

The Prevalence of Depressive Symptoms Among Medical Students of Tbilisi State Medical University in Georgia

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ABSTRACT

Background: Depression and anxiety are prevalent global mental health conditions. In the 21st century, mental well-being and physical and social health are increasingly vital. Due to the intense competition in the profession, medical students may experience stress and depression due to the pressure to perform well academically. These symptoms can impact their academic progress, future medical practice, and patient care abilities.

Objectives: The research investigates the prevalence of depressive symptoms among medical students at TSMU. It also aims to find causative factors that influence the onset of these symptoms, such as the period before an important exam, time spent away from family, or how mood changes impact their GPA. Furthermore, the study aims to identify gender-based disparities in symptom prevalence among participants.

Methods: This study is a cross-sectional survey using a questionnaire. The prevalence of depressive symptoms among medical students at TSMU and their causative factors were assessed using a modified Patient Health Questionnaire-9 (PHQ-9).

Results: In the study, 182 out of 195 participating medical students (93.33%) reported experiencing depressive symptoms. Notably, more female students (63.07%) exhibited these symptoms than male students (30%). The chi-square test results indicated no significant correlation between depressive symptoms and changes in symptom frequency before exams or the duration of time spent away from family and loved ones.

Conclusions: Our study highlights the widespread occurrence of depressive symptoms in TSMU medical students. Implementing counseling services and interventions to enhance the academic environment may effectively reduce these symptoms. Further research is needed to determine the most effective interventions for addressing depression among medical students.

Keywords: Depression; medical students; PHQ-9.

INTRODUCTION

Medical education is known for its demanding and stressful nature, often affecting students' emotional and psychological well-being. Extensive research has shown that medical students are at a heightened risk of experiencing depressive symptoms, with rates reaching as high as 27.2%.¹ The rigors and emotional strains of medical training can lead to various mental health issues, including depression, anxiety, and burnout.

Depression, a pervasive mental disorder characterized by persistent sadness, hopelessness, and reduced interest in activities, can significantly impact a student's life quality, academic performance, and career prospects. Those grappling with depressive symptoms often struggle to cope with the demands of medical education, leading to academic underperformance and an elevated risk of dropping out.²

Numerous studies worldwide have delved into the high prevalence of stress, anxiety, and depression among medical students and have sought to identify contributing factors. Research in Palestine revealed widespread depression and anxiety among students.³ A study in China linked depression and anxiety to factors like living alone, employment pressure, financial stress, family issues, and inadequate social support.⁴ Meanwhile, in Cameroon, major depressive

disorders in medical students were associated with chronic illnesses, significant life events, female gender, and clinical-level students.⁵ A comprehensive meta-analysis encompassing 77 studies found that approximately one-third of medical students globally suffered from depression, often with insufficient treatment.⁶

These depressive symptoms are alarmingly widespread among medical students and are influenced not only by the demands of their education but also by sociodemographic factors like age, gender, and nationality.⁷ Boasting a diverse student population, Georgia offers a unique context for studying the impact of medical training on mental health concerning various sociodemographic factors.

This study aims to assess the prevalence of depressive symptoms among Tbilisi State Medical University (TSMU) students and to pinpoint potential risk factors. By shedding light on the intense demands of medical training and their mental health consequences, this research could pave the way for intervention and prevention strategies to alleviate the burden of depression among medical students worldwide.



METHODS

Study context

The study is a cross-sectional survey conducted at Tbilisi State Medical University (TSMU) in Tbilisi, Georgia, from August 2022 to January 2023. Medical students from Year 1 to Year 6, enrolled in the European MD and American MD programs within the Faculty of Medicine, were encouraged to participate in the study. Participants were further divided into two groups based on their year of study (Preclinical: Year 1-3 and Clinical: Year 4-6). They were also classified according to other sociodemographic factors such as age and gender.

Study settings

The study assesses the prevalence of depressive symptoms through email questionnaires sent to the students. The email IDs were obtained from the administrative office after procuring approval from the university.

Study design

A two-part questionnaire was emailed to Tbilisi State Medical University (TSMU) students. The first section consisted of general information regarding their age, gender, year of study, GPA (out of 100), prior diagnosis of depression, whether there was an increase in symptoms during exam periods, social life, and financial status. The Patient Health Questionnaire-9 (PHQ-9) scale was adjusted for the second portion, which evaluated symptoms of depression. Instead of a scale, the questionnaire was changed to a yes-or-no format. The sample size needed for the study was 196 students. The study's inclusion criteria were all students enrolled in European and American MD programs of TSMU. Students with a previous clinical diagnosis of depression were excluded.

Study population

The sample size was calculated using the Qualtrics online calculator. It was estimated based on a population size of 300 with a confidence interval of 95% and a 5% margin of error. The sample size needed for the study was 196. A total of 300 students received the questionnaire by electronic mail, and 214 of them responded. After excluding students with a prior diagnosis of clinical depression, 195 responses were evaluated.

Study tool

The questionnaire used for the study consisted of two sections. The first section contains general questions about age, gender, year of study, GPA, social life, and financial status. The second section consisted of a modified Patient Health Questionnaire-9 (PHQ-9) scale. The Patient Health Questionnaire (PHQ)-9 is the major depressive disorder (MDD) module of the full PHQ, which is employed in general medical and mental health settings to diagnose depression and assess symptoms. In this study, ten symptoms were

considered, and the severity of symptoms was not assessed. Rather than making a clinical diagnosis of clinical depression, the study's primary goal was to determine the frequency of depressive symptoms among medical students. The intention was to demonstrate that, even if some students might not explicitly fall into the categories of mild, moderate, or severe depression, the majority of students experience one or more depressive symptoms.

Statistical analysis

The data collected from the study was entered into GraphPad Prism 9.4.1 and analyzed using several statistical tests to determine associations between parameters such as age, gender, year of study, GPA, and if they caused an increase in depressive symptoms. Chi-square was used to determine the significance of gender in association with depressive symptoms. Chi-square analysis was used to determine the association between preclinical and clinical years with depressive symptoms. Chi-square analysis was used to examine the significant change in GPA between students who had depressive symptoms and those who did not. The correlation coefficient was used to determine if there is a positive, negative, or no association between the number of months before the USMLE exams and the depressive symptoms. It was also used to determine if there is an association between the symptoms and time spent away from family. The results from the correlation coefficient were used to determine if depressive symptoms varied with age. Multiple logistic regression analyses were performed to investigate whether student age and the academic year influenced the number of depressive symptoms.

RESULTS

Response rate and characteristics of the participants

Out of 300 TSMU medical students in European MD (EUMD) and American MD (USMD) programs who were interested in participating in the survey, 214 (71.34%) completed the questionnaire. After excluding 19 students with a previous depression diagnosis, 195 responses were analyzed. Among them, 125 (64.1%) were females, and 70 (35.69%) were males. Additionally, 87 (43.07%) were in preclinical years (Years 1-3), while 108 (56.93%) were in clinical years (Years 4-6). The sociodemographic characteristics of the study participants are shown in [Table 1](#).

Prevalence of depressive symptoms

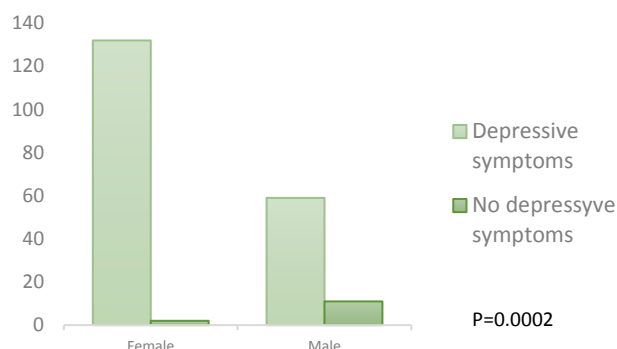
The questionnaire revealed significant gender disparities in the prevalence of depressive symptoms among respondents. An alarming 84.28% of male students and a staggering 98.4% of female students reported experiencing one or more depressive symptoms. Notably, eight students exhibited all symptoms outlined in the PHQ-9, while 13 (0.06%) reported none. A profound association between depressive symptoms and female students emerged when

compared to male students in both medical programs, with a statistically significant chi-square result (p-value: 0.0002, df:1) (Fig.1)

TABLE 1. Characteristics of the study participants

Characteristics	Number (%)
Age <20	85 (43.5)
Age >20	110 (56.5%)
Gender	
Female	125 (64.1%)
Male	70 (35.69%)
Academic stage	
Preclinical Years 1-3	84 (43.07%)
Clinical Years 4-6	111 (56.93%)
Medical programs	
European MD (EUMD)	67 (34.35%)
American MD (USMD)	128 (65.65%)

FIGURE 1. Male and female students with or without depressive symptoms



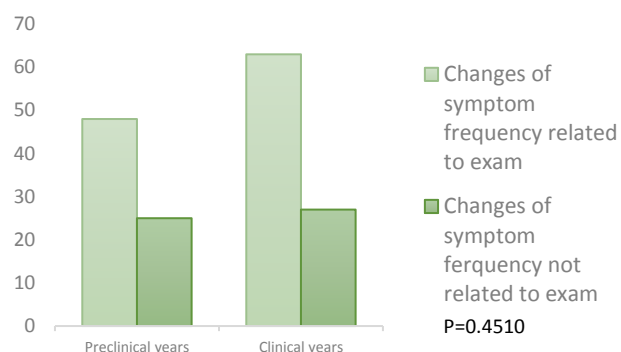
The self-administered questionnaire unveiled the extent of depressive symptoms among students: 61.3% experienced diminished interest or pleasure, 53.9% felt down or hopeless, 50.5% had sleep disturbances, 48% slept excessively, 75% felt persistently fatigued, 58.8% had appetite fluctuations, 56.4% perceived themselves as a failure, 62.7% struggled with concentration, 39.7% had thoughts of self-harm, and 38.2% felt restless.

Efforts were made to uncover potential correlations between specific depressive symptoms and variables such as age and academic year. Students were stratified into age groups (≤ 20 , > 20) and academic years (preclinical and clinical) to facilitate this investigation. However, the analysis revealed non-significant findings ($p > 0.05$) across all tests.

Factors associated with symptoms of depression among medical students

The questionnaire revealed that 35.3% experienced worsening symptoms when away from family, and 62.3% saw symptoms intensify near exams. However, a Chi-square test found no significant association between symptoms and pre-exam changes ($p = 0.4510$; $df=1$) (Fig.2)

FIGURE 2. Changes in the frequency of depressive symptoms concerning an important exam



A multiple logistic regression analysis was conducted to assess the potential influence of student age and academic year on the number of depressive symptoms they experienced. The findings revealed non-significant results (Pseudo r squared: 0.0048, p-value: 0.09), indicating no causal relationship between age, study year, and depressive symptom count. Additionally, social life and financial circumstances emerged as linked factors affecting depressive symptom prevalence. Among respondents, 21 (10.8%) expressed dissatisfaction with their social life, potentially contributing to their depressive symptoms, particularly among international students adjusting to a new environment. Moreover, 24 students (12.3%) reported struggling to afford necessities due to financial constraints, which could impact their mental health. Notably, 70 students (36.3%) reported a decline in GPA following the onset of depressive symptoms.

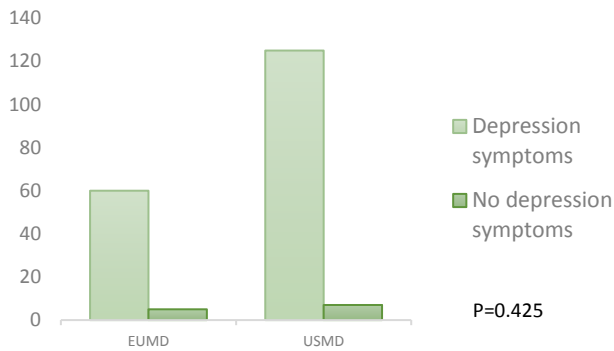
Differences between the two medical programs

This study included 67 students from the European MD program (EUMD) and 128 students from the American MD program (USMD). Findings revealed that 92.54% of EUMD students and 95.31% of USMD students reported at least one depressive symptom based on the modified PHQ-9 questionnaire.

A chi-square test examined whether the choice of medical program correlated with depressive symptoms. The results indicate no statistical association between the chosen medical program and depressive symptoms, as reflected in the p-value of 0.4250 (Fig.3).

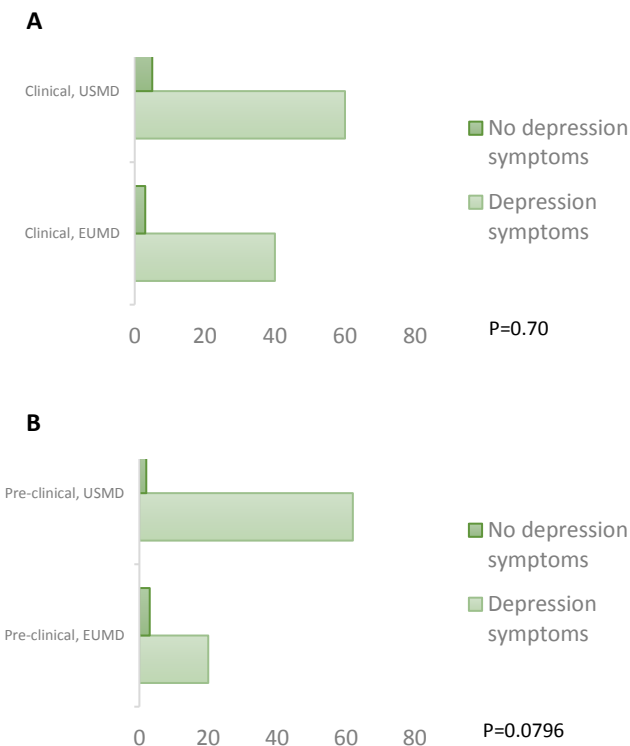
Furthermore, chi-square analyses were conducted to investigate potential differences between clinical and preclinical students in both programs. Neither the academic year nor the selected medical program displayed statistical significance, with p-values of 0.7 and 0.0796, respectively (Fig.4)

FIGURE 3. Different programs students with depressive symptoms



Abbreviations. EUMD: European MD Program; USMD: United States MD Program

FIGURE 4. Number of students with depressive symptoms in clinical (A) and preclinical (B) years of European and American MD programs



Abbreviations. EUMD: European MD Program; USMD: United States MD Program

DISCUSSION

This study investigates depressive symptoms among Tbilisi State Medical University (TSMU) medical students and the associated factors. High rates of depression among medical students globally persist despite changes in medical education.^{8,9} However, prior research mainly focused on the general population and medical students at large;¹⁰ medical students in TSMU were not independently examined as a subgroup with their distinct characteristics and predictors. Our research aimed to identify causative factors for depressive symptoms.

The self-administered questionnaire unveiled the extent of depressive symptoms among students: 61.3% experienced diminished interest or pleasure, 53.9% felt down or hopeless, 50.5% had sleep disturbances, 48% slept excessively, 75% felt persistently fatigued, 58.8% had appetite fluctuations, 56.4% perceived themselves as a failure, 62.7% struggled with concentration. Comparable international studies reported varying depression rates;¹¹⁻¹⁵ depression was prevalent in 57.9%, 40.4%, 30.6%, and 14.0% of medical students in Egypt,¹⁵ Bahrain,¹⁶ Estonia,¹⁷ and Lithuania,¹² respectively. The differences in prevalence rates could be due to differences in lifestyle disparities. Suicidal ideation affected 39.7% of our subjects, aligning with international and national data.¹⁸⁻²⁰

Notably, 10.8% were dissatisfied with their social lives. It has been argued that the psychological environment provided by medical schools is toxic when students are exposed to constant academic and social pressure.^{21,22} Moreover, 12.3% cited financial difficulties impacting necessities, consistent with previous research associating financial hardships with poor mental health. Other studies found that medical students are plagued by financial worries in many countries, an essential cause of their stress.²³

Female medical students showed a higher prevalence of depressive symptoms (98.4% vs. 84.28% in males). The study could not pinpoint the cause of this gender difference. Preclinical (1-3 years) and Clinical (4-6 years) students also reported high rates, with 94.25% and 92.59%, respectively.

This study showed there is a higher prevalence of depressive symptoms among female medical students compared to the mixed findings, with some showing no difference or a much higher prevalence among female medical students in the studies conducted before.^{24,25}

Further research is essential since this study could not identify the reasons behind the gender disparities. A potential factor is the unequal gender distribution among survey respondents, possibly influencing the results.

Limitations

Elevated scores on depressive symptom questionnaires should not be equated with a higher prevalence of depressive disorders like major depression. Tools like the modified PHQ-9 for self-assessment cannot substitute an

expert's evaluation and might inaccurately gauge the prevalence of depressive symptoms.²⁶ The study's narrow focus on two programs of Tbilisi State Medical University students in Georgia yielded a small sample, potentially reducing the result's significance. Expanding to include students from diverse programs could have improved reliability. The limited sample may stem from depression stigma, which could discourage sharing personal details, and self-report bias might have affected symptom reporting accuracy. The study did not explore how coping mechanisms, resilience, and family support influenced depression levels despite evidence of their impact on medical students' mental health.^{27,28} Lastly, this study's limited scope, conducted in one Georgian university with a diverse student population, hinders its generalizability to other medical student groups. Future research should encompass multiple Georgian universities for broader insights.

CONCLUSIONS

Our results strongly imply that medical students at TSMU exhibit a significantly high prevalence of depressive symptoms. Even though female students had much greater rates of depressive symptoms than male students, the precise reason for this disparity is yet to be determined. Between the students in the two different medical programs offered by TSMU—the American MD program and the European MD program—there were no appreciable variations in depressive symptoms. Furthermore, regulation of the depressive symptoms and the associated factors in this study should be addressed by encouraging students to self-regulate, providing professional psychological intervention programs, and timely monitoring in controlling the depressive symptoms among students in TSMU.

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