; in session 3, personal values were identified, and skills based on self-compassion and mindfulness were trained to cope with emotional experiences; and finally, in session 4, interpersonal difficulties were explored, gratitude practices were performed and recommendations were given to continue the practice of the trained skills. In addition, a complementary manual to the program was used, which was divided according to the structure of the sessions containing the theoretical components seen in the sessions and exercises and recommendations for daily practice and the effective development of the skills trained.

The content of the protocol was taken from the book “*Teaching The Mindful Self-Compassion Program*”. A guide for professionals (Germer & Neff, 2019), and from the adaptation of the same by Arcila (2019). The content of the consultant activity manual was taken from “*The Mindful Self-Compassion Workbook. A proven way to accept yourself, build inner strength, and thrive*” (Germer & Neff, 2019), and the translation and adaptation of the content was done in conjunction with an expert translator.

Therapist

A clinical psychologist trained in cognitive behavioral therapy with a clinical experience of 4 years introduced the implementation of the MSC treatment. The therapist's age was 25 years. The intervention was supervised in all its phases by an expert clinical psychologist (8 years of clinical experience) with certification in the Mindfulness-Based Stress Reduction (MBSR) program and previous training in cognitive and contextual behavioral therapies.

Assessment

All the questionnaires used in this research have good psychometric properties and were administered before the beginning of the intervention and after it ended.

Treatment Effects

The dependent variables were divided into two categories of instruments: primary outcome measures and secondary outcome measures. Since one of the main objectives of this study was to explore the effect of the MSC on the indicators of self-compassion, self-criticism, emotional symptoms and mindfulness, these were determined to be the primary outcome measures. Secondary outcomes include measures of self-efficacy, rumination, and worry.

Primary Outcomes

Self-Compassion Scale (Raes et al., 2011). It is a 5-point Likert-type scale (1 = rarely; 5 = almost always), composed of 26 items assessing the reported frequency of self-compassionate behaviors. The scale is divided into positive scores for Self-kindness, Common Humanity and Mindfulness (positive SCS), and negative scores for Self-criticism, Self-isolation and Over-identification (negative SCS). For this study, the Spanish version was used which shows a Cronbach's coefficient of .87 for the full scale, and .71 - .77 in the 6 subscales (Garcia-Campayo et al., 2014); however, this scale does not have validation in the Colombian population.

Forms of Self-Criticizing/Attacking and Self-Reassuring Scale (Gilbert et al., 2004). Is a 4-point Likert-type scale (0 = not at all; 4 = extremely). It consists of 22 items and three subscales (Inadequacy, Reassurance and Hatred) in which critical or supportive positions towards others are evaluated when experiencing difficult life situations. This scale lacks validation in the Colombian population, however, it has a Cronbach's Alpha of .90.

Depression Anxiety and Stress Scales – 21 (Antony, Cox, Enns, Bieling, & Swinson, 1998). A 4-point Likert-type scale (0 = has not happened to me; 3 = has happened to me a lot, or most of the time), consisting of 21 items and 3 subscales (depression, anxiety and stress). It aims to characterize symptom scores as normal, mild moderate, severe and extremely severe. For this study, the Spanish version validated in Colombia was used (Ruiz, Martín, et al., 2017), which shows a Cronbach's Alpha from .92 to .95 (depression from .86 to .92; anxiety from .80 to .87; stress from .80 to .86).

Mindful Attention Awareness Scale (Brown y Ryan, 2003). It is a 15-item, 6-point scale (1 = almost always; 6 = rarely), which assesses the extent to which individuals are attentive while performing different tasks. The version validated in Colombia was used (Ruiz et al., 2016), which shows excellent internal validity ($\alpha = .92$).

Secondary Outcomes

General Self-Efficacy Scale (Baessler y Schwarzer, 1996). A scale of 10 4-point Likert-type items (0 = never; 4 = always), evaluates the perception of one's abilities to cope with different stressful situations in daily life. The validated version was used in Colombia, which shows a Cronbach's Alpha of .87 and a correlation between two halves of .88 (Zambrano, Vargas-Nieto, Olaya, Avila, Guerrero and Hernandez, manuscript in preparation).

Ruminative Responses Scale - Short Form (Treyner, Gonzales, & Nolen-Hoeksema, 2004). A 10-item 4-point Likert-type scale (1 = rarely; 4 = almost always), was designed to assess the tendency to ruminate about feelings of sadness. It is divided into two subscales, brooding ($\alpha = .77$) and reflection ($\alpha = .77$). The Spanish version adapted for Colombia shows adequate psychometric properties on both subscales which shows a Cronbach's Alpha of $\alpha = .79$ for the brooding subscale and $\alpha = .79$ for the reflection subscale (Ruiz, Sierra, et al., 2017).

Penn State Worry Questionnaire (Meyer, Miller, Metzger, & Borkovec, 1990). It is a self-report instrument consisting of 16 items, on a 5-point Likert scale (1 = not at all typical for me; 5 = fairly typical for me), designed to assess chronic and unfocused worry. The short version validated in Colombia was used (Ruiz, Monroy-Cifuentes, et al., 2018), which shows adequate psychometric properties ($\alpha = .95$).

Suicide risk assessment

Suicide Risk section of the International Neuropsychiatric Interview. – MINI. It is a structured assessment interview for the identification of suicide risk indicators, consisting of 6 items whose response format is dichotomous Yes/No (Sheehan et al., 1998).

Data analysis

All statistical analyses were performed using the free-access software JASP version 0.13.1 (JASP Team, 2021). Finally, the G*Power program was used to corroborate the statistical power of the analyses performed.

Results

Initially, the Shapiro-Wilk test was performed to evaluate the distribution of the data. Subsequently, to evaluate the changes in the variables of interest between the experimental group and the control group between the pre-treatment and post-treatment stages, the Wilcoxon signed-rank test and the Student's *t*-test for related samples were used (intragroup analysis); to assess the differences between the groups in the post-treatment phase (intergroup analysis) we used a repeated measures ANOVA analysis of variance. Furthermore, the effect size was estimated by calculating Cohen's *d* to establish the magnitude of change of the intervention on the variables studied (Cohen, 1992).

The Shapiro-Wilk test of the experimental group evidenced compliance with the assumption of normal distribution ($p > 0.05$) for most of the data (DASS-21 ANX; DASS-21 STR; SCS SK; SCS CH; SCS M; SCS SC; SCS SI; SCS OI; FSCRS I; FSCRS H; FSCRS R; RRS REF; RRS BRO), except for the depression subscale of the DASS-21 questionnaire and the MAAS questionnaire.

Between-group analysis

To determine whether the experimental group showed significant changes compared to the waiting list control group, a 2 (group) x 2 (stage) repeated measures analysis of variance was performed (Table 1). A significant interaction effect between the group and stage variable was observed in the scales of stress (DASS STR $F(1) = 7.118, p = 0.012, \eta_p^2 = 0.177, 1 - \beta = 0.30$), self-compassion (SCS $F(1) = 34.301, p < 0.001, \eta_p^2 = 0.510, 1 - \beta = 0.98$), self-kindness subscale (SCS SK $F(1) = 17,191, p < 0.001, \eta_p^2 = 0.343, 1 - \beta = 0.67$), common humanity subscale (SCS CH $F(1) = 6,925, p = 0.013, \eta_p^2 = 0.173, 1 - \beta = 0.30$), Mindfulness subscale (SCS M $F(1) = 12,666, p = 0.001, \eta_p^2 = 0.277, 1 - \beta = 0.39$), self-criticism subscale (SCS SC $F(1) = 29,120, p < 0.001, \eta_p^2 = 0.469, 1 - \beta = 0.96$), self-isolation subscale (SCS SI $F(1) = 10,038, p = 0.003, \eta_p^2 = 0.233, 1 - \beta = 0.35$), over-identification subscale (SCS OI $F(1) = 33,060, p < 0.001, \eta_p^2 = 0.500, 1 - \beta = 0.98$), inadequacy subscale (FSCRS I $F(1) = 17.661, p < 0.001, \eta_p^2 = 0.349, 1 - \beta = 0.69$), hatred subscale (FSCRS R $F(1) = 15.916, p < 0.001, \eta_p^2 = 0.325, 1 - \beta = 0.59$), self-efficacy (EAG $F(1) = 4,290, p = 0.046, \eta_p^2 = 0.115, 1 - \beta = 0.25$), worry (PSWQ $F(1) = 15,714, p < 0.001, \eta_p^2 = 0.323, 1 - \beta = 0.58$) and mindfulness skills (MAAS $F(1) = 20,359, p < 0.001, \eta_p^2 = 0.382, 1 - \beta = 0.80$).

A significant main effect of the group variable was also observed for the subscales DASS-21 DEP $F(1) = 5,782, p = 0.022, \eta_p^2 = 0.149, 1 - \beta = 0.09$, SCS $F(1) = 10,021, p = 0.003, \eta_p^2 = 0.233, 1 - \beta = 0.07$, SCS SK $F(1) = 15,127, p < 0.001, \eta_p^2 = 0.314, 1 - \beta = 0.09$, SCS CH $F(1) = 5,371, p = 0.027, \eta_p^2 = 0.140, 1 -$

$\beta = 0.10$, SCS SC $F(1) = 4,132$, $p = 0.050$, $\eta_p^2 = 0.111$, $1 - \beta = 0.11$, SCS SI $F(1) = 5,801$, $p = 0.022$, $\eta_p^2 = 0.150$, $1 - \beta = 0.09$, FSCRS I $F(1) = 6,132$, $p = 0.019$, $\eta_p^2 = 0.157$, $1 - \beta = 0.09$ y FSCRS H $F(1) = 6,321$, $p = 0.017$, $\eta_p^2 = 0.161$, $1 - \beta = 0.09$.

To avoid type 1 errors, we decided to use post hoc analysis with the Bonferroni correction since this conservative statistical approach offers a stricter form of error control than most control alternatives (VanderWeele & Mathur, 2019). We found significant differences between the experimental group and the control group in the post-treatment stage. Concerning the variable of emotional symptoms in the experimental group, significant reductions were observed in the subscales DASS-21 Depression of 4,680 points ($M = 3.556$; $SD = 1,563$; $p = 0.022$; Pbonf = 0.026) and DASS-21 stress of 4,144 points ($M = 6.444$; $SD = 1,434$; $p = 0.085$; Pbonf = 0.033) in comparison with the control group.

Regarding the Self-Compassion variable, significant increases were observed in the SCS scale scores of 1.023 points ($M = 3.641$; $SD = 0.184$; $p = 0.003$; Pbonf < 0.001), and the SCS SK subscales of 1.331 points ($M = 3.778$; $SD = 0.243$; $p < 0.001$; Pbonf < 0.001), SCS HC of 0.750 points ($M = 3.5$; $SD = 0.214$; $p = 0.027$ Pbonf = 0.005), SCS M of 0.748 points ($M = 3.793$; $SD = 0.220$; $p = 0.071$; Pbonf = 0.008), and FSCRS R of 5.307 points ($M = 22.722$; $SD = 1.903$; $p = 0.196$; Pbonf = 0.046) in the experimental group in contrast to the waitlist control group.

Concerning the Self-criticism variable, significant reductions were evidenced in the SCS SC subscale scores of 1,161 points ($M = 2.344$; $SD = 0.292$; $p = 0.050$; Pbonf = 0.002), SCS SI of 1,114 points ($M = 2.444$; $SD = 0.312$; $p = 0.022$ Pbonf = 0.005), SCS OI of 1,066 ($M = 2.417$; $SD = 0.301$; $p = 1.860$; Pbonf = 0.005), and FSCRS I of 9,275 points ($M = 12.667$; $SD = 2.362$; $p = 0.019$ Pbonf = 0.001).

Finally, the experimental group did not show superior differences to the waiting list control group in the variables of self-efficacy, rumination, worry and mindfulness in the post-treatment stage.

Table 1. Repeated measures analysis of variance 2 (group) X 2 (phase).

Group		Pre-treatment	Post-treatment	Intra-group effect (interaction group*phase)			Inter-group effect		
		<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)	<i>F</i>	<i>p</i>	η_p^2	<i>F</i>	<i>p</i>	η_p^2
DASS-21 DEP	MSC	7.556 (5.447)	3.556 (3.014)	14.456	0.069	0.097	5.782	0.022*	0.149
	Control	9.588 (4.691)	8.235 (4.994)						
DASS-21 ANX	MSC	6.056 (3.873)	4.056 (3.096)	3.379	0.075	0.093	3.379	0.075	0.093
	Control	8.176 (4.953)	6.647 (4.873)						
DASS-21 STR	MSC	11.167 (3.618)	6.444 (3.129)	7.118	0.012*	0.177	3.161	0.085	0.087
	Control	11.412 (4.597)	10.588 (5.363)						
SCS	MSC	2.587 (0.579)	3.641 (0.524)	34.301	<.001**	0.510	10.021	0.003**	0.223
	Control	2.586 (0.542)	2.618 (0.526)						
SCS SK	MSC	2.733 (0.820)	3.778 (0.636)	17.191	<.001**	0.343	15.127	<.001**	0.314
	Control	2.459 (0.670)	2.447 (0.726)						

	Group	Pre-treatment	Post-treatment	Intra-group effect (interaction group*phase)			Inter-group effect		
		<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)	<i>F</i>	<i>p</i>	η_p^2	<i>F</i>	<i>p</i>	η_p^2
SCS CH	MSC	2.639 (0.708)	3.500 (0.582)	6.925	0.013*	0.173	5.371	0.027*	0.140
	Control	2.706 (0.645)	2.750 (0.586)						
SCS M	MSC	2.861 (0.749)	3.792 (0.687)	12.666	0.001**	0.277	3.482	0.071	0.095
	Control	2.897 (0.552)	3.044 (0.588)						
SCS SC	MSC	3.644 (0.867)	2.344 (0.754)	29.120	<.001**	0.469	4.132	0.050*	0.111
	Control	3.576 (0.871)	3.506 (0.957)						
SCS SI	MSC	3.403 (0.810)	2.444 (0.834)	10.038	0.003**	0.233	5.801	0.022*	0.150
	Control	3.632 (1.043)	3.559 (0.994)						
SCS O	MSC	3.667 (0.748)	2.417 (0.664)	33.060	<.001**	0.500	1.860	0.182	0.053
	Control	3.353 (1.097)	3.482 (0.997)						
FSCRS I	MSC	20.278 (7.622)	12.667 (6.748)	17.661	<.001**	0.349	6.132	0.019*	0.157
	Control	21.765 (7.571)	21.941 (5.815)						
FSCRS H	MSC	4.389 (3.415)	3.222 (3.001)	0.865	0.359	0.026	6.321	0.017*	0.161
	Control	6.647 (4.015)	6.471 (3.923)						
FSCRS R	MSC	16.722 (6.095)	22.778 (5.298)	15.916	<.001**	0.325	1.745	0.196	0.050
	Control	17.412 (5.421)	17.471 (5.647)						
EAG	MSC	25.833 (6.662)	29.611 (5.511)	4.290	0.046*	0.115	0.357	0.554	0.011
	Control	26.647 (5.958)	26.706 (4.959)						
RRS REF	MSC	11.556 (3.451)	10.778 (2.184)	0.004	0.950	0.001	0.280	0.600	0.008
	Control	12.000 (3.953)	11.294 (2.867)						
RRS BRO	MSC	11.944 (3.472)	10.500 (2.358)	0.001	0.974	0.001	1.474	0.233	0.043
	Control	13.235 (3.977)	11.765 (3.308)						
PSWQ	MSC	28.889 (11.999)	19.278 (10.851)	15.714	<.001**	0.323	0.013	0.910	0.003
	Control	24.647 (11.113)	24.353 (11.264)						
MAAS	MSC	48.611 (15.953)	63.611 (13.929)	20.359	<.001**	0.382	0.127	0.724	0.004
	Control	56.000 (15.338)	52.882 (15.070)						

Note. statistically significant differences between groups. DASS-21 DEP: Depression subscale. DASS-21 ANX: anxiety subscale. DASS-21 STR: stress subscale. SCS: Self-compassion scale. SCS SK: self-kindness subscale. SCS CH: common humanity subscale. SCS M: Mindfulness subscale. SCS SC: self-criticism subscale. SCS SI: self-isolation subscale. SCS O over-identification subscale. FSCRS I: inadequacy subscale. FSCRS H: hatred subscale. FSCRS R: reassurance subscale. EAG: self-efficacy scale. RRS REF: reflection subscale. RRS BRO: brooding subscale. PSWQ: Penn State Worry Questionnaire. MAAS: Mindfulness attention and awareness scale. * $p < 0.05$ ** $p \leq 0.01$

Within-group analysis

Measures of emotional symptoms in the experimental group showed significant differences between pre-treatment and post-treatment stages. In the Depression subscale, a significant reduction was found estimated in a range of 4 points with a large effect size ($p < .001$; $r_B = 0.980$; $1 - \beta = 0.65$), as well as, in the Stress subscale a significant reduction of 4.72 points was observed ($SD = 1.060$; $p < .001$) with a large effect size ($d = 1.050$; $1 - \beta = 0.77$); as for the Anxiety subscale, no significant effects of the intervention were found ($p = 0.056$).

Regarding the Self-Compassion measures, in the SCS scale a significant increase of 1.054 points was evidenced ($SD = 0.155$; $p < .001$), with a large effect

size in the overall scale ($d = 1.603$; $1 - \beta = 0.99$), as well as, in the Self-Kindness subscale an increase of 1.044 points on average was found ($SD = 0.179$; $p < .001$) with a large effect size ($d = 1.375$; $1 - \beta = 0.97$). In the Common Humanity subscale, there was an average increase of 0.861 points ($SD = 0.228$; $p = .002$) with a large effect size ($d = 0.890$; $1 - \beta = 0.67$), and in the Mindfulness subscale an increase of 0.931 points on average ($SD = 0.172$; $p < .001$) with a large effect size ($d = 1.272$; $1 - \beta = 0.94$); as for the FSCRS scale, a significant increase of 6.056 points on average ($SD = 1.200$; $p < .001$) with a large effect size ($d = 1.1891$ - $\beta = 0.89$) was found in the Reassurance subscale.

In the negative subscales of the SCS related to the Self-criticism measures, a significant reduction of 1.300 points on average was evident ($SD = 0.212$; $p < .001$. 001) with a large effect size ($d = 1.444$; $1 - \beta = 0.98$), in the Self-Isolation subscale a reduction of 0.958 points on average ($SD = 0.237$; $p < .001$) with a large effect size ($d = 0.954$; $1 - \beta = 0.65$), and in the Over-identification subscale a reduction of 1.250 points on average ($SD = 0.212$; $p < .001$) was found with a large effect size ($d = 1.390$; $1 - \beta = 0.97$); additionally, in the FSCRS scale, significant effects were found in the Inadequacy subscale with a reduction of 7.611 points on average ($SD = 1.627$; $p < .001$) with a large effect size ($d = 1.102$; $1 - \beta = 0.82$). However, no significant differences were found for the Hatred subscale ($p = 0.160$).

The self-efficacy indicators of the EAG questionnaire showed a significant increase of 3.778 points on average ($SD = 1.359$; $p = 0.013$) in the post-treatment stage, with a moderate effect size ($d = 0.655$; $1 - \beta = 0.64$). Concerning the Rumination variable, significant differences were found only for the Brooding subscale, in which, a reduction of 1.444 points on average ($SD = 0.544$; $p = 0.017$), and a moderate effect size ($d = 0.626$; $1 - \beta = 0.64$) was found. No changes were observed in the Reflection subscale ($p = 0.358$). On the other hand, in the Worry measures, a reduction of 9.611 points on average ($SD = 2.104$; $p < .001$) was found in the results of the PSWQ questionnaire, with a large effect size ($d = 1.077$; $1 - \beta = 0.80$). Likewise, in the MAAS questionnaire, an estimated increase in a range of 13.5 points was observed between treatment stages ($p < .001$), with a large effect size ($rB = 0.954$; $1 - \beta = 0.61$). The waitlist control group only showed significant differences in the brooding subscale of the RRS-SF questionnaire with a reduction of 1.471 points on average ($p = 0.019$; $SD = 0.563$) during the 4 weeks. No significant changes were observed in any of the other variables.

Discussion

The present study aimed to explore preliminarily the effect of a brief group intervention based on MSC through a pilot study, delivered through synchronous

virtual sessions on indicators of self-compassion, self-criticism, self-efficacy, emotional symptoms, mindfulness, rumination and worry in Colombian university students.

Based on our preliminary findings and the between-subjects analyses, the effects of the intervention seemed to be superior to the change that occurred in the waiting list group in the variables of emotional symptoms, self-compassion and self-criticism; however, there was found no significant differences concerning mindfulness (primary outcome), self-efficacy, rumination and worry (secondary outcomes). This could be explained due to the small number of participants in each group, since as established by Kazdin (2016) a small sample size could reduce statistical power, making it difficult to detect differences between groups and negatively affect the accuracy of this estimate. As a result, we can't accept hypotheses 1 and 2, more specifically regarding the primary variable of mindfulness, and the secondary variables of self-efficacy, worry and rumination.

Regarding intra-subject analyses, we found promising results related to the effect of the MSC protocol on variables such as self-compassion, self-criticism, emotional symptoms and mindfulness (all variables show a $p < 0.05$). The protocol seems to be effective in decreasing emotional symptoms, self-critical behaviors, and increasing core processes related to compassion-focused therapy such as self-compassion, self-efficacy, and mindfulness; also, changes were observed with moderate to large effect sizes (consistent with hypothesis 3).

These results are consistent with similar research in student populations in which the effect of training in mindfulness and self-compassion skills to increase emotional and psychological well-being was examined. For example, in the study conducted by Smeets et al. (2014), increases in self-compassion, mindfulness, optimism and self-efficacy were evidenced, as well as a reduction in rumination (large effect sizes), after the application of face-to-face modality of a 3-session protocol based on the MSC program in university students. Likewise, Andersson et al. (2021) found that mindfulness and self-compassion increased and stress indicators decreased after 6 weeks of self-compassion training delivered through a mobile phone app (moderate and large effect sizes).

In our research, participants who received the MSC treatment evidenced reductions in emotional symptom indicators below clinically relevant ranges, suggesting that increases in mindfulness, self-compassion, and self-efficacy improve subjects' psychological functioning by intervening and modifying underlying transdiagnostic processes of psychopathology such as self-criticism (Beato et al., 2021; MacBeth & Gumley, 2012), rumination (Krieger et al., 2013), and worry (Blackie & Kocovski, 2018).

An interesting finding was observed in the indicators of rumination, in which only the brooding subscale (in contrast to the reflection scale) had a clinically relevant decrease. This particular style of negative repetitive thinking (brooding-

focused rumination) has generally been related to the maintenance of depressive symptoms (Burwell & Shirk, 2007; Crane et al., 2007; Rutter et al., 2020), so changes in this type of rumination could indicate that an increase in self-compassionate behaviors promotes the reduction of perseverative thought patterns characterized by negative, problem-focused self-evaluation without altering those repetitive thought patterns that focus on identifying possible solutions to the experienced problematic situation, favoring problem-solving (Fresnics et al., 2019; Wu et al., 2019).

Another relevant finding is the change observed in the self-efficacy variable, which has been established as a protective factor by increasing the indicators of emotional and psychological well-being and influencing the relationship between the stressful life situations experienced and the type of emotional reaction evoked by these (Schönfeld et al., 2017). Interventions aimed at increasing self-efficacy could therefore be very valuable in improving emotional adjustment to stressful life situations such as those caused by COVID-19-associated confinement (Ransing et al., 2020). In comparison, this intervention would be on the same track as other brief interventions designed to address emotional issues in the context of the pandemic. For example, Wang et al., (2021), evidenced a reduction in "negative emotions" and an increase in "positive emotions" through a brief intervention based on cognitive reappraisal. This would imply that short-term, virtual-based psychological interventions are effective in addressing the stress responses generated by the COVID-19 pandemic by facilitating the use of adaptive and coping strategies in multiple populations with different cultural characteristics.

In addition, evidence has been found that increases in self-efficacy produce greater effectiveness in work and academic contexts, which would be beneficial considering the different effects of academic failure on the emotional well-being of university students (Amézquita Medina et al., 2003; Peixoto & Almeida, 2010).

Because increased self-compassion is related to increased indicators of self-efficacy, Liao and collaborators (2021) report that a self-compassionate attitude would allow people to consider failures and difficulties as a common part of the human experience, whereas mindfulness would help individuals to maintain a balanced perspective on failure, preventing them from maximizing the implications and consequences or interpreting it as an indicator of personal worth. This could suggest that self-compassion may become a protective factor that helps individuals maintain a positive evaluation of self-efficacy even when experiencing personal failures or difficulties in daily life (Liao et al., 2021; Manavipour & Saeedian, 2016; Neff et al., 2005).

Regarding hypothesis 3, the effect size for the changes in the dependent measures is identified as being moderate to large ($d = 0.6 - 1.12$), which could indicate that the intervention used is useful to promote increases in variables such as self-compassion and mindfulness, as well as, reduction of emotional

symptomatology and problematic thought patterns such as rumination and worry in a way that implies a significant clinical impact (Kazdin, 2016; Naing et al., 2006); however, these results should be taken with caution given the small sample size, since it would not be advisable to generalize the results to other populations, as this is not a representative size of the reference population that was intended to be studied.

Limitations

The results of the present research should be analyzed considering some important limitations. Although the high percentage of female participants, as well as the small sample size, are a trend that can be observed in other previous studies (MacBeth & Gumley, 2012; Neff & Germer, 2013; Smeets et al., 2014), these types of factors can be considered a threat to external validity which decreases the generalizability of the results.

Another limitation to mention is the questionnaires used as outcome measures. Although other studies have reported adequate psychomotor properties in the Spanish-speaking population (Naismith et al., 2019; Neff, 2015; Tóth-Király & Neff, 2021), these have not been subjected to an adequate cultural validation process, so the measures obtained may not be entirely accurate (Baião et al., 2015).

Finally, it is acknowledged that the very small sample size, the lack of preliminary analyses that would allow calculating the adequate sample size for the study and the attrition of participants throughout the study ($n = 22$), could be considered threats against the validity by statistical conclusiveness and internal validity respectively (Kazdin, 2016). Also, given the preliminary nature of the study as well as the sample size, the large effect sizes obtained in our analyses should be interpreted with caution. For example, Funder & Ozer (2019) have mentioned that these types of results obtained with small samples may be due to problems of overestimation of the implemented analyses, so further replication studies with larger samples are necessary. Therefore, the conduct of future better-controlled studies with larger sample sizes would allow for more robust conclusions (Brybaert, 2019).

Conclusions

The results of this study suggest that brief interventions based on compassion-focused therapy are effective in training mindfulness and self-compassion skills even if they are delivered in a digital format. Considering that mindfulness and self-compassion promotes emotional adjustment in the face of stressful life situations (Beato et al., 2021), this therapy format is recognized as

useful for addressing emotional, affective and behavioral problems resulting from the current COVID-19 pandemic in populations vulnerable to developing some type of mood disorder (Caballero-Domínguez et al., 2020; Ramírez-Ortiz et al., 2020; Xiong et al., 2020).

Likewise, it is recognized that factors such as self-criticism, rumination and worry are central transdiagnostic processes in the origin and maintenance of different types of emotional and affective disorders (Schanche, 2013; Wahl et al., 2019). Therefore, building and adapting therapeutic models and strategies that focus on addressing these processes is imperative to maximize professional and therapeutic practice, promoting research beyond intervention efficacy and focusing on identifying and explaining underlying change processes (Hofmann & Hayes, 2019). However, these results should be taken with caution because the small sample size prevents the generalization of results and maintains low statistical power.

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Authors' contributions. All authors conducted the statistical analyses, interpreted the results, and critically revised the manuscript. All authors read and approved the final manuscript.

Ethics statements. The authors have respected the Ethical Principles for Psychologists and the Code of Conduct established by the British Association for Behavioural and Cognitive Psychotherapies and the British Psychological Society. The study was approved by a review by expert judges from Fundación Universitaria Konrad Lorenz. Bogotá, Colombia. Participants gave written informed consent.

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