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# A Study of Stressful Life Events and Pattern of Substance use Among Medical Students: A Cross Sectional Study

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## Abstract

*Introduction*: The medical program is one of the most demanding academic programs in the world, which has a detrimental impact on medical students' mental and physical health. Stress among students jeopardizes their perceptions and leads to maladaptive practices like addiction to substances, self-medication, and absenteeism.

*Objective*: To correlate stressful life events and patterns of substance use among Indian medical student.

*Methods*: A cross-sectional randomized study was conducted involving 250 medical students. Participants were given four self-administered scales to assess stressful life events and substance use patterns in them. Statistical analysis was performed using SPSS v29.0 to determine the correlation of stressful life events and patterns of substance use among Indian medical students.

**Results**: In this study 34.0% of medical students were found to be substance users. Stressful Life Event Scale scores were compared in the substance users ( $10.79\pm5.37$ ) and the non-substance users ( $9.27\pm5.03$ ), with a statistically significant difference (p < 0.05). A significant positive correlation was observed between substance use and the stressful life event scale score (p=0.031), suggesting that higher stressful life event scores were associated with an increased likelihood of substance use.

*Conclusions*: This study confirms that high educational stress among medical students is linked with psychological morbidity and substance abuse, highlighting the need for regular mental health screening and targeted interventions in medical schools.

Keywords: Stressful life events; substance use; medical students

# Introduction

The physical and mental well-being of medical students is negatively impacted by one of the world's most challenging academic programs, according to medical school surveys. According to numerous international surveys, about 30 to 94% of medical students struggle with stress [1-4]. Research on stress among Indian medical students reveals a broad range in stress prevalence, ranging from 37.3% to 97%. Variations in case definitions, no uniformity in measuring instruments, and changes in the academic years of the students under study can all account for the observed discrepancy [1]. Most students find the academic demands and competitive circumstances of medical school to be overwhelming. While some kids struggle to acclimatise, the majority do. A person's challenges may lead to the development of physical symptoms, substance abuse, depression, anxiety, self-doubt, difficulty at school, or issues with family or friends [5, 6]. Medical students are more likely to cheat on exams, have difficulty handling interpersonal conflicts, experience lower attention spans and concentration, lose credibility, make more mistakes, and engage in inappropriate behaviour such as negligence because of the overwhelming stress associated with the field [7]. Furthermore, stress among students leads to poor judgment, self-medication, absenteeism, and substance abuse, such as drinking, smoking, and chewing khat [8]. Low family involvement, limited free time, and course-specific difficulties such as challenging workload, weariness, anxiety about grades, and exposure to human suffering and mortality are risk factors for drug use throughout college [9]. White et al. stated that traumatic life experiences have been linked to mental health issues such as depression, which has been linked to alcohol abuse [10]. Rice & Arsdale and Park & Levenson suggest that alcoholism may be a maladaptive coping strategy used to deal with life's pressures and frustrations [11]. Finally, according to Morutwa and Platner stress is associated with a lack of self-control, which has been linked to an increase in alcohol consumption due to an inability to exercise self-control [12]. According to a poll of students from eight US medical schools, 20.0% reported binge drinking at least once in the previous 30 days, and 28.0% reported that their alcohol consumption increased while in medical school [13].

So far, few studies have provided data on the stressful life and substance use patterns of each professional year of medical education individually. Such investigations might aid in the early detection of stress and control of addictive behaviour.

#### **Material and Methods**

Study Design: Cross-sectional randomized study design. Randomization was performed using chit method.

Setting: Career Institute of Medical Sciences and Hospital, Lucknow.

*Participants*: A Total of 250 participants were selected using a simple randomized sampling strategy from first, second, third, and final professional-year medical students.

Inclusion Criteria: • Indian medical students of all professional years aged above 18 years • Willing to give informed consent.

*Exclusion Criteria*: Married students • Co-morbid psychiatric illness: Schizophrenia, Mood disorders, Anxiety disorder, Behavioural syndromes, Personality disorder.

*Study Methods*: A Total of 250 participants were selected using a simple randomized sampling strategy from first, second, third, and final professional-year medical students at Career Institute of Medical Sciences and Hospital, Ghaila, Lucknow. Participants were randomly selected using the chit method. They completed four self-administered scales (Stressful Life Events Scale, PASS, DAST, and AUDIT) within 20 minutes. A brief one-on-one session explained the study's purpose and response method. Completed forms were collected and digitized in Excel for analysis.

## Study Tools

- 1. *Semi-Structured Proforma*: it included sections such as age, gender, year of study, religion, family type, present stay, locality. The proforma ensured data collection consistency and facilitated the capture of relevant information for analysis.
- 2. Stressful life events scale: The scale consists of 26 items, which include stressful life events related to various domains of medi-

cal undergraduates. The stressful life events range from family to school-related events. The events were binary coded as 'Yes=1' to indicate occurrence and 'No=0' to indicate no occurrence.

- 3. *Perceived Academic Stress Scale (PASS):* The PASS consists of 18 items that assess different aspects of academic stress, such as workload, time management, exams, and competition. Participants rated the extent to which they perceived each item to be stressful on a Likert-type scale.
- 4. **Drug Abuse Screening Test (DAST):** The DAST is a self-report questionnaire that measures the frequency and consequences of drug use. It consists of a series of items that assess various aspects of drug use, including the presence of dependence symptoms and negative consequences related to drug use (excluding alcohol and tobacco).
- 5. Alcohol Use Disorders Identification Test (AUDIT): developed by the World Health Organization (WHO), was employed to assess alcohol consumption, drinking behaviours, and alcohol-related problems. The AUDIT consists of multiple items that assess the frequency and quantity of alcohol consumption, symptoms of alcohol dependence, and alcohol-related problems.

#### Ethical approval

Ethical approval for the study was obtained from the Institutional Research Cell. Participation was limited to students aged 18 years and above. All participants were assured of complete confidentiality, with no names or identifying details collected. The purpose of the study was clearly explained, and participants were informed that if they experienced any emotional distress during the process, they could seek help from the Psychiatry Department.

## Data Analysis

The data was analysed using SPSS version 29, Chicago, with frequency tables and cross-tabulations for sample size. It was entered into Excel spreadsheets. The graphical representation was also used for data analysis. Descriptive statistics, including mean, standard deviation, and percentages, were calculated. The mean was used to measure central tendency, and the standard deviation was used to assess variability. To compare qualitative data, we employed the chi-square test. A p-value of less than 0.05 was judged statistically significant. The data was presented using graphs and tables.

## Results

Our study sample comprises of 250 medical students from different professional years, in which more than half were male (n = 134, 53.6%) and aged between 21-25 years (n = 120, 48.0%). The mean age of the sample was  $24.06\pm2.93$  years (Mean $\pm$ SD). Most students were from an urban background (n = 173, 69.2%) and belonged to nuclear families (n = 125, 50.0%). A significant proportion were in their first or third year of study (n = 70, 28.0% each), with the majority residing in hostels (n = 204, 81.6%). Substance use was reported by approx. one third students (n= 85, 34%).

Variables	Categories	N=250	Percentage	
Age group (year)	18-20 years	36	14.4%	
	21-25 years	120	48.0%	
	26-30 years	93	37.2%	
	>30 years	1	0.4%	
	Mean age (+/- SD)	24.06±2.93		
Gender	Male	134	53.6%	
	Female	116	46.4%	
Year	First Year	70	28.0%	
	Second Year	63	25.2%	
	Third Year	70	28.0%	
	Final year	47	18.8%	

Locality	Urban	173	69.2%	
	Rural	77	30.8%	
Present Stay	Hostel	204	81.6%	
	Day Scholar	46	18.4%	
Substance	Yes	85	34.0%	
use	No	165	66.0%	

Table 1: Distribution of the studied participants based on demographic details.



Graph 1: Distribution of the studied participants based on age.

Year	Substa	p-value	
	Yes (n=85) (%)	No (n=165) (%)	
First Year	20 (23.5%)	50 (30.3%)	χ <sup>2</sup> =2.516
Second Year	22 (25.9%)	41 (24.8%)	df-3
Third Year	23 (27.1%)	47 (28.5%)	ui-5
Final year	20 (23.5%)	27 (16.4%)	p=0.472

Table 2: Comparison of substance use and the year of course of studying of participants.

The proportion of substance users was almost similar across all four years, ranging from 20 (23.5%) to 23 (27.1%). Similarly, the distribution of non-substance users was also comparable across the years, varying between (16.4%) and 50 (30.3%). There was no significant association found between substance use and the year of study (p>0.05).



*Graph 2:* Comparison of substance use and the year of the course of study of participants.

	Substa	Substance use	
	Yes (n=85) (%)	No (n=165) (%)	p-value
DAST-10	2.33±2.56	0.00±0.00	< 0.001
Audit	14.45±7.02	0.00±0.0	<0.001
PAS scale	55.21±8.82	49.0±6.19	< 0.001
Stressful Life Event Scale score	10.79±5.37	9.27±5.03	0.031

Table 3: Association of substance use and various scales scores.

Substance users had significantly higher mean scores on the DAST-10 2.33 $\pm$ 2.56 vs. 0.00 $\pm$ 0.00), AUDIT (14.45 $\pm$ 7.02 vs. 0.0 $\pm$ 0.0), and PAS scales (55.21 $\pm$ 8.82 vs. 49.0 $\pm$ 6.19) compared to non-substance users (p<0.001 for all). Stressful Life Event Scale scores were compared in the substance users (M = 10.79, SD = 5.37) and the non-substance users (M = 9.27, SD = 5.03), with a statistically significant difference (p < 0.05).

A significant negative correlation was found between substance use and DAST-10, AUDIT, and PAS scale scores (p<0.001 for all), indicating that higher scores on these scales were associated with substance use. Conversely, a significant positive correlation was observed between substance use and the stressful life event scale score (p=0.031), suggesting higher stressful life event scores were associated with an increased likelihood of substance use.

## Discussion

Training informed, skilled, and professional doctors who can treat the sick, progress medical science, and enhance public health is the aim of medical education. Nonetheless, medical students deal with a lot of pressure, and drug abuse is a major risk factor for them. In addition to the typical stress that all students encounter, medical school adds to it. Students face a variety of stresses, including social, academic, family, psychological, and economic ones [14]. Thus, to explore the patterns of stressful life events and substance use among medical students from our medical college across all professional years of MBBS, we conducted this observational study with a modest sample size of 250.

Our study results reflected that out of 250 studied participants, more than half were males, 134 (53.6%) aged 21-25 years, 120 (48.0%) from an urban background, and 173(69.2%). Most participants were Hindu, 134 (53.6%) belongs to nuclear family, 125 (50.0%), and studying in first- or third- professional year 70 (28.0% each) residing in hostels 204 (81.6%). The mean age was

24.06±2.93 years (range: 18-31 years).

Substance use was reported by 85 (34.0%) of the participants. Thus, the overall prevalence of substance use in the present study was 34.0%. These results are in line with earlier research that demonstrated a greater risk of drug abuse in medical students as compared to the general population Singh et al [15].

Mannapur B et al [16] revealed that more than half of medical students enrolled in undergraduate programs said they had experienced stress to varying degrees, which puts them at risk of substance use. Medical students and other college students use drugs at similar rates and in similar ways, according to several studies conducted in India and other nations [17, 18]. A recent study found that very high rates of substance usage (up to 91.3% alcohol users and 26.2 cannabis users) Ayala EE at al [19] across 49 medical institutions' medical students. However, a recent study conducted in India revealed that the incidence of drug misuse among medical students was 20.43%, with usage increasing in the latter years of medical school. The most prevalent cause for substance use was to relieve psychological stress, accounting for 72.4% of cases.

The distribution of stressful life events among study participants, consisting of 134 males and 116 females, revealed that the most common stressors were academic including failing to get the desired grade, reported by 214 students (85.6%), with assignments, tests, and exams (187 students, 74.8%), trouble with registration 175 students (70%), failing a course 125 (125), having to retake or write supplementary exams 119 (47.9%). Interpersonal issues including losing a close friend or family 130 (52%), splitting up with a guy or girlfriend 127 (50.8%), starting a new relationship 122 (48.8%), having a big dispute with a close friend 114 (45.6%), and having issues with parents 65 (26%), were among the other major stresses. Other stressors were financial problems (179 patients, 71.6%), change in living conditions or accommodation 162 (64.8%), trouble with transport 134 (53.6%) and personal injury or illness 110 (44.0%). Issues with alcohol or drugs (32 patients, 12.8%) and problems with the police (24 patients, 9.6%) were more prevalent among males, with significant gender differences (p=0.026 and p=0.008, respectively). These findings are consistent with a previous study in Tamil Nadu by Anuradha R et al [20] Stress was found to be influenced by the breadth of the academic program, lack of leisure, and worry of failing or performing poorly on a test. Numerous additional studies have also revealed that among medical students, stress is frequently caused by the academic program, the frequency of exams, test performance, and peer competitiveness [1, 21-25]. Studies conducted in Mangalore [1] and Nepal [26] discovered that a major cause of stress at the institution is the absence of leisure time. The two biggest psychosocial stressors identified were family issues and loneliness.

In addition, becoming a senior/older in the college (odds ratio (OR: 0.76), staying in the hostel (OR: 2.57, CI: 1.3-4.8), and having a higher socio- economic background (OR: 1.16), parents with lower education, students living away from parents, family substance use history and urban residents were considered significant risk factors for substance use. Studies from Ethiopia [27] Egypt, [28] Iran, [29] Turkey, [30] and the United States [31] reported similar findings.

In our study, we noted that a significant negative correlation was found between substance use and DAST-10, AUDIT, and PAS scale scores (p<0.001 for all), indicating higher scores on these scales were associated with substance use. Conversely, a significant positive correlation was observed between substance use and the stressful life event scale score (p=0.031), suggesting higher stressful life event scores were associated with an increased likelihood of substance use.

The previous studies haven't studied in detail each substance of use and each domain of stress. However, the specific association between the type of stress and certain substance abuse needs to be investigated further.

#### Limitations

The main limitation of the current study was that, being a cross-sectional study, it could only get a snapshot of the psychological stress and morbidity among the undergraduates. Stressful life events and alcohol use were self-reported. This could have limited the reliability of the scales as participants could have under-reported alcohol use due to social desirability. Furthermore, in the absence of a clinical interview by a mental health professional, the scores of the used scales only indicate possible psychological morbidity but

do not confirm any diagnosis. Also, environmental variations across different medical college campuses may have behaviors unique to their setting; as such, the study results may not be generalized to other medical colleges. Consequently, more longitudinal research is required to disentangle the roles of individual, family, and environmental contexts.

## Conclusion

The study reveals that medical students experience significant levels of educational stress, with academic stressors (such as exams, failed courses, and registration difficulties) being the most prominent. Male students reported more engagement in alcohol/drug-related difficulties and police encounters (p=0.026 and p=0.008, respectively).

The prevalence of substance use was 34%, with no significant correlation with age or study year. Males (69.4%) had considerably higher substance usage rates than females (30.6%) (p<0.001). Substance users scored considerably higher on DAST-10, AUDIT, PASS, and Stressful Life Event Scale (p < 0.05 for all). First-year students scored higher on stressful life events, but final-year students indicated the most academic stress.

Substance use was positively correlated with stressful life event scores (p=0.031) and negatively with DAST-10, AUDIT, and PASS scores (p<0.001), indicating that higher stress and academic burden are linked with increased substance use.

# Recommendations

In order to investigate long-term psychological effects, longitudinal follow-up with students beyond graduation is recommended. Regular stress management workshops, mentor-mentee programs, and substance addiction education sessions should be implemented. To promote students' mental health, campus security needs to be strengthened to reduce substance availability, and confidential counselling services must be established.

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