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Self-compassion, academic stress, and academic self-efficacy among undergraduate nursing students: a cross-sectional, multi-center study

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Abstract

Background According to the literature, academic stress, academic self-efficacy, and self-compassion are the most effective variables that affect nursing students' psychological health and learning engagement. This study aimed to examine the relationship between self-compassion, academic stress, and academic self-efficacy among undergraduate nursing students.

Methods We conducted this descriptive cross-sectional study in 2024 using convenience sampling to recruit nursing students. The study involved 200 nursing students from three Iranian universities of medical sciences. Data for the study were collected using demographic questionnaires, Self-Compassion Scale-Short Form (SCS-SF), and Academic Self-Efficacy and Stress Scale.

Results The mean score of academic stress, academic self-efficacy, and self-compassion was 78.39 ± 47.27, 180.99 ± 53.43, and 42.29 ± 8.58, respectively. There was a significant relationship between self-compassion and academic stress (r=-0.42, $P < 0.001$), self-compassion and academic self-efficacy ($r = 0.57$, $P < 0.001$), and academic self-efficacy and academic stress (r=-0.45, $P < 0.001$). Self-compassion was significantly associated with academic stress and academic self-efficacy of nursing students, such that with one unit increase in self-compassion score, the likelihood of having a low level of academic stress and having a high level of academic self-efficacy increased by 10% and 13%, respectively.

Conclusion The outcomes of this study magnify the significance of implementing interventions that focus on enhancing self-compassion and academic self-efficacy among these students. This approach would effectively reduce perceived stress and its associated outcomes, ultimately leading to enhanced student experiences.

Clinical trial number Not applicable.

Keywords Self-Compassion, Academic Self-Efficacy, Perceived Academic Stress, Undergraduate Nursing Students

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Background

The concept of self-compassion encompasses acts of kindness towards oneself, accepting suffering or difficult experiences without judgment, and demonstrating warmth and care during times of adversity. Neff (2003) asserts that self-compassion encompasses three core elements: self-kindness versus self-criticism, common humanity versus isolation, and mindfulness versus over-identification [1]. It is linked to resilience and contributes to the improvement of nursing students' well-being, enabling their transformation into a competent workforce and preparing them for the demands of their profession [2]. Self-compassion, often regarded as the capacity to recognize and alleviate suffering in oneself and others exhibits a robust correlation with positive mental health experiences among numerous healthcare students [3]. Self-compassion is regarded as a constructive self-perception during times of adversity and is considered a safeguard against difficulties [1]. Previous research has indicated that the practice of self-compassion has the potential to enhance academic success indicators among undergraduate nursing students, as well as positively influence their caring conduct and compassion [4, 5].

Over the past few years, educational researchers have increasingly focused on the impact of learning thoughts and beliefs on students' academic performance [6]. According to educational researchers, academic self-efficacy plays a crucial role in determining students' motivation to learn, cognitive abilities, and emotional state. It has a significant impact on students' beliefs, learning process, and goal achievement [7, 8, 9]. Academic self-efficacy has been recognized as a predictor of students' academic performance [7, 10, 11]. When students possess low academic self-efficacy, their learning motivation and ability are compromised, resulting in hindrances to their development of professional knowledge and an increased sense of uncertainty in clinical practice [6, 12, 13]. Students who possess a high level of self-efficacy are more inclined to address challenges by problem-solving, thereby fostering their academic success and facilitating their professional pursuits [14, 15].

Nursing education is distinguished by its emphasis on practical training, which poses a significant challenge for students as they navigate a combination of academic and clinical coursework. This stress is unique to nursing students, although academic stress is common among university students in general [16, 17, 18]. It is widely recognized that nursing students are prone to experiencing heightened levels of stress, which can be attributed to a range of objective threats and subjective evaluations, leading to a response that is highly personalized based on individual circumstances. Failure to effectively handle these demands can result in an imbalance of stress [19]. During their education, nursing students experience three primary stressors: academic, clinical, and personal/social. Academic stress stems from the apprehension of failure in exams, assessments, and training, as well as concerns regarding workload [20]. Conversely, clinical stress emerges as a result of challenges encountered in the workplace, including managing death, apprehension about failing, and interpersonal interactions within the organization. Personal and social stressors arise from an imbalance between home and university, financial hardships, and other contributing factors. Nursing students are confronted with substantial workloads, time limitations, clinical experiences, and demanding academic standards throughout their educational journey. Numerous studies have indicated that nursing students encounter elevated stress levels in comparison to students in other disciplines [21, 22, 23].

It is necessary to focus on nursing students and understand the factors that influence their psychological health and their learning engagement in order to develop strategies that will enhance their education. Despite the previously reported pairwise associations between self-compassion, academic stress, and academic self-efficacy among nursing students [24, 25, 26], it is still unclear how the three variables interact internally. Accordingly, this study aimed to determine the relationship between self-compassion, academic stress, and academic self-efficacy of undergraduate nursing students.

Methods

Study design, sample, and setting

This descriptive correlational study was conducted in three nursing faculties affiliated with Shahid Beheshti, Tehran, and Iran University of Medical Sciences located in Tehran, the capital of Iran. During the sampling period (July to December 2024), the study population included nursing students from these nursing faculties. We calculated the sample size using the following formula:

$$N = \left[\frac{Z_{\alpha} + Z_{\beta}}{C}\right]^2 + 3$$

$$C = \frac{\ln[(1+r)/(1-r)]}{2}$$

The sample size for this study was estimated to be 210 nursing students based on previous studies [25, 26], with a correlation coefficient of 0.20, a power of 0.80, an estimation error of 0.05, and a potential dropout rate of 10%. Nursing students were selected through convenience sampling. Inclusion criteria were: (1) Consent and willingness to participate in the study; (2) Being a nursing student currently studying in one of the eight academic semesters; Exclusion criteria were: (1) Not returning a

completed questionnaire; and (2) being a guest or transfer student.

Measurements

The research tools were a demographic questionnaire, Self-Compassion Scale– Short Form (SCS-SF) [27], and Academic Self-Efficacy and Stress Scale [28].

Self-compassion scale-short form (SCS)

Self-compassion was measured using 12 items developed by Raes et al., (2011). The scale consists of six dimensions: extreme identification (items 1 and 9), mindfulness (items 3 and 7), isolation (items 4 and 8), common human experience (items 5 and 10), self-judgment (items 11 and 12), and self-kindness (items 2 and 6). Each item is rated on a five-point scale (1 = almost never, 5 = almost always). A negative score is given to six items on this scale (items 1,4,8,9, 11, and 12). Scores range from 12 to 60, with the highest score indicating the highest level of self-compassion among nurses. The Cronbach's alpha coefficient for the entire scale was 0.92 according to Raes et al.'s research, and the convergent validity was 0.59 according to their research [27]. In Iran, Shahbazi et al. (2015) found that Cronbach's alpha coefficients for the subscales of over-identification, mindfulness, isolation, common humanity, self-judgment, and self-kindness were 0.77, 0.92, 0.88, 0.91, 0.87, and 0.83, respectively [29]. According to Cronbach's alpha method, the reliability of the scale was 83.1 in the present study.

Academic self-efficacy and stress scale

Based on the Milestone scale and the College Self-Efficacy Index [30, 31], the new academic self-efficacy and stress scale was developed. In this scale, academic stress is measured through 27 university assignments. The students are asked to rate their tension while completing 27 academic assignments related to interactions at school, performance outside of class, performance in class, and managing work, family, and school using a Likert scale ranging from "no tension" (0) to "completely tensile" (10). This subscale has a minimum and maximum score of 0 and 270, with higher scores reflecting greater academic stress. Based on the cut-off points, the total scores were divided into three categories: low academic stress (0–81), moderate academic stress (82–162), and high academic stress (163–270). The construct validity of this instrument was explored and confirmed with exploratory and confirmatory factor analysis by Zajacova et al. (2005) [28]. In Iran, Shokri et al. (2010) found Cronbach's alpha coefficient for academic stress and its subscales as challenging to do homework in class, challenging to do homework outside of class, challenging to interact with others, and challenging to manage work, family, and university as 0.95, 0.85, 0.83, 0.82, and 0.74, respectively [32]. Moreover, this scale measures self-efficacy through 27 homework assignments. In order to assess how confident the participants are of completing the 27 academic assignments related to interaction at school, performance outside the classroom, performance in the classroom, and managing work, family, and school, they use an 11-point Likert scale ranging from absolutely uncertain (0) to absolutely sure (10). This subscale also had a minimum and maximum score of 0 to 270, with higher scores representing increased academic stress, and the total score was categorized according to the cut-off points as low academic self-efficacy (0 to 81), moderate academic self-efficacy (82 to 162), and high academic self-efficacy (163 to 270) [28]. Shokri et al. (2010) in their study found a coefficient of internal consistency of 94% on the overall factor of academic self-efficacy [32]. Based on Cronbach's alpha, the current study determined the reliability of this questionnaire as 95.7 for the academic stress subscale, 96.2 for the academic self-efficacy subscale, and 0.88 for the entire questionnaire.

Data gathering

An official letter of introduction with approval from the Medical Ethics and Law Research Center of Shahid Beheshti University of Medical Sciences and the code of ethics was received by the researcher, who then referred to the faculties mentioned above, explained the study objectives, coordinated with the authorities, and began sampling. Using a convenience sampling method, the researcher selected eligible nursing students, explained the objectives of the study, and obtained informed consent from them. It was requested that nursing students answer the questionnaires during breaks or after classes and then hand them over to the appropriate staff member. To collect the questionnaires, the researcher usually visited the person in charge of the project once every two days. Researchers were available to answer questions or clarify doubts about the questionnaire questions for nursing students. A guarantee of anonymity and confidentiality was made to all participants. There were 210 questionnaires distributed across three faculties. We analyzed 200 questionnaires, with 10 being excluded due to outliers and unanswered questions. There was a 95.2% response rate to the questionnaires. Tehran University contributed 35% of the total samples, comprising 40 male and 30 female participants, while Shahid Beheshti University and Iran University each provided 32.5% of the samples, with Shahid Beheshti University contributing 40 male and 25 female participants and Iran University contributing 45 male and 20 female participants.

Statistical analysis

In this study, statistical analysis of data was conducted using IBM's SPSS Statistics package for Windows

Table 1 Sociodemographic variables of the nursing students ($n=200$)

Variable(s)	*n* (%)
Gender	
Male	125 (62.5%)
Female	75 (37.5%)
Marital Status	
Single	194 (97%)
Married	6 (3%)
Academic Semester	
1	30 (15%)
2	21 (10.5%)
3	32 (16%)
4	37 (18.5%)
5	26 (13%)
6	16 (8%)
7	10 (5%)
8	27 (13.5%)
Interest in nursing	
Yes	131 (65.5%)
No	69 (34.5%)
Variable(s)	**Mean (SD)**
Age (year)	21.48 (1.90)

*SD: Standard Deviation

(Version 20.0). A descriptive statistical analysis was performed using frequencies, percentages, means, and standard deviations. Continuous variables were analyzed using the independent sample t-test, whereas categorical variables were analyzed using the chi-square test. The factors associated with self-compassion, academic stress, and academic self-efficacy of nursing students were determined by logistic regression and multivariate linear regression analysis.

Ethical considerations

This study was conducted in accordance with the ethical considerations of the Helsinki declaration and approved by the Medical Ethics and Law Research Center of Shahid Beheshti University of Medical Sciences (IR.SBMU.RETECH.REC.1403.286). In line with ethical requirements, the participants were explained about the purpose of the study, and they were assured of their privacy and confidentiality of their personal information. They were explained regarding the voluntary nature of the study, and they can leave the study at any time. They signed the consent form before participating in the study.

Results

The mean age of the participants was found to be 21.48 (SD = 1.90). A significant proportion of the participants were male (62.5%), single (97%), in the fourth academic semester (18.5%), and interested in nursing (65.5%) (Table 1).

Table 2 The mean core of academic stress, academic self-efficacy, and self-compassion of the nursing students ($n=200$)

Variable(s)	Mean	SD	Min	Max
Self-compassion	42.29	8.58	21	60
Academic stress	78.39	47.27	0	234
Academic self-efficacy	180.99	53.43	40	270

In terms of self-compassion, academic stress, academic self-efficacy, and undergraduate nursing students, the mean scores were 42.29 (8.58), 78.39 (47.27), and 180.99 (53.43), which indicates a favorable level of self-compassion, a low level of academic stress, and a high level of academic self-efficacy (Table 2).

The results of the Pearson's correlation coefficient showed a significantly negative relationship between nursing students' self-compassion and academic stress (r=-0.419, $P<0.001$) and between academic self-efficacy and academic stress (r=-0.448, $P<0.001$). While, there was a significantly positive relationship between nursing students' self-compassion and academic self-efficacy ($r=0.573$, $P<0.001$) (Table 3).

The results of the independent sample t-test showed that the mean score of self-compassion was higher in nursing students with a low level of academic stress and with a high level of academic self-efficacy ($P<0.001$) (Table 4).

The results of the chi-square test showed that there was a significant relationship between academic stress and academic self-efficacy, such that 55.4% of the nursing students with a low level of academic stress had a high level of academic self-efficacy, while this score was 20.5% among nursing students with a moderate level of academic stress ($P<0.001$) (Table 5).

The results of the linear regression analysis showed that the mean score of self-compassion in nursing students with a high level of academic self-efficacy was 6.335 points higher compared to those with a moderate level of academic self-efficacy (B = 6.335, $P<0.001$). Also, the mean score of self-compassion in nursing students with a moderate level of academic stress was 4.235 points lower compared to those with a low level of academic stress (B=-4.235, $P<0.001$) (Table 6).

According to the results of the logistic regression analysis, with one-unit increase in self-compassion score, the likelihood of having a low level of academic stress increased by 10% in nursing students [OR = 1.105, 95% CI (1.049, 1.164), $P<0.001$]. Also, the likelihood of having a low level of academic stress in nursing students with a high level of academic self-efficacy is 2.621 times greater than those with a moderate level of academic self-efficacy [OR = 2.621, 95% CI (1.284, 5.350), $P<0.001$] (Table 7).

Another model of the logistic regression analysis showed that with one-unit increase in self-compassion score, the likelihood of having a high level of academic

Table 3 Pearson's correlation coefficient between academic stress, academic self-efficacy, and self-compassion of nursing students ($n=200$)

Variable(s)	Self-Compassion						
	Self-Kindness	Self-Judgment	Common Human Experience	Isolation	Mindfulness	Extreme Identification	Total
Academic Stress	**-0.341****	**-0.223****	**-0.426****	**-0.212****	**-0.425****	**-0.207****	**-0.419****
Interaction at School	-0.323**	-0.229**	-0.400**	-0.184**	-0.370**	-0.154**	-0.379**
Performance out of Class	-0.264**	-0.215**	-0.429**	-0.147**	-0.410**	-0.165**	-0.370**
Performance in Class	-0.373**	-0.204**	-0.405**	-0.220**	-0.430**	-0.211**	-0.420**
Managing Work, Family, and School	-0.259**	-0.168**	-0.310**	-0.240**	-0.323**	-0.245**	-0.359**
Academic Self-Efficacy	**0.451****	**0.332****	**0.529****	**0.331****	**0.486****	**0.341****	**0.573****
Interaction at School	0.351**	0.271**	0.539**	0.318**	0.458**	0.286**	0.514**
Performance out of Class	0.396**	0.322**	0.481**	0.365**	0.454**	0.353**	0.554**
Performance in Class	0.499**	0.330**	0.503**	0.280**	0.483**	0.340**	0.563**
Managing Work, Family, and School	0.420**	0.311**	0.452**	0.269**	0.406**	0.267**	0.493**

** Correlation is significant at the 0.01 level (2-tailed)

Table 4 The relationship between the mean score of self-compassion with the mean score of academic stress, and academic self-efficacy among the nursing students ($n=200$)

Variable(s)	Self-compassion				
Academic stress	Categories	Number	Mean	SD	*P*-value
	Low academic stress	112	45.30	9.32	< 0.001*
	Moderate academic stress	88	38.46	5.58	
Academic self-efficacy	Moderate academic self-efficacy	120	38.89	5.41	< 0.001*
	High academic self-efficacy	80	47.40	9.87	

* Independent sample t-test

Table 5 The relationship between the mean score of academic stress with the mean score of academic self-efficacy among the nursing students ($n=200$)

Variable(s)			Academic stress	
Academic self-efficacy	Categories		Low academic stress	Moderate academic stress
	Low or moderate academic self-efficacy	Number	50	70
		Percent	44.6%	79.5%
	High academic self-efficacy	Number	62	18
		Percent	55.4%	20.5%
Total		Number	112	88
		Percent	100.0%	100.0%

self-efficacy increased by 13% in nursing students [OR = 1.135, 95% CI (1.076, 1.196), $P<0.001$]. Also, the likelihood of having a high level of academic self-efficacy in nursing students with a low level of academic stress is 2.517 times greater than those with a moderate level of academic stress [OR = 2.517, 95% CI (1.244, 5.092), $P<0.001$] (Table 8).

Discussion

The primary goal of this study was to investigate and illuminate the complex interplay and correlations that exist between self-compassion, the experience of academic stress, and the overall levels of academic self-efficacy specifically within a sample population of undergraduate nursing students. The current investigation revealed that nursing students exhibited a favorable mean score of self-compassion, concurrently demonstrating low levels of academic stress and high levels of academic self-efficacy. Consistent with the present study's results, the study by Hamed et al. (2019) [33] found that the average scores for self-compassion and self-efficacy among nursing students were in the moderate and high ranges, respectively.

Shehadeh et al. (2020) in their study revealed that nursing students experienced high levels of academic stress coupled with moderate levels of academic self-efficacy, a result supported by another study that also reported

Table 6 Multivariate linear regression analysis of the factors associated with self-compassion among the nursing students ($n=200$)

Model	Unstandardized Coefficients		Standardized Coefficients	t	*P*-value
	B	Std. Error	Beta		
Constant	34.342	7.680		4.472	0.000
High academic self-efficacy	6.335	1.130	0.362	5.606	< 0.001
Moderate academic stress	-4.235	1.103	-0.246	-3.839	< 0.001
Age	0.081	0.382	0.018	0.212	0.832
Gender	1.962	1.129	0.111	1.738	0.084
Academic semester	0.176	0.286	0.054	0.617	0.538
Interested in Nursing	1.559	1.105	0.087	1.411	0.160

Table 7 Factors associated with low level of academic stress among nursing students ($n=200$)

Model 1	Wald	*P*-value	OR	95% Confidence Interval	
				Lower Bound	Upper Bound
Constant	0.726	0.394	0.097	----	----
Self-compassion	14.231	< 0.001	1.105	1.049	1.164
High academic self-efficacy	7.011	< 0.001	2.621	1.284	5.350
Age	0.880	0.348	0.884	0.684	1.143
Gender	0.900	0.343	0.706	0.344	1.450
Academic semester	1.868	0.172	1.170	0.934	1.464
Interested in Nursing	1.428	0.232	1.532	0.761	3.082

Table 8 Factors associated with a high level of academic self-efficacy among nursing students ($n=200$)

Model 2	Wald	*P*-value	OR	95% Confidence Interval	
				Lower Bound	Upper Bound
Constant	5.309	0.021	0.001	----	----
Self-compassion	21.687	< 0.001	1.135	1.076	1.196
Low academic stress	6.590	0.010	2.517	1.244	5.092
Age	0.088	0.766	0.960	0.731	1.260
Gender	0.834	0.361	1.417	0.671	2.992
Academic semester	0.115	0.735	1.039	0.834	1.294
Interested in Nursing	2.354	0.125	1.768	0.854	3.663

moderate mean scores for both academic stress and self-efficacy among nursing students [34, 35]. Discrepancies between the results on academic stress and academic self-efficacy might be explained by differences in societies and study subjects.

The present study's findings revealed a significant negative correlation between self-compassion and academic stress, as well as between academic self-efficacy and academic stress among nursing students; conversely, a significant positive correlation was observed between the nursing students' self-compassion and academic self-efficacy. In a study conducted by Shirmohammadi and colleagues (2023) [26], an inverse correlation was observed between self-compassion and perceived academic stress, and also between perceived academic stress and academic well-being of the students, indicating that higher levels of self-compassion were associated with lower levels of perceived academic stress and better academic well-being. Furthermore, the research conducted by Safarzaie and colleagues (2017) also revealed a statistically significant inverse correlation between academic stress and the levels of academic self-efficacy experienced by the graduate student population, as detailed in their publication [36], which was in agreement with the present study results.

This study indicated that moderate academic stress negatively correlated with nursing students' self-compassion, whereas high academic self-efficacy positively predicted their self-compassion, suggesting a complex interplay between these factors and students' well-being. In their study, Manavipour et al. (2016) [37] found that self-efficacy significantly influenced the self-compassion of nursing students, also Khodapana et al. (2022) [38] further suggested in their research that self-efficacy acts as a predictor of self-compassion among these students, which were similar to the results of this study.

Given the findings of this study, it was found that higher levels of self-compassion and academic self-efficacy were significantly associated with lower levels of academic stress among the nursing students who participated in the research. The research conducted by Wang et al. (2024) [39] revealed a strong correlation between self-compassion and academic stress in students, indicating that self-compassion predicts levels of academic stress; this aligns with the findings of Kristensen et al. (2023) [40], whose study established academic self-efficacy as another key predictor of academic stress within the adolescent student population, which were consistent with the present study results.

Additionally, the present study found that self-compassion and low academic stress were significantly related to high levels of academic self-efficacy among nursing students. In their respective studies, Moeini et al. (2019) [41] reported a significant relationship between self-compassion and academic self-efficacy among nursing students, while Chen et al. (2024) [42] similarly found a significant relationship between academic stress and academic self-efficacy, these were similar to the results of this study.

The results of this study generally agreed with previous research, revealing a significant correlation between higher levels of self-compassion, reduced perceived academic stress, and enhanced academic self-efficacy among nursing students, suggesting that fostering self-compassion and mitigating perceived academic stress may be a valuable approach to improving their academic self-efficacy.

Study limitations

There are several limitations to our study. Firstly, due to the cross-sectional design and self-report measures, we were unable to draw a causal relation between self-compassion, academic stress, and academic self-efficacy. It is therefore necessary to conduct further research on these variables in the future. In addition, we only included nursing students from a specific city in our study, which may not accurately reflect the entire nursing student population. Increasing the applicability and breadth of the findings may require expanding the sample to include more regions and nursing educational institutions.

Conclusion

In this study, nursing students reported favorable self-compassion, while their academic stress and academic self-efficacy were low and high, respectively. A significantly negative correlation was found between nursing students' self-compassion and academic stress as well as their academic self-efficacy and academic stress. However, the relationship between nursing students' self-compassion and academic self-efficacy was significantly positive. Using this study, we gained a better understanding of the relationship between self-compassion, academic stress, and academic self-efficacy among undergraduate nursing students. The findings of this study also identified the factors that contribute to low academic stress and high academic self-efficacy in nursing students. Through identifying these factors, educational policymakers can improve nursing students' academic achievement.

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Author contributions
Design of the study: A.N, F.B, A.A; data collection: MA.KK; analysis and interpretation of data: A.N; manuscript preparation: A.N; manuscript revision: AN, F.B, A.A. The Final manuscript was checked and confirmed by all authors before submission, and they were all read and approved.

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Data availability
The datasets generated and analyzed during the current study are not publicly available due to the necessity of ensuring participant confidentiality policies and the laws of the country. Still, they are available from the corresponding author upon reasonable request.

Declarations

Ethics approval and consent to participate
This study was conducted in accordance with the ethical considerations of the Helsinki declaration and approved by the Medical Ethics and Law Research Center of Shahid Beheshti University of Medical Sciences (IR.SBMU.RETECH.REC.1403.286). Participants were informed of the study's purpose, and their privacy and confidentiality were assured. It was explained to them that the study was voluntary, and they could leave at any time. Their consent was obtained before they participated in the study.

Consent for publication
Not applicable.

Competing interests
The authors declare no competing interests.

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