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Reducing Academic Procrastination in Spanish University Students through a Mindfulness-Based Intervention

Reducción de la procrastinación académica en estudiantes universitarios españoles mediante una intervención basada en Mindfulness

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Abstract

Procrastination is defined as an irrational tendency to delay required tasks and is a complex phenomenon driven by personal, motivational and situational factors. For university students in particular, difficulties in self-regulation and reductions in coping resources and/or tolerance for negative affective states are key reasons why stressful contexts can increase vulnerability to procrastination. The purpose of this study was to investigate whether a 10-week mindfulness intervention known as *Flow Meditation* is a feasible and efficacious tool for reducing academic procrastination in Spanish university students. A total of 51 university students completed the intervention and the final sample at a four-month follow-up assessment comprised 42 students who had been randomly allocated to a 10-week Flow Meditation group (n = 22; Mean age = 19.95; SD=2.92; 77.3% women) or a waitlist control group (n = 20; Mean age = 20.55; SD=2.74; 70% women). Measures were taken at three time points: pre-test, post-test, and 4-month follow-up. Findings revealed significant reductions in academic procrastination mediated by mindfulness competence and its different facets, which were maintained until the 4-month follow-up assessment. Effect sizes ranged from moderate to high. *Flow Meditation* shows promise for reducing procrastination in Spanish university students through the enhancement of mindfulness competencies, particularly the Observing, Acting with Awareness and Non-judging dimensions of the Five Facets of Mindfulness Questionnaire.

Keywords: Academic procrastination; coping; Mindfulness competencies; university students.

Resumen

La procrastinación se define como una tendencia irracional a retrasar las tareas requeridas y es un fenómeno complejo impulsado por factores personales, motivacionales y situacionales. Para los estudiantes universitarios en particular, las dificultades en la autorregulación y la reducción de los recursos de afrontamiento y/o la tolerancia a los estados afectivos negativos son razones clave por las que los contextos estresantes pueden aumentar la vulnerabilidad a la procrastinación. El propósito de este estudio fue investigar si una intervención de mindfulness de 10 semanas conocida como Meditación Flow es una herramienta factible y eficaz para reducir la procrastinación académica en estudiantes universitarios españoles. Un total de 51 estudiantes universitarios completaron la intervención y la muestra final en una evaluación de seguimiento de cuatro meses incluyó a 42 estudiantes que habían sido asignados aleatoriamente a un grupo de Meditación Flow de 10 semanas (n = 22; edad media = 19,95; DT=2,92; 77,3% mujeres) o a un grupo de control en lista de espera (n = 20; edad media = 20,55; DT=2,74; 70% mujeres). Las medidas se tomaron en tres momentos: antes de la prueba, después de la prueba y a los cuatro meses de seguimiento. Los resultados revelaron reducciones significativas en la procrastinación académica mediadas por la competencia de mindfulness y sus diferentes facetas, que se mantuvieron hasta la evaluación de seguimiento de 4 meses. Los tamaños del efecto oscilaron entre moderados y altos. La Meditación de Flujo se muestra prometedora para reducir la procrastinación en estudiantes universitarios españoles a través de la mejora de las competencias de mindfulness, en particular la Observación, la Actuación con Conciencia, y el No Enjuiciar.

Palabras clave: Procrastinación académica; afrontamiento; competencias Mindfulness; estudiantes universitarios.

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Introduction

Procrastination is a complex phenomenon linked to self-regulation failure and is driven by personality traits, motivational and situational factors. It can be defined as an irrational tendency to delay required tasks, assignments or decisions, despite the negative effects of this postponement on individuals and organizations (Yan & Zhang, 2022). Academic procrastination is high among college students, with about 50 to 70% of students reporting procrastination on learning tasks, with incidence being higher in males (Li et al., 2023; Lindner et al., 2023).

Research suggests that task characteristics (e.g., delayed rewards, task aversiveness, and/or test anxiety), personality facets (e.g., low conscientiousness, perfectionism, psychological inflexibility, impulsiveness, low self-efficacy, low motivation), and environmental factors (e.g., temptations, distractions, unhealthy habits) are the main determinants of academic procrastination (Roshanisefat et al., 2021). In addition, the key role of stress beliefs in determining procrastination in college students is also emphasized. More specifically, stressful life events can threaten positive self-schemas and increase the level of fatalism, thereby resulting in lower core self-evaluations and the adoption of maladaptive avoidant coping styles in university students, rather than seeking to proactively solve problems (Ma et al., 2023).

Most people who procrastinate experience adverse effects of one form or another and would prefer to reduce this behavior. Indeed, procrastination can be an impediment to success and increase anxiety (e.g., exam anxiety), depression, and low self-esteem (Huang et al., 2022). In the case of students in particular, procrastination can lead to poor academic performance, with lower exam scores, academic dropout, reduced employment opportunities, poorer health, and low general well-being (Lindner et al., 2023). Procrastination has also been found to correlate with future anxiety, which involves feeling uncertain and worried about what may happen in the future (Przepiorka et al., 2023; Ragusa et al., 2023). In addition, procrastination has been linked to low levels of self-compassion and mindfulness, which at the same time may be risk factors for low emotional and physical well-being (Sirois, 2023).

The significant rise in availability of information and communication technologies (e.g., via social media and smart phones) is asserted to amplify chronic procrastination (Pekpazar et al., 2021; Suárez-Perdomo et al., 2022). In fact, bedtime procrastination – defined as going to bed later than intended without external reasons for doing so – is an emerging area of focus and typically involves the use of smart phones and other communication technologies. Bedtime procrastination has been identified as a particular issue amongst university students (Meng et al., 2022), which is linked with poor sleep quality that can negatively affect cognitive processes, including recovery from stress and academic performance (Soriano-Ayala et al., 2020). These negative effects can be further compounded due to the fact university students often lack adequate self-regulation strategies as well as suitable external support systems via the university (Kotera et al., 2019; Nordby et al., 2016;).

Overall, research on the effectiveness of self-regulation procrastination interventions and strategies is underdeveloped, including in academic settings (Pekpazar et al., 2021; Yan & Zhang, 2022). Currently, several types of intervention have been used, including time-management, cognitive-behavioral therapy, and acceptance-based behavior therapy, with some beneficial effects reported (Roshanisefat et al., 2021; Salguero-Pazos & Reyes-de-Cózar. 2023). Mindfulness is also attracting attention in this regard yet within the context of higher education in particular, more research is needed. An issue here has been that students prone to procrastination are typically low in dispositional mindfulness and tend to engage less frequently with mindfulness-based practices such as meditation, yoga, and Tai Chi (Cheung & Ng, 2019; Sirois, 2023).

Thus, although research indicates that different strategies may be helpful for academic procrastination, there remains a gap in knowledge concerning the efficacy of mindfulness for university

student populations. Consequently, the goal of this study was to investigate whether a mindfulness-based training program known as *Flow Meditation* provides a feasible and efficacious coping strategy in relation to academic procrastination amongst university students. The primary purpose of *Flow Meditation* is helping participants learn to allow their thoughts, emotions and sensations to arise and dissipate, without attempting to modify or interfere with them, while remaining aware of their arising and accepting of their presence. The effectiveness of this type of mindfulness meditation has been evaluated and described in various controlled studies, including fostering significant improvements in active coping strategies and emotional competences for individuals with negative cognitions, sleep problems, and low self-efficacy related to academic performance (Amutio et al., 2015; Franco et al., 2016). *Flow Meditation* (also known as *Meditación-Fluir*) includes mindfulness techniques and principles based on 1. Kabat-Zinn´s (1990) MBSR program, 2. Acceptance and Commitment Therapy (e.g., observing thoughts) (Hayes et al., 2012), and 3. Buddhism – particularly via studying and debating metaphors from Zen and practicing vipassana meditation (e.g., non-identification with mental events), and integrating ethical, existential and spiritual principles.

It was hypothesized that compared with a waitlist control group, university students that completed the mindfulness program would demonstrate significant improvements in academic procrastination, as compared to the control group. A further objective of the study was to evaluate the mediating variables, including Observing, Describing, Acting with Awareness, Non-Judging, Non-Reactivity of the intervention effects in academic procrastination.

Method

Participants

Undergraduate students undertaking the first year of the Degree in Social Education at the University of Almeria, Spain, were offered an optional course entitled “Learning and Practicing Mindfulness”. Participants agreed to take part in the study voluntarily after having been duly informed and signing the corresponding informed consent document. Participants were unaware of the objectives of the study. Eligibility criteria were as follows: (i) not having any previous experience in the practice of mindfulness, including relaxation techniques, yoga, or tai chi, (ii) attending at least 80% of the weekly training sessions, and (iii) available to practice the mindfulness exercises at home for at least 50% of the days. A total of fifty-one students met the eligibility criteria and enrolled in the course, of which 25 were assigned to the intervention group and the remaining 26 to the control group. Group allocation occurred via randomization using ballots concealing the number 1 (waitlist control) or 2 (intervention). Equal numbers of each type of ballot (i.e., labelled 1 or 2) were placed in a container and each participant was asked to extract one ballot. A researcher not participating in the study conducted the randomization procedure and participants completed baseline assessments prior to group allocation. Participants were not aware of the assigned condition (control group participants were offered the mindfulness training course after the end of the intervention). Participants in the experimental group were asked not to disclose any aspect of the intervention with their other classmates who would attend the mindfulness workshop in a second session as a control group. The sample size was determined by the maximum number of students who were willing to enrol in the course. Both groups completed the questionnaires at the same three time points (pre-test, post-test, and 4-month follow-up).

Of the 25 participants allocated to the intervention group, three were excluded from the final analysis because they did not attend at least 80% of the weekly training sessions, and/or self-reported as not having practiced the mindfulness exercises for at least 50% of the days. Finally, six control group participants did not complete the post-test questionnaires and were also excluded from the analyses. This reduced the final sample size at the follow-up assessment to 42 students (11 males and 31 female): intervention group (n = 22; Mean age = 19.95; SD=2.92; 77.3% women), and control group (n = 20; Mean age = 20.55; SD=2.74; 70% women) (Fig. 1 Suppl.).

[SEE FLOW-CHART IN SUPPLEMENTARY MATERIAL]

Instruments

Five Facets of Mindfulness Questionnaire (FFMQ) (Baer et al., 2008): The Spanish version (Cebolla et al., 2012) of the scale was used. It measures a person´s general tendency to be mindful in their everyday life based on five competencies or factors: *Observing* (e.g. "I pay attention to sensations, such as the wind in my hair or sun on my face."); *Describing* (e.g., "I'm good at finding words to describe my feelings"); *Acting with Awareness* (e.g., "I don't pay attention to what I'm doing because I'm daydreaming, worrying, or otherwise distracted."- [inverted item]); *Non-Judging* (e.g., "I tell myself I shouldn't be feeling the way I'm feeling" - [inverted]); *Non-Reacting* (e.g., "I watch my feelings without getting lost in them"). The response scale ranges from 1 (*never or very rarely true*) to 5 (*always or very often true*). Higher scores indicate higher levels of mindfulness. In the current study, the internal consistency and reliability values were $\alpha = 0.89$ and $\omega = 0.90$ for the whole scale. By scale factors, internal consistency and reliability reached the following values: Observing ($\alpha = 0.75$; $\omega = 0.74$), Describing ($\alpha = 0.81$; $\omega = 0.79$), Acting with Awareness ($\alpha = 0.87$; $\omega = 0.89$), Non-Judging ($\alpha = 0.85$; $\omega = 0.83$), and Non-Reactivity ($\alpha = 0.89$; $\omega = 0.91$).

Academic Procrastination Scale (APS) (Busko, 1998): The Spanish version was used (Álvarez, 2010), made up of 16 items that are scored using a five-point Likert scale from 1 (*never*) to 5 (*always*). Higher scores indicate higher levels of procrastination (e.g., "When I have to do a task, I usually leave it until the last minute," "I usually prepare in advance for exams"). In the present study, the scale showed good internal consistency and reliability ($\alpha = 0.82$; $\omega = 0.84$).

Record Sheet: Prepared *ad hoc* to evaluate the frequency of practice of the Body Scan and Mindful Breathing intervention components.

Procedure

Flow Meditation (Franco et al., 2016) was delivered to the intervention group (90-minute weekly group sessions for a 10-week duration during the first semester of the academic year). The program was conducted by a meditation instructor with extensive experience of teaching secular and Buddhist meditation techniques. The content of the program has been previously outlined in Franco et al., (2016, 2020) and has been applied successfully in different contexts including with students of different educational levels (Amutio et al., 2015; Soriano-Ayala et al., 2020). Each weekly session included the following components:

1. Review of the previous week's meditation exercises.
2. Guided mindful body scan of 10-minutes duration.
3. Exercises from Zen and Vipassana meditation, including the presentation of stories and metaphors.
4. Full awareness of breathing for 20-minutes duration. This practice involves returning attention repeatedly to the breath in the present moment, being open to the experience of each moment as it flows and simply being aware of the reality of the here and now without passing any value judgment or mental reactions.

Furthermore, during the 10-week intervention period and between the end of the week 10 and 4-month follow-up assessment phase, participants were asked to continue practicing the 10-minute body-scan and 20-minute full awareness of breathing exercises daily at home. Participants were provided with a record sheet and were requested to keep a daily record of their engagement with the home practices.

Statistical Analysis

First, the Shapiro-Wilk´s normality test was conducted. Homoscedasticity of data was also verified. Since the variables conformed to the normal distribution, parametric tests were performed. SPSS Version 28.0 statistical package was employed for the descriptive analyses, reliability analyses (Cronbach´s alpha and McDonald's omega), and multivariate analyses of variance (2x3 mixed repeated measures ANOVA with Bonferroni corrections). The factors that were included in the model were group (experimental vs control) as the intergroup factor and time [pre-intervention – hereafter T1) versus post-

intervention (T2) versus 4-month follow-up (T3)] as the intrasubject factor. The relevant F statistics were extracted, according to compliance with the assumption of sphericity calculated through the Mauchly (1940) test. Likewise, Bonferroni post hoc tests were performed to determine the levels of the variables that were significant. On the other hand, to obtain data at the intragroup level, a univariate repeated measures ANOVA was carried out in both the experimental and control groups, including time as a factor (T1-T2-T3). For variables where statistically significant differences were found, the effect size was calculated using eta2 (where ηp2 low = 0.01, medium = 0.09, and large = 0.25). Due to the low sample size in the intragroup comparisons, the analyses were completed with the effect size using hedges' g.

Finally, mediation analyses were performed to assess the indirect effect of the intervention in two different time points (T2 and T3) on procrastination, using the macro–PROCESS Version 3.0 (Hayes, 2013), with mediation model 4.

Results

No statistically significant differences were found between both groups by gender (p = .603) and age (p= .501), or between the means of the studied variables (i.e., the five mindfulness facets and procrastination levels) at T1 (p> .05). The mean compliance level with the body-scan exercise was 64%, while for the mindful breathing exercise it was 73%, based on data collected via the record sheet that participants completed at home.

To verify the normal distribution of the responses to the questionnaires (i.e., homogeneity), the values of asymmetry and kurtosis were used, considering a normal distribution when the kurtosis values were less than 3 (Westfall & Henning, 2013). The results revealed that the values ranged between 2.12 for Describing and 0.81 for Non-Reactivity.

Treatment Effects

After treatment (T2) and at follow-up (T3), the intervention led to significant within and between-group improvements for most of the outcome measures, including improving the capacity to be mindful (i.e., *FFMQ total, Observing, Acting with Awareness, Non-Judging, Non-Reactivity*) and reducing procrastination in students, based on a linear model of repeated ANOVA measures (pre-post-follow-up - Table 1). However, no significant differences were observed for the *Describing* factor of the FFMQ.

Regarding the control group, no statistically significant positive differences were found in any of the variables studied across any of the assessment points (Factor *Observing:* $F_{(2, 39)} = 0.885$, p =.421; η_p^2= .043; *FFMQ Total:* $F_{(2, 39)} = 0.831$, p =.443; η_p^2= .041; *Procrastination:* $F_{(2, 39)} = 1.556$, p =.224; η_p^2= .074). The only exceptions were in the FFMQ scale factors of *Acting with Awareness* (decreased across T1-T2; T1-T3; $F_{(2, 39)} = 3.442$, p = .042; η_p^2= .150), *Non-Judging* (decreased across T1-T2; $F_{(2, 39)} = 0.076$, p = .927; η_p^2= .004) and *Non-Reactivity* (decreased across T1-T3; T2-T3; $F_{(2, 39)} = 5.547$, p =.008; η_p^2= .221), but these changes meant a worsening of mindfulness levels. Therefore, compared to the control group, the 10-week Flow Meditation intervention significantly improved mindfulness competencies, as measured with the FFMQ scale.

Next, intra-subject interactions in the intervention group were evaluated. Significant differences were observed between the means across treatment times in the *FFMQ Total:* $F_{(2, 39)} = 8.407$, p <.001; η_p^2= .301; T1 *vs* T2, and in the following factors: *Observing* ($F_{(2, 39)} = 12.100$, p <.001; η_p^2= .383; T1*vs* T2, T1 *vs* T3) and *Non-Reactivity* ($F_{(2, 39)} = 20.050$, p <.001 η_p^2= .507; T1*vs*T2, T2 *vs* T3). Also, significant changes were observed in Procrastination ($F_{(2, 39)} = 13.918$, p <.001; η_p^2= .416; T1*vs* T2, T1 *vs* T3, T2*vs*T3).

Table 1

Repeated measures ANOVA, post-hoc testing, and intervention effect sizes

Variables		Experimental	Control	*P*[a]time*group	*Eta*^{2} *part*[a]	*Bonferroni intergroup*[b]	*Bonferroni intragroup*[C]
		Mean (SD)					
Observing	Pre-test	20.68 ±3.79	21.50 ±4.04	<.001	.299	.503	E1-E2*** / E1-E3* /
	Post-test	24.05 ±2.01	21.25 ±3.59			.003	
	4 months	23.50 ±2.80	21.85 ±3.18			.082	
Describing	Pre-test	23.05±3.10	23.50±3.47	.186	.083	.657	-
	Post-test	23.68±3.04	22.60±2.74			.235	
	4 months	23.55±2.26	22.30±3.48			.173	
Acting with Awareness	Pre-test	21.23±3.22	22.65±2.70	.008	.220	.131	C1-C2* / C1-C3*
	Post-test	23.27±2.43	20.05±3.31			<.001	
	4 months	22.77±2.38	20.00±3.29			.003	
Non-Judging	Pre-test	21.75±2.82	21.59±3.97	.027	.169	.883	C1-C2**
	Post-test	21.90±2.77	20.23±2.84			.061	
	4 months	21.90±3.30	20.32±3.35			.132	
Non-Reactivity	Pre-test	17.32±3.07	17.60±2.64	<.001	.376	.753	E1-E2*** / E2-E3** / C1-C3* / C2-C3*
	Post-test	19.91±3.23	17.75±3.11			.034	
	4 months	18.27±2.54	16.30±2.36			.013	
FFMQ Total	Pre-test	103.86±7.89	107.00±8.46	.044	.148	.221	E1-E2**
	Post-test	108.04±6.44	106.95±7.22			.606	
	4 months	105.72±5.40	105.30±7.25			.829	
Procrastination	Pre-test	42.59±9.73	38.00±9.77	<.001	.378	.136	E1-E2** / E1-E3*** / E2-E3*
	Post-test	37.73±9.04	39.60±10.07			.529	
	4 months	39.59±9.56	39.30±9.15			.920	

a Eta square partial

[b] Intergroup comparisons across time

[c] Intragroup comparisons. * p = 0,05, ** $p \leq 0{,}01$, *** $p \leq 0{,}001$. E1: Experimental group at Pretest; E2: Experimental group at Posttest; E3: Experimental group at Follow-up (4 months after the intervention; C1: Control group at Pretest; C2: Control group at Post-test; C3 Control group at Follow-up (4 months)

Pairwise comparisons using ANOVA with Bonferroni correction showed that the experimental group experienced a statistically significant increase in the FFMQ *Observation* factor at T2 ($p < .001$, Hedges $g = 1.11$) and T3 ($p = .019$, Hedges $g = 0.85$) compared to T1, with large effect sizes accordingly. In addition, a statistically significant increase in *Non-Reactivity* was also experienced at T2 ($p < .001$, Hedges $g = 0.82$) and T3 ($p = .071$, Hedges $g = 0.34$) in comparison with T1, with a large effect size between T1 and T2. In relation to the *FFMQ total score*, the experimental group showed a statistically significant increase at T2 ($p = .002$, Hedges $g = 0.58$) and T3 ($p = 0.765$, Hedges $g = 0.28$) compared to T1. Finally, the experimental group reduced procrastination levels in a statistically significant way after the intervention at T2 (p < .001, Hedges g = 0.52) and T3 ($p < .001$, Hedges $g = 0.52$). = 0.31), compared to T1.

Mediation Model

After controlling for the pre-test measure using the FFMQ questionnaire, results revealed that the intervention increased participants´ competency in mindfulness, and that this increment reduced procrastination levels (controlling for T1 procrastination levels), with significant direct and indirect effects at T2 (Figure 1). Similar results can be observed at T3, where the increase in mindfulness competence also reduced the perceived procrastination levels, with significant direct and indirect effects (Figure 2).

Figure 1

*Effect of mindfulness intervention at T2 on procrastination through FFMQ (standardized indirect effect->intervention->FFMQ T1->Procrastination T1; -.243(.101); 95% confidence interval [.273, .485]; **p ≤ .01; ***p ≤ .001. Total effect in brackets)*

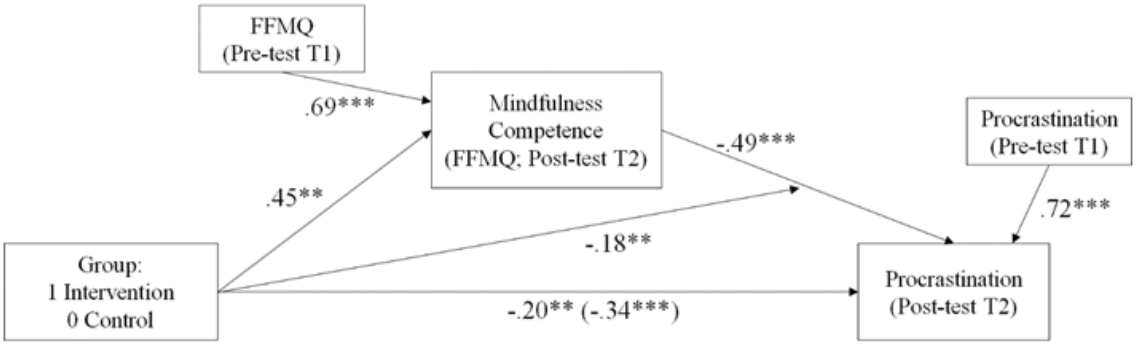
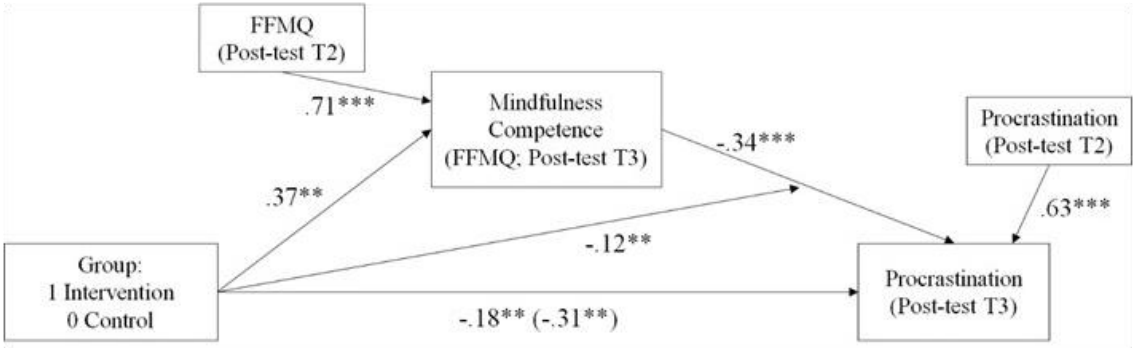


Figure 2

*Effect of mindfulness intervention at T3 on procrastination through FFMQ (standardized indirect effect->intervention->FFMQ T2->Procrastination T2; -.277(.138); 95% confidence interval [.167, .388]; **p ≤ .01; ***p ≤ .001. Total effect in brackets)*



In addition, different facets of mindfulness predicted a reduction in procrastination at T2 and T3, with the exception of Non-Reactivity (Figures 3 and 4).

Figure 3

Effect of the mindfulness intervention at T2 on perceived procrastination A) Standardized indirect effect ->intervention->Acting with Awareness T2->Procrastination T2 -.213(.120). B) Standardized indirect effect->intervention->Describing T2->Procrastination T2 -.302(.105). C) Standardized indirect effect->intervention->Non-Judging T2->Procrastination T2 -.177(.080). D) Standardized indirect effect->intervention->Non-Reactivity T2->Procrastination T2 .020(.011). E) Standardized indirect effect->intervention->Observing T2->Procrastination T2 -.121(.062)

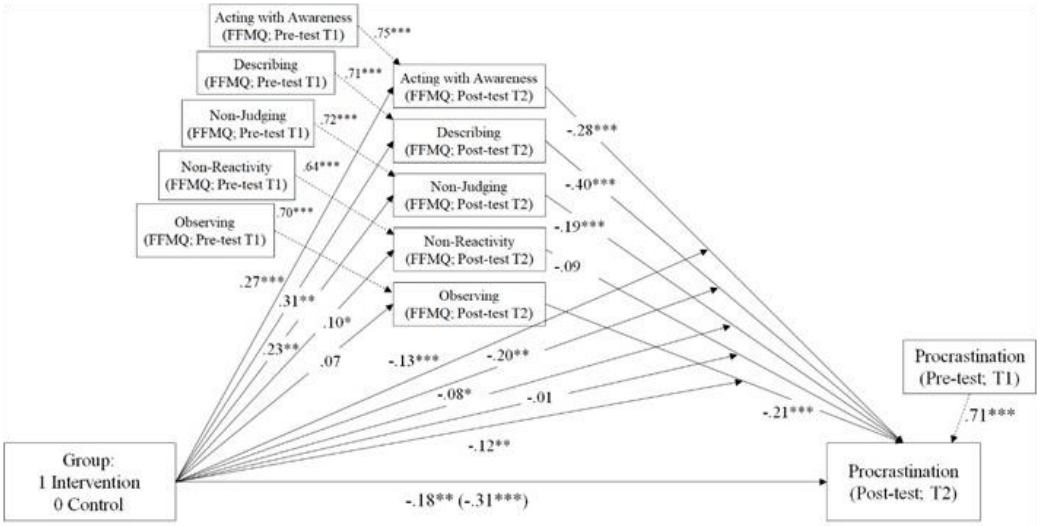
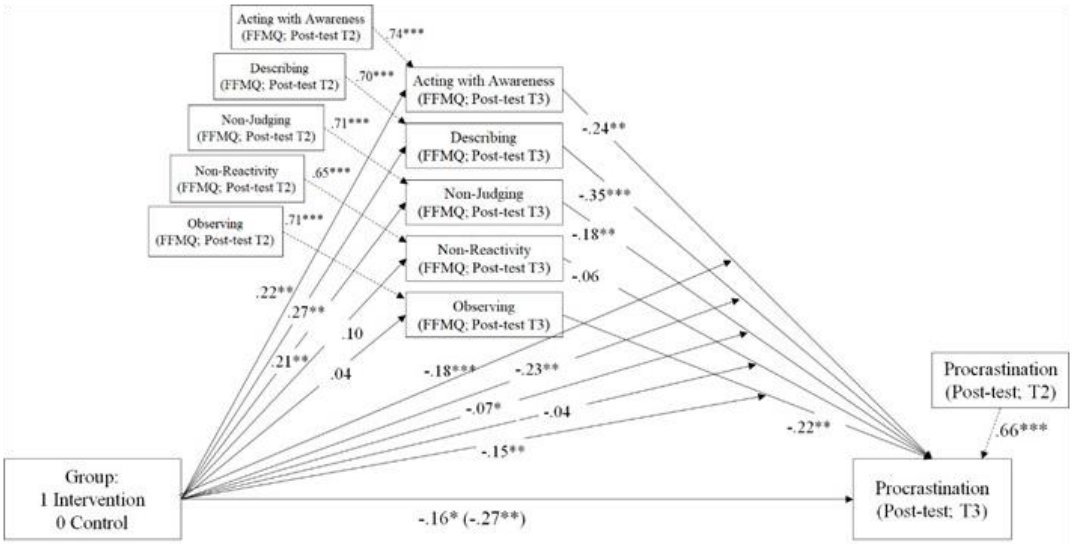


Figure 4

Effect of the mindfulness intervention at T3 on procrastination through the FFMQ factors. A) Standardized indirect effect ->intervention->Acting with Awareness T3->Procrastination T3 -.184(.111). B) Standardized indirect effect ->intervention->Describing T3->Procrastination T3 -.132(.101). C) Standardized indirect effect ->intervention->Non-Judging T3->Procrastination T3 -.116(.041). D) Standardized indirect effect ->intervention->Non-Reactivity T3->Procrastination T3 .018(.009). E) Standardized indirect effect ->intervention->Observing T3->Procrastination T3 -.091(.032)



Discussion

The *Flow Meditation* intervention was shown to be effective for enhancing mindfulness competencies (as measured with the FFMQ – Observing, Acting with Awareness, Non-judging, and Non-Reactivity) and for reducing procrastination in this sample of Spanish university students. Mindfulness competencies mediated the effect of the *Flow Meditation* program on procrastination, which is consistent with the findings of Amutio et al (2022) where the development of these competencies mediated improvements in perceived stress and well-being in a university sample. In addition, findings from the present study support previous research in which the application of *Flow Meditation* increased motivation to study and self-efficacy in a sample of immigrant students (Franco et al., 2020). The study findings also align with other studies where *Flow Meditation* has shown effectiveness in i) reducing impulsivity and enhancing relaxation and self-efficacy in high school students (Amutio et al., 2015; Franco et al., 2016); ii) promoting a healthy lifestyle in university students (Soriano-Ayala et al., 2020). This is noteworthy considering that impulsivity, low self-efficacy, low levels of relaxation and emotional regulation, and a lack of healthy habits have been positively related to procrastination (Ren et al., 2023). Results from this study are also consistent with the small number of extant studies in which different mindfulness programs and techniques have been effective in reducing academic procrastination (Johnson et al., 2024; Rad et al., 2023; Yao et al., 2024).

A key objective of *Flow Meditation* is to help participants learn to allow their thoughts to flow, rather than try to control, resist or interfere with them. Indeed, as opposed to advocating the rejection of negative thoughts or temporarily pausing thought processes, the program aims to offer an alternative to automatic and conditioned ways of responding to outer and inner stimuli. In other words, during practice, one becomes conscious of the presence of thoughts but breaks with the habit of analysing their content or veracity. Rather, the idea is to become conscientious in acknowledging that thoughts (as well as sensations) change every moment, and that they are constantly flowing. Therefore, participants are guided to understand experientially that thoughts and emotions arise and disappear continuously, with the intention being to simply observe and accept rather than identify or react to them (Franco et al., 2016, 2020).

Studies have found that conscientiousness is negatively associated with procrastination, and that the tendency to procrastinate is associated with low mindfulness and low self-compassion (Cheung & Ng, 2019; Nordby et al., 2016). In fact, individuals with low mindfulness are more likely to put off tasks, which increases the risk of anxiety, stress and other negative emotions (e.g., fear, low self-esteem) (Li et al., 2023). Conversely, higher mindfulness is linked to task persistence and less procrastination over time (Sirois, 2023). Thus, conscientious people are more likely to regulate internal and external cognitions and maintain attention on goal-relevant tasks. In this way, mindfulness might represent a key clinical variable and could be a fundamental step in the self-regulation process necessary to initiate actions towards achieving goals when procrastination is the habitual coping response (Gao et al., 2021).

Academic procrastination has been explained through different models consistent with a broad theory of self-regulation, with the *Stress Context Vulnerability Model* (Sirois, 2023) and *Theory of Psychological Flexibility* (Hayes et al., 2012) arguably being the most relevant. The *Stress Context Vulnerability Model* proposes that reductions in coping resources and/or tolerance for negative affective states are key reasons why stressful contexts can increase vulnerability for procrastination (Sirois, 2023). Therefore, taking a mindful and compassionate approach to personal flaws and setbacks is likely to be an effective coping strategy to deal with stress.

According to the *Theory of Psychological Flexibility*, inflexibility can be defined as the inability to connect with the present moment more fully, avoidance of unwanted inner experiences, and lack of commitment to personal values (Hayes, 2012). Amongst Spanish university students, psychological inflexibility has been shown to mediate the relationship between general psychological distress and academic procrastination. This is likely to be because university students engaging in problematic procrastination might be delaying their academic tasks, not only because they experience negative emotional states (i.e., distress), but because they have a pattern of reacting to such experiences with avoidance (Eisenbeck et al., 2019). Conversely, students responding to their negative emotions with

acceptance, and sustaining their focus on what really matters for them (e.g., future-oriented goals), are less likely to engage in academic procrastination, despite feeling depressed, anxious, or distressed. In the same vein, recent research has found that lower future time consciousness is directly related to academic procrastination, such that individuals with poor future time consciousness and low mindfulness typically demonstrate a poor ability to regulate impulsive emotions and behaviors (Li et al., 2023). However, since mindfulness can provide positive psychological resources for university students and increase their ability to buffer against negative emotional states (Van Gordon et al., 2014), it follows logically that the frequency and degree of academic procrastination will be lower.

Some studies have related mindfulness with the optimal experience of flow (Amutio et al., 2022; Sinnott et al., 2020). The experience of flow includes having clear goals, the merging of action and awareness, and concentration on the activity with total absorption (Csikszentmihalyi, 1990). In a similar way, one of the tools used in mindfulness techniques to avoid distraction is concentration (e.g., on breathing, the body, or the task at hand), without responding to any other outside stimulus. Consistent with this view, a study conducted with undergraduate students concluded that high procrastination was associated with lack of self-determined motivation and low incidence of flow state (Lee, 2005). The results of the same study also indicated that, although intrinsic motivation showed significant unique effects on procrastination, it did not contribute significantly to the variance in procrastination when the effects caused by flow experiences were considered. These results also agree with the study of Yao et al (2024) in which mindfulness was positively related to creativity and mediated by the experience of flow.

The *Flow Meditation* intervention appears to reduce procrastination through the development of mindfulness competencies. According to the findings of the present study, the mindfulness facets of Acting with Awareness, Describing, Non-judging, and Observing mediated the reductions in procrastination. This is a relevant result given calls for greater understanding of the potential mechanisms of action of mindfulness techniques and the mediating role of different variables (Maloney et al., 2023; Salguero-Pazos & Reyes-de-Cózar, 2023). More specifically, it appears that specific facets of mindfulness may improve emotion regulation skills that are effective for reducing procrastination (Calvete et al., 2017; Johnson et al., 2024; Sirois, 2023). Therefore, mindfulness training that focusses on the Acting with Awareness, Describing, Non-Judging, and Observing factors of mindfulness may reduce negative affect and increase positive affect (Amutio et al., 2015; Asani et al., 2023), leading to improved self-perceptions through the development of self-efficacy, self-compassion, and self-acceptance. In the same vein, a recent study found that mindfulness-based interventions can enhance executive control over excessive smartphone use by promoting self-awareness (Kim et al., 2024). In turn, self-awareness and self-efficacy can facilitate reduced avoidance of activities that can threaten self-worth (Ma et al., 2023; Gu et al., 2024), amplify stress and/or precipitate academic procrastination (Sirois, 2023).

Limitations and Future Research

The results of the present study should be considered in light of their limitations, which arise as a result of 1) the relatively small sample size and the imbalance in gender representation, with a larger sample of women, 2) reliance on self-report measures, 3) a relatively short follow-up assessment term, and 4) the absence of an active control condition. In addition, effect sizes were low to moderate; however, changes were maintained through to the 4-month follow-up assessment. Consequently, future studies using larger sample sizes could continue to evaluate the efficacy of *Flow Meditation* and other mindfulness approaches for reducing academic procrastination in university students, as well as investigate additional mediating effects (e.g., self-perceptions, emotion regulation, self-compassion).

Despite the aforementioned limitations, the present study showed that *Flow Meditation* fostered significant improvements in academic procrastination in university students that were mediated by an increase in mindfulness competencies, adding further support to the role for mindfulness-based interventions in educational settings. Mindfulness is considered not only a cost-effective tool, but a core competency that can be developed through sustained practice within the university context (Lee et al., 2024). In this sense, the incorporation of mindfulness programs in the university setting can contribute

to the improvement of self-regulation skills and academic performance, thus positively impacting the quality of education and the comprehensive preparation of future professionals. However, given the complexity of academic procrastination, a holistic approach integrating additional complementary techniques that seek to develop core competencies, including time-management, positive study values and habits, adaptive learning attitudes (e.g., increased academic engagement), healthy thinking strategies, and mindfulness (Joghataei et al., 2023; Salguero-Pazos & Reyes-de-Cózar, 2023) is likely to be the best approach.

Conclusions

The findings of this study indicate that a 10-week mindfulness program can significantly reduce academic procrastination among university students. This suggests the potential value of implementing mindfulness-based programs within educational settings, both through student support services and through faculty and staff training. Offering elective courses or workshops on mindfulness could provide students with transferable skills that benefit both their academic performance and overall well-being. In addition, it is essential to highlight the importance of including teaching professionals in these types of programs to enhance their well-being and professional development, thereby improving the quality of education (García-Álvarez et al., 2023). Beyond the reduction of academic procrastination, mindfulness programs in university settings also foster a more positive classroom climate by promoting emotional self-regulation, sustained attention, and stress reduction among both students and faculty (Amutio et al., 2022; Santamaria et al., 2023). In this sense, the potential impact of these interventions transcends the individual level, contributing to the collective well-being and the creation of more collaborative, focused, and receptive academic environments, which translates into educational benefits for the dynamics of the academic community as a whole.

Flow Meditation shows promise for reducing procrastination in Spanish university students through the enhancement of mindfulness competencies, particularly the Observing, Acting with Awareness, Non-judging and Observing dimensions of the Five Facets of Mindfulness Questionnaire. Findings have implications for mindfulness-based intervention research and practice in pedagogic settings, highlighting the importance of programs that enhance the development of mindfulness competencies among university students to optimize academic performance and reduce procrastination. Future research should examine the sustainability of these effects over the medium and long term, as well as compare mindfulness-based programs with other interventions, such as time-management training or cognitive-behavioral approaches. It would also be valuable to continue investigating potential mediating variables to better understand the mechanisms underlying the reduction of procrastination. Moreover, testing these interventions across different educational levels and cultural contexts, as well as exploring variations in program design (e.g., intensive formats, brief programs, hybrid, or fully online modalities), would help to optimize implementation and strengthen the evidence base for their effectiveness in higher education.

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