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Relationship between academic procrastination, self-esteem, and moral intelligence among medical sciences students: a cross-sectional study

Saeed Ghasempour¹ , Aliasghar Babaei¹ , Soheil Nouri¹ , Mohammad Hasan Basirinezhad² and Ali Abbasi^{3*}

Abstract

Background Academic procrastination is a widespread phenomenon among students. Therefore, evaluating the related factors has always been among the major concerns of educational system researchers. The present study aimed to determine the relationship of academic procrastination with self-esteem and moral intelligence in Shahroud University of Medical Sciences students.

Methods This cross-sectional descriptive-analytical study was conducted on 205 medical sciences students. Participants were selected based on inclusion and exclusion criteria using the convenience sampling technique. The data collection tools included a demographic information form, Solomon and Rothblum's Procrastination Assessment Scale-Students, Rosenberg Self-Esteem Scale, and Lennick and Kiel's Moral Intelligence Questionnaire, all of which were completed online. The data were analyzed using descriptive statistics and inferential tests (multivariate linear regression with backward method) in SPSS software.

Results 96.1% of participating students experienced moderate to severe levels of academic procrastination. Based on the results of the backward multivariate linear regression model, the variables in the model explained 27.7% of the variance of academic procrastination. Additionally, self-esteem ($P < 0.001$, $\beta = -0.942$), grade point average ($P < 0.001$, $\beta = -2.383$), and interest in the study field ($P = 0.006$, $\beta = -1.139$) were reported as factors related to students' academic procrastination.

Conclusion According to the findings of this study, the majority of students suffer from high levels of academic procrastination. Furthermore, this problem was associated with low levels of self-esteem, grade point average, and interest in their field of study.

Keywords Academic procrastination, Self-esteem, Moral intelligence, Students

*Correspondence:

Ali Abbasi

abbasi_msn@yahoo.com

¹Student Research Committee, School of Nursing and Midwifery, Shahroud University of Medical Sciences, Shahroud, Iran

²Department of Epidemiology and Biostatistics, School of Public Health, Shahid Sadoughi University of Medical Sciences, Yazd, Iran

³Department of Nursing, School of Nursing and Midwifery, Shahroud University of Medical Sciences, Shahroud, Iran



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Introduction

Investigating factors associated with students' academic performance has always been the focus of researchers in the education system [1–3]. One of these factors is academic procrastination, which is a common phenomenon among students [4–6]. This particular type of postponement refers to learners' dominant and constant tendency to postpone academic tasks such that it affects their anticipated performance [6]. In general, two types of procrastination are observed in students' homework. One type is purposeful, planned, and thoughtful postponement. For example, when students have to complete many assignments simultaneously, they prioritize some important assignments. Another type is irrational, self-defeating, and harmful postponement, which is known as academic procrastination [7]. Rothblum et al. (1986) propose two criteria in the definition and diagnoses of this problem: (a) tendency to always or almost always discard academic assignments and (b) always or almost always experiencing anxiety caused by such behavior. They emphasize that academic procrastination should include frequent postponement and considerable anxiety [8]. Research has shown that at least 70% of students are somehow involved in academic procrastination, and 50% always procrastinate in doing homework and learning course materials [9, 10]. These figures redouble the need to evaluate academic procrastination and its related factors in this group.

Academic procrastination is a complex concept that depends on some factors. These factors are both affected by academic procrastination and can also decelerate its process. Therefore, it is essential to identify the underlying factors affecting students' academic procrastination [11]. In addition, academic procrastination and related factors have not yet been well investigated and require more studies, especially among medical students [12].

Moreover, academic procrastination is associated with high levels of anxiety, depression, and feeling guilty in students and affects their self-esteem [13–15]. Self-esteem is considered among the factors affecting students' academic procrastination in various studies [16–18]. Self-esteem refers to our perception of ourselves, how we evaluate ourselves, and our self-evaluation of ourselves as individuals [19–21]. Coopersmith (1990) considers self-esteem as people's evaluation of their worth and usually maintains, indicating an attitude of approval or disapproval. In other words, self-esteem is a personal judgment of one's worth, which refers to a person's feelings about their worth in various areas of life [22]. As one of the major factors that moderate psychosocial pressure, this concept forms based on family relationships, academic success, body image, social interaction, and sense of self-worth. In this respect, the importance of these

contexts changes depending on individual differences and one's growth [23].

Moral intelligence is another factor affecting students' academic procrastination [24]. Moral intelligence is the capacity and ability to understand good issues from bad issues [25]. Indeed, this intelligence enhances appropriate behavior and can provide stability in social life over time through qualities (e.g., honesty, responsibility, forgiveness, and sympathy) and reduce misbehaviors. Moral intelligence reflects the fact that a person is not born moral or immoral but must learn good performance, conscientiousness, and responsibility [26]. According to Lennick and Kiel (2007), moral intelligence includes four principles: honesty, responsibility, forgiveness, and sympathy. The honesty principle refers to harmonization between people's beliefs and actions. The responsibility principle is the acceptance of actions and their consequences, as well as mistakes and failures. The forgiveness principle includes awareness of faults and mistakes and forgiving oneself and others. Finally, the sympathy principle means paying attention to others [27].

As previously mentioned, academic procrastination is a prevalent phenomenon among students. Determining the factors associated with it has captured the attention of many researchers in the education system. However, there are limited studies on the relationship between psychological variables, such as self-esteem and moral intelligence, with academic procrastination. It seems that understanding the relationship between them will lead to providing appropriate solutions and approaches to reduce this problem and improve students' academic performance. Therefore, since no study has been conducted to determine the relationship between these variables, this study aimed to investigate the relationship between academic procrastination, self-esteem, and moral intelligence among medical sciences students.

Materials and methods

Study design and participants

This descriptive-analytical study was conducted on 205 Shahroud University of Medical Sciences students from April to September 2023. Participants were included in the study based on inclusion and exclusion criteria through the convenience sampling technique. This technique was chosen for its ease of implementation, high response rate to questionnaires, and frequent use in similar studies [28].

The inclusion criteria were studying at bachelor and professional doctorate levels (no history of studying in other universities) and having theoretical and practical courses. Besides, exclusion criteria were the history of suffering from serious mental illnesses (SMI) (such as Major Depression Disorder (MDD), Schizophrenia, Bipolar Disorder (BD), Obsessive-Compulsive Disorder

(OCD), Post-Traumatic Stress (PTSD), and other related disorders), using neuropsychological drugs (e.g., antidepressants, antipsychotics, anti-anxiety, and mood stabilizers), and the recent occurrence of unfortunate events or stressful events in the past six months, which was self-reported by the student.

The sample size was estimated to be 205 students based on the study by Uma et al. (2020) [29]. This estimation took into account a power of 90% at a confidence level of 95%, as well as a 15% attrition rate.

$$\alpha=0.05 \quad \beta=0.10 \quad r=0.24$$

$$n = \left[\frac{Z_{1-\alpha/2} + Z_{1-\beta}}{\frac{1}{2} \log \frac{1+r}{1-r}} \right]^2 + 3 = 178$$

Measurements

The data collection tool in this study consisted of four sections designed using the DigiSurvey system, a web-based questionnaire tool (<https://www.digisurvey.net/>). The study objectives, along with the created link, were shared with students in their respective groups and channels on Telegram and WhatsApp social networks for them to complete in their free time.

Section 1. Demographic information form

Information related to gender, age, marital status, field of study, academic semester, previous semester grade point average (GPA), interest levels in the field of study, study hours, parent's education, and student's place of residence were asked in this form.

Section 2. Solomon and Rothblum's Procrastination Assessment Scale-Students (PASS)

Students' academic procrastination was measured using the PASS. It consists of 27 items that examine three components, namely preparation for exams (items 1–6), preparation for assignments (items 9–17), and preparation for end-semester papers (items 20–25). In this study, two sets of questions were presented after each component: The first three questions (items 7, 18, and 26) measure the student's feelings and emotions about procrastination. The second three questions (items 8, 19, and 27) assess their tendency to change the procrastination habit. The scoring criteria for the items are based on a 5-point Likert scale, including "never" (1), "rarely" (2), "sometimes" (3), "often" (4), and "always" (5). Items 4, 6, 11, 15, 16, 21, 23, and 25 are scored reversely. The scores of this scale range between 27 and 135, with scores of 27–62 indicating mild procrastination, 63–98 moderate procrastination, and 99–135 severe procrastination [18]. Solomon and Rothblum (1984) reported the reliability and internal consistency of 0.79 and 0.84, respectively,

for this scale using Cronbach's alpha method. The validity of the construct was assessed using factor analysis, and the results confirmed the acceptable validity of this scale. Besides, this scale was significantly correlated with the Beck Depression Inventory (BDI) ($P < 0.0005$, $r = 0.44$), Ellis's Assessment Test for Irrational Belief (ATIB) ($P < 0.0005$, $r = 0.30$), and Rosenberg's Self-Esteem Scale (RSES) ($P < 0.0005$, $r = -0.23$) [30]. Roshanzadeh et al. (2021) studied the psychometrics of the Persian version of this scale and calculated a Cronbach's alpha coefficient of 0.87, suggesting its acceptable reliability. The validity of this scale was also investigated by confirmatory factor analysis (CFA). The results confirmed an acceptable fit for the structure of this scale, and all the goodness of fit (GoF) indices properly confirmed the model [30]. In the present study, the reliability of the Persian version of this scale was obtained at 0.85 by Cronbach's alpha method.

Section 3. Rosenberg Self-Esteem Scale (RSES)

Students' self-esteem was evaluated by RSES, a ten-item scale developed by Rosenberg (1965). This scale measures one's positive and negative feelings about oneself. Although RSES is a single-factor scale, two positive and negative factors have been emphasized in this scale in the past years [31]. This scale is scored using several proposed methods, some of which score it as a four-option spectrum (completely agree to completely disagree) and others as two options (I agree and I disagree). The second form of this scale has been prepared in the Persian version in Iran, which is scored as "I agree" and "I disagree". In this scale, +1 and -1 scores are respectively assigned to each "I agree" answer and each "I disagree" answer in questions 1–5. Questions 6–10 are scored in reverse, i.e., +1 and -1 scores are respectively assigned to each "I agree" answer and each "I disagree" answer in questions 6–10. Scores +10, >0, <0, and -10 indicate very high, high, low, and very low self-esteem levels, respectively [32, 33]. Rosenberg (1956) proposed this scale as a simple and short tool with appropriate reliability (internal consistency and re-test) and validity (convergent and divergent) [34]. Researchers claim this scale is a two-dimensional construct of positive and negative self-images when using the CFA. Besides, five items with positive words on one factor were named "positive self-esteem" (PSE), and five items with negative words on another factor were termed "negative self-esteem" (NSE) [35, 36]. Previous studies have reported a poor fit for the single-factor model of this scale using the CFA, as well as a better fit with positive and negative self-images for the two-factor model [37]. The Persian version of this scale was presented in a psychometric study [38]. The items' internal similarity coefficients were obtained at 0.84, 0.87, and 0.80 for the whole sample, male students and female students, respectively. In addition, the correlation

coefficients between each item of this scale and the total score of the items ranged from 0.56 to 0.72, and all were statistically significant at the 0.01 level. The CFA using principal axis factorization (Promax rotation) in the above scale resulted in two factors of personal competence and capability (items 4, 5, 7, 8, 9, and 10) and self-satisfaction (items 1, 2, 3, and 6), which explained 53.83% of the variance of the scale. Furthermore, a significant negative relationship was observed between the RSES and the Death Obsession Scale (DOS) in the whole sample (-0.34), in male students (-0.44), and in female students (-0.27), indicating the divergent validity of this scale [38]. In the present study, the reliability of the

Persian version of this scale was calculated by Cronbach's alpha method (0.82).

Section 4. Lennick and Kiel's Moral Intelligence Questionnaire (MIQ)

The students' moral intelligence was evaluated using Lennick and Kiel's MIQ, which consists of 20 items examining four subscales, namely honesty (items 1–6), responsibility (items 7–12), forgiveness (items 13–16), and sympathy (items 17–20). Items are scored based on a 5-point Likert scale (never=1, rarely=2, sometimes=3, oftentimes=4, and always=5). The scores of this questionnaire range between 20 and 100, with scores 20–33, 34–66, and >67 indicating low, average, and high moral intelligence levels, respectively [27]. Shahbaziyan et al. (2019) reported a Cronbach's alpha coefficient of 0.91 for the reliability of the Persian version of this questionnaire, indicating a favorable level. The validity of this questionnaire was assessed by the CFA, where the good fit of the model revealed its favorable validity [24]. In the present study, the reliability of the Persian version of this questionnaire was obtained at 0.94 using Cronbach's alpha method.

Ethical considerations

The necessary permits were obtained from the Vice-Chancellor for Research and Technology and the Research Ethics Council of Shahrood University of Medical Sciences (Code of Ethics: IR.SHMU.REC.1402.043). Additionally, necessary arrangements were made with the officials of all four faculties, namely nursing and midwifery, medicine, paramedicine, health, and the heads of each field of study. Afterwards, the study objectives and relevant link were posted on social networks such as Telegram and WhatsApp within the students' study groups and channels. They were asked to complete it in their free time.

Statistical analysis

The data were analyzed using descriptive statistics (frequency, percentage, mean, and standard deviation) and inferential tests (multivariate linear regression with backward method) in SPSS software, with a significance level of 0.05.

Results

In this study, most participants were female (64.4%) and single (95.1%). The mean and standard deviation of the participants' age and GPA were 22.39 ± 2.21 and 16.65 ± 1.40 , respectively. Other demographic characteristics of participating students are listed in Table 1. The participants' average academic procrastination, self-esteem, and moral intelligence scores were 81.13 ± 89.06 , 5.4 ± 03.84 , and 78.87 ± 12.31 , respectively. Table 2

Table 1 The demographic characteristics of participating students

Variables		N (%)	
Gender	Male	73 (35.6)	
	Female	132 (64.4)	
Marital status	Single	195 (95.1)	
	Married	10 (4.9)	
Field of study	Medical	45 (22.0)	
	Nursing	52 (25.4)	
	Midwifery	31 (15.1)	
	Anesthesiology	13 (6.3)	
	Operating Room	9 (4.4)	
	Laboratory Science	15 (7.3)	
	HIT	7 (3.4)	
	Radiology	16 (7.8)	
	Public Health	7 (3.4)	
	Occupational Health Engineering	3 (1.5)	
	Environmental Health Engineering	7 (3.4)	
Mother's education	Below diploma	58 (28.3)	
	Diploma	72 (35.1)	
	Associate	6 (2.9)	
	BSc	52 (25.4)	
	MSc	16 (7.8)	
Father's education	Below diploma	1 (0.5)	
	Diploma	49 (23.9)	
	Associate	54 (26.3)	
	BSc	18 (8.8)	
	MSc	51 (24.9)	
Residence status	Dormitory	27 (13.2)	
	Being with family	6 (2.9)	
	Rental house	4 (2.0)	
		Mean (SD)	
	Age	22.39 (2.21)	
	Term	6.36 (1.85)	
	GPA	16.65 (1.40)	
	Field interest	7.16 (2.04)	
	Study hours	8.10 (10.33)	

N: Frequency; %: Percent; HIT: Health Information Technology; BSc: Bachelor of Sciences; MSc: Master of Sciences; SD: Standard Deviation; GPA: Grade Point Average

Table 2 The mean score of academic procrastination, self-esteem, moral intelligence, and their subscales of participating students

Variables		Mean	SD
Academic Procrastination	Total	81.89	13.06
	Preparing for exams	25.02	4.83
	Preparing for assignments	32.36	5.46
	Preparing for term papers	24.51	4.76
Self-Esteem	Total	5.03	4.84
	Personal competence	1.94	3.69
	Self-satisfaction	3.09	1.55
Moral Intelligence	Total	78.87	12.31
	Honesty	24.02	3.81
	Responsibility	24.59	4.45
	Forgiveness	14.49	2.97
	Sympathy	15.78	2.91

SD: Standard Deviation

presents the averages of these scores based on their subscales.

In this study, 96.1% of the students experienced moderate to severe levels of academic procrastination, and 80% of the students reported high and very high levels of self-esteem. Also, only 12.7% of the students experienced mild to moderate levels of moral intelligence. Figure 1 presents different levels of academic procrastination,

Table 3 The role of independent variables on academic procrastination based on a multivariate linear regression model

Model	β	SE	t	P
(Constant)	134.352	9.499	14.144	< 0.001
Self-Esteem	-0.942	0.169	-5.575	< 0.001
GPA	-2.383	0.579	-4.112	< 0.001
Field interest	-1.139	0.407	-2.800	0.006

SE: Standard Error; P: P-value; GPA: Grade Point Average

self-esteem, and moral intelligence of the participating students.

The results of the backward multivariable linear regression model explained 27.7% of the variance of academic procrastination by the variables in the model. This model demonstrated that for every unit increase in self-esteem, GPA, and interest in the study field, the students' average score of academic procrastination decreased by 0.94, 2.38, and 1.14 units, respectively (Table 3). Furthermore, no statistically significant relationship was observed between the students' academic procrastination and moral intelligence ($P=0.285$).

Discussion

In this study, 96.1% of students experienced moderate to severe levels of academic procrastination. In a survey of students at five universities in Saudi Arabia, 7.7% and

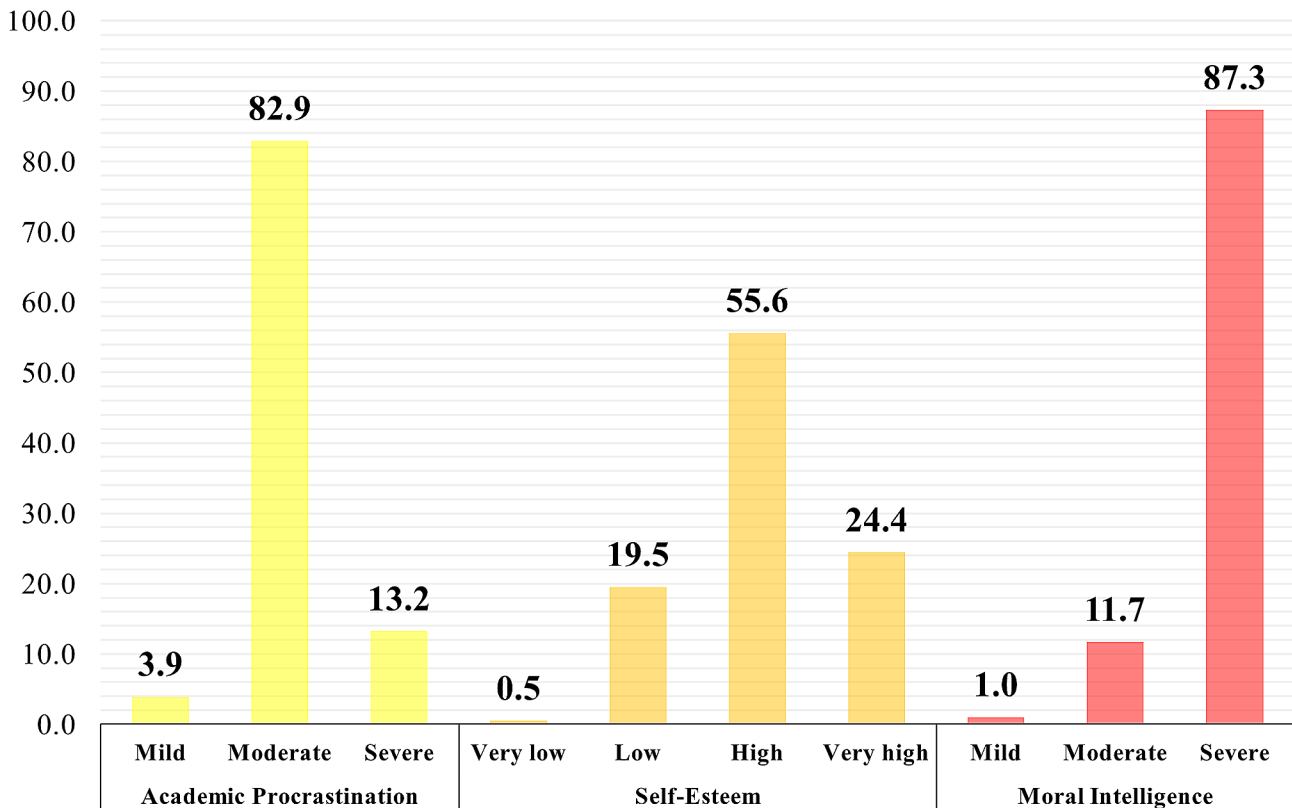


Fig. 1 The level of academic procrastination, self-esteem, and moral intelligence of participating students

62.8% of the participants reported severe and moderate academic procrastination, respectively [39]. Zhang et al. (2018) presented evidence that 74.1% of second to fourth-year undergraduate students of health professions were somehow involved in academic procrastination and postponed at least one of their coursework [10]. Uma et al. (2020) reported that 28.5% and 38.0% of dental students experienced severe and moderate levels of academic procrastination, respectively [29]. Accordingly, academic procrastination is among the most common problems students face. Therefore, it is necessary to highlight the importance of using appropriate strategies, such as cognitive-behavioral therapy (CBT) [40] and acceptance and commitment therapy (ACT)-based interventions [41, 42], to reduce students' academic procrastination.

The results of this study indicated a significant negative relationship between students' academic procrastination and self-esteem. Similarly, self-esteem is reportedly one of the factors affecting students' academic procrastination in various studies [10, 16–18]. In this respect, lower degrees of academic procrastination were observed in students with higher self-esteem. Katz et al. (2014) claim that academic procrastination leads to adverse cognitive and emotional consequences, including a decrease in people's self-confidence and self-esteem. As a result, those with low self-esteem procrastinate to protect themselves [43]. According to Babu et al. (2019), people with high self-esteem usually do not postpone completing assignments and tasks. In contrast, people with low self-esteem often suffer from procrastination and postpone doing tasks until the last moment [17]. In other words, students with low self-esteem often experience high levels of academic procrastination due to the fear of failure in achieving their goals. In fact, when students do not expect success and growth because of low self-esteem, they do not strive to achieve their goals [18]. Therefore, low self-esteem will result in students' academic procrastination.

The present study showed no significant relationship between academic procrastination and students' moral intelligence. However, Shahbaziyan et al. (2018) observed a significant negative relationship between students' academic procrastination and moral intelligence [24]. Nariyani et al. (2017) believe that students with high moral intelligence behave consistently with individual and social values and are reluctant to procrastinate. Furthermore, students with rooted honesty as a particular behavior in the depths of their souls do not postpone their work and assignments without any reasonable cause and are always regular [44]. Therefore, moral intelligence is considered a predictive and deterrent factor of procrastination and helps a person avoid procrastination and negligence [24, 44]. The obtained inconsistency may be due to the difference in the individual, cultural, and social characteristics

of the studied societies and the different educational and environmental conditions at universities.

In this study, lower GPAs were recorded in students with higher levels of academic procrastination. Similar to this finding, a meta-analytical study showed a significant negative relationship between students' academic procrastination and academic success [45]. Goroshit and Hen (2021) investigated the impact of academic procrastination on academic performance in general and specifically in students with learning disabilities (LD). The results indicated that students with LD reported lower GPAs and higher levels of academic procrastination than students without LD. In addition, a significant negative correlation was observed between students' academic procrastination and GPA [46]. Thus, academic procrastination adversely affects students' academic performance and many psychophysical problems and negative emotions [47].

Based on the results of this study, students with less interest in their field of study experienced higher levels of academic procrastination. According to Valizadeh et al. (2016), interest in the study field negatively affects and reduces students' academic procrastination; in other words, less procrastination occurs in students interested in their field of study. On the other hand, when students feel more capable and efficient in doing their academic assignments and possess skill and mastery goals, they will be more interested in their field. Hence, they will not postpone tasks until the last minute [48]. Overall, it can be claimed that students who consider a task unpleasant and tedious or are not very interested in it will probably postpone doing the task. This lack of interest is also true even for students whose academic success is not affected by delaying behaviors [49].

Research limitations and recommendations

A major limitation of this study is the use of self-reporting tools. Hence, the subjects might not have answered the questions responsibly and correctly. The large number of questions in the questionnaires and their long completion time could also have negatively affected the accuracy of the participants' answers. Moreover, this study was conducted only on the Shahroud University of Medical Sciences students, making it difficult to generalize the results to students of non-medical sciences universities in Iran. Hence, it is suggested to conduct similar studies with a longitudinal design and a larger sample size in the future.

Conclusion

Based on the results of this study, the majority of students experienced moderate to severe levels of academic procrastination and tended to delay their academic tasks. Furthermore, predictors of higher academic

procrastination among students included low levels of self-esteem, GPA, and interest in the field of study. Therefore, improving students' self-esteem is crucial in reducing academic procrastination. Additionally, the importance of students' interest in their field of study in reducing issues like academic procrastination should not be overlooked. By addressing these factors, academic procrastination can be minimized, ultimately leading to improved academic outcomes such as academic performance and GPA.

Abbreviations

SMI	Serious Mental Illnesses
MDD	Major Depression Disorder
BD	Bipolar Disorder
OCD	Obsessive-Compulsive Disorder
PTSD	Post-Traumatic Stress
GPA	Grade Point Average
PASS	Procrastination Assessment Scale-Students
BDI	Beck Depression Inventory
ATIB	Assessment Test for Irrational Belief
RSES	Rosenberg's Self-Esteem Scale
CFA	Confirmatory Factor Analysis
GoF	Goodness of Fit
PSE	Positive Self-Esteem
NSE	Negative Self-Esteem
DOS	Death Obsession Scale
MIQ	Moral Intelligence Questionnaire
SPSS	Statistical Package for the Social Sciences
CBT	Cognitive-Behavioral Therapy
ACT	Acceptance and Commitment Therapy
LD	Learning Disabilities

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Author contributions

Conceptualization: SGH, AA; Methodology: SGH, AA; Formal analysis and investigation: MHB; Data collection: SGH, AB, SN; Writing - original draft preparation: SGH, AB, SN, MHB, AA; Writing - review and editing: SGH, AA; Resources: AA; Supervision: AA.

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Data availability

The datasets used and/or analyzed during the current study are available from the corresponding author upon reasonable request.

Declarations

Ethical approval and consent to participate

This study was approved under the Code of Ethics IR.SHMU.REC.1402.043 by the Ethics Council for Biomedical Research at Shahrood University of Medical Sciences. Participants were fully informed about the study protocol and provided verbal and written informed consent before participating.

Consent for publication

Not applicable.

Competing interests

The authors declare no competing interests.

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References

- Bulfone G, Mazzotta R, Cocco M, Maurici M, Anastasia M, Macale L, Sili A, Vellone E, Alvaro R. Variables Predicting Academic success of nursing students: a longitudinal study in a nursing bachelor's degree program. *Ann Ig*. 2022;34(4):384–97.
- Altwijri S, Alotaibi A, Alsaeed M, Alsalam A, Alatiq A, Al-Sarheed S, Agha S, Omair A. Emotional Intelligence and its Association with Academic Success and Performance in Medical Students. *Saudi J Med Med Sci*. 2021;9(1):31–7.
- Ghasempour S, Esmaeeli M, Abbasi A, Hosseinzadeh A, Ebrahimi H. Relationship between academic success, distance education learning environments, and its related factors among medical sciences students: a cross-sectional study. *BMC Med Educ*. 2023;23(1):847.
- Tao X, Hanif H, Ahmed HH, Ebrahim NA. Bibliometric Analysis and Visualization of Academic Procrastination. *Front Psychol*. 2021;12:722332.
- Svartdal F, Dahl TI, Gamst-Klaussen T, Koppenborg M, Klingsieck KB. How Study environments Foster Academic Procrastination: overview and recommendations. *Front Psychol*. 2020;11:540910.
- Mohammadi Bytamar J, Saed O, Khakpoor S. Emotion regulation difficulties and academic procrastination. *Front Psychol* 2020, 11.
- Grunschel C, Patrzek J, Fries S. Exploring different types of academic delayers: a latent profile analysis. *Learn Individual Differences*. 2013;23:225–33.
- Rothblum E, Solomon L, Murakami J. Affective, cognitive, and behavioral differences between high and Low Procrastinators. *J Couns Psychol*. 1986;33:387–94.
- Atalayin C, Balkis M, Tezel H, Kayrak G. Procrastination and predictor variables among a group of dental students in Turkey. *Psychol Health Med*. 2018;23(6):726–32.
- Zhang Y, Dong S, Fang W, Chai X, Mei J, Fan X. Self-efficacy for self-regulation and fear of failure as mediators between self-esteem and academic procrastination among undergraduates in health professions. *Adv Health Sci Education: Theory Pract*. 2018;23(4):817–30.
- Dryden W. Dealing with procrastination: the REBT approach and a demonstration session. *J Rational-Emot Cognitive-Behav Ther*. 2012;30:264–81.
- Klassen RM, Krawchuk LL, Rajani S. Academic procrastination of undergraduates: low self-efficacy to self-regulate predicts higher levels of procrastination. *Contemp Educ Psychol*. 2008;33(4):915–31.
- Desai M, Pandit U, Nerurkar A, Verma C, Gandhi S. Test anxiety and procrastination in physiotherapy students. *J Educ Health Promotion*. 2021;10:132.
- Erdoğan D, Balkis M. Procrastination, self-esteem, academic performance, and well-being: a moderated mediation model. *Int J Educational Psychol*. 2017;6:97.
- Ozmen S, Amarnath A, Struijs S, de Wit L, Cuijpers P. A guided web-based intervention targeting procrastination in College Students: protocol for an Open Trial. *JMIR Res Protocols*. 2023;12:e44907.
- Yang X, Liu R-D, Ding Y, Hong W, Jiang S. The relations between academic procrastination and self-esteem in adolescents: a longitudinal study. *Curr Psychol* 2021.
- Babu P, Chandra K, Vanishree M, Amritha N. Relationship between academic procrastination and self-esteem among dental students in Bengaluru City. *J Indian Association Public Health Dentistry*. 2019;17(2):146–51.
- Roshanzadeh M, Tajabadi A, Mazhari Dehkordi B, Mohammadi S. Correlations of self-esteem and relationship with parents with academic procrastination in students: an Analytical, cross-sectional study. *Iran J Nurs*. 2021;34(131):31–43.
- Monteiro RP, Coelho GLH, Hanel PHP, de Medeiros ED, da Silva PDG. The efficient Assessment of Self-Esteem: proposing the brief Rosenberg Self-Esteem Scale. *Appl Res Qual Life*. 2022;17(2):931–47.
- García JA, y, Olmos FC, Matheu ML, Carreño TP. Self esteem levels vs global scores on the Rosenberg self-esteem scale. *Heliyon* 2019, 5(3).
- Gnambs T, Scharl A, Schroeders U. The structure of the Rosenberg Self-Esteem Scale. *Z Psychol*. 2018;226(1):14–29.
- Coopersmith S. Self-esteem inventories. Eighth printing. In. California: Consulting Psychologists; 1990.

23. Ariyanpooran S, Amiri Manesh M, Taghavi D, Haghtalab T. Relationship between self-concept and academic motivation (reading, writing and math) in elementary students with LD. *J Learn Disabil*. 2014;4(1):56–72.
24. Shahbaziyan A, Husaynpourbanadig K, Rahnemayibastam A. Survey of the role of Moral Intelligence and Cell phone addiction in academic procrastination of students. *Educ Strategies Med Sci*. 2019;11(5):76–83.
25. Narimani M, Ghaffari M. The role of moral and social intelligence in predicting resiliency and quality of life in parents of children with learning disabilities. *J Learn Disabil*. 2016;5(2):106–28.
26. Pakdel L, Sharifi S. Moral intelligence relationship with job satisfaction and organizational deviant behaviors youth and sports department of Fars Province. *Int Bus Manage*. 2016;10(7):1151–61.
27. Lennick D, Kiel F. *Moral intelligence: enhancing business performance and leadership success*. Pearson Prentice Hall; 2007.
28. Andrade C. The inconvenient truth about convenience and purposive samples. *Indian J Psychol Med*. 2021;43(1):86–8.
29. Uma E, Lee CH, Shapiai S, Binti Mat Nor AN, Soe HHK, Varghese E. Academic procrastination and self-efficacy among a group of dental undergraduate students in Malaysia. *J Educ Health Promotion*. 2020;9:326.
30. Solomon LJ, Rothblum ED. Academic procrastination: frequency and cognitive-behavioral correlates. *J Couns Psychol* 1984(31(4)):503–9.
31. Huis EM, Vingerhoets AJ, Denollet J. Attachment style and self-esteem: the mediating role of type D personality. *Pers Individ Differ*. 2011;50(7):1099–103.
32. Noruzi Zamenjani M, Rahzani K, Barati N, Harorani M, Heidari M, Farmahini Farahani M. The Effect of Exercise on Self-Esteem and Happiness of operating Room students. *Complement Med J*. 2022;11(4):372–83.
33. Shadfard Z, Taghizadeganzadeh M, Pournouroz N, Maarefi F, Badiyepymaiejahromi Z. Investigating the role of self-esteem, happiness and hospital's ethical climate in predicting perceived stress of paramedical students. *Res Med Educ*. 2020;12(3):44–54.
34. Rosenberg M. Rosenberg self-esteem scale (RSE). *Acceptance Commitment Therapy Measures Package*. 1965;61(52):18.
35. Syropoulou A, Vernadakis N, Papastergiou M, Kourtessis T. Psychometric evaluation of the Rosenberg Self-Esteem Scale in primary school students with mild intellectual disability: first evidence. *Res Dev Disabil*. 2021;114:103964.
36. Kielkiewicz K, Mathúna C, McLaughlin C. Construct validity and dimensionality of the Rosenberg Self-Esteem Scale and Its Association with spiritual values within Irish Population. *J Relig Health*. 2020;59(1):381–98.
37. Michaelides MP, Zenger M, Koutsogiorgi C, Brähler E, Stöbel-Richter Y, Berth H. Personality correlates and gender invariance of wording effects in the German version of the Rosenberg Self-Esteem Scale. *Pers Individ Differ*. 2016;97:13–8.
38. Rajabi G, Bohlol N. Reliability and validity of the Rosenberg Self-Esteem Scale in first-year students of Shahid Chamran University. *New Educational Approaches*. 2007;3(2):33–48.
39. Albusan IS, Al Qudah MF, Al-Barashdi HS, Bakhiet SF, Darandari E, Al-Asqah SS, Hammad HI, Al-Khadher MM, Qara S, Al-Mutairy SH et al. Smartphone Addiction among University students in light of the COVID-19 pandemic: prevalence, relationship to academic procrastination, quality of life, gender and Educational Stage. *Int J Environ Res Public Health* 2022, 19(16).
40. Rozental A, Bennett S, Forsström D, Ebert DD, Shafran R, Andersson G, Carlbring P. Targeting procrastination using psychological treatments: a systematic review and Meta-analysis. *Front Psychol*. 2018;9:1588.
41. Armani Kian A, Rostami B, Moosavi SE, Maghbooli M, Fakoor E. The effectiveness of Acceptance and Commitment Therapy on Academic Procrastination in Medical sciences students of Zanjan University. *Iran J Psychiatry Clin Psychol*. 2020;26(2):142–53.
42. Gagnon J, Dionne F, Raymond G, Grégoire S. Pilot study of a web-based acceptance and commitment therapy intervention for university students to reduce academic procrastination. *J Am Coll Health*. 2019;67(4):374–82.
43. Katz I, Eilott K, Nevo N. I'll do it later: type of motivation, self-efficacy and homework procrastination. *Motivation Emot*. 2014;38:111–9.
44. Narimani M, Mohammadi G, Almasi Rad N, Mohammadi J. The role of moral intelligence and risk perception in predicting students' academic burnout and procrastination. *J Sch Psychol*. 2017;6(2):124–45.
45. Kim KR, Seo EH. The relationship between procrastination and academic performance: a meta-analysis. *Pers Individ Differ*. 2015;82:26–33.
46. Goroshit M, Hen M. Academic procrastination and academic performance: do learning disabilities matter? *Curr Psychol*. 2021;40(5):2490–8.
47. Zhao W, Wang X, Li J, Li Q, Chen C. Time is my own treasure: parental autonomy support and academic procrastination among Chinese adolescents. *Psychol Res Behav Manage*. 2022;15:2773–82.
48. Valizadeh Z, Ahadi H, Hiedari M, Mazaheri MM, Kajbaf MB. The structural relationship of perfectionism, Self-efficacy, goal orientation and interest in field of study, and academic procrastination. *J New Thoughts Educ*. 2016;12(2):9–30.
49. Steel P. The nature of procrastination: a meta-analytic and theoretical review of quintessential self-regulatory failure. *Psychol Bull*. 2007;133(1):65.

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