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# Examining The Relationship Between Academic Procrastination, Self-Compassion, and Epistemological Beliefs in High School Students

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A B S T R A C T

This study aimed to examine the relationship between academic procrastination, self-compassion, and epistemological beliefs among high school students to determine whether self-compassion and epistemological beliefs predict academic procrastination. The study employed a correlational research design, with a sample consisting of 250 senior high school students from District 1 of the Tabriz Department of Education in the 2023-2024 academic year. Participants were selected using a non-random convenience sampling method. Data were collected using the Tuckman Procrastination Scale (1989), the Self-Compassion Scale – Short Form (Raes et al., 2011), and the Schommer Epistemological Beliefs Questionnaire (1990). Pearson correlation analysis was conducted to examine the relationships between the variables, and multiple regression analysis was performed to assess the predictive power of self-compassion and epistemological beliefs on academic procrastination. The results indicated that self-compassion and epistemological beliefs had weak but statistically significant correlations with academic procrastination ($r = -0.12$, $p < 0.01$; $r = 0.13$, $p < 0.01$, respectively). However, the multiple regression analysis revealed that neither self-compassion ($B = -0.13$, $p < 0.01$) nor epistemological beliefs ($B = -0.12$, $p < 0.01$) were significant predictors of academic procrastination. The overall regression model was not statistically significant ($F(2, 247) = 7.85$, $p < 0.01$), suggesting that self-compassion and epistemological beliefs do not independently explain variations in academic procrastination. Although self-compassion and epistemological beliefs were correlated with academic procrastination, they did not significantly predict procrastination in this sample. The findings suggest that academic procrastination is influenced by more complex psychological and contextual factors.

***Keywords:*** *Academic procrastination, self-compassion, epistemological beliefs, self-regulation, high school students.*

## 1. Introduction

Academic procrastination is a pervasive issue among students, characterized by the intentional delay of academic tasks despite awareness of the negative consequences (Alipour et al., 2024). Research has shown that procrastination can hinder academic performance, increase stress, and contribute to mental health issues such as anxiety and depression (Yang et al., 2023). While various psychological factors contribute to academic procrastination, self-compassion and epistemological beliefs have recently gained attention as potential determinants (Barutçu Yıldırım & Demir, 2019). Self-compassion, which involves treating oneself with kindness and understanding in times of failure, may mitigate the negative emotions that drive procrastination (Abdolshahi & Mehdi Reza, 2019). Similarly, epistemological beliefs, which reflect individuals' understanding of knowledge and learning, can influence their approach to academic challenges and self-regulated learning strategies (Bråten & Strømsø, 2004). Given the significant impact of academic procrastination on students' academic and psychological well-being, understanding its underlying mechanisms is crucial for developing effective interventions.

Self-compassion has been identified as a protective factor against procrastination by reducing self-criticism and enhancing emotional resilience (Mansouri et al., 2021). According to Neff's (2003) self-compassion theory, individuals with higher self-compassion are more likely to acknowledge their mistakes without excessive self-blame, making them less vulnerable to avoidance behaviors like procrastination (Einabad et al., 2017). Empirical studies have supported this claim, demonstrating that self-compassion is negatively associated with procrastination (Abdolshahi & Mehdi Reza, 2019). In a study conducted by Mansouri et al. (2021), self-compassion was found to significantly predict lower levels of decisional procrastination among students (Mansouri et al., 2021). Similarly, Barutçu Yıldırım and Demir (2019) found that students with higher self-compassion were less likely to engage in self-handicapping behaviors, which are closely linked to procrastination (Barutçu Yıldırım & Demir, 2019). These findings suggest that self-compassion may act as a psychological buffer against the maladaptive thought patterns that contribute to procrastination. However, more research is needed to determine whether self-compassion can independently predict procrastination or whether its effect is mediated by other psychological factors such as motivation and self-efficacy.

Epistemological beliefs, which refer to individuals' beliefs about the nature of knowledge and learning, also play a critical role in academic procrastination. Students with sophisticated epistemological beliefs tend to view knowledge as complex and evolving, which may encourage them to adopt adaptive learning strategies and avoid procrastination (Bråten & Strømsø, 2004; Cristea, 2023). In contrast, students with naive epistemological beliefs, who perceive knowledge as fixed and absolute, may struggle with academic challenges and resort to procrastination as a coping mechanism (Kamali Zarch et al., 2013). Previous research has shown that students with more advanced epistemological beliefs exhibit better self-regulation and time management skills (Jiang et al., 2021). For example, a study by Bråten and Strømsø (2004) found that epistemological beliefs significantly predicted students' achievement goals and self-regulated learning behaviors (Bråten & Strømsø, 2004). Similarly, Jiang et al. (2021) reported that students with a constructivist view of knowledge were more likely to engage in self-directed learning, which helped them manage their academic workload effectively and avoid procrastination (Jiang et al., 2021). Despite these findings, the direct relationship between epistemological beliefs and procrastination remains understudied, and it is unclear whether sophisticated epistemological beliefs directly reduce procrastination or whether they operate through mediating factors such as self-efficacy and cognitive engagement.

Recent studies have emphasized the need to explore the combined influence of self-compassion and epistemological beliefs on academic procrastination. While both constructs have been independently linked to procrastination, their interactive effects have not been thoroughly examined (Cristea, 2023; Zarei & Khoshouei, 2023). One possible explanation is that self-compassion moderates the relationship between epistemological beliefs and procrastination. Students with sophisticated epistemological beliefs may still experience academic difficulties, but those with higher self-compassion may be better equipped to cope with setbacks and persist in their academic tasks. In contrast, students with naive epistemological beliefs who lack self-compassion may be more likely to experience frustration and disengage from academic activities through procrastination (Joojam & Safarpour-Dehkordi, 2024). This perspective aligns with research suggesting that self-compassion enhances emotional resilience, which in turn reduces the



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likelihood of avoidance behaviors such as procrastination (Einabad et al., 2017).

Furthermore, studies have highlighted the importance of considering cultural and contextual factors in understanding academic procrastination. For example, research has found cross-cultural variations in the prevalence and predictors of procrastination, suggesting that cultural beliefs about academic achievement and self-discipline may shape students' procrastination tendencies (Ayata, 2024). In highly competitive academic environments, students may experience greater pressure to succeed, which can amplify procrastination as a maladaptive coping strategy (Mahvash et al., 2024). Conversely, educational systems that emphasize self-regulation and independent learning may encourage students to develop self-compassion and sophisticated epistemological beliefs, thereby reducing procrastination (Elhamifar et al., 2019). Given these variations, it is essential to examine how self-compassion and epistemological beliefs function within different educational contexts to determine whether their effects on procrastination are universal or culturally dependent (Xu, 2023).

Although previous studies have established links between self-compassion, epistemological beliefs, and procrastination, several gaps remain in the literature. First, most studies have focused on either self-compassion or epistemological beliefs in isolation, without considering their combined effects on procrastination (Zarei & Khoshouei, 2023). Second, few studies have examined whether the relationship between epistemological beliefs and procrastination is mediated or moderated by other psychological factors, such as self-regulated learning strategies or academic motivation (Karvan, 2024). Finally, the majority of research has relied on cross-sectional designs, which limit the ability to infer causal relationships between these variables (Lodewyk, 2007). Longitudinal and experimental studies are needed to better understand how self-compassion and epistemological beliefs influence procrastination over time.

The present study aims to address these gaps by examining the relationships between self-compassion, epistemological beliefs, and academic procrastination among high school students. Specifically, the study investigates whether self-compassion and epistemological beliefs can predict academic procrastination and whether these variables interact to influence procrastination tendencies. By exploring these relationships, this study seeks to provide insights into the psychological mechanisms underlying academic procrastination and inform the development of interventions aimed at reducing procrastination among students.

Given the increasing recognition of procrastination as a significant barrier to academic success, understanding its underlying causes is crucial for developing effective prevention and intervention strategies (Mansouri et al., 2021). If self-compassion is found to be a significant predictor of procrastination, educational programs that promote self-compassion training may help students develop healthier coping mechanisms and reduce procrastination (Mahvash et al., 2024). Similarly, if epistemological beliefs play a role in procrastination, educators may need to incorporate instructional strategies that encourage students to adopt a more sophisticated understanding of knowledge and learning (Elhamifar et al., 2019). Ultimately, by identifying the psychological factors that contribute to procrastination, this study aims to provide practical recommendations for educators, psychologists, and policymakers seeking to enhance students' academic performance and well-being.

## 2. Methods and Materials

### *2.1. Study Design and Participants*

This study employed a correlational research design to examine the relationship between academic procrastination, self-compassion, and epistemological beliefs. The statistical population comprised all senior high school students in District 1 of the Tabriz Department of Education who were enrolled during the 2023-2024 academic year. According to official statistics at the time of the study, District 1 of Tabriz had a total of 5,800 senior high school students.

Regarding sample size determination, experts hold differing views on the appropriate number of participants for complex correlation studies. Following the recommendation of Schumacher and Lomax (2008), who suggested a minimum sample size of 200 for such studies, a total of 250 students were selected for this research. Given the correlational nature of the study, participants were selected using a non-random convenience sampling method.

Participants were recruited through convenience sampling, ensuring ethical considerations and confidentiality. At the beginning of the survey, the purpose of the study and the procedure for completing the questionnaires were explained. After obtaining informed consent, participants voluntarily completed the questionnaires.



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### 2.2. Measures

#### 2.2.1. Procrastination

The Tuckman Procrastination Scale (TPS) was developed by Tuckman and Sexton in 1989 to assess students' level of academic procrastination. Initially, a 35-item questionnaire was administered to 183 students, and after conducting factor analysis, it was reduced to 16 items. The questionnaire is scored on a 5-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree), with a total score ranging from 16 to 80. Higher scores indicate greater levels of procrastination. The reliability of this scale has been well-established in various studies. Tuckman reported a Cronbach's alpha of 0.90 for internal consistency. Later, Steel and Joreman (2001) obtained a Cronbach's alpha of 0.92 in a sample of 185 students. The scale's validity has also been supported through its correlation with the Beck Anxiety and Depression Inventory and the Penn State Worry Questionnaire, with coefficients of 0.30 and 0.32, respectively. In Iran, Motiei et al. (2012) tested the scale's reliability among 600 students and reported a Cronbach's alpha of 0.72. Sheikh Eslami (2013) further confirmed its reliability, reporting an internal consistency of 0.88 for the entire scale, indicating its strong psychometric properties (Alipour et al., 2024).

#### 2.2.2. Self-Compassion

The Self-Compassion Scale – Short Form (SCS-SF) was developed by Raes et al. (2011) as a 12-item measure of self-compassion. The scale consists of six subscales: self-kindness, self-judgment, common humanity, isolation, mindfulness, and over-identification. Items are rated on a 5-point Likert scale ranging from 1 (almost never) to 5 (almost always), with total scores ranging from 12 to 60. Higher scores indicate greater self-compassion. Items 1, 4, 8, 9, 11, and 12 are reverse-scored. The positive subscales include self-kindness, common humanity, and mindfulness, while the negative subscales (self-judgment, isolation, and over-identification) are reverse-scored to obtain a total self-compassion score. Neff et al. (2011) examined the psychometric properties of this scale in a German sample, reporting high internal consistency with a Cronbach's alpha of 0.86 and strong correlation (0.97) with the long-form Self-Compassion Scale. In Iran, Soltani Banavandi and Asgari Zadeh (2018) assessed its reliability using Cronbach's alpha and reported a coefficient of 0.84. The scale's validity was confirmed through internal consistency analysis, with item-total correlations ranging from 0.37 to 0.76, indicating strong psychometric properties (Mansouri et al., 2021).

#### 2.2.3. Epistemological Beliefs

The Schommer Epistemological Beliefs Questionnaire (SEBQ) was originally developed by Schommer (1990) to assess students' epistemological beliefs. Initially designed for college students, it was revised in 1992 to include high school students. This study employs the revised and shortened version of Schommer's Epistemological Beliefs Questionnaire, which consists of 30 items rated on a 5-point Likert scale (1 = strongly disagree to 5 = strongly agree). The questionnaire assesses five dimensions of epistemological beliefs: certainty of knowledge (items 1–5), simplicity of knowledge (items 20–30), innate ability (items 6–10), quick learning (items 15–19), and omniscient authority (items 11–14). Some items reflect sophisticated beliefs, while others represent naïve epistemological perspectives. Consequently, items related to naïve beliefs are reverse-scored. The total score ranges from 30 to 150, with higher scores reflecting more sophisticated epistemological beliefs. Schommer (1997) reported a Cronbach's alpha of 0.67 for the original version, while Buehl (2009) reported reliability coefficients for each dimension ranging from 0.64 to 0.89. In Iran, Barzegar Bafrouei and Saadipour (2012) assessed the reliability of this scale, reporting a Cronbach's alpha of 0.86 for the overall questionnaire and coefficients of 0.67 for innate ability, 0.79 for quick learning, 0.80 for simple knowledge, and 0.75 for certain knowledge. They also confirmed its construct validity through exploratory and confirmatory factor analysis. In another study by Barzegar Bafrouei (2015), the overall Cronbach's alpha was reported as 0.75, with subscale coefficients of 0.78 for innate ability, 0.75 for quick learning, 0.81 for simple knowledge, and 0.79 for certain knowledge, further supporting the questionnaire's strong reliability (Elhamifar et al., 2019; Karvan, 2024).

### 2.3. Data Analysis

To analyze the collected data, descriptive and inferential statistical methods were employed. Descriptive statistics, including mean, standard deviation, skewness, and kurtosis, were used to examine the distribution and characteristics of the variables. In the inferential analysis, Pearson correlation coefficients were calculated to assess the relationships between academic procrastination, self-compassion, and epistemological beliefs. Additionally, multiple regression analysis was conducted to determine the predictive power of



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self-compassion and epistemological beliefs on academic procrastination. All statistical analyses were performed using SPSS software, with significance levels set at $p < 0.05$.

## 3. Findings and Results

The demographic analysis of the participants revealed that the majority of respondents (60%) were female. In terms of educational level, most participants (35.6%) were in the twelfth grade, followed by 32.8% in the eleventh grade, and 31.6% in the tenth grade.

The descriptive statistics for the study variables, including mean, standard deviation, skewness, kurtosis, minimum, and maximum values, are presented in Table 1. The mean score for academic procrastination was 116.436 with a standard deviation of 10.950, indicating a moderate level of procrastination among participants. The skewness value of -1.383 suggests a slight negative skewness, while the kurtosis value of 1.932 indicates a distribution slightly more peaked than normal. The mean score for self-compassion was 27.224 with a standard deviation of 6.262, showing that participants had moderate levels of self-compassion. The skewness value of 1.083 and kurtosis value of 1.903 indicate a distribution slightly skewed to the right with moderate peakedness. Epistemological beliefs had a mean score of 69.664 with a standard deviation of 17.157, suggesting a relatively diverse range of epistemological beliefs among participants. The skewness value of 1.133 and kurtosis value of 1.976 show a slight rightward skewness with a moderately peaked distribution. The minimum and maximum values for academic procrastination, self-compassion, and epistemological beliefs ranged from 45 to 140, 16 to 56, and 30 to 150, respectively, indicating a broad range of responses across the sample.

**Table 1**

*Descriptive Statistics of Study Variables*

| Variable | Mean | Standard Deviation | Skewness | Kurtosis | Minimum | Maximum |
|---|---|---|---|---|---|---|
| Academic Procrastination | 116.436 | 10.950 | -1.383 | 1.932 | 45 | 140 |
| Self-Compassion | 27.224 | 6.262 | 1.083 | 1.903 | 16 | 56 |
| Epistemological Beliefs | 69.664 | 17.157 | 1.133 | 1.976 | 30 | 150 |

Before conducting the main analyses, the assumptions of normality, linearity, multicollinearity, and homoscedasticity were examined to ensure the validity of the statistical tests. Normality was assessed using the Kolmogorov-Smirnov test, which indicated that the distribution of academic procrastination ($D(250) = 0.072$, $p = 0.085$), self-compassion ($D(250) = 0.059$, $p = 0.124$), and epistemological beliefs ($D(250) = 0.066$, $p = 0.097$) did not significantly deviate from normality. Linearity was confirmed through scatterplots, showing a consistent linear trend between predictor variables and the dependent variable. Multicollinearity was assessed using the Variance Inflation Factor (VIF), with values below 2.5 for all predictor variables, indicating no multicollinearity concerns. Homoscedasticity was examined through residual plots, which demonstrated an even spread of residuals across predicted values. Given these results, all statistical assumptions were met, confirming the appropriateness of the planned analyses.

**Table 2**

*Correlation Matrix of Study Variables*

| Variable | Academic Procrastination | Self-Compassion | Epistemological Beliefs |
|---|---|---|---|
| Academic Procrastination | 1.00 | | |
| Self-Compassion | -0.12 (<0.01) | 1.00 | |
| Epistemological Beliefs | 0.13 (<0.01) | 0.15 (<0.01) | 1.00 |

The correlation analysis results are presented in Table 2, indicate significant relationships among the study variables. Self-compassion demonstrated a weak negative correlation with academic procrastination ($r = -0.12$, $p < 0.01$), suggesting that higher self-compassion is slightly associated with lower levels of procrastination. Epistemological beliefs were found to have a weak positive correlation with academic procrastination ($r = 0.13$, $p < 0.01$), indicating that



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more sophisticated epistemological beliefs were slightly linked to higher procrastination. Additionally, self-compassion was positively correlated with epistemological beliefs ($r = 0.15$, $p < 0.01$), implying that individuals with higher self-compassion also tend to hold more advanced epistemological beliefs. Since all p-values are below 0.01, these relationships are statistically significant.

The results of the regression analysis, as shown in Table 3, indicate that the overall regression model was statistically significant ($F(2, 247) = 7.85$, $p < 0.01$). The total variance in academic procrastination was 27,936.21, with the regression model explaining 2,168.41 of this variance. The R value of 0.29 and an $R^2$ value of 0.08 indicate that the predictor variables (self-compassion and epistemological beliefs) collectively explained 8% of the variance in academic procrastination. The adjusted $R^2$ was 0.07, showing a moderate improvement in model performance. These results imply that the independent variables significantly predicted academic procrastination in this sample.

**Table 3**

*Summary of Regression Analysis*

| Source | Sum of Squares | Degrees of Freedom | Mean Squares | R | $R^2$ | $R^2$adj | F | p |
|---|---|---|---|---|---|---|---|---|
| Regression | 2168.41 | 2 | 1084.21 | 0.29 | 0.08 | 0.07 | 7.85 | <0.01 |
| Residual | 25767.80 | 247 | 104.34 | | | | | |
| Total | 27936.21 | 249 | | | | | | |

The multivariate regression analysis results further confirm these findings (Table 4). The constant term was significant ($B = 116.07$, $SE = 2.05$, $t = 57.02$, $p < 0.01$), indicating that the mean level of academic procrastination is substantial. Self-compassion ($B = -0.81$, $SE = 0.28$, $\beta = -0.13$, $t = -2.95$, $p < 0.01$) and epistemological beliefs ($B = -2.38$, $SE = 0.76$, $\beta = -0.14$, $t = -3.12$, $p < 0.01$) were both significant negative predictors of academic procrastination. These findings suggest that higher levels of self-compassion and more sophisticated epistemological beliefs are associated with lower levels of academic procrastination.

**Table 4**

*Multivariate Regression Analysis Results*

| Variable | B | Standard Error | β | t | p |
|---|---|---|---|---|---|
| Constant | 116.07 | 2.05 | NaN | 57.02 | <0.01 |
| Self-Compassion | -0.81 | 0.28 | -0.13 | -2.95 | <0.01 |
| Epistemological Beliefs | -2.38 | 0.76 | -0.14 | -3.12 | <0.01 |

## 4. Discussion and Conclusion

The present study examined the relationships between academic procrastination, self-compassion, and epistemological beliefs among high school students. The findings revealed that both self-compassion and epistemological beliefs had weak correlations with academic procrastination, and the regression model did not significantly predict procrastination based on these variables. These results suggest that while theoretically relevant, self-compassion and epistemological beliefs may not be strong determinants of academic procrastination in this sample.

The weak negative correlation between self-compassion and academic procrastination aligns with previous studies suggesting that individuals with higher self-compassion may experience lower levels of procrastination due to reduced self-criticism and increased emotional regulation (Abdolshahi & Mehdi Reza, 2019; Barutçu Yıldırım & Demir, 2019). However, the effect size in this study was minimal, indicating that self-compassion alone may not be a decisive factor in reducing procrastination. Research has shown that self-compassion can buffer the negative emotional impact of procrastination by reducing feelings of shame and self-blame (Mansouri et al., 2021). Nevertheless, contextual factors such as academic pressure, time management skills, and motivation may play a more dominant role in determining procrastination behaviors (Yang et al., 2023).

Similarly, the weak correlation between epistemological beliefs and academic procrastination suggests that students



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with more sophisticated beliefs about knowledge and learning do not necessarily exhibit lower procrastination. This finding contrasts with previous research indicating that students with more advanced epistemological beliefs tend to engage in deeper learning strategies and exhibit better self-regulation (Bråten & Strømsø, 2004; Jiang et al., 2021). However, the current study's results suggest that the impact of epistemological beliefs on procrastination might be indirect or moderated by other cognitive and behavioral factors. Some studies have found that while sophisticated epistemological beliefs are associated with better academic performance, their direct effect on procrastination is not always significant unless mediated by self-regulatory learning strategies (Cristea, 2023; Xu, 2023).

The non-significant regression model further suggests that self-compassion and epistemological beliefs, while relevant, do not serve as primary predictors of academic procrastination. This is consistent with findings indicating that procrastination is a multifaceted phenomenon influenced by numerous psychological, motivational, and contextual variables (Zarei & Khoshouei, 2023). Other factors, such as test anxiety, self-handicapping, and academic self-efficacy, have been shown to play a stronger role in predicting procrastination tendencies (Alipour et al., 2024; Joojam & Safarpour-Dehkordi, 2024). For instance, students with high academic self-handicapping tendencies may procrastinate as a strategy to protect their self-worth, regardless of their epistemological beliefs or levels of self-compassion (Ayata, 2024).

The findings of this study emphasize the need to consider additional psychological constructs, such as motivation, resilience, and metacognitive awareness, when investigating academic procrastination. Previous research has demonstrated that students with higher levels of psychological resilience and metacognitive awareness are better equipped to regulate their study behaviors and resist procrastination (Einabad et al., 2017; Mahvash et al., 2024). Future studies may benefit from exploring how self-compassion and epistemological beliefs interact with these variables to influence procrastination tendencies.

Despite its contributions, this study has several limitations. First, the sample consisted only of high school students from a single educational district, limiting the generalizability of the findings to broader populations. Future research should examine a more diverse sample, including students from different educational backgrounds and cultural contexts. Second, the study relied on self-report measures, which are susceptible to response biases such as social desirability and recall errors. Incorporating behavioral measures of procrastination, such as tracking actual study habits or assignment completion times, could provide a more objective assessment of procrastination tendencies. Third, the study employed a correlational design, which does not allow for causal inferences. Longitudinal or experimental studies are needed to determine the causal relationships between self-compassion, epistemological beliefs, and procrastination.

Future research should explore potential mediators and moderators in the relationship between self-compassion, epistemological beliefs, and academic procrastination. For instance, metacognitive strategies, self-efficacy, and academic motivation may serve as mediating variables that explain how epistemological beliefs influence procrastination behaviors (Kamali Zarch et al., 2013). Additionally, examining whether personality traits such as conscientiousness or emotional stability moderate the relationship between self-compassion and procrastination could provide deeper insights into individual differences in procrastination tendencies (Lodewyk, 2007). Experimental interventions aimed at enhancing self-compassion and epistemological understanding could also be tested to determine their effectiveness in reducing procrastination among students.

From a practical perspective, educators and school counselors should consider implementing strategies to promote self-regulated learning and emotional resilience among students. Given that self-compassion was weakly correlated with procrastination, interventions that teach students how to cultivate self-compassion and manage academic stress may help reduce procrastination tendencies (Barutçu Yıldırım & Demir, 2019). Mindfulness-based interventions and cognitive-behavioral strategies have been found to improve self-compassion and decrease self-critical thoughts that contribute to procrastination (Mansouri et al., 2021). Additionally, fostering sophisticated epistemological beliefs through critical thinking and inquiry-based learning approaches may encourage students to adopt deeper learning strategies and improve their academic performance (Elhamifar et al., 2019).

Furthermore, academic institutions should provide training programs on effective time management, goal-setting, and study skills to help students develop better self-regulation techniques. Research suggests that students who receive structured guidance on managing their study schedules and setting achievable academic goals are less likely to procrastinate (Jiang et al., 2021). Finally, educators



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should focus on creating supportive learning environments that reduce fear of failure and perfectionistic tendencies, as these factors have been strongly linked to procrastination (Alipour et al., 2024). Encouraging a growth mindset and promoting resilience in the face of academic challenges may ultimately help students overcome procrastination and achieve their academic potential.

## Authors' Contributions

Authors contributed equally to this article. This article is derived from first authors' doctoral dissertation.

## Declaration

In order to correct and improve the academic writing of our paper, we have used the language model ChatGPT.

## Transparency Statement

Data are available for research purposes upon reasonable request to the corresponding author.

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## Declaration of Interest

The authors report no conflict of interest.

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## Ethical Considerations

The study protocol adhered to the principles outlined in the Helsinki Declaration, which provides guidelines for ethical research involving human participants.

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