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Depressions, anxiety, stresses, and sleep quality among medical undergraduate students and its correlation with sociodemographic factors and academic performance

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ABSTRACT

Background: Medical undergraduate students are exposed to intense academic and psychological stress, placing them at high risk for mental health issues such as depression, anxiety, stress, and sleep disturbances, all of which can adversely affect academic performance. **Aims and Objectives:** This study aims to determine the prevalence of depression, anxiety, stress, and poor sleep quality among medical students and to analyze their correlation with sociodemographic characteristics and academic performance. **Materials and Methods:** A descriptive cross-sectional study was conducted among 384 MBBS students at Hind Institute of Medical Sciences, Sitapur, over 18 months. Psychological distress was measured using the depression, anxiety, and stress scale-42, and sleep quality via the Pittsburgh Sleep Quality Index. Academic performance was assessed using a validated 8-item scale. Statistical analyses included Chi-square tests, t-tests, analysis of variance, and multivariate logistic regression. **Results:** The prevalence of depression, anxiety, and stress was 32%, 38%, and 45%, respectively, with 58% of students reporting poor sleep quality. A significant negative correlation was found between academic performance, severity of psychological symptoms, and poor sleep ($P<0.001$). Independent predictors of poor academic performance included low attendance (adjusted odds ratios [AOR] = 3.42), poor sleep quality (AOR = 2.71), moderate-to-severe depression (AOR = 2.63), anxiety, stress, male sex, 2nd-year status, day scholar residence, and absence of siblings. **Conclusion:** Depression, anxiety, stress, and poor sleep are highly prevalent and significantly affect academic outcomes among MBBS students. Targeted mental health interventions, promotion of sleep hygiene, and academic support strategies are crucial to improving student well-being and performance.

Key words: Depression; Anxiety; Stress; Sleep quality; Academic performance; Medical students; Mental health; Sociodemographic factors; Depression, anxiety, and stress scale-42; Pittsburgh sleep quality index

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INTRODUCTION

Medical education is known for its rigorous academic demands, long hours, and high levels of competition, which often result in elevated psychological distress among undergraduate medical students. Depression, anxiety, and stress are prevalent mental health concerns in this population, frequently compounded by poor sleep quality, which further affects academic performance and overall well-being. Studies have reported that between 30% and

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60% of medical students suffer from at least one of these conditions during their training.[1]

The transition into medical school introduces various sociodemographic stressors – such as financial burden, gender disparities, and lack of social support – which can exacerbate psychological symptoms. Gender, in particular, has shown a consistent association, with female students typically reporting higher levels of distress.[2]

Sleep disturbances are also widely reported, with over 60% of students experiencing poor sleep quality, often linked to screen time, lifestyle habits, and academic stress.[3] These disturbances are positively correlated with anxiety, depression, and lower academic performance.[4]

Furthermore, several studies highlight the bidirectional relationship between psychological well-being and academic achievement. Poor academic performance not only contributes to psychological distress but also results from it, forming a vicious cycle.[5]

Understanding the complex interplay between sociodemographic variables (e.g., income and family background), academic stress, and mental health is critical for designing effective interventions.[6] For instance, dissatisfaction with academic performance and a decline in quality of life were significantly linked to higher depression, anxiety, and stress scale (DASS-21) scores during the COVID-19 pandemic.[7]

Despite the high prevalence of psychological disorders, stigma and fear of academic repercussions often prevent students from seeking help. Therefore, integrating mental health services within medical education frameworks is increasingly advocated.[8,9,10]

This study aims to assess the levels of depression, anxiety, stress, and sleep quality among medical undergraduate students and explore their associations with sociodemographic factors and academic performance.

Aims and objectives

This study aims to determine the prevalence of depression, anxiety, stress, and poor sleep quality among medical students and to analyze their correlation with sociodemographic characteristics and academic performance.

MATERIALS AND METHODS

This descriptive cross-sectional study was conducted over a period of 18 months (12 months for data collection and 6 months for data analysis) at a tertiary care center in Sitapur, Uttar Pradesh. A total of 384 undergraduate medical students from the Hind Institute of Medical Sciences, Ataria, Sitapur, were enrolled in the study. The sample size was calculated using Cochran's formula for absolute error-based sampling: $n=z^2pq/e^2$, where z was 1.96 at a 95% confidence level, P was the prevalence (as per the study by Fauzi et al., 2021), q=1-p, and e was the margin of error (0.05).[9]

Participants included students from the first to the final year of the MBBS program, of either sex, who provided informed written consent. The following individuals were excluded from the study: those who did not give informed consent, Participants were excluded if they did not provide informed consent, had enrolled in the institution less than six months prior to the study, were suffering from any physical illness during the study period, or had a documented history of psychiatric illness or substance use disorders.

Data collection involved the administration of a pre-designed, pre-tested, self-administered anonymous questionnaire in English or Hindi. A semi-structured proforma was used to record personal characteristics and sociodemographic details, ensuring confidentiality. Depression, anxiety, and stress levels were assessed using the DASS-42, and diagnoses were further supported by the International Classification of Diseases criteria. Sleep quality was evaluated using the Pittsburgh Sleep Quality Index. Academic performance was measured using an 8-item academic performance scale, which classified performance into five categories: Excellent, Good, Moderate, Poor, and Failing.

Data were entered into Microsoft Excel and analyzed using the Statistical Package for the Social Sciences version 26. Descriptive statistics such as means, standard deviations, frequencies, and percentages were used to summarize the variables. Chi-square tests were used to assess associations between categorical variables and t-tests or analysis of variance were applied to compare group means where appropriate. Bivariate analyses were initially conducted to explore relationships between mental health indicators and academic outcomes. This was followed by multivariable logistic regression analysis to identify independent predictors of poor academic performance. Predictor variables included demographic characteristics, psychological parameters, sleep quality, and academic engagement indicators such as attendance. Adjusted odds ratios, 95% confidence intervals, and P-values were reported, with statistical significance set at $P<0.05$. Graphs and tables were prepared to visually present key findings for better interpretation and understanding.

Table 1: Demographic characteristics of study participants (n=384)

Characteristic	Value (%)
Age (mean±SD)	21.4±2.1 years
Sex - male	178 (46.4)
Sex - female	206 (53.6)
Year of study - 1st year	98 (25.5)
Year of study - 2nd year	88 (22.9)
Year of study - 3rd year	98 (25.5)
Year of study - final year	100 (26.0)
Residence-hostel	374 (97.4)
Residence-day scholar	10 (2.6)
Attendance ≥75%	290 (75.5)
Attendance <75%	94 (24.5)
Family history of mental illness-present	65 (16.9)
Family history-absent	319 (83.1)
With siblings	328 (85.4)
Without siblings	56 (14.6)

SD: Standard deviation

Table 2: Prevalence of psychological and behavioral issues (n=384)

Variable	Prevalence (n, %)
Depression	123 (32.0)
Anxiety	146 (38.0)
Stress	173 (45.0)
Poor sleep quality	223 (58.0)

Table 3: Academic performance distribution (n=384)

Performance category	Frequency (n)	Percentage
Excellent	50	13.0
Good	75	19.5
Moderate	105	27.3
Poor	90	23.4
Failing	64	16.7

Table 4: Key predictors of poor academic performance-multiple regression analysis (n=384)

Predictor	Adjusted odds ratio	95% CI	P-value
Low attendance (<75%)	3.42	2.21–5.31	<0.001
Poor sleep quality	2.71	1.69–4.35	<0.001
Moderate-to-severe depression	2.63	1.49–4.65	<0.001
Moderate-to-severe anxiety	2.35	1.38–4.01	0.002
Moderate-to-severe stress	1.92	1.14–3.24	0.015
Day scholar	2.95	1.01–8.60	0.048
Second year of study	2.10	1.35–3.26	0.001
Male sex	1.67	1.10–2.54	0.015
Without siblings	1.76	1.01–3.06	0.045
Family history of mental illness	2.18	1.30–3.65	0.003

CI: Confidence interval

RESULTS

The demographic characteristics of the study participants are detailed in Table 1. The study included 384 MBBS students with a mean age of 21.4 years. Female students slightly outnumbered males. All academic years were well represented. The majority were hostel residents and had ≥75% class attendance. Around 17% had a family history of mental illness, and nearly 15% reported not having siblings.

The prevalence of psychological and behavioral issues is summarized in Table 2. A high proportion of students experienced psychological and behavioral issues. Stress and poor sleep quality were the most commonly reported problems, followed closely by anxiety. Depression was present in nearly one-third of participants.

Academic performance distribution is presented in Table 3. Only 13% of students performed excellently, whereas over 40% were in the poor or failing categories. This suggests that academic difficulties are common and may be influenced by underlying psychological distress and lifestyle factors.

Table 4 outlines the key predictors of poor academic performance based on multivariate regression analysis. Multivariate regression identified low attendance, poor sleep quality, and moderate-to-severe depression as the strongest predictors of poor academic performance. Sociodemographic factors such as being a day scholar, 2nd year student, male, or having no siblings also contributed significantly. These findings suggest a complex interplay between academic, psychological, and social determinants of student performance.

DISCUSSION

Our study involving 384 MBBS students revealed high levels of psychological and behavioral concerns, with 32% suffering from depression, 38% from anxiety, 45% from stress, and 58% experiencing poor sleep quality. These findings align with earlier research, which has consistently reported high prevalence rates of psychological distress among medical undergraduates. For instance, Iqbal et al.,[10] reported depression, anxiety, and stress levels ranging from 31% to 65%, whereas Alrashed et al.,[5] found high co-prevalence of mental health issues and sleep disorders.

The correlation of psychological distress and sleep quality with academic performance noted in our study is consistent with results from Mihăilescu et al.,[12], Al Ani et al.,[13] and Walther et al.,[14] all of whom highlighted a negative impact of stress, anxiety, and depression on academic success. In addition, demographic and lifestyle factors identified in our study – such as gender, academic year, day scholar status, and low attendance-were also observed in studies by Fawzy and Hamed,[15] Fauzi et al.,[2] and Mishra et al.,[16]

These comparisons highlight the need for urgent psychological and institutional interventions across similar student populations worldwide.

Limitations of the study

This cross-sectional study cannot establish causality between psychological factors, sleep quality, and academic performance. Data were self-reported, which may be subject to recall and social desirability biases. As a single-centre study, generalizability is limited. Additionally, confounding factors such as socioeconomic status, medication use, and access to mental health support were not assessed.

CONCLUSION

This study highlights a substantial prevalence of depression, anxiety, stress, and poor sleep quality among undergraduate medical students, with significant correlations observed between these psychological and behavioral factors and academic performance. Sociodemographic variables such as age, sex, year of study, residence status, attendance, family history of mental illness, and sibling status were found to influence both mental health status and academic outcomes. Poor sleep quality and moderate to severe psychological distress emerged as strong independent predictors of poor academic performance, alongside modifiable factors such as class attendance. These findings underscore the urgent need for integrated mental health services, structured stress management programs, and targeted academic support within medical institutions to foster well-being and optimize performance among medical students.

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REFERENCES

1. Iorga M, Muraru ID, Munteanu C and Petrariu FD. Depression, Anxiety and Stress among Medical Students. Grigore T. Popa University of Medicine and Pharmacy; 2019. Available from: https://scispace.com/papers/depression-anxiety-and-stress among-medical-students-3xa5wsy2zn [Last accessed on 2025 Apr 25].
2. Fauzi MF, Anuar TS, Teh LK, Lim WF, James RJ, Ahmad R, et al. Stress, anxiety and depression among a cohort of health sciences undergraduate students: The prevalence and risk factors. Int J Environ Res Public Health. 2021;18(6):3269.
https://doi.org/10.3390/ijerph18063269
3. Al-Khani AM, Sarhandi MI, Zaghloul MS, Ewid M and Saquib N. A cross-sectional survey on sleep quality, mental health, and academic performance among medical students in Saudi Arabia. BMC Res Notes. 2019;12(1):665.
https://doi.org/10.1186/S13104-019-4713-2
4. Walther S, Hughes J, Holladay C and Reynolds A. 0131 depression, anxiety, stress, sleep quality, and perceived academic performance in college students. Sleep. 2024;47(Suppl_1):A53.
https://doi.org/10.1093/sleep/zsae067.0131
5. Alrashed F, Alsubiheen A, Alshammari H, Mazi SI, Abou Al-Saud S, Alayoubi S, et al. Stress, anxiety, and depression in pre-clinical medical students: Prevalence and association with sleep disorders. Sustainability. 2022;14(18):11320.
https://doi.org/10.3390/su141811320
6. Razouk O, Al-Khalidi M, Kalach A and Abu Helwa R. Assessing the factors affecting health-related quality of life in medical students. Res Int J Community Med Public Health. 2024;3(1): 5-8.
https://doi.org/10.37179/rijcmph.000013
7. Kumar R, Sinha P, Dutta R, Sinha DN, Sinha M, Bhargava V. Prevalence and risk factors of depression, anxiety and stress among medical students of a government medical college in Delhi. Indian J Psychiatry. 2019;61(3):338-342.
https://doi.org/10.4103/psychiatry.IndianJPsychiatry_88_18
https://doi.org/10.6084/m9.figshare.21640064
8. Deekala RS, Mandyam S, Swetha Rao G, Guthi VR and Rosivari PS. A study on depression, anxiety and stress among medical undergraduate students of a women's medical college, South India. Natl J Community Med. 2023;14(2): 226-229.
https://doi.org/10.55489/njcm.140220232669
9. Semwal P, Kumari R, Rawat VS, Aravindan N and Dhankar A. Psychological and other correlates of academic performance in medical students at a tertiary care hospital: A cross-sectional study. Indian J Community Med. 2022;47(3): 442-447.
https://doi.org/10.4103/ijcm.ijcm_1067_21
10. Iqbal S, Gupta S and Venkatarao E. Stress, anxiety and depression among medical undergraduate students and their socio-demographic correlates. Indian J Med Res. 2015;141(3):354-357.
https://doi.org/10.4103/0971-5916.156571
11. Mihăilescu AI, Diaconescu LV, Ciobanu AM, Donisan T and Mihailescu C. The impact of anxiety and depression on academic performance in undergraduate medical students. Eur Psychiatry. 2016;33(S1):S284.

https://doi.org/10.1016/j.eurpsy.2016.01.761

12. Al Ani HM, Al Shawi AF, Lafta RK, Abdulqadir O, Nadhim S and Abdulkarim S. Influence of stress, anxiety, and depression on sleep quality and academic performance of medical students in Fallujah University, Iraq. Int J Soc Psychiatry. 2024;70(4): 772-777.

    https://doi.org/10.1177/00207640241229381

13. Fawzy M and Hamed SA. Prevalence of psychological stress, depression and anxiety among medical students in Egypt. Psychiatry Res. 2017;255:186-194.

    https://doi.org/10.1016/j.psychres.2017.05.027

14. Mishra J, Panigrahi A, Samanta P, Dash K, Mahapatra P and Behera MR. Sleep quality and associated factors among undergraduate medical students during Covid-19 confinement. Clin Epidemiol Glob Health. 2022;15:101004.

    https://doi.org/10.1016/j.cegh.2022.101004

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RS- Definition of intellectual content, literature survey, prepared first draft of manuscript, implementation of study protocol, data collection, data analysis, manuscript preparation, and submission of article; **AP-** Concept, design, clinical protocol, manuscript preparation, editing, and manuscript revision; **VY-** Design of study, statistical analysis and interpretation; **JP-** Review of manuscript; **DK-** Review of manuscript; **MS-** Literature survey and preparation of figures; **YR-** Coordination and manuscript revision.

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