Learning styles and test anxiety in nursing students

Seyed Kazem Mousavi[1], Mohsen Kamali[1], Omid Saed[2]

Abstract:

BACKGROUND: Test anxiety has always been a common problem among students, which may be influenced by various factors such as learning styles. Considering the high prevalence of test anxiety in nursing students, the present study investigated the relationship between their learning styles and test anxiety.

MATERIALS AND METHODS: The present research was a correlational descriptive study conducted in January of 2023, in which 235 students from the first to sixth semesters in two nursing schools affiliated with Zanjan University of Medical Sciences were selected by stratified random method. The data collection tools included demographic questionnaires, Kolb's learning styles, and Sarason's test anxiety, completed by the self-report method. The data were analyzed using descriptive and inferential statistics by SPSS (v. 26).

RESULTS: The mean test anxiety score in students was 28.30 ± 3.56, which showed a high level of test anxiety, and most of them had a divergent learning style (32.2%). The highest mean of test anxiety was among students with divergent learning styles. Also, the relationship between learning styles and test anxiety is statistically significant. The LSD test for more detailed information showed that the level of test anxiety with divergent learning styles is significantly higher than those with convergent learning styles ($P < 0.05$).

CONCLUSION: The findings showed that students with divergent learning styles suffer the highest test anxiety level. Considering that most nursing students participating in this research had divergent learning styles, it can be one reason for their high test anxiety. Because students with divergent learning styles mainly learn through seeing and experiencing, one of the solutions to reduce test anxiety in these students is to use observational learning methods as much as possible during teaching. Holding anxiety control and management workshops before the exam by psychological experts can be considered by educational managers.

Keywords:

Learning styles, nursing students, test anxiety

[1]Department of Nursing, Abhar School of Nursing, Zanjan University of Medical Sciences, Zanjan, Iran, [2]Department of Clinical Psychology, School of Medicine, Zanjan University of Medical Sciences, Zanjan, Iran

Address for correspondence:
Seyed Kazem Mousavi, Department of Nursing, Abhar School of Nursing, Zanjan University of Medical Sciences, Zanjan, Iran.
E-mail: kazemmoosavi69@gmail.com

Introduction

Most of the developments in the world result from human learning.[1] Learning is a relatively stable change in behavior that results from experience.[2] In this regard, identifying factors affecting learning, including learning styles, is crucial.[3] Learning styles, as one of the essential factors related to learner characteristics, are part of the concept of individual differences.[4] In the most comprehensive definition of learning style, learning style is a set of relatively stable cognitive, emotional, and physiological factors.[5] These indicators include how the learner understands, receives, interacts, and responds to the educational environment.[6] There are many theories about learning styles; in this regard, Kolb's learning theory is mainly used. According to Kolb, learning characteristics are achieved as an experiential learning cycle, a process of transformation and change through experience.[7] In Kolb's model, concrete experience (feeling) against abstract conceptualization (thinking) and active experimentation (doing) stand

against reflective observation (observation). Each person emphasizes two pairs of steps; in this way, four learning styles are divergent, convergent, accommodating, and assimilating.[8] Learners with divergent learning styles can learn by experiencing and looking closely. They can look at different situations from different angles and organize some communications as a meaningful whole.[9] Individuals with assimilating learning styles learn more by thinking and looking deeply.[10] Convergent learning style learners can learn by thinking about topics and practically doing those activities. This group is successful in using ideas and theories to solve specific problems.[9] Finally, learners with an accommodating learning style learn by experiencing and doing.[11]

Learning styles are fundamental in nursing education, because the primary mission of the nursing education program is to train competent nurses with the necessary knowledge, attitude, and skills to maintain and improve the health of society.[12] Also, the awareness of nursing professors and instructors about the students' learning styles helps them to improve the learning process according to these styles and the emotional, motivational, and cognitive characteristics related to them and to increase the engagement of students with the course content.[13] Nevertheless, the studies conducted in the field of learning styles of nursing students are limited and mostly have inconsistent results.[14-16]

Various factors influence learning, of which anxiety is critical.[17] Test anxiety, identified chiefly during preparation for the exam, is a unique form of anxiety and can be accompanied by physical, cognitive, and behavioral symptoms.[18] Also, test anxiety can be experienced before, during, and even after the exam, and its intensity changes in some cases.[19] It becomes a problem when its high level interferes with preparing and taking the exam and disrupts achieving educational goals.[20] According to statistics, 10–20% of students suffer from test anxiety.[21] The level of test anxiety in nursing students is almost twice as high as that of students in other and equal to 30%.[22] One of the most important reasons for high-test anxiety in nursing students is the large number of courses in each semester, the inadequacy of the content of the taught courses with the amount of each course, and the compactness of the educational calendar and exams.[23] Therefore, nursing professors and educators play an important role in improving learning outcomes by identifying exam anxiety in students, helping to refer them for therapeutic measures, and providing supportive and emotional strategies.[24]

Considering the high statistics of exam anxiety in nursing students and its significant impact on students' academic performance, investigating the relationship between learning styles and exam anxiety can help us to understand the cognitive, emotional, and motivational roots of learning related to exam anxiety. Therefore, the researchers decided to plan and implement the present study with the aim of investigating this issue.

Materials and Methods

Study design and setting
This descriptive correlational study was conducted in all nursing students from the first to sixth semesters in two nursing schools affiliated with Zanjan University of Medical Sciences in January 2023.

Study participant and sampling
The number of samples was calculated at the confidence level of 95%, and the power of the test was 80%, and with a 10% sample loss. Based on this, 235 people were calculated using the following formula (N = 600, $P = 0/5$, $d = 0/05$).

$$n = \frac{\frac{z^2 pq}{d^2}}{1 + \frac{1}{N}\left[\frac{z^2 pq}{d^2} - 1\right]}$$

The sampling method was stratified; first, the number of selected samples in each semester was selected according to the number of students and in proportion to the total number of students in both Zanjan and Abhar faculties. Then, the samples of each semester were selected using the list of students in a simple random sampling method using a table of random numbers. Also, willingness to participate in the study, full-time employment in nursing and not experiencing a severely stressful event in the last six months as entry criteria and incomplete completion of questionnaires, and the use of drugs related to stress diseases based on self-reporting were considered as exclusion criteria.

Data collection tools and technique
Data collection tools included demographic questionnaires, Kolb's learning styles, Sarason test anxiety, and the DASS questionnaire (depression, anxiety, and stress scale). The demographic questionnaire included age, sex, marital status, college name, academic semester, GPA, and interest in nursing. Kolb's III learning styles questionnaire consists of 12 questions with four options; the student must choose one of the options that are most similar to him. Each option represents one of the four main learning methods, including concrete experience (CE), reflective observation (RO), abstract conceptualization (AC), and active experimentation (AE). From the total questions in four sections, four scores are obtained, and these four scores represent four ways of learning. According to the questionnaire guide, two

scores are obtained by subtracting two by two methods, i.e. abstract conceptualization from concrete experience and active experimentation from reflective observation. These two scores are placed on two coordinate axes: one vertical axis means (AC - CE) and the other horizontal axis means (AE - RO), and based on this, the student's learning styles are determined. Due to the cut points recommended by the questionnaire authors based on learning methods, the learning styles of the participants are obtained as follows[25]:

1. Divergent = AC-CE ≤ 7 and AE-RO ≤ 6
2. Accommodating = AC-CE ≤ 7 and AE-RO ≥ 7
3. Assimilating = AC-CE ≥ 8 and AE-RO ≤ 6
4. Converging = AC-CE ≥ 8 and AE-RO ≥ 7

Versions of this scale have been used in several studies over the past 30 years, and its validity and reliability have been confirmed. In the research of Ghahremani *et al*. (2013),[26] the method of internal consistency and Cronbach's alpha was used to determine the scientific reliability of the data. Cronbach's alpha of concrete experience was 71%, reflective observation was 68%, abstract conceptualization was 71%, and active experimentation was 71%. In the present study, the reliability value of this questionnaire was determined using Cronbach's alpha method of 0.94.

The Sarason Test Anxiety Scale was developed by Sarason in 1958 and revised in 1980. This tool has 37 items. Scoring in this questionnaire is based on the participants' answers to yes and no. The range of the test anxiety score is between 0 and 48, and the higher the score, the higher the test anxiety level. After collecting the data, the person's test anxiety score is obtained, and according to the obtained score, the person is classified into one of three categories: mild anxiety (score 12 and below), moderate anxiety (score 13-20), and severe anxiety (score 21 and above).[27] The validity and reliability of this questionnaire have been measured in several studies. It has been obtained with Cronbach's alpha coefficient of 0.88, internal consistency of 95%, and criterion validity of 0.72, which is generally acceptable.[27] Also, in this study, the reliability value of this questionnaire was determined using Cronbach's alpha method of 0.91.

The short form of the Depression, Anxiety, and Stress Scale (DASS) was also designed by Lavibond *et al*. in 1995 and included 21 statements that evaluate the three constructs of depression (7 questions), anxiety (7 questions), and stress (7 questions). This scale is scored based on a four-part Likert scale from zero to three, and the range of scores varies from zero to 63.[28] In the study of Joukar *et al*. (2007),[29] the three-factor structure of this scale was confirmed. The reliability of this tool has been evaluated through test–retest and Cronbach's alpha,

respectively. The coefficients for depression are 0.80 and 0.87; for anxiety, 0.78 and 0.85; and for stress, 0.82 and 0.75 were reported. In this study, the reliability of this questionnaire was determined using Cronbach's alpha method of 0.88. The reason for using this scale in the study was to control the effect of depression, anxiety, and stress on the students' baseline, and the students whose depression, anxiety, and stress scores were higher based on this scale were excluded from the study.

Questionnaires and the consent form to participate in the research were sent to the participants one week before the end of the semester exams using the online questionnaire. The researchers' contact number was also provided to the participants to answer the possible questions. The obtained data were analyzed with the help of SPSS v26 software using descriptive (mean and standard deviation) and inferential (ANOVA, LSD) statistics.

Ethical consideration

Initially, the ethical approval of the current research was received through the Ethics Committee of Zanjan University of Medical Sciences (IR.ZUMS.REC.1400.505); then, we obtained the participants' written informed consent and asked the participants to complete the anonymous questionnaire voluntarily. We also assured them that their data would remain confidential and anonymous.

Results

Out of 235 participants in our study, five students were excluded from the study due to incomplete completion of the questionnaires, and 12 were excluded from the study due to obtaining a higher score on the DASS scale. Thus, the information obtained from 218 participants was analyzed. According to the results, the students' mean age was 21.12 years, and 61.4% were female. Most participants were single (88.3%) and studied in the fourth semester (22.2%). Also, 59.9% had a grade point average (GPA) between 16 and 18, and 32.9% had a moderate interest in nursing. Demographic information of the current study's participants is listed in Table 1.

In the next step, we analyzed the results of the learning style questionnaire. The findings showed that the most score of the learning method of the participants was active experimentation (AE), and the lowest learning method was the concrete experience (CE). On the other hand, the results of the test anxiety questionnaire revealed that the mean and standard deviation of the test anxiety score of the nursing students participating in this research was 28.30 ± 3.56, indicating the high anxiety of the students [Table 2]. Afterward, we determined the learning styles of the participants due to the cut points recommended by the questionnaire authors based

on learning methods. Therefore, the majority (32.2%) of students had a divergent learning style, whereas the convergent learning style had the lowest (14.3%) frequency [Table 3]. In line with the primary goal of the research, we investigate the relationship between learning styles and test anxiety of nursing students. In this regard, first, the research data were evaluated in terms of normality. According to the number of participants and referring to the central limit theorem as well as the result of the Kolmogorov–Smirnov statistical test ($P > 0.05$), the use of parametric statistical tests was confirmed. Then, we used ANOVA statistical tests to analyze the relationships between learning styles and test anxiety. According to the obtained P value, it can be said that there is a statistically significant relationship between learning styles and the level of students' test anxiety [Table 4].

Post hoc statistical tests were used for more detailed analysis. The results of the LSD test showed that the level of test anxiety in students with divergent learning styles is significantly higher than the students with convergent learning styles ($P < 0.05$). However, the difference in the mean score of students' test anxiety in other learning styles was not statistically significant [Table 5].

Moreover, regarding the relationship between test anxiety and the learning styles with the demographic characteristics of the participants, the results of the multiple statistical tests revealed that the learning style of the participants has no statistically significant relationship with any of their demographic characteristics. In other words, we can say that student's learning style is not affected by their demographic characteristics, such as age, gender, marital status, semester, GPA, and interest in the field of study. Furthermore, the statistical relationship between the mean test anxiety score and the participants' demographic characteristics was investigated. The results showed that only the statistical relationship between the gender of the participants and the mean score of their test anxiety is significant. For this purpose, we used the independent *t*-test, and it was found that women have a higher test anxiety score than men, and this relationship is statistically significant ($P < 0.05$). The relationship of other demographic variables with test anxiety scores was not statistically significant ($P > 0.05$).

Discussion

Based on the results, the most widely used learning style in nursing students was divergent. This finding

Table 1: Frequency and percent of demographic characteristics variables

Variable	Frequency (%)	Percentage
Age		
>22	132	60.7%
22-26	59	27.1%
>26	27	12.2%
Gender		
Male	84	38.6%
Female	134	61.4%
Marital status		
Single	192	88.3%
Married	26	11.7%
College		
Abhar	146	67.2%
Zanjan	72	32.8%
Semester		
First	26	11.8%
second	20	9.2%
Third	42	19.2%
Fourth	48	22.2%
Fifth	44	20.4%
Sixth	38	17.2%
Total grade point average		
<16	45	20.6%
16-18	131	59.9%
>18	42	19.5%
Interest		
Uninterested	21	9.8%
Low	65	29.9%
Moderate	72	32.9%
High	60	27.4%

Table 2: Mean, standard deviation, minimum and maximum scores, and score ranges of learning methods and test anxiety in nursing students

Variables	Mean±SD	Min score	Max score	Score range
Concrete Experience (CE)	28.43±4.18	12	32	12-48
Reflective Observation (RO)	33.59±3.81	15	42	12-48
Abstract Conceptualization (AC)	30.06±3.68	14	40	12-48
Active Experimentation (AE)	38.17±4.22	26	48	12-48
Test Anxiety	28.30±3.56	8	34	0-37

Table 3: Students' learning styles based on their learning methods

Variables	Cut points	Frequency	Percentage
Learning Styles			
Diverging	AC-CE≤7 & AE-RO≤6	70	32.2%
Accommodating	AC-CE≤7 & AE-RO≥7	66	30.3%
Assimilating	AC-CE≥8 & AE-RO≤6	51	23.2%
Converging	AC-CE≥8 & AE-RO≥7	31	14.3%

Table 4: Relationship between test anxiety and Learning Styles in nursing students

Variables	Learning Styles				Test	P- value
	Diverging	Accommodating	Assimilating	Converging		
Test Anxiety	32.11±4.01	28.27±3.62	27.90±3.28	24.88±3.51	ANOVA	0.038

Table 5: The post hoc test (LSD) results for the mean differences of the test anxiety based on Learning Styles

Variables	Learning styles	Mean difference	*P*
Test Anxiety	Diverging		
	Accommodating	3.84	0.11
	Assimilating	4.21	0.06
	Converging	7.23	0.02
	Accommodating		
	Diverging	-3.84	0.11
	Assimilating	0.37	0.67
	Converging	3.39	0.14
	Assimilating		
	Diverging	-4.21	0.06
	Accommodating	-0.37	0.67
	Converging	3.02	0.18
	Converging		
	Diverging	-7.23	0.02
	Accommodating	-3.39	0.14
	Assimilating	-3.02	0.18

is similar to the results of some studies in Iran, such as Kamran *et al*. (2022)[14] and Shirazi *et al*. (2019),[6] and most foreign studies, such as Campos *et al*. (2022)[30] in Brazil and the United States of America, Nosheen *et al*. (2020) in Pakistan,[31] AbuAssi *et al*. (2016) in Saudi Arabia,[32] and Madu *et al*. (2019) in Nigeria.[33] In this context, it can be said that the dominant abilities of students with a divergent style lie in the fields of concrete experience and reflective observation; They see a situation from multiple angles, emphasize brainstorming and idea generation, have a powerful imagination, are more sensitive to values, respect the feelings of others, and listen with an open mind and without bias.[9] Studies show that this learning style is suitable for practical and clinical environments. Because more than half of nursing courses are taught in skill lap and clinical environments, nursing students are more inclined to use this style for learning.[6,30] Also, based on the findings, no significant relationship was found between the learning styles and the demographic characteristics of the participants, which is in line with the findings of similar studies in this field.[5,9,11] Learning styles express people's personal and individual characteristics and are less affected by demographic variables.[11]

On the other hand, nursing students' test anxiety level was reported at a high level. This rate was high in the studies of Kumar *et al*. (2022)[34] and Vasli *et al*. (2021).[35] However, Zargarzadeh *et al*. (2014)[36] and Khoramirad *et al*. (2013)[37] reported a low level. By reviewing the related articles, it can be claimed that there is some relationship between the year of the study and the degree of test anxiety. So that students have reported a higher level of test anxiety in recent years, and perhaps one of the reasons for this increase in test

anxiety can be the COVID-19 pandemic. Because with the start of this pandemic, the general level of anxiety among students increased, and teaching and evaluation methods underwent a sudden transformation.[38] On the other hand, it should be kept in mind that in this study, the participants' test anxiety level was evaluated one week before the exams, and it may be expected for students to report a higher level of test anxiety during this period.

According to the most crucial finding of our study, there was a relationship between learning styles and test anxiety in nursing students. In this way, students with divergent and accommodating learning styles had a higher level of test anxiety than students with assimilating and convergent learning styles. Consistent with this finding, in Ayalp *et al*.'s (2016)[17] study, students with a divergent learning style, and in Yadi Yosefabad *et al*.'s (2021)[39] study, students with an accommodating learning style reported higher levels of test anxiety. On the other hand, in the study of Kan Öntürk *et al*. (2021),[15] students with an assimilating learning style had less anxiety in the learning environment, and in the research of Baigi *et al*. (2019),[40] secondary school students with a convergent learning style expressed less test anxiety. Perhaps one of the reasons for the difference in the level of test anxiety can be found in students' individual and personality characteristics.[41] Based on Kolb's learning cycle, divergent and accommodating learning styles are placed on one side of the cycle, and convergent and assimilating styles are placed on the other. Thus, people with two learning styles on the same side of the cycle have many points in common regarding personality and individual characteristics. For example, both groups of people with divergent and accommodating learning styles have sensitive and emotional personalities; therefore, it is not far from the expectation that they experience higher test anxiety.[8] On the contrary, people with a convergent and assimilating learning style have high planning and forecasting power; thus, they can plan better for the exam time and experience less test anxiety during this period.[9,10] In the next step, for detailed investigation, the relationship between learning styles and test anxiety was analyzed by the LSD *post hoc* statistical tests. The results of LSD showed that only in students with divergent learning styles, the level of test anxiety is significantly higher than in students with convergent learning styles. It can be justified by the argument mentioned above. Convergent and divergent learning styles are on opposite ends of the spectrum. People with a divergent style are emotional and act impulsively, whereas convergent people have a higher ability to think and solve problems.[9] Therefore, it is natural that people with a converging style perform better in managing tensions and anxiety. This finding is consistent with the study results by Yadi Yosefabad

et al. (2021)[39] and Baigi *et al.* (2019).[40] Among the demographic variables, only gender had a significant relationship with test anxiety; thus, women reported more test anxiety. In this regard, it can be said that, in general, women experience more anxiety when facing stressful situations because they are more sensitive to getting a grade and being encouraged; therefore, on average, they are expected to experience higher test anxiety than men.[42]

Limitations and recommendation

The first limitation of this study was the possibility of not completing the questionnaires accurately due to the electronic data collection method and the high number of questions. In order to control this factor, during the data collection, the participants were contacted by phone, and the necessary guidance and counseling were provided to them. Another study limitation was using self-report tools, especially to measure participants' anxiety, which was beyond the researcher's control.

As mentioned, learning styles are a complex structure, and in the present study, only Kolb's theory was used to investigate it. Therefore, in future studies, other available theories and tools are suggested to investigate it, and for in-depth analysis, it is better to use qualitative or mixed studies.

Conclusions

Test anxiety is undoubtedly a most common, essential, and complex phenomenon that various factors can influence. The present study only investigated one of the factors affecting it, i.e. learning styles, and showed that learning styles could affect students' perceived anxiety. Based on the results of this study, the divergent learning style was the most frequent among the participants. The exciting thing to note is that these students also reported the highest level of test anxiety. Based on this, it is easy to justify the high statistics of nursing students' test anxiety in different texts. The results of the present study cannot consider all students' test anxiety under the influence of their learning style. There is a need to investigate various factors to assess this phenomenon accurately. However, based on the results of this research, it can be said that due to the significant frequency of divergent learning styles in nursing students and the reliance of these people on seeing and experiencing for better learning, it is recommended for teachers to use observational learning methods as much as possible during their training process. Photos, videos, shows, and games can strengthen their learning process and reduce test anxiety. On the other hand, holding anxiety control and management sessions before the exam by psychological experts can be considered by educational managers.

Conflicts of interest
There are no conflicts of interest.

References

1. Lövdén M, Garzón B, Lindenberger U. Human skill learning: Expansion, exploration, selection, and refinement. Curr Opin Behav Sci 2020;36:163-8.
2. Yazıcı. K. The relationship between learning style, test anxiety and academic achievement. Univers J Educ Res 2017;5:61-71.
3. Maya J, Luesia JF, Pérez-Padilla J. The relationship between learning styles and academic performance: Consistency among multiple assessment methods in psychology and education students. Sustainability 2021;13:33-41.
4. Mangold K, Kunze KL, Quinonez MM, Taylor LM, Tenison AJ. Learning style preferences of practicing nurses. J Nurses Prof Dev 2018;34:212-8.
5. Kadiriye P, Eda A, Aynur K, Ayla Y. Determination of the learning styles of nursing students: A descriptive study. Inte J Caring Sci 2022;15:395-405.
6. Shirazi F, Heidari S. The relationship between critical thinking skills and learning styles and academic achievement of nursing students. J Nurs Res 2019;27:1-7.
7. Figueiredo LDF, Silva NC, Prado ML. Primary care nurses' learning styles in the light of David Kolb. Rev Bras Enferm 2022;75:1-7.
8. Golafshani A, Zameni F. Effect of learning styles on postgraduate students and clinical assistants (a case study in Mazandaran University of Medical Sciences). Educ Strateg Med Sci 2020;13:179-86.
9. Shumba TW, Iipinge SN. Learning style preferences of undergraduate nursing students: A systematic review. Afr J Nurs Midwifery 2019;21:1-25.
10. Rahimi Sh, Sohrabi Y, Nafez AH, Dabirian M. Learning styles in university education (systematic review). Indian J Public Health Res Dev 2017;8:386-91.
11. Rahiminia E, Rahiminia H, Sharifirad G. Assessment of Kolb's learning styles among college students of Qom University of Medical Sciences. J Med Educ Dev 2017;9:24-32.
12. Razaghpoor A, Namdar P, Panahi R, Yekefallah L, Javanmardi E. Learning styles and their relationship with self-esteem and self-efficacy among nursing students in Qazvin. Mod Care J 2021;18:1-6.
13. Brannan J, White A, Long J. Learning styles: Impact on knowledge and confidence in nursing students in simulation and classroom. Int J Nurs Educ Scholarsh 2016;13:63-73.
14. Kamran A, Naeim M, Mohammadi M, Masoumi N. Prediction of academic performance based on learning style and critical thinking among medical students. J Pedagog Res 2022;6:57-66.
15. Kan Öntürk Z, Kanığ M, Aslan E, Kuğuoğlu S. Reflection of learning styles on students' anxiety and learning levels in simulation education: An obstetrics and neonatology nursing experience. Florence Nightingale J Nurs 2021;29:186-93.
16. Alkhasawneh IM, Mrayyan MT, Docherty C, Alashram S, Yousef HY. Problem-based learning (PBL): Assessing students' learning preferences using VARK. Nurse Educ Today 2008;28:572-9.

17. Ayalp G, Özdemir N. Relationship between test anxiety and learning styles of architecture undergraduates. Creat Educ 2016;7:364-75.

18. Quinn BL, Peters A. Strategies to reduce nursing student test anxiety: A literature review. J Nurs Educ 2017;56:145-51.

19. Alkowatli H, Khan Sh, Bhyat Y, Alsuwaidi M. Test anxiety amongst university students: A cross-sectional study. Med Rep Case Stud 2022;7:1-12.

20. Roshanisefat S, Azizi SM, Khatony A. Investigating the relationship of test anxiety and time management with academic procrastination in students of health professions. Educ Res Int 2021;1:1-6.

21. Jenaabadi H, Nastiezaie N, Jalalzaei S. The effect of time management training on student's test anxiety. JNE 2016;5:12-22.

22. Ramezani J, Hossaini M, Ghaderi MR. The relationship between test anxiety and academic performance of Nursing and Emergency Medical Technician students. Educ Strategy Med Sci 2016;9:392-9.

23. Kaur Khaira M, Raja Gopal RL, Mohamed Saini S, Md Isa Z. Interventional strategies to reduce test anxiety among nursing students: A systematic review. Int J Environ Res Public Health 2023;20:1-15.

24. Shapiro MS, April L. Test anxiety among nursing students: A systematic review. Teach Learn Nurs 2014;9:193-202.

25. Kolb AY, Kolb DA. The Kolb Learning Style Inventory Version 3.1 2005 Technical Specifications. Experiential Based Learning Systems [Internet]. 2005.

26. Ghahremani Z, Amini K, Roohani M, Aghvamy MA. The relationship between preferred learning styles and academic achievement of zanjan nursing and midwifery students. J Med Educ Dev 2013;6:51-61.

27. Sarason IG. Introduction to the study of test anxiety. In I. Test anxiety: Theory, Research, and Applications. Hillsdale, NJ: Lawrence Erlbaum; 1980. p. 3-14.

28. Henry JD, Crawford JR. The short-form version of the Depression Anxiety Stress Scales (DASS-21): Construct validity and normative data in a large non-clinical sample. Br J Clin Psychol 2005;44:227-39.

29. Joukar B, Samani S. Evaluation of the validity of the short scale of depression, anxiety and stress. Journal of Social Sciences and Humanities 2007;26:65-77.

30. Campos DG, Alvarenga MRM, Morais SCRV, Gonçalves N, Silva TBC, Jarvill M, *et al*. A multi-centre study of learning styles of new nursing students. J Clin Nurs 2021;31:111-20.

31. Nosheen N, Hussain M. The association between learning style, learning strategies with academic performance among nursing students. J Health Med Nurs 2020;72:62-7.

32. AbuAssi N, Alkorashy H. Relationship between learning style and readiness for self-directed learning among nursing students at King Saud university, Saudi Arabia. Int J Adv Nurs Stud 2016;5:109-16.

33. Madu OT, Ogbonnaya NP, Chikeme PC, Omotola NJ. A Study to assess the learning style preference of undergraduate nursing students in Southeast, Nigeria. Asian J Nurs Educ Res 2019;9:177-84.

34. Kumar LM. Exam anxiety and factors influencing exam preparation: A mixed method study. Indian J Psy Nsg 2022;19:9-15.

35. Vasli P, Shahsavari A, Estebsari F, AsadiParvar-Masouleh H. The predictors of nursing students' clinical competency in pre-internship objective structured clinical examination: The roles of exam anxiety and academic success. Nurse Educ Today 2021;107:e105148.

36. Zargarzadeh M, Shirazi M. The effect of progressive muscle relaxation method on test anxiety in nursing students. Iran J Nurs Midwifery Res 2014;19:607-12.

37. Khoramirad A, Arsangjang S, Ahmaritehran H, Dehghani H. The relation between spiritual intelligence and test anxiety among nursing and midwifery students: Application of path analysis. Iran J Med Educ 2013;13:319-30.

38. Ewell SN, Josefson CC, Ballen CJ. Why did students report lower test anxiety during the COVID-19 pandemic? J Microbiol Biol Educ 2022;23:e00282-21.

39. Yadi Yosefabad SH, Kiani Q, Entesar Foumani GH. The mediating role of academic self -efficacy and self -esteem in the relationship between learning styles and test anxiety in female students. Middle Eastern Journal of Disability Studies 2021;27:1-8.

40. Baigi Z. Investigating the relationship between learning styles and motivational strategies with exam anxiety in students. The 1st National Conference of the Future School, Ardabil, Iran, 2019.

41. Abouzeid E, Fouad S, Wasfy NF, Alkhadragy R, Hefny M, Kamal D. Influence of personality traits and learning styles on undergraduate medical students' academic achievement. Adv Med Educ Pract 2021;12:769-77.

42. Yusefzadeh H, Amirzadeh Iranagh J, Nabilou B. The effect of study preparation on test anxiety and performance: A quasi-experimental study. Adv Med Educ Pract 2019;10:245-51.