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Prevalence and determinants of test anxiety among medical students in Addis Ababa Ethiopia

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Abstract

Abstarct Background Worldwide, problematic test anxiety is a common health problem among medical students. The magnitude of problematic test anxiety ranges from 25 to 40% in undergraduate medical students and has a detrimental effect on academic achievement and success of students. However, data on the prevalence of test anxiety among medical students is limited. Thus, the study aimed to assess the prevalence and associated factors of test anxiety among medical students. Methods In this cross-sectional study, a stratified random sampling technique was used to select the participants. The level of test anxiety was determined by the Westside Test Anxiety Inventory (WTAI). We utilized logistic regression to explore the association between test anxiety and the potential sociodemographic/student related characteristics among medical students. Results The study included 423 medical students. Our study resulted the prevalence of problematic test anxiety among medical students to be 52.30% (95% CI 47.40-57.30). The prevalence of test anxiety was remarkably higher in women (79.75%) than in men (33.62%) students. Female sex [AOR=3.25, 95% CI: (1.54, 6.89)], having low grade [AOR=0.11,95% CI: (0.044,0.288)], being first year [AOR=10.55,95% CI: (1.4,76.7)], excessive course load [AOR=6.128,95% CI: (2.675,14.039)], and taking oral examination [AOR=2.89,95% CI: (1.42,5.84)] were determined as some of the predicting factors of test anxiety among medical students. Additionally, lack of systemic study plan [AOR=2.4,95% CI: (1.25,4.59)], poor social support [AOR=3.6,95% CI: (1.56,8.29)], moderate social support [AOR=3.39,95% CI: (1.56,7.4)], psychologically distressed [AOR=2.68,95% CI: (1.37,5.27)] independently predicts test anxiety among medical students. Conclusion A substantial percentage of medical students had problematic test anxiety (52.30%) in Ethiopia. Female sex, having poor grade point average, being the first year, excessive course load, oral examination, lack of study plan, poor social support, moderate social support, and psychological distress were found to be the potential determinants of test anxiety. Problematic test anxiety which is found to be common among medical students deserves more attention.

Background

Test anxiety is referred to as a set of psychological and behavioral responses that go with a concern about likely negative consequences or failure of an exam or similar evaluation situations. Test anxiety is a situation specific trait that refers to the anxiety states and worries conditions that are happened during examinations. This type of anxiety appeared abruptly or gradually. Sometimes it is persistent, and sometimes or ended within a few hours (1-3).

Although everybody feels irregular stress when evaluated, test anxiety represents a persistent personality predisposition in evaluative situations. All kind of tests and exams may cause different levels of stress and anxiety. Generally speaking, test anxiety is a great obstacle in the way of many individuals to reach their real academic destination(4)

Test anxiety can be diagnosed using the Diagnostic and Statistical Manual-IV, under the classification of social phobia and has emotional and cognitive components (5). Cognitive test anxiety is the worry part of cognitive reaction or internal dialogue in the lead up to, during and after evaluative situations which is

correlated with academic performance. Individuals who have high levels of cognitive test anxiety often report feelings of comparing self-performance to peers, worries over the consequences of failure, low levels of confidence in their own abilities as well as too much worry over evaluation. Additionally, the emotional component (sometimes called tension) refers the sharp physiological symptoms stemming from arousal of the autonomic nervous system and related affective responses that students have during the test, which is physiological manifestations include increased galvanic skin response and heart rate, muscle tension dizziness, nausea, or feelings of panic (2, 6).

According to educational psychologists and experts in education, an average level of anxiety is useful as an effective motivational factor can enhance one's performance for more effort. However, excessive anxiety can result in different effects like disturbance of mental processes. Experimental impact of evaluative stress caused high test anxious students to make more performance errors than those students with low test anxiety. Studies estimated that 10 million primary and secondary students' test anxiety causes decreased test performance and 10-35% of college student's experience functionally impairing levels of test anxiety. Highly test-anxious students score about 12 percentile points below their low anxiety peers (3).

Medical school programs are characterized by challenging classes and high credit loads each academic term and test anxiety is considered as one of the major problems among medical students. A study showed that 20% of test anxious students quit school before graduating because of repeated failure. This stressful anxiety may continue during the internship, postgraduate study period, and later into practical life (7)

Moderate to high levels of test anxiety has been shown to have harmful consequences such as impaired learning capacity, increased likelihood of school dropout and this too much worry can be very weakening and disturbing that leads to a mental block. Physical health (higher blood pressure, insomnia, loss of appetite, hair loss, higher blood pressure and likely increased chronic medical illnesses across the lifespan), psychosocial functioning (alcohol dependence and social phobia). Sometimes, anxiety can have extreme consequences depression and tendency to attempt suicide is high. (8).

Researchers evaluated that between 25 to 40% of undergraduate students experienced test anxiety. Many studies were conducted to reveal the prevalence of test anxiety among undergraduate and post-graduate. Out of these studies which identified the prevalence of test anxiety among medical students were in German 29.9 %, Iran 40.3 %, Malaysia 52 %, and Pakistan 64 %, Taiwan 7.0 and in India 6%(7, 9).

Most studies revealed that the major factors associated with test anxiety were female sex, inability to manage time, and lacking study skills, low previous GPA, psychological distress, poor self-esteem, and poor social support. Excessive course load, lack of revision time before the exam. In addition, there is variation across faculty, having low academic competence and test competencies were the significant predictors of test anxiety (2, 10-14).

In this study, we sought to estimate the prevalence of test anxiety and its determinates in undergraduate medical students at Addis Ababa University in Ethiopia because to best of our knowledge, there are no previous studies that explored the prevalence and associated factors of test anxiety in undergraduate medical students in Ethiopia. Additionally, the study is important for a better understanding of the level of test anxiety and its predictors which enables the responsible stakeholders to intervene based on the findings.

Methods

Methods

Study design and population

This was an institutional based cross-sectional study conducted from May to May 2018 at Addis Ababa University (AAU). Of 1650 medical students, 390 of them were randomly selected and completed the required questionnaires. All undergraduate medical students were eligible to participate in the current study.

Sample Size determination and Sampling techniques

The sample size (n) to estimate the prevalence of test anxiety among medical students was determined by a single population proportion formula. 95% confidence level was considered to estimate the sample size and since there are no previous similar studies conducted in Ethiopia, we assumed the prevalence of test anxiety 50% and a precision of 5% between the sample and the parameter was taken. α =0.05 (95%) =1.96

We employed the following sample size calculation formula for a single proportion:

n = Z α 2 2 p 1 - p d 2 Where;

n= sample size

Z ∝ 2 = significance level at ∝ = 0.05

The p=expected proportion of test anxiety among undergraduate medical students supports to be 50% since no related study is found in Ethiopia.

d = margin of error = 0.05

Therefore,

n = 1.96 2 0.5 1 - 0.5 0.05 2 = 384

Assuming the non-respondent rate 10% of, the final sample size was 384+39=423

Concerning the sampling technique, in this study, a total of 390 participants, were randomly selected by using a stratified random sampling technique. As suggested, we used a proportionate stratified random sampling to allocated sample for students in each year (year 1 to 5) and we employed a simple random sampling method to select each participant. (See figure 1).

Measures

Measures for the dependent variable (test anxiety)

Data was collected by a self-administrated questionnaire. Westside Test Anxiety inventory developed by Richard Driscoll (WTAI), is a self-reported questionnaire of 10 statements to which respondents are asked to report how often they experience anxiety symptoms before, during, and after taking tests. Each statement response is scored with a 5-point Likert scale (1–5) yielding a total test anxiety score ranging from 10 to 50 points. Participant were attributed to five different levels of test anxiety according to WTAI score: score of 1.0-1.9 comfortably low-test anxiety, a score between 2.0—2.5 Normal or average test anxiety, 2.5—2.9 High normal test anxiety, 3.0—3.4 Moderately high ,3.5—3.9 High test anxiety ,4.0—5.0 Extremely high anxiety and the cut point for problematic test anxiety is ≥30. The Cronbach alpha was alpha of .78, split-half reliability of .77 in a Nigerian sample(15, 16).

Therefore, In this study, those students who scored below 30 were considered as having no test anxiety and those score 30 and above were classified as having test anxiety(16).

Measures for the predictor variables

Study skills

Study skills referred to as the ability to effectively use the specific skills (learning and planning study, library use, note taking, course participation, preparation for exams, motivation, preparation for courses, effective reading, writing, health and nutrition, and listening skills). Time Management (TM) includes six items inventory was used in this study to measure the time management of students it has 6 questions and 5 points Likert scale<20 suggest not effective time management skill (17).

To assess the study skills we used approaches and a study skills inventory for students (ASSIST) (17).The inventory consists of 51 items 5-point Liker scale. It measures the scores on six subscales regarding study habits and skills. These subscales are Textbook Reading, Note-Taking, Memory, Test Preparation, Concentration and Time Management. The domain of Time Management (TM) includes six items of the inventory. The convergent validity of the tool is high and consistency reliability is 0.96 which is

Self-stem

Rosenberg Self-esteem scale – RSES was used to measure levels of self-esteem among the study participants (18). Students were scored based on a 4-point Liker scale, scoring of the scale “Strongly Disagree” 1 point, “Disagree”2 points, “Agree” 3 points, and “Strongly Agree” 4 points. The sums of the scores for all ten items and keep them on a continuous scale. Higher scores indicate higher self-esteem. The scale ranges from 0-30. Scores between 15 and 25 are within normal range; scores below 15 suggest low self-esteem. Internal Validity is 0.78-0.84 And reliability is 0.94 which is high (18).

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. The scale has a sensitivity of 70% and specificity 67% (19).

Social support

We also measured social support of the students and individual who were scored 3-8 poor, 9-11 moderate and 12-14 strong social support on Oslo 3-item social support scale (20)

The sociodemographic and other variables

We collected self-reported data on sociodemographic and other characteristics of the participants using self-reported and structured questioners.

Data collection procedure

In this study to maintain the quality of the data high, before they engage in the actual data collection activities the data collectors received adequate training on data collection procedure and protocol. Data was collected by using an English version of self-administrated questionnaire.it had components which assess a different aspect of the participant. The 1st part assessed a socio-demographic characteristic of participants. The 2nd part assessed the level of test anxiety by using the WTAI scale. The 3rd part was on psychosocial factors (psychological distress, self-esteem, and social support) which affect the level of test anxiety and measured by K-10 scale, RSES and oslo3-social support scale respectively. The 4rth part was on questions assessing behavioral factors using SSI scale to assess time management. The fifth part assessed the academic-related factors that affect test anxiety using yes or no questions. This questionnaire disseminated to 423 eligible medical students.

Data quality assurance

The questionnaire was designed and modified appropriately. The self-administrated English version was disseminated. The training was given for data collectors and supervisor. Pre-test conducted two days before the actual data collection on saint Paulo's medical school and the Pre-test was conducted among 22 samples (5%) of saint Paulo's medical 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 assist the students to fill the questionnaire and checked daily by the supervisors and principal investigator. The solution to problems during data collection was given immediately by discussing with the supervisors and the data collectors.

Data processing and analysis

First, the data was checked for completeness and consistency and then coded and entered in the computer using EPIDATA software for cleaning, storing and recording and then imported to SPSS version 25 for analysis. Descriptive statistic was used to explain the study participants in relation to study variables. A p-value of less than 0.05 was considered statistically significant. Bivariate and multivariate logistic regression analysis was conducted to identify associated factors of test anxiety among medical students and the strength of the association was presented by odds ratio with a 95% confidence interval.

Ethical consideration

This cross-sectional study was reviewed and approved by the Institutional Review Board (IRB) of the University of Gondar and Amanuel Mental Specialized Hospital. Informed consent from each participant was obtained after clearly explaining the objectives as well as the significance of the study for each study participant. We advised the study participants about the right to participate as well as refuse or discontinue participation at any time they want and the chance to ask anything about the study. The participants were also advised that all data collected would remain confidential.

Result

Socio-demographic characteristics of respondents

Of the total 423 participants reached by random sampling, 390 participants were involved in this study with a response rate of 92.2%. The population was (40.5%) female and (59.5%) male and with a mean of 21.8 years with SD (±1.72) ranging 18 to 26 years.

More than half of the participants 245 (62.8%) were Orthodox by religion and most of the respondents were single 385(98.7%) and regarding education level of the respondent's majority of the participant were 3rd year 92(23.6%) followed by 2nd year 80(20.5%). (Table 1)

Academic characteristics

Out of 390 students, 192(49.2%) of them reported maternal educational status as tertiary and above, (75.6%) of them reported history of anxiety that increased during oral exam and (24.4%) reported history of anxiety that increased during a written exam, (43.1%) faced excessive course load, and (73.8%) of them lack enough time to revise before exam. (Table 2)

Psychosocial characteristics of participants

In this study, 186 (47.7%) of the participant had psychologically distressed. Regarding social support (35.4%) and (42.6) had poor and strong social support respectively. In this study, 86.4% of the participant had high self-esteem. (Table 3).

Behavioral characteristics of the participant

The results of this study found that about 10 (2.6%) of the participant had attempted suicide in their lifetime. Regarding time management, 267(68.5%) of students had poor time management and 24.1% of the participant used the internet more than 5 hours per day and 22.8% used more 30 minutes to one hour per day. (Table 4).

Prevalence of test anxiety among medical students

In this study, more than half (52.30% (95%CI 47.40-57.30)) of medical students had problematic test anxiety. The prevalence of test anxiety in females (79.75%) was remarkably higher than in males (33.62%). (Figure 2).

Factors associated with the level of test anxiety among medical students

In this study, female sex, having a poor average grade, being the first year, excessive course load, oral examination, lack of study plan, poor social support, moderate social support, and psychological distress were significantly associated with test anxiety in our final multivariable logistic regression.

The odds of having positive test anxiety for a female is 3.25-fold higher than male [AOR=3.25, 95% CI: (1.54, 6.89)]. Regarding grade of students, when the average grade point increase in a unit, the odds of developing severe test anxiety decreased by 88.8% [AOR=0.11,95% (0.044,0.288)].

We also found that the risk of developing positive test anxiety for first-year students is 10 times higher than the fifth-year students [AOR=10.55, 95 % (1.4, 76.7)]. Having excessive course load was 6 times higher risk to develop positive test anxiety [AOR=6.128,95% (2.675,14.039)]

Furthermore, the odds of having positive test anxiety for an oral examination is 2 times higher than that of written examination. [AOR=2.89,95(1.42,5.84)]. The odds of having severe test anxiety for students who did not have a systemic study plan is 2.4 higher than those who had a study plan [AOR=2.4,95%

(1.25,4.59)]. The odds of having severe test anxiety for those who have poor social support is 3.6 higher than those who have strong social support [AOR=3.6,95% (1.56,8.29)].

Additionally, the odds of having positive test anxiety for those who have moderate social support is 3.39 higher than those who have strong social support [AOR=3.39,95% (1.56,7.4)]. The odds of having severe test anxiety for those psychologically distressed students is 2.68 times higher than those not distressed [AOR=2.68,95% (1.37,5.27)]

Discussion

Main findings

This is the first study that assessed the prevalence of problematic test anxiety and determinants among medical students in Ethiopia. The findings of this study demonstrated that more than half of the medical students had problematic test anxiety (52.30%). This prevalence is consistent with the reported magnitude of test anxiety from Saudi Arabia (53%) (21), the USA (55%) (22), and Turkey(48%) (23).

However, the result of the current study was higher than the study conducted at Iran ((43.4%) (24), Malaysia (32.5%) (1), and India (32.3%) (25). 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.

On the contrary, the result of this study is lower than the study conducted in Saudi Arabia and Kenya with the prevalence of (65%)(26) 68.1%) (27) respectively. This difference may be due to the variations in several factors that have an impact on anxiety, such as different course contents, educational environment, test conditions, types of test questions and other factors.

In this study prevalence of high level of test, anxiety was found to be more than two times higher in females than males. This result is supported by a study carried out in Sudan and Pakistan (28, 29). The possible reason for this strong association can be due to the reason that all night studying before exams is significantly higher among female students, as compared to male, this can create fatigue and overall exertion among students which may lead to a lower performance in examinations or due to females over report their problems than males (30).

On the other hand, the present finding does not agree with the results the study conducted in Iran (10) where no significant relationship between test anxiety and gender was reported and a study in India (42) where test anxiety is higher in males compared to female students. The discrepancy might be due to variation in the study area and study participants were high school students in addition to that variation on sample size (highest frequency of male) also considered.

We also found that the score of the students as a significant predictor for test anxiety. As average grade point increase in a unit, the odds of developing severe test anxiety decreased by 84.8%. This result is supported by studies conducted in Saudi Arabia, Sri Lanka and Nigeria (13, 31, 32) the possible

justification for this strong association could be In fact, test anxiety has been shown to impair attention and working memory capacity which negatively impacts the ability to learn, understand and solve the academic problem. Test taker with moderate and severe test anxiety level develop Forgetfulness due to test anxiety produces interference between relevant responses and irrelevant responses generated from the person's anxious state. On the other hand, A study was done in Iran(33) shows no significant relationship between GPA and test anxiety. The discrepancy could be due to differences between universities educational environment, teaching and evaluation methods, and systems of rewards and punishments resulting from test results play a role in this regard.

In the present study, first-year medical students tend to develop high-level test anxiety 7 times higher than the fifth year. The finding of this study is in agreement with studies done in India (25). this might be due to substantial stress from the beginning of the course with more concern for academic performance may be the cause for high levels of exam anxiety among first-year medical students.

on the other hand, this study contradicted with study conducted in Saudi Arabia(10) test the difference can be due to the study was conducted on female medical students only or due to curriculum difference.

In the present study test anxiety for an oral examination is 5.5 higher than written examination. this is in line with study conducted in Germany and India (34, 35) the possible reason for this consistency could be due the reason that oral test situations could be presumed as social situations that require social skills, interaction, and communication with others and that may elicit fear of negative evaluation by others when they present in the presence of fellow students and face to face with the professor in combination with the importance attributed to the exam that aggravates oral exams.

In the current study level of test anxiety for students who faced extensive course, the load is four times higher than those who did not face excessive course load. this is in line with studies conducted in Pakistan and Saudi Arabia (26, 36). Extensive course load contributes 90.5%and 23.4% for exam anxiety, it can be due to the reason that since the medical course is so vast and examination process is so lengthy students' perception of course load and their ability to manage time with their course work is associated with exam anxiety (26).

In this study test anxiety for students who do not have a systemic study plan is two times higher than those who have a study plan. This study is in line with studies conducted in Pakistan(37). the possible reason can be due to Ineffective study habits leads 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.

The odds of having high test anxiety for those who have poor social support is three times higher than those who have strong social support. This is similar to the study conducted in Turkey and Iran (38, 39). Having someone around when needed and participating in social activities decrease students' emotional tension and release energy, decreasing anxiety.

In this study those psychologically distressed students three times higher develop positive test anxiety than those not distressed, this study is in line with a study done in Saudi Arabia(10, 40).82.5% 0f students distressed before the exam which can be a result of an inability to cope with the examination pressure. It can be due to students experiencing assessment anxiety are preoccupied with negative self-referential thoughts including doubts about academic competence and fear of failure, also due course load, duration of the assessment period, and lack of knowledge.

Conclusion

This study showed that the average prevalence of test anxiety was high among undergraduate medical students (52.30%). Female sex, being the first year, lower grade point average, oral exam, excessive course load, lack of systemic study plan, lower social support and psychological distress were significantly associated with the level of test anxiety. Early screening and interventions of test anxiety among medical students were warranted.

Abbreviations

ASSIST: Approaches and Study Skills Inventory for Students

IRB: Institutional Review Board

K-10: Kessler Psychological Distress Scale

RSES: Rosenberg Self-esteem scale

SPSS: Statistical Software for Social Science

TM: Time Management

WTAI: Westside Test Anxiety inventory

Declarations

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Competing interests

The authors declare that they have no competing interests.

Consent for publication

Not applicable

Availability of data and materials

The datasets used and analyzed during the current study are not publically available due to ethical restriction and personal data protections but are available from the corresponding author on reasonable request.

Ethics approval and consent to participate

This cross-sectional study was reviewed and approved by the Institutional Review Board (IRB) of the University of Gondar and Amanuel Mental Specialized Hospital. Informed consent from each participant was obtained after clearly explaining the objectives as well as the significance of the study for each study participant. We advised the study participants about the right to participate as well as refuse or discontinue participation at any time they want and the chance to ask anything about the study. The participants were also advised that all data collected would remain confidential.

Authors' contributions

LT conceived the study and was involved in the study design, reviewed the article, analysis, report writing and drafted the manuscript. SS, WD, GZ, and GA were involved in the study design, analysis and drafted the manuscript. All authors read and approved the final manuscript.

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Figures

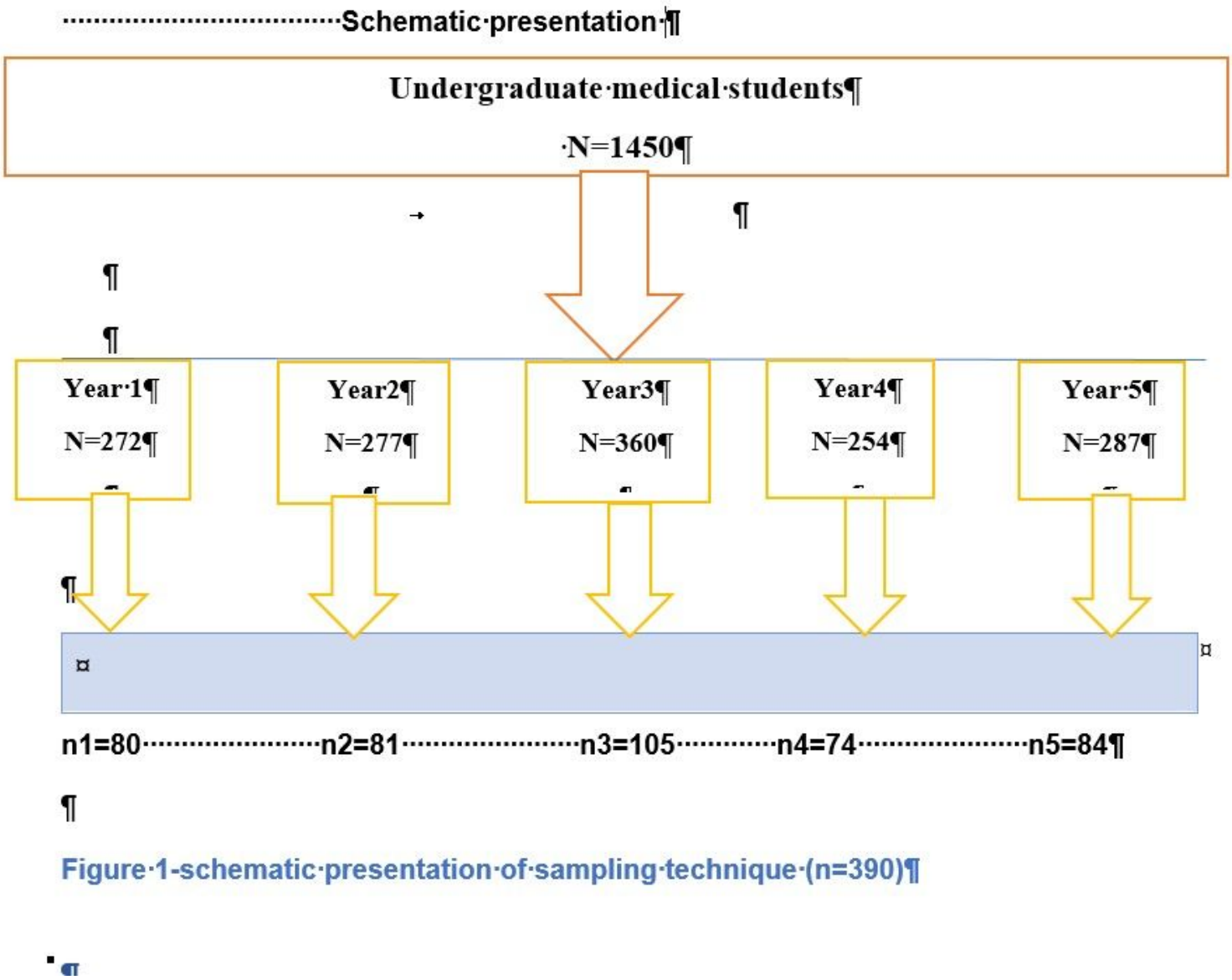
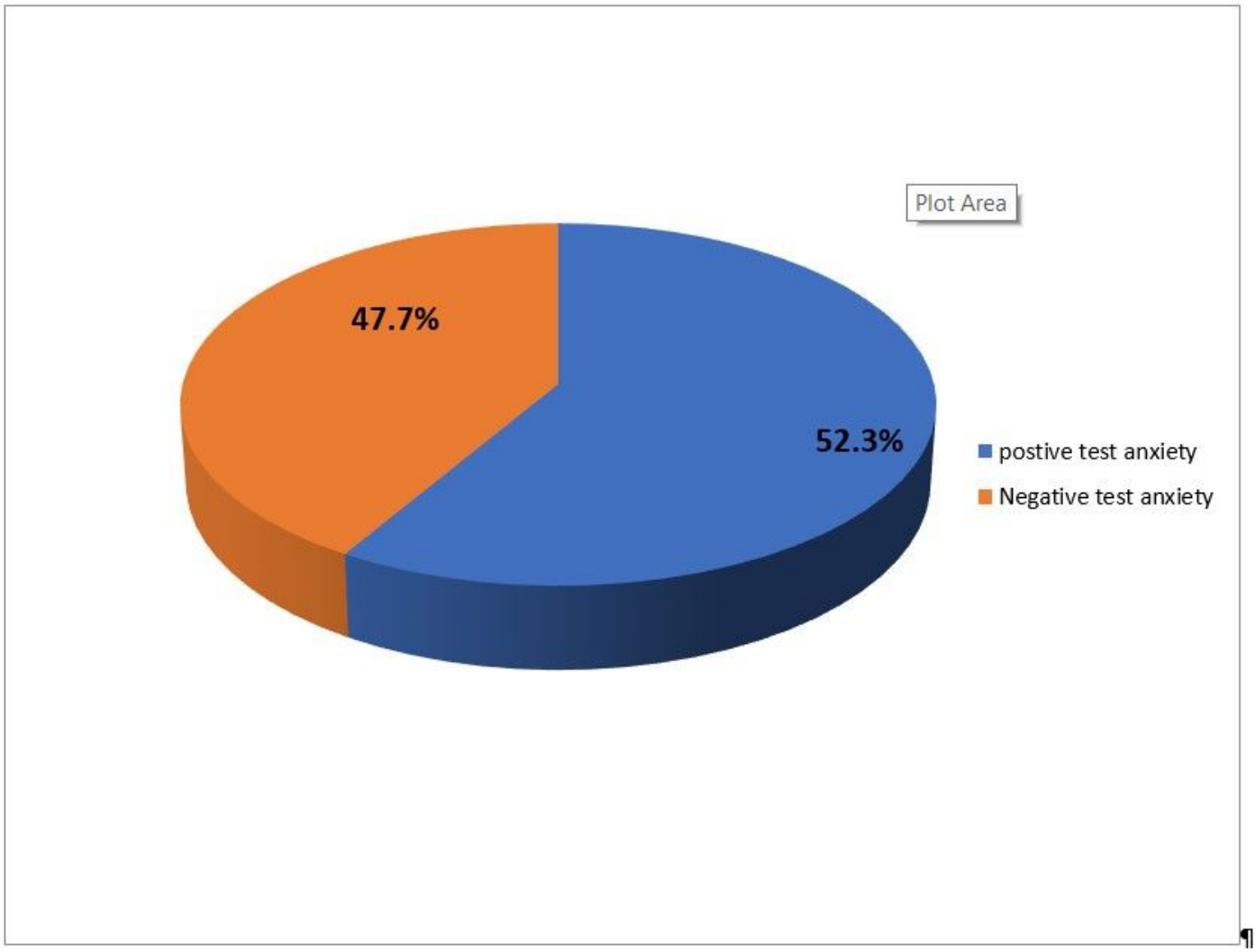


Figure 1-schematic presentation of sampling technique (n=390)

Figure 1



Figure·2:··Prevalence·of·test·anxiety·among·undergraduate·medical·students·at·Addis·Ababa·University,·Addis·Ababa,·Ethiopia,·2018.¶

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Figure 2