International Journal of Scientific Reports
Hassen MA et al. Int J Sci Rep. 2025 Mar;11(3):126-134
http://www.sci-rep.com
pISSN 2454-2156 | eISSN 2454-2164
DOI: https://dx.doi.org/10.18203/issn.2454-2156.IntJSciRep20250390

Original Research Article

Magnitude of test anxiety and its determinants among midwifery and nursing students in Eastern Ethiopia, 2023

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Received: 09 November 2024
Revised: 19 January 2025
Accepted: 21 January 2025

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ABSTRACT

Background: Test anxiety is referred to as the set of psychological and behavioral responses that accompany concern about likely negative consequences or failure of an exam or similar evaluation situations. Test anxiety has an effect on academic achievement and success of students. Thus, the aim of this study is to assess the magnitude of test anxiety among midwifery and nursing students in Eastern Ethiopia, 2023.
Methods: An institution-based cross-sectional study was conducted among midwifery and nursing students at Eastern Ethiopia universities. Study subjects were selected using a simple random sampling technique. The data were entered into Epi Data version 4.1, and the data was exported to SPSS version 24 for analysis. Bivariate and multivariable logistic regression analyses were performed to identify the association between test anxiety and independent variables. Finally, the AOR, 95% CI, and p-value < 0.05 were considered statistically significant.
Results: the overall magnitude of test anxiety among midwifery and nursing students was 53.5% (95% CI=42.49-58.83). Being female [AOR=2.03, 95% CI=1.40-2.94], poor time management [AOR=2.33, 95% CI=1.62-3.36], psychological distress [AOR=1.4, 95% CI=1.03-2.14], and lack of study plan [AOR=1.59, 95% CI=1.09-2.30] were significantly associated with test anxiety.
Conclusions: Magnitude of test anxiety among midwifery and nursing students is pressing concern that can adversely affect their academic performance and overall well-being. Data suggests that this anxiety is not only common but also influenced by identifiable factors such as gender, time management, psychological health, and study habits.

Keywords: Test anxiety, Magnitude, Midwifery, Nursing, Eastern Ethiopia

INTRODUCTION

Anxiety is considered when the worry is excessive or disproportionate to the underlying threat and involves the expectation of future threat, and it is often considered a disease when associated with personal distress, abnormal behavior, impaired concentration, or avoidance. Test anxiety is referred to as the set of psychological and behavioral responses that accompany concern about likely negative consequences or failure of an exam or similar evaluation situations. This type of anxiety appeared abruptly or gradually. Sometimes it is persistent, and sometimes it ends within a few hours.[1,2]

The etiology of test anxiety is not attributed to a single agent. Individual, parent, and teacher characteristics, the student learning environment, and the nature of the education program account for the majority of the causative agents. Regarding the learning environment and nature of the program, medical and health sciences students are more exposed to test anxiety than others due to the large credit hours and stressful clinical settings.[3-5]

Nursing and midwifery education is based on both theory and clinical practice. Tests are an integral part of midwifery and nursing students' experiences, and test anxiety is prevalent among them. Test anxiety is common

in nursing education when students are exposed to assignments and written examinations in the classroom, as well as rating scales, written assignments, e-portfolios, projects on clinical experiences, and examinations, such as the objective structured clinical examination in clinical practice.[6-8]

A study shows that most students experience test anxiety during exams, but when the anxiety interferes with the student's capacity to perform in exams adequately and express their knowledge on examinations, it becomes a problem. It also endangers the student's social, emotional, and behavioral development and feelings about himself and the learning environment. It is the primary cause of poor academic performance and increased attrition at the university. Besides its impact on academic achievement, extreme anxiety could lead to a mental disorder.[8-11]

Globally, the magnitude of test anxiety has been erratically distributed among different health sciences students of different disciplines, like nursing, midwifery, medical students, and others. For instance, in the United States, the prevalence of test anxiety among students varies, with estimates ranging from 25% to 40%. Similarly, according to a study conducted in India, Saudi Arabia, and Kenya, the magnitude of test anxiety was 37%, 65%, and 68.1%, respectively.[12-15] In Ethiopia, a previous few studies show that the magnitude of test anxiety ranged from 25.3-54.7% among undergraduate students. Gender, family educational status, year of study, field of study, excessive course load, substance use, and psychological distress were the determinants of test anxiety.[16-18]

In Ethiopia, however, little study has been conducted on test anxiety; the midwifery and nursing students were not addressed yet. But it is a solid fact that the rigorous nature of nursing and midwifery programs makes them particularly vulnerable to test anxiety, which can affect their academic performance and overall well-being. Research indicates that a significant percentage of nursing and midwifery students experience test anxiety. For instance, a study found that 98% of midwifery students reported some level of test anxiety, with many experiencing moderate to severe anxiety during assessments.[19] This high magnitude highlights the need to understand the underlying causes. So, the main objective of this study was to assess the magnitude of test anxiety and its determinants among midwifery and nursing students in Eastern Ethiopia, 2023.

METHODS

Study setting and design

An institution-based multicenter cross-sectional study was conducted among midwifery and nursing students at Eastern Ethiopia university's from September to November, 2016. Dire Dawa, Haromaya, and Jigjiga university are higher institutions located in the eastern part of Ethiopia.

Study population and eligibility criteria

All midwifery and nursing students who were attending their education in Dire Dawa, Haromaya and Jigjiga university were considered the source population, whereas all selected midwifery and nursing students who were attending their education in Dire Dawa, Haromaya and Jigjiga university were the study populations. All selected regular undergraduate midwifery and nursing students from the second to the fourth who were willing to participate were included in the study. Students enrolled in programs other than regular undergraduates were, however, excluded from this study.

Sample size determination, and sampling procedure

The sample size was calculated by using the single population proportion formula with the assumption of n=sample size required for the study, Zα/2=1.96, which is the standardized normal distribution curve value for the 95% CI, p=25.3% and d=0.04, which is the degree of freedom or margin of error.[18]

$n=(z\alpha/2)2\ p(1-p)/\ d^2$

$=(1.96)^2 0.253(1-0.253)/(0.04)^2$

=454 considering 10% of non-response rate, the final sample size was 522.

After the sample size was calculated, the population was stratified based on their year of study (batches). Then the sample was proportionally allocated to each stratum. Finally, the study units were randomly selected using a lottery method (computer generated). The total number of students in the two department (midwifery and nursing), along with their identification number (ID), was used as a sampling frame.

Study variables

Test anxiety was the outcome of interest (dependent variable) in this study. The sociodemographic variable (age, gender, religion, marital status, academic year, department, residence, family educational status, pocket money, and family size). Academic related characteristics (GPA, entrance score, field of study was first choice, pattern of study, study plan, managing course load, and miss of lecture).

Psychosocial characteristics (social support and psychological distress) behavioral characteristics (time management, internet and substance use, use of substance for study, history of negative life events, and history of known chronic physical illness) were the independent variables.

Operational definitions

Test anxiety: test anxiety was measured using the test anxiety questionnaire (TAQ). The tool has 10 items, and each item is scored 1-5 according to specific criteria: "How often each statement describes them?" which is rated as 1 "never," 2 "rarely," 3 "half-time," 4 "often," and 5 "always." The sum-up scores range from 10-50. A score of 10-19 indicates do not suffer from test anxiety, 20-35 indicates a moderate level of test anxiety, and over 35 indicates severe test anxiety.[16, 20]

*Current substance use***:** refers to participants who have used substances in the last 3 months prior to the survey.

Chronic physical illness: participants who had confirmed medical illnesses by health professionals like diabetes mellitus (DM), epilepsy, hypertension (HTN), and human immune virus/acquired immune deficiency syndrome (HIV/AIDS).

Oslo social support scale: It has a 3-item questionnaire commonly used to assess social support, and it was used in several studies, with the sum score scale ranging from 3-14, which is three broad categories: poor support (3-8), moderate support (9-11), and strong support. Evidence suggests that the OSSS-3 is a very brief and economic scale that has satisfactory internal consistency with an α=0.640.[21,22]

Psychological distress: Psychological distress was measured using the Kessler psychological distress scale (K-10). It is a simple measure of psychological distress; the K10 scale involves 10 questions about emotional states, each with a five-level response scale. According to the scale, a score 10-19 likely to be well, 20-24 likely to have a mild disorder, 25-29 likely to have a moderate disorder, 30-50 Likely to have severed distress.[17,23]

Data collection tools and procedures

Data was collected by using a self-administered questionnaire with both open and closed-ended questions in English, which was adapted by reviewing different literature. A total of 6 health care workers were recruited for data collection. The self-administered questionnaires have 5 sections (sociodemographic related factors, TAQ, academic-related factors, psychosocial factors, and behavioral factors). To assure the data quality control, data collectors obtained two-day training about the aim of the study and the content of the instrument before the actual data collection. The pre-test was conducted 2 days before the actual data collection, and it was conducted among 5% of samples of post basic students. The result was not included in the main survey. Based on the finding from the pre-test, the questioner revised and helped to estimate the time needed for data collection. The data collectors were supervised daily and assisted the students to fill out the questionnaire, which was checked daily by the supervisors and principal investigator.

Data processing and analysis

After the data collection, the completed questionnaires were checked for completeness and consistency. Then, the data template format was prepared, coded, and entered into Epi Data version 4.1. Then data will be exported to SPSS version 24 for analysis. First, descriptive analysis was done, and then bivariate analysis was used to find out the association of independent variables with the dependent variable. Multivariate logistic regression analysis was done for variables with $p<0.2$ in bivariate logistic regression analysis to identify predicting factors of test anxiety at the confidence interval of 95%. The variable with a $p<0.05$ in multivariate logistic regression, which showed statistically significant association, was considered a predicting variable for test anxiety. An odds ratio with a 95% confidence interval was used to measure the degree of association between those significant independent variables and test anxiety. The dependent variable was classified into a dummy variable.

The model fit was checked by the Hosmer and Lemeshow test, which is the most reliable test of model fit available in SPSS, indicating the goodness of model fit. A multicollinearity test was also done to assess how much the variance of an estimated regression coefficient increases if the predictors are correlated. All values of the variance inflation factor show that there was no problem with multicollinearity in this study. To check for internal consistency of the Likert scale item measurement tool, a reliability analysis was done. The overall value of Cronbach's alpha for items of test anxiety was (0.84), psychological distress (0.87), and Oslo social support (0.88) were reflecting a very high consistency of the instrument to measure competence. The results are presented in the form of narrations, tables, and graphs.

RESULTS

Of the total 522 participants reached by random sampling, 516 participants were involved in this study with a response rate of 98.8%.

Socio-demographic characteristics of the study participants for the study on magnitude of test anxiety among midwifery and nursing students in Eastern Ethiopia, 2023

Regarding the socio-demographic characteristics of the respondents, more than half of the participants were males, 282 (54.7%) with a mean of 21.76 years with SD (±1.89) ranging from 18 to 25 years. More than half of the participants, 264 (51.2%), were Orthodox by religion, and most of the respondents were single (469) (90.8%). Regarding academic year level and profession of the respondents', about 227 (44%), and 285 (55.2%) of them were fourth-year nursing students consecutively. Concerning the educational status of the study participants' families, 234 (45.3%) had mothers who

attended formal education, and 348 (67.4%) of the respondent´s fathers attended formal education. The majority of the study participants, 310 (60.1%), were from rural areas **(**Table 1).

Magnitude of test anxiety among midwifery and nursing students in Eastern Ethiopia, 2023

In the current study, the mean score of test anxiety among participants was 23.11±8.52. The minimum and maximum scores were 11 and 45, respectively. Over all, more than half 53.5% (95% CI=42.49-58.83) of the midwifery and nursing students had had test anxiety. The magnitude of test anxiety in females (62.8%) was higher than in males (45.7%) (Figure 1).

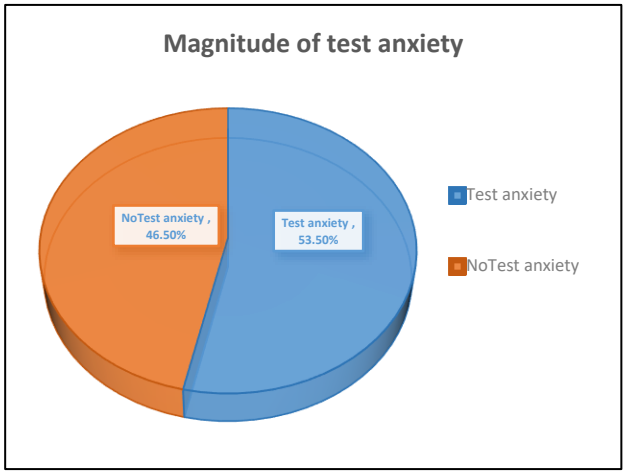

Figure 1: Magnitude of test anxiety among midwifery and nursing students in Eastern Ethiopia, 2023.

Academic related characteristics of study participants for the study on magnitude of test anxiety among midwifery and nursing students in Eastern Ethiopia, 2023

More than half of the study participants, 313 (60.7%), have scored a GPA between the range of 2.76-3.75, and almost all of the study participants have a score of 400 and above in the higher institution entrance exam. About one third, 160 (31.1%), of study participants responded that their field of study was their first choice, and more than half, 276 (53.5%), of the study participants had a study plan. Concerning pattern of study and managing course load, majority (373 (72.3%) of study participants studied regularly, and nearly one-third of them have difficulty managing their course load (Table 2).

Psychosocial characteristics of study participants for the study on magnitude of test anxiety among midwifery and nursing students in Eastern Ethiopia, 2023

In the present study, half of the study participants, 262 (50.8%), and about one-third of them, 160 (31%), had poor and moderate social supports, respectively. Regarding the psychological distress, 102 (19.7%), 62 (12%), and 76 (14.8%) have mild, moderate, and severe distress, respectively. In general, about 240 (46.5%) of the study participants had faced psychological distress (Table 3).

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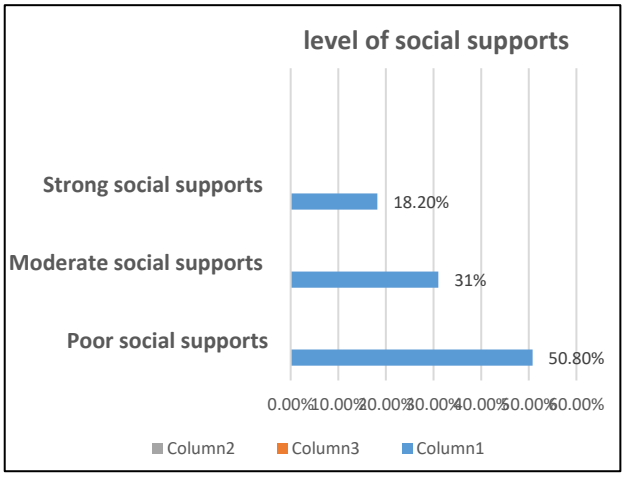

Figure 2: Level of social supports among midwifery and nursing students in Eastern Ethiopia, 2023.

Behavioral characteristics of study participants for the study on magnitude of test anxiety among midwifery and nursing students in Eastern Ethiopia, 2023

The results of this study found that 273 (52.9%) of study participants had poor time management. Regarding the internet use, 91 (17.6%), 303 (58.7%) and 122 (23.5%) of the participants had used the internet for less than two hours, two up to four hours, and more than four hours per day, respectively. Of the 91 participants who used substances, 80.2% of them used substances for study purposes. Moreover, about one-thirds of 164 (31.8%) of participants had experienced a negative life event, and about 71 (13.7%) had a history of known chronic physical illness (Table 4).

Factors associated with test anxiety at bivariate and multivariate logistic regression analysis for magnitude of test anxiety among midwifery and nursing students in Eastern Ethiopia, 2023

In the present study gender, residence, study pattern, time management, psychological distress, choice of field of study, study plan and substance use were associated with test anxiety only at COR at $p<0.05$. Multivariate logistic regression analysis was used to minimize the effect of confounding variables and identify real factors contributing to test anxiety. Accordingly, gender, time management, psychological distress, and study plan were all significantly associated with test anxiety at both crude

and adjusted odd ratios at p<0.05 (Table 5). In present study, the gender of study participants showed a significant association with test anxiety. The odds of test anxiety were two [AOR 2.03, 95% CI (1.40-2.94)] times higher in female students than their counterparts. This study also revealed that time management of study participants was significantly associated with test anxiety. Respondents with poor time management were 2 [AOR=2.33, 95% CI (1.62-3.36)] times more likely to have test anxiety as compared to respondents with good time management.

Psychological distress was also the other variable that has been significantly associated with test anxiety. The odds of test anxiety were almost two [AOR 1.49, 95% CI (1.03-2.14)] times higher in students with psychological distress than their counterparts

Lastly, in this study, odd of test anxiety were higher in students who did not have study plan than those who had a study plan. Students who do not have study plan were nearly 2 [AOR=1.59, 95% CI=1.09, 2.30] times more likely have test anxiety as compared to their counterparts

Table 1: Socio-demographic characteristics of the study participants for the study on magnitude of test anxiety among midwifery and nursing students in Eastern Ethiopia, 2023

Variables	Category	N	Percent (%)
Age (in years)	<20	114	22.1
	20-24	243	47.1
	>24	159	30.8
Gender	Female	234	45.3
	Male	282	54.7
Religion	Orthodox	264	51.2
	Muslim	169	32.8
	Protestant	64	12.4
	Other	19	3.6
Marital status	Single	469	90.8
	Married	47	9.2
Academic year	Second year	158	30.6
	Third year	131	25.4
	Fourth year	227	44.0
Department	Nursing	285	55.2
	Midwifery	231	44.8
Residence	Rural	310	60.1
	Urban	206	39.9
Mother educational status	Formal	234	45.3
	Informal	282	54.7
Father educational status	Formal	348	67.4
	Informal	168	32.6
Pocket money	Less than 500 ETB	74	14.4
	500-1,000 ETB	213	41.2
	Greater than 1,000 ETB	229	44.4
Family size	<3	127	24.6
	>3	389	75.4

Table 2: Academic related characteristics of study participants for the study on magnitude of test anxiety among midwifery and nursing students in Eastern Ethiopia, 2023.

Variables	Category	N	Percent (%)
GPA	2.00-2.75	144	27.9
	2.76-3.75	313	60.7
	3.76-4.00	59	11.4
Entrance score	Less than 400	13	2.5
	400 and above	503	97.5
Field of study was first choice	Yes	160	31.1
	No	356	68.9
Pattern of study	Regularly	373	72.3
	For exam only	143	22.7
Study plan	Yes	276	53.5
	No	240	46.5

Continued.

Variables	Category	N	Percent (%)
Mange course load	Yes	345	66.9
	No	171	33.1
Miss of lecture	Yes	158	30.6
	No	358	69.4

Table 3: Psychosocial characteristics of study participants for the study on magnitude of test anxiety among midwifery and nursing students in Eastern Ethiopia, 2023

Variables	Category	N	Percent (%)
Social support	Poor	262	50.8
	Moderate	160	31
	Strong	94	18.2
Psychological distress	Well	276	53.5
	Mild disorder	102	19.7
	Moderate disorder	62	12
	Sever distress	76	14.8

Table 4: Behavioral characteristics of study participants for the study on magnitude of test anxiety among midwifery and nursing students in Eastern Ethiopia, 2023.

Variables	Category	N	Percent (%)
Time management	Good	273	52.9
	Poor	243	47.1
Internet use	<2hr	91	17.6
	2-4hr	303	58.7
	>4 hr	122	23.5
Substance use	Yes	91	17.6
	No	425	82.4
Use of substance for study	Yes	73	80.2
	No	18	19.8
History of negative life event	Yes	164	31.8
	No	352	68.2
History of known chronic physical illness	Yes	71	13.7
	No	515	86.3

Table 5: Factors associated with test anxiety at bivariate and multivariate logistic regression analysis for magnitude of test anxiety among midwifery and nursing students in Eastern Ethiopia, 2023.

Variables	Category	Test anxiety, N (%)		COR (95%CI)	AOR (95%CI)	P value
		Yes	No			
Gender	Female	147 (62.8)	87 (37.2)	2.004 (1.40-2.855)	2.03 (1.40-2.94)	0.000
	Male	129 (45.7)	153 (54.3)	1		
Residence	Urban	125 (60.7)	81 (39.3)	1.625 (1.37-2.32)		
	Rural	151 (48.7)	159 (51.3)	1		
Study pattern	Regularly	210 (56.3)	163 (43.7)	1		
	For exam only	66 (46.2)	77 (53.8)	1.503 (1.02-2.214)		
Time management	Good	175 (64.1)	98 (35.9)	1	2.33 (1.62-3.36)	0.000
	Poor	101 (41.6)	142 (58.4)	2.51(1.76-3.582)		
Psychological distress	No	149 (58.4)	127 (48.7)	1	1.4 (1.03-2.14)	0.031
	Yes	106 (41.6)	134 (51.3)	1.48 (1.04-2.10)		
Study plan	Yes	175 (63.4)	101 (47.2)	1	1.59 (1.09-2.30)	0.014
	No	127 (42.1)	113 (52.8)	1.54 (1.08-2.193)		
Field of study was my 1st choice	Yes	102 (63.8)	58 (36.3)	1		
	No	174 (48.9)	182 (51.1)	1.83 (1.25-2.699)		
Substance use	Yes	55 (60.4)	36 (39.6)	1.98 (1.2-3.14)		
	No	185 (43.5)	240 (56.5)	1		

DISCUSSION

The current study revealed that the magnitude of test anxiety among midwifery and nursing students was 53.5%. This finding was almost in line with the study conducted at the university of Gondar, Northwest Ethiopia (54.7%), Addis Ababa Ethiopia (52.3%), Azad university, Iran (52.25%) and Saudi Arabia (53.3%).[16,17,24,25]

However, the result of this finding was lower than studies done in Nyeri district, Kenya (68.1%), Taibah university (65%), and Babul university of medical sciences (98%).[14,16,19] It was also higher than studies done in Uganda (13.3%), Brazil (45.4%), the United Arab Emirates (22.2%), and Malaysia (18.2%).[24-27] This discrepancy might be due to the sampling size difference, the methodological differences, including the instrument used to measure test anxiety, and differences in the study in the characteristics of the population in each country.

In this study, the odds of test anxiety were almost higher in female students than their counterparts. This finding was in line with studies conducted at Addis Ababa university, university of Malaya, Hayyan medical university, Iraq, King Abdullah international medical research centre Riyadh, SAU, Ghana, and Pakistan.[17,12,28-31] The possible reason for this can be that females are generally found to experience higher levels of test anxiety than males due to several interrelated factors, including self-esteem, academic self-efficacy, and social pressures. The combination of lower self-esteem, reduced academic self-efficacy, heightened achievement motivation, and societal pressures contributes to the higher levels of test anxiety experienced by females compared to males.[32]

In the current study, poor time management of students was significantly associated with test anxiety. This finding was supported by studies done in Yarmouk university, Jordan, St. John's college, India, Kermanshah university of medical sciences, Iran, Azikiwe university, Awka, Nigeria, and Islamic Azad university, Ahvaz.[33-37] This can be explained by the fact that students with poor time management often face higher levels of academic procrastination, which is closely associated with test anxiety. Additionally, ineffective time management can lead to cognitive overload, causing students to feel overwhelmed by their tasks. This results in difficulty concentrating and increased anxiety levels.[37]

The odds of test anxiety were higher in students with psychological distress than their counterparts, which was concurrent with the studies done at Addis Ababa university, Tikur Anbessa specialized hospital, Ethiopia, Mettu university, university of Gonder, university of Augsburg, Germany, and international medical university, Kuala Lumpur, Malaysia.[16-18,38,39] The possible reason can be due to the psychological distress contributing to a cycle of heightened test anxiety by fostering negative emotions, impairing cognitive function, inducing physiological symptoms, and diminishing self-confidence.[40]

Lastly, in this study, the odds of test anxiety were higher in students who did not have a study plan than those who had a study plan. This result is in line with the reported result from a study conducted at the university of Houston, GC university Lahore, Addis Ababa university, and Pakistan.[17,41-42] The possible reason can be due to ineffective study habits that lead to poor preparation, and students encode and store the material inadequately; as a result, they are unable to recall poorly learned material during the examination.

Limitations

The study was a multicenter study rand had utilized standardized tools to measure test anxiety, the psychosocial distress and, social support. But Due to the cross-sectional nature of the study, it was difficult to establish a causal relationship between the dependent and the associated factor.

CONCLUSION

The magnitude of test anxiety among midwifery and nursing students is a pressing concern that can adversely affect their academic performance and overall well-being. The data suggests that this anxiety is not only common but also influenced by identifiable factors such as gender, time management, psychological health, and study habits. Implementing time management workshops, enhancing psychological support services, encourage structured study plans, promote gender-sensitive approaches and research-based interventions are the main recommendation of the current study. By addressing these recommendations, educational institutions can create a supportive environment that not only reduces test anxiety but also enhances the academic success and mental health of nursing and midwifery students.

ACKNOWLEDGMENTS

Authors would like to thanks to Dire Dawa University and college of medicine and health.

Funding: Funding sources by Dire Dawa University for data collection purposes.
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

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Cite this article as: Hassen MA, Tadesse D, Tefera B, Abera L, Hailu M. Magnitude of test anxiety and its determinants among midwifery and nursing students in Eastern Ethiopia, 2023. Int J Sci Rep 2025;11(3):126-34.