

Psychological and other Correlates of Academic Performance in Medical Students at a Tertiary Care Hospital: A Cross-Sectional Study

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Abstract

Background: High percentage of medical students showed multiple psychological factors that may interfere with their academic performance and identifying the problems in early stage and providing them advice is very important for their mental health. **Methodology:** The study targeted undergraduate medical students studying at All India Institute of Medical Sciences, Rishikesh, Uttarakhand, India. Selected students completed the self-administered questionnaire comprising the psychological correlates such as perceived stress scale, Pittsburgh sleep quality index, ten-item personality inventory, and other correlates such as sociodemographic and scholastic characteristics. The association of these psychological and other correlates with academic performance was analyzed using the Chi-square test at $P > 0.05$. **Results:** Students with poor sleep quality 60.2% and 57.1% of students had high-stress levels perform well in academics. 70.2% of girls and 64.5% of general category students performed well in academics. Student's family head having a professional degree was associated with good performance in academics 64.3%. Moreover, students belonging to the upper class (69.2%) performed better. No significant association was observed between psychological correlates with academic performance but observed between sociodemographic and scholastic variables with academic performance. **Conclusion:** Among undergraduate medical students, there was no significant association of psychological correlates such as stress level, sleep quality, and anxiety trait with academic performance.

Keywords: Academic performance, anxiety trait, medical students, sleep disorder, stress level

INTRODUCTION

Academic success is very important for medical students for achieving better career outcomes, and medical education is becoming an area of concern due to some psychological and other factors that may influence their academic performance. Multiple factors affect a student's performance such as the type of personality, family status, stress, and sleep disturbance.^[1,2] They are a vulnerable group of population owing to the increased demands of good academic performance throughout their education and career, thereby posing them to a higher risk of anxiety, stress, and other psychological effects. The global prevalence of anxiety is 33.8%, while stress is 54% and is slightly higher among females and 19% of the medical students were found to have poor sleep quality.^[3,4] All these symptoms are increasing globally and worsen the academic performance of medical students and their working ability.^[5]

The precise amount of stress could be beneficial; however, excess stress may lead to tension, anxiety, and could also result in a disturbance in sleep or certain sleep disorders such as insomnia. Stress in limit allows an individual to perform best in challenging conditions. It is important to manage stress properly and modify it with counseling and behavior modification training. Some of the stress coping strategies include meditation, yoga, daily exercise, listening to music, spending time with nature, and taking proper sleep.^[6] If the

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stressful situations are not managed properly, they may also affect the physical and mental health or well-being of a person.^[4]

This study was undertaken to assess the level of these psychological and other correlates among medical students and determine the association of these psychological correlates with the academic performance of students.

METHODOLOGY

A cross-sectional study was conducted at All India Institute of Medical Science, Rishikesh, Uttarakhand, India, for 1 year among the undergraduate medical students from 2016 to 2020 academic year.

The sample size required for this study was calculated as 218 students, among which 44 students were selected from each batch using the multistage random sampling technique. A self-administered questionnaire was distributed batch wise among the selected undergraduate MBBS students, and information was collected. The academic performance of the study participants was calculated by taking a mean percentage of all the final professional exams conducted since they had joined the institution.

The median academic performance percentage was calculated. Students having <65% were classified as average performer and those with ≥65% were classified as a good performer. Perceived stress scale was used to assess level of stress, Ten Item Personality Inventory was used to assess anxiety trait and Pittsburgh sleep quality index was used to evaluate sleep quality.

The data were analyzed using IBM SPSS Statistics version 23 SPSS South Asia Pvt Limited Bangalore, India. Descriptive statistics, in asymmetric distribution, were expressed by median and interquartile range and symmetric distribution, by mean and standard deviation. An independent *t*-test was used to compare the mean qualitative variables. For categorical variables, proportions between groups were compared using Pearson's Chi-square test/Fisher exact test. A $P < 0.05$ was considered significant for all analyses determining the association between variables.

The study was started after getting ethical approval from the Institutional (Ref no AIIMS/IEC/20/848). All the participants were notified about the study objective and response confidentiality and also took their consent.

RESULTS

The mean age of 218 participants was 21 years, and 44 students were enrolled from each batch and proportionate number of boys and girls were enrolled. The majority of the students were boys, 73.9% and 85.3% Hindu and half of the students belonged to general category. Maximum students belonged to urban area 72.9%. The educational status of the head of the family of the respondents was good, with 77.5% of them having a professional degree 38.5% or degree/

diploma. 77.2% of the students belonged to the middle class of which 44.3% belonged to the upper-middle class. 67.9% of students went to a CBSE board school in 10th with 85.3% English medium and 67% in 12th standard with 87.2% had English medium. Nearly 94% of students had undertaken coaching. Nearly 53.2% of students scored average marks in their previous exams, while 46.8% of students got <65% marks in their academics.

Binary logistic regression was applied to determine the effect of multiple variables on academic performance of medical student's gender, caste, place of residence, education status of the head of the family, monthly income of the family, socioeconomic status (SES), batch, class 10th and 12th board, and medium of the study were significant predictor variables as shown in Table 1.

Effect of psychological correlates on academic performance

Comparison of mean of various variables of anxiety trait personality with academic performance among study participants revealed no significant differences with respect to extraversion, agreeableness, conscientiousness, emotional stability, and openness to experience between the two groups. Furthermore, no statistically significant association was observed between perceived stress based on perceived stress scale scores and sleep quality based on Pittsburgh sleep quality index score among study participants with their academic performance as shown in Table 2.

Effect of other correlates on academic performance

Sociodemographic characteristics such as gender, religion, caste, place of residence, education of the head of the family, monthly family income, and SES and also scholastic characteristics such as batch, class 10th and 12th board, and medium of study as shown in Table 3 showed a significant association with academic performance, while the occupation of the head of the family, handedness, coaching for entrance, doctors in the family, sibling pursuing medical study, and knowledge of language did not show any significant association with academic performance among study participants

DISCUSSION

The study aimed to discover the psychological (stress, sleep disorder, and anxiety trait) and other correlates (sociodemographic and scholastics characteristics) among medical students and examine their association with academic performance through the use of well-validated screening tools. The result of our study provides valuable insight regarding the performance trends of medical students, particularly important are the sociodemographic characteristics and psychological correlates. We observed the association between psychological and other-related correlates of academic performance among medical students. A Chi-squared test analysis indicated a highly significant *P* value for certain sociodemographic variables.

Table 1: Logistic regression analysis to determine the correlates of academic performance in study participants

Variable	B	Adjusted OR (95% CI)	95% CI for Exp (B)		P
			Lower	Upper	
Gender					
Male	-1.16	0.312	0.14	0.70	0.005
Caste					
General/OBC	1.25	3.473	1.40	8.61	0.01
Place of residence					
Urban	0.63	1.879	0.80	4.42	0.15
Education of the head of the family					
Professional degree/honors and above	-0.70	0.495	0.01	30.36	0.74
Graduate/diploma	-21.75	0.00	0.00	-	0.99
Intermediate	-0.10	0.90	0.18	4.44	0.89
High school	0.39	1.48	0.43	5.09	0.53
Middle school	-0.17	0.84	0.37	1.95	0.69
Socioeconomic status					
Upper class	0.78	2.17	0.07	64.68	0.65
Upper middle	-0.45	0.62	0.03	15.06	0.77
Lower middle	-1.70	0.18	0.01	3.70	0.27
Batch					
2016	1.46	4.32	1.42	13.07	0.01
2017	0.91	2.48	0.83	7.36	1.10
2018	0.91	2.48	0.85	7.25	0.10
2019	2.24	1.88	3.01	29.49	0.15
Class 10 th board					
CBSE/ICSE	0.63	1.88	0.39	9.14	0.43
Class 10 th medium					
English	-1.74	0.18	0.02	1.75	0.14
Class 12 th board					
CBSE/ICSE	-0.58	0.56	0.15	2.14	0.39
Class 12 th medium					
English	2.24	9.39	0.98	90.41	0.05

OR: Odd ratio, CI: Confidence interval

Table 2: Association of academic performance of study participants and psychological correlates

Psychological variables	Good performer	Average performer	P#
Anxiety trait (TIPI), mean±SD			
Extraversion	4.10±1.55	4.28±1.42	0.28
Agreeableness	4.92±1.20	4.97±1.11	0.50
Conscientiousness	4.72±1.29	4.90±1.40	0.47
Emotional stability	4.57±1.50	4.66±1.51	0.99
Openness to experiences	4.97±1.25	5.22±1.11	0.21
Perceived stress (PSS), %*			
Low (0-13)	50.0	50.0	0.81
Moderate (14-26)	54.0	46.0	
High (27-40)	57.1	42.9	
Sleep quality (PSQI), %*			
Poor sleep quality (>5)	60.2	39.8	0.10
Good sleep quality (<5)	48.9	51.1	

P value of <0.05 was considered significant. TIPI: Ten-item personality inventory, SD: Standard deviation, PSS: Perceived stress scale, PSQI: Pittsburgh sleep quality index

Psychological correlates

Our results showed that the prevalence of stress in medical students in the current study was 73.1%. Our results showed that the prevalence of stress among medical students in

the current study was higher (73.1%) as compared to other similar study among medical students (54%)^[7]. In contrast to our study, 56.1% of the study participants were under low stress^[8]. Increased stress has been attributed to exposure to a

Table 3: Association of academic performance of study participants and other correlates

	Good performer (%)	Average performer (%)
Sociodemographic characteristics		
Gender*		
Boys	47.2	52.8
Girls	70.2	29.8
Caste*		
General	64.5	35.5
OBC	44.8	52.2
SC/ST	36.6	63.4
Place of residence*		
Urban	59.1	40.9
Rural	37.3	62.4
Education status of the head of the family*		
Professional degree	64.3	35.7
Graduate	48.2	51.8
Intermediate/diploma	55.6	44.4
High/middle school certificate/illiterate	27.3	72.7
SES*		
Upper class	69.2	30.8
Upper middle	55.7	44.3
Lower middle	45.8	54.2
Upper lower	20	80
Scholastic characteristics		
Batch of joining*		
2016	54.8	45.2
2017	52.3	47.7
2018	47.7	52.3
2019	77.3	22.7
2020	34.1	65.9
Class 10 th board*		
CBSE/ICSE	58.0	42.0
State board	40	60
Class 10 th medium*		
Hindi	56.5	43.5
English	34.4	65.6
Class 12 th board*		
CBSE/ICSE	58.0	42.0
State board	42.6	57.4
Class 12 th medium*		
Hindi	56.8	43.2
English	28.6	71.4

* $P < 0.05$. SES: Socioeconomic status

new environment that is different from home environment.^[9] Another correlates showed that 38% of the students had a poor quality of sleep. This result is similar to a study in a Saudi medical university that reports 30% of poor sleep quality. However, another study from the Southern region of Saudi Arabia had a different result 29.7% and 77%.^[10,11] The students in our study could be described as more open-minded, more diligent and agreeable, and overall less emotional and less

extroverted. Some similar findings were found among the surgeons who were less modest, more extroverted, more diligent, more organized, and overall less emotional.^[12]

Other correlates and academic performance

In general, studies regarding factors affecting the academic performance of medical students worldwide have mainly focused on sociodemographics and other variables affecting students from disadvantaged schools and family backgrounds. In contrast to our study, an earlier study observed that financial problems were among the least source of stressors.^[13] Students' academic performance is affected by sociodemographic factors. We found that gender, caste, residence of the student, education, occupation of the head of the family, monthly income of the family, and SES was significantly associated with the academic performance of medical students. Some studies showed SES has a direct influence on their children's internalizing disorders such as an anxiety though others reported no association or mixed results.^[14]

Psychological correlates and academic performance

Our study shows that high stress leads to good performance among medical students, in contrast, all four articles about the effect of stress on academic achievement confirmed that higher levels of stress were associated with poor academic performance,^[15] while in some studies, it was found that many students felt that more stress motivated them to perform better. The negative impact of poor sleep quality and stress on academic performance has been well reported in the literature.^[16] However, in our study, academic performance showed no statistically significant association with sleep quality or stress levels. This result is similar to the data reported by two studies.^[16] Some studies may draw attention to the new trends in sleep-wake habits and their relationship to the professional life of students. However, there is also evidence, suggests that insufficient or poor sleep quality may be associated with a lower academic performance.^[17]

The result of my study indicates that there was no statistically significant association between the anxiety trait and academic performance. Some studies found significant correlation between academic achievement and negative emotionality,^[18] but another study showed that emotional stability predicts academic achievement.^[19] One article showed no correlation^[20] and another two cited agreeableness^[21] and extraversion.^[19] Seven articles found to had emotional stability, conscientiousness, and agreeable personality correlate with academic achievement.

CONCLUSION

As the data were collected for 1 month, but the academic score was calculated as average of all exams since they joined the institution, so we could not find such association between psychological correlates and academic performance.

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Conflicts of interest

There are no conflicts of interest.

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