Original Article

Access this article online

Quick Response Code:

Website: www.jehp.net

DOI: 10.4103/jehp.jehp_1501_23

Relationship between mindfulness, test anxiety, and academic performance among nursing students

Ali Asghar Hayat, Rahmatollah Soltani, Tayebeh Bahmani Tazangi, Fereshteh Baradaranfar, Azam Zareh, Azam Norouzi[1], Mohammad Hasan Keshavarzi

Abstract:

BACKGROUND: The content of mindfulness-based social-emotional learning (MBSEL) concentrates on conscious attention to thoughts, emotions, and bodily senses, which reduces test stress and anxiety and also leads to an increase in students' performance regarding stress management and improving responsible behaviors. This study aimed to explore the relationship between the degree of test anxiety and the level of students' mindfulness and the academic performance of nursing students.

MATERIALS AND METHOD: This descriptive cross-sectional study was conducted during 2021–2022, and the target population included all nursing students of the Faculty of Nursing and Midwifery, Shiraz University of Medical Sciences, Shiraz, Iran. The sample size is determined by Cochran's formula (151 participants). The sampling method was also simple random. The Sarason's test anxiety questionnaire and the short form of the Freiburg Mindfulness Inventory were used to collect data. The student's academic performance was also evaluated based on their previous academic semester scores. Data were analyzed by SPSS version 23 software through descriptive statistics, Pearson correlation coefficient, and an independent *t*-test.

RESULT: According to the Pearson correlation coefficient, there was an inverse and significant correlation between the variable of mindfulness and the level of test anxiety in nursing students (r = -170, *P* = 0.033), a positive and significant correlation between academic performance and mindfulness (r = 0.284, *P* = 0.001), and a negative and significant correlation between academic performance and test anxiety level (r = -0.170, *P* = 0.037).

CONCLUSION: Mindfulness-based cognitive therapy is effective in reducing negative thoughts, ineffective attitudes, depression, stress, and anxiety, and this therapy strategy can be used to reduce or treat anxiety and worry in students.

Keywords:

Academic performance, mindfulness, nursing students, test anxiety

Clinical Education Research Center, School of Medicine, Shiraz University of Medical Sciences, Shiraz, Iran, [1]Department of Medical Education, School of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran

Address for correspondence:
Dr. Mohammad Hasan Keshavarzi, Clinical Education Research Center, School of Medicine, Shiraz University of Medical Sciences, Shiraz, Iran.
E-mail: keshavarzi20014@gmail.com

Received: 19-09-2023
Accepted: 20-01-2024
Published: 28-03-2025

Introduction

Anxiety disorders, including generalized anxiety disorder, panic disorder/agoraphobia, and social anxiety disorder, are the most common psychiatric conditions and carry a significant burden of illness.[1] Emotional states are one of the issues that humankind has always faced and has never been able to get rid of it completely. Meanwhile, the most common emotional reaction is anxiety.[2] The anxiety phenomenon is not a new issue, and a majority of the population has experienced it at least once in their lifetime.[3,4] Anxiety is not necessarily a bad thing, but if it exceeds the limit, it will be problematic.[5] Stress level in all aspects of life is growing at an exponential rate, but stress level in students is alarming.[6] Among dimensions of anxiety, test anxiety is the one that can be seen in universities and educational centers.[7]

How to cite this article: Hayat AA, Soltani R, Tazangi TB, Baradaranfar F, Zareh A, Norouzi A, *et al*. Relationship between mindfulness, test anxiety, and academic performance among nursing students. J Edu Health Promot 2025;14:93.

Test anxiety is an internalizing behavior among students and a major emotional problem that has a negative effect on learning. It is a reaction of an emotional negative character generated before the expectation created by the imminence or presence of a test, and many students perceive it as a threat to themselves.[8] Arana and Furlan (2016) consider test anxiety as a set of phenomenological, physiological, and behavioral responses related to the fear of failure and the person experiencing it in assessment situations.[9] The consequences of poor coping with test anxiety may be the inability to pass an exam, reduced success in studies, increased dropout rates at the university, and a decline in self-esteem.[10] Nursing students often experience anxiety and stress when taking exams that test their fundamental nursing skills. Additionally, they are required to take various courses in their major. Consequently, they experience higher levels of stress than students in other majors.[11] Studies have shown that between 50% and 100% of nursing students have been shown to experience test anxiety and are at increased risk due to several factors, including the need to work outside of school and academic workload.[12] Although researchers believe that the main cause of test anxiety in students is diverse, they consider that psychological services effectively lessen test anxiety.[13] Researchers consider the ability to handle problems caused by stress a relatively conscious process based on which a person changes himself or herself and sometimes changes the environment.[14] Some researchers have also mentioned that other factors such as personality traits,[15] mindfulness,[16] and spiritual intelligence[17] have a significant impact on test anxiety. Mindfulness training is an effective method of treatment in reducing test anxiety and increasing the attitude toward the educational environment.[18] Mindfulness is commonly defined as the awareness that arises when paying attention to the present moment nonjudgmentally[19] and is a technique whereby a person becomes purposefully cognizant of the present moment and learns to address their thoughts, feelings, and sensations in a nonjudgmental manner.[20] Its skills have been associated with higher levels of life satisfaction, lower levels of anxiety and stress, and the well-being of university students.[21] Mindfulness can directly reduce stress and anxiety by increasing the clarity of a person's current experience and having direct and moment-to-moment contact with life.[22] Additionally, it can also indirectly impact a person's psychological aspects by increasing self-regulation capacity.[23]

Anxiety and stress caused by the test can affect students' mental health. Considering the vital role of nurses in providing healthcare, the importance of the mental health status of nursing students is more important than ever. Therefore, paying attention to ways such as mindfulness and stress management to control this stress and anxiety is crucial. Because nursing students, who are on the front line of fighting the disease and in direct contact with patients, have experienced the corona and postcorona eras, the study of this issue was considered by the researchers. Thus, this study intends to explore the relationship between the level of mindfulness, test anxiety, and nursing students' academic performance.

Materials and Methods

Study design and setting

This was a cross-sectional study conducted in the academic year 2021–2022 to explore the relationship between the level of mindfulness, test anxiety, and nursing students' academic performance. The target population included all students of the School of Nursing and Midwifery at Shiraz University of Medical Sciences, Shiraz, Iran.

Study participants and sampling

The total population consisted of 260 nursing students. The sample size was determined to be 151 (n = 151) using Cochran's sample size formula. A simple random sampling technique was used. The sample of the study consisted of 155 nursing students. A total of 151 completed questionnaires were returned. Four questionnaires filled out incompletely were excluded from this study. The inclusion criteria were signing the informed consent to participate in the study, willingness to participate in the study, and being an associate or bachelor's degree nursing student.

Data collection tool and technique

Research instruments included the personal information form, Sarason's test anxiety questionnaire, and the short form of the Freiburg mindfulness inventory (FMI).

Sarason's test anxiety questionnaire

Sarason's test anxiety questionnaire is a reliable and valid measurement tool for measuring, evaluating, and diagnosing test anxiety. The original questionnaire has 37 items, and its shortened form includes 25 items. For this study, a 25-item form was employed.

The score interpretation in this questionnaire is that choosing the right option indicates greater anxiety and gets a score of 1, while choosing the wrong option means the absence of anxiety and gets a score of 0. The higher score of the person in this questionnaire indicated greater anxiety. A score of 8 and below indicates normal and low anxiety; 8–14 is a sign of mild anxiety; and greater than 14 indicates the presence of pathological test anxiety that causes a person to have dysfunction. The validity and reliability of this questionnaire in Iran have been confirmed through a study conducted by Yazdani *et al*.[24] The Cronbach's alpha coefficient of this

questionnaire, internal consistency, and content validity are 0.88, 0.95, and 0.72, respectively. In this study, the reliability of Cronbach's alpha of the Sarason's test anxiety questionnaire was 0.87.

Freiburg mindfulness inventory (FMI)

In its long form, the FMI designed by Buchheld *et al*.[21] included 30 items that measure mindfulness as a general construct that has some interrelated attention, awareness, and acceptance facets. However, it is difficult to apply to people without any background knowledge of mindfulness. The published short form (14 items) designed by Walach *et al*.,[22] captures all aspects of the long form. It is semantically independent of a Buddhist or meditation context and applies to all population groups. Considering that the short form of this questionnaire is more suitable for implementation in groups that are not familiar with the Buddhist field of mindfulness and can be used in different cultures, therefore, it was used for the current study. The validity and reliability of the FMI in Iran were investigated by Ghasemi Jobaneh *et al*.[20] Its Cronbach's alpha and ordinal theta are 0.92 and 0.93, respectively. In the four-week retest reliability check, the retest reliability coefficient is 0.83. So, they found that in an Iranian population, the validity and reliability of FMI were acceptable. In this study, Cronbach's alpha reliability coefficient was 0.87. The short version used in this study consists of 14 items and is rated on a 4-point Likert scale, with answer options ranging from 1 (rarely) to 4 (almost always). The minimum and maximum scores are 14 and 56, respectively. A higher score indicates that you are more mindful. To measure academic performance, the student's academic semester grade point average (GPA) was used as a self-report. Data were analyzed by SPSS version 23 software through descriptive statistics, the Pearson correlation coefficient, and an independent *t*-test.

Ethical consideration

This research was carried out by the Ethics Committee of Shiraz University of Medical Sciences with the ethical code of IR.SUMS.REC.1400.481.

Result

This study included 151 participants. Sixty percent of the population were male, and 40% were female.

This study revealed that the average total mindfulness score among nursing students was 34.88, and the minimum and maximum mindfulness levels were 19 and 52, respectively. This means that students' mindfulness levels were higher than average [Table 1].

Regarding test anxiety, results showed that 49 (32.5%) students reported mild or low levels of anxiety, 67 (44.3%) reported moderate levels of anxiety, and 35 (23.2%) reported severe levels of anxiety [Table 2].

A Pearson correlation test was run to determine the relationship between mindfulness and test anxiety among nursing students. Data analyses revealed a significant negative relationship between test anxiety and mindfulness (r = -0.170, *P*- value $\leq$ 0.001). The results showed a lower level of anxiety among nursing students with higher levels of mindfulness and vice versa.

According to the results, the study found that there is a positive and significant correlation between academic performance and mindfulness level but a significant and negative correlation between academic performance and test anxiety (r = -0.170, *P* = 0.037). This implies that as students' mindfulness levels improved, their academic performance also increased, while an increase in test anxiety decreased academic performance. Therefore, by decreasing their levels of anxiety, students were able to enhance their academic performance [Table 3].

Furthermore, an independent *t*-test was conducted to assess the difference between obtained scores, test anxiety, mindfulness level, and academic performance based on gender. The finding revealed that there is no significant difference in the mindfulness level and academic performance of students based on gender. In other words, gender is not an influencing factor in the variables of mindfulness and academic performance among nursing students. Based on the mean scores of male ($\bar{X}$=11.89) and female students ($\bar{X}$=10.37) and the

Table 1: Description of nursing students' mindfulness states based on Freiburg scale

Variable	Minimum	Maximum	Mean	SD	Number
Level of Mindfulness	19	52	34.88	6.53	151

Table 2: Frequency distribution of students according to the test anxiety level

Level of anxiety	Frequency	Percentage
Low	49	32.5
Moderate	67	44.3
High	35	23.2
Total	208	100

Table 3: Correlation between mindfulness, test anxiety, and academic performance among nursing students

Variables	*n*	Mean	SD	Correlation coefficient (r)	*p*
Mindfulness	151	34.88	6.53	0.284	0.001
Academic performance	151	16.27	1.87		
Test anxiety	151	10.98	4.46	-0.170	0.037
Academic performance	151	16.27	1.87		

significance level of 0.04, it can be inferred that male students experienced a higher degree of test anxiety compared to their female counterparts.

Discussion

This study was conducted to investigate the relationship between mindfulness, test anxiety, and academic performance among nursing students at Shiraz University of Medical Sciences. The results indicated that as test anxiety levels increased among students, their academic performance levels decreased, and as they decreased, their academic performance levels improved. In line with the present study, Yazici and von der Embse *et al*. demonstrated that academic performance has a significant negative correlation with test anxiety and that test anxiety can affect academic performance.[25,26] However, the results of Cochanco *et al*.'s[27] (2021) study demonstrated that test anxiety has a positive effect on the academic performance of information technology students, and a small level of anxiety allows individuals to work harder and be more responsible towards their work. This could be due to differences in the study's statistical population. Test anxiety among nursing students is often more prevalent and effective than among information technology students, and the working environment of these two groups differs significantly.

Teaching cognitive-behavioral strategies reduces students' test anxiety and improves their academic performance. Furthermore, the results showed that an increase in students' mindfulness led to an improvement in their academic performance, which is consistent with the findings of the study done by Vorontsova-Wenger *et al*.[28] Additionally, Real *et al*.'s[29] findings showed that residents with higher levels of mindfulness had better performance, which is similar to the findings of the present study. The reason for this similarity in findings could be due to the similar study population.

Alzahrani *et al*.[30] were unable to find a relationship between mindfulness and students' academic performance; they considered the limited range of GPA as the reason for the lack of a significant correlation. Considering the high prevalence of stress and anxiety among medical students,[30] it is important to seek solutions to reduce and manage this stress. One of these solutions is to improve mindfulness.

The present study investigated the relationship between the level of mindfulness and test anxiety among nursing students, and the results indicated a significant negative correlation between these two variables.

In line with the results of this study, Snippe *et al*.'s[31] study showed that mindfulness-based stress reduction (MBSR) training significantly reduces perceived stress, negative emotions, and stress sensitivities. Furthermore, the results of Goldin and Gross's study demonstrated that a mindfulness-based therapeutic program leads to the improvement of symptoms related to stress, anxiety, and self-esteem.[32] They also found that MBSR training reduces symptoms of stress, anxiety, and depression in adolescents with social anxiety disorder.[32]

Regarding the relationship between the study variables (mindfulness, test anxiety, academic performance) and gender, the results showed that the level of mindfulness and academic performance did not differ significantly based on gender among nursing students; in other words, gender did not play a significant role in the relationship between mindfulness and academic performance. However, male students experienced significantly higher levels of test anxiety compared to female ones. Contrary to these findings, Putwain *et al*.[33] demonstrated that female students reported higher levels of test anxiety, indicating that females perceived evaluative situations as more threatening. This difference could be due to differences in the study population.

Mindfulness training exerts a noteworthy and opposite impact on students' test anxiety, leading to a reduction in their levels of test-related stress. This training lessens an individual's anxiety and physical tension by heightening their awareness of present experiences and redirecting attention toward cognitive processes, resulting in more effective information handling. It aids in the modification of negative behaviors and automatic thoughts while fostering positive behaviors relevant to health and education. The influence of mindfulness training extends to shaping an individual's perspective on school situations and exams, reshaping interpretations, and ultimately diminishing test anxiety among students.[34] Hayat *et al*.[35] conducted a study to explore the connection between test anxiety and students' academic resilience. The results revealed that academic resilience was found to have a notable negative impact on test anxiety. Students with higher levels of resilience tended to experience less test anxiety, enabling them to maintain their performance even when faced with evaluative pressure. Thus, it can be inferred that test anxiety may arise as a result of academic resilience. Noroozi *et al*.[36] asserted that participating in mindfulness-based training could lead to a decrease in test anxiety and an enhancement of students' psychological well-being before the comprehensive test.

Limitations and recommendations

This study had two limitations. First, the research paper's cross-sectional design may limit the ability to establish causal relationships between mindfulness, test anxiety, and academic performance. Two, the use of self-report

measures for academic performance introduces the potential for response bias.

Future research is recommended to compare the relationship between mindfulness, test anxiety, and academic performance across different healthcare disciplines (e.g., medicine, pharmacy) to shed light on potential variations in the relationships and inform targeted interventions for specific student populations. It is suggested to conduct longitudinal studies to examine the temporal relationships between mindfulness, test anxiety, and academic performance among nursing students to determine whether changes in mindfulness levels precede changes in test anxiety and academic performance or vice versa.

Conclusion

The findings of the research indicated that an increase in test anxiety can lead to a decline in academic performance among students. Additionally, there was a negative and significant correlation between mindfulness and test anxiety among nursing students, indicating that an increase in mindfulness can decrease test anxiety. It is recommended that the process of mindfulness should be explained to students through designing macro-programs, holding educational workshops. Students should be taught that they have many positive, acquirable traits, and that through timely and accurate training, they can grow and develop.

Acknowledgments
This research was carried out as part of a master thesis by Ms. Azam Zare, approved at Shiraz University of Medical Sciences with the ethical code of IR.SUMS.REC.1400.481. We also appreciate the contributions of all participants during the study.

Financial support and sponsorship
Nil.

Conflicts of interest
There are no conflicts of interest.

References

1. Bandelow B, Michaelis S, Wedekind D. Treatment of anxiety disorders. Dialogues Clin Neurosci 2017;19:93-107.
2. Barlow DH, Ellard KK, Cummings JA, Deleurme K, Campoli J. 4.1 Anxiety and related disorders. Abnorm Psychol 2020.
3. File SE, Hyde J. Can social interaction be used to measure anxiety? Br J Pharmacol 1978;62:19-24.
4. Desouky D, Allam H. Occupational stress, anxiety and depression among Egyptian teachers. J Epidemiol Glob Health 2017;7:191-8.
5. Richardson-Jones JW, Craige CP, Nguyen TH, Kung HF, Gardier AM, Dranovsky A, *et al*. Serotonin-1A autoreceptors are necessary and sufficient for the normal formation of circuits underlying innate anxiety. J Neurosci 2011;31:6008-18.
6. Mittal R, Kumar R. Exam stress in MBBS students and the methods used for its alleviation. Int J Med Dent Sci 2018:1604-8. doi: 10.18311/ijmds/2018/18909.
7. Pena M, Losada L. Test anxiety in Spanish adolescents: Examining the role of emotional attention, and ruminative self-focus and regulation. Front Psychol 2017;8:1423.
8. Hashmat S, Hashmat M, Amanullah F, Aziz S. Factors causing exam anxiety in medical students. J Pak Med Assoc 2008;58:167-70.
9. Arana FG, Furlan L. Groups of perfectionists, test anxiety, and pre-exam coping in Argentine students. Pers Individ Differ 2016;90:169-73.
10. Stojanović G, Vasiljević-Blagojević M, Stanković B, Terzić N, Terzić-Marković D, Stojanović D. Test anxiety in pre-exam period and success of nursing students. Serb J Exp Clin Res 2018;19:167-74.
11. Son HK, So W-Y, Kim M. Effects of aromatherapy combined with music therapy on anxiety, stress, and fundamental nursing skills in nursing students: A randomized controlled trial. Int J Environ Res Public Health 2019;16:4185.
12. Quinn BL, Peters A. Strategies to reduce nursing student test anxiety: A literature review. J Nurs Educ 2017;56:145-51.
13. Kavanagh BE, Harvey JT, Mesagno C. Social anxiety mediates the relationship between social connectedness and test anxiety: An exploratory investigation. J Theor Soc Psychol 2017;1:60-9.
14. Weiten W, Dunn DS, Hammer EY. Psychology Applied to Modern Life: Adjustment in the 21st Century. Cengage Learning; 2014.
15. Shehata GA, El Mistikawi T, Al Sayed KR, Hassan HS. The effect of aphasia upon personality traits, depression and anxiety among stroke patients. J Affect Disord 2015;172:312-4.
16. Bellinger DB, DeCaro MS, Ralston PA. Mindfulness, anxiety, and high-stakes mathematics performance in the laboratory and classroom. Conscious Cogn 2015;37:123-32.
17. Rahman ZA, Shah IM. Measuring Islamic spiritual intelligence. Procedia Econ Financ 2015;31:134-9.
18. Eccles JS, Roeser RW. Schools, academic motivation, and stage-environment fit. In: Lerner RM, Steinberg L. edotors. Handbook of Adolescent Psychology: Individual Bases of Adolescent Development. 3rd ed. John Wiley & Sons, Inc.; 2009. p. 404-34.
19. Schuman-Olivier Z, Trombka M, Lovas DA, Brewer JA, Vago DR, Gawande R, *et al*. Mindfulness and behavior change. Harv Rev Psychiatry 2020;28:371-94.
20. Ghasemi Jobaneh R, Arab Zadeh M, Jalili Nikoo S, Mohammad Alipoor Z, Mohsenzadeh F. Survey the validity and reliability of the Persian version of short form of freiburg mindfulness inventory. JRUMS 2015;14:137-50.
21. Buchheld N, Grossman P, Wallach H. Measuring mindfulness in insight meditation (Vipassana) and meditation-based psychotherapy: The development of the Freiburg Mindfulness Inventory (FMI). JMMR 2001;1:11-34.
22. Walach H, Buchheld N, Buttenmuller V, Kleinknecht N, Schmidt S. Measuring mindfulness – The Freiburg mindfulness inventory (FMI). Pers Individ Dif 2006;40:1543-55.
23. Kaunhoven RJ, Dorjee D. How does mindfulness modulate self-regulation in pre-adolescent children? An integrative neurocognitive review. Neurosci Biobehav Rev 2017;74:163-84.
24. Yazdani F. Test anxiety and academic performance in female nursing students. Nurs Horiz Q 2012;1:47-58.
25. Yazici K. The relationship between learning style, test anxiety and academic achievement. Univ J Educ Res 2017;5:61-71.
26. von der Embse N, Jester D, Roy D, Post J. Test anxiety effects, predictors, and correlates: A 30-year meta-analytic review. J Affect Disord 2018;227:483-93.
27. Cochanco R, Olipas C, Cochanco A, Sison R. An assessment on the test anxiety and academic performance of information technology students. Int J Adv Eng Res Sci 2021;8:118-22.
28. Vorontsova-Wenger O, Ghisletta P, Ababkov V, Barisnikov K. Relationship between mindfulness, psychopathological

symptoms, and academic performance in university students. Psychol Rep 2021;124:459-78.
29. Real K, Fields-Elswick K, Bernard AC. Understanding resident performance, mindfulness, and communication in critical care rotations. J Surg Educ 2017;74:503-12.
30. Alzahrani AM, Hakami A, AlHadi A, Batais MA, Alrasheed AA, Almigbal TH. The interplay between mindfulness, depression, stress and academic performance in medical students: A Saudi perspective. PLoS One 2020;15:e0231088.
31. Snippe E, Dziak JJ, Lanza ST, Nyklíček I, Wichers M. The shape of change in perceived stress, negative affect, and stress sensitivity during mindfulness-based stress reduction. Mindfulness 2017;8:728-36.
32. Goldin PR, Gross JJ. Effects of mindfulness-based stress reduction (MBSR) on emotion regulation in social anxiety disorder. Emotion 2010;10:83-91.
33. Putwain DW. Test anxiety and GCSE performance: The effect of gender and socio-economic background. Educ Psychol Pract 2008;24:319-34.
34. Zandi H, Amirinejhad A, Azizifar A, Aibod S, Veisani Y, Mohamadian F. The effectiveness of mindfulness training on coping with stress, exam anxiety, and happiness to promote health. J Educ Health Promot 2021;10:177.
35. Hayat AA, Choupani H, Dehsorkhi HF. The mediating role of students' academic resilience in the relationship between self-efficacy and test anxiety. J Educ Health Promot 2021;10:297.
36. Noroozi M, Mohebbi-Dehnavi Z. Comparison of the effect of two educational methods based on mindfulness and cognitive emotion strategies on psychological well-being and anxiety of eighth-semester midwifery students before the final clinical trial. J Educ Health Promot 2022;11:295.