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Prevalence and Correlates of Alcohol Dependence Among Medical Students: A Cross-Sectional Study

Sudheera Sulgante[1], Swetha Kunkeri[2], Baburao C. Markhal[3], Mahesh B. Tondare[4], Praveen Ganganahalli[5]

[1]Associate Professor, Dept of Community Medicine, Maheshwara Medical College & Hospital, Sangareddy
[2]Associate Professor, Dept of Psychiatry, Bidar Institute of Medical Sciences, Bidar – Karnataka
[3]Assistant Professor, Dept of Psychiatry, Bidar Institute of Medical Sciences, Bidar – Karnataka
[4]Assistant Professor, Dept of Community Medicine, Bidar Institute of Medical Sciences, Bidar – Karnataka
[5]Professor (Additional), Dept of Community Medicine, BLDE(DU) Shri. B. M. Patil Medical College, Vijayapura – Karnataka

Corresponding Author: Dr. Mahesh B. Tondare

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ABSTRACT

Introduction: Adolescence is a critical period in which exposure to adversities such as poverty, family conflict and negative life experiences (e.g. violence) can have long-term emotional and socio-economic consequences for adolescents, their families and communities. Substance use, including alcohol, is typically established during adolescence and this period is peak risk for onset and intensification of substance use behaviours that pose risks for short- and long-term health.
Objectives: To estimate the prevalence of alcohol dependence among medical students and to explore the reasons and identify demographic and psychosocial correlates for alcohol use and dependence among young students.
Methodology: Cross-sectional study was conducted among the Undergraduate medical students of tertiary care medical college of North Karnataka by using structured proforma consisting of Socio-demographic profile, Alcohol consumption details & Psychosocial assessment tools The Depression, Anxiety and Stress Scale - 21 Items (DASS-21).
Results: Majority of the participants belongs to the age group of 21 to 23 years (54%). Around 88 (38%) were currently alcohol users whereas 52 (22%) never consumed alcohol and 90 (38%) never consumed alcohol. DASS-21 scores, nearly half of the participants fall into the normal category whereas remain students were having one or different categories of depression, anxiety or stress. Very few number (<10%) of students were having sever or extremely sever forms.
Conclusion: Alcohol consumption was strongly and consistently linked to greater levels of stress, anxiety, and depression. Additionally, there was a higher likelihood of moderate to severe psychological discomfort among male students and those living in dorms.

Keywords: prevalence, alcohol dependence, medical students, DASS-21

INTRODUCTION

Adolescence is a critical period in which exposure to adversities such as poverty, family conflict and negative life experiences (e.g. violence) can have long-term emotional and socio-economic consequences for adolescents, their families and communities. Substance use, including alcohol, is typically

established during adolescence and this period is peak risk for onset and intensification of substance use behaviours that pose risks for short- and long-term health.[1]

Alcohol use is typically established during adolescence and initiation of use at a young age poses risks for short- and long-term health and social outcomes. However, there is limited understanding of the onset, progression and impact of alcohol use among adolescents in India.[1,2]

Medical students face a multitude of stressors during their academic journey. These stressors, ranging from demanding coursework to clinical rotations, can significantly affect well-being and coping mechanisms.[3] Consequently, substance use and abuse have become a prevailing global concern among medical students and practitioners. Despite its concealed nature, the phenomenon of substance abuse necessitates a comprehensive investigation to facilitate effective prevention and intervention strategies. In the context of medical students in India, recreational drug use involving substances such as alcohol, tranquilizers, and psychedelics has been reported.[3,4]

The expanding substance use trend across the general population can be attributed to cultural shifts, evolving socioeconomic conditions, and improved transport and access services.[4] This trend likely extends to subgroups like medical students, who hold a unique societal position with distinct rights and responsibilities. Substance abuse among medical students poses risks to their effectiveness and future fitness to practice as healthcare professionals. A systematic review reported a pooled prevalence of substance use among Indian medical students at 40.3%.[5]

With this background the following study was planned to with objectives to estimate the prevalence of alcohol dependence among medical students and to explore the reasons and identify demographic and psychosocial correlates for alcohol use and dependence among young medical students.

MATERIAL & METHODS

The cross-sectional study was conducted among the medical undergraduate students of BRIMS Bidar; a tertiary care institution located in northern part of Karnataka state.

Sample Size: With 95% confidence level and margin of error of ± 10%, and anticipated prevalence rate of prevalence of alcohol dependence among undergraduate medical students as 50% a sample size of minimum 100 students will help to achieve the objective. Sample size of 100 was obtained by using the formula: $n=z^2p(1-p)/d^2$ where Z= z statistic at 5% level of significance, d is margin of error, p is anticipated proportion of students of health science with adequate knowledge.

Simple random sampling techniques was used to enrol medical students after explaining them the purpose of the study and taking informed verbal consent. Institutional Ethics Committee permission as also obtained for the study.

Data Collection Tools: Structured proforma consists of details of Socio-demographic profile and Alcohol consumption details was obtained through the google form link sent to the students. The Depression, Anxiety and Stress Scale - 21 Items (DASS-21) was used for Psychosocial assessment of the students. DASS-21 is a set of three self-report scales designed to measure the emotional states of depression, anxiety and stress.

Each of the three DASS-21 scales contains 7 items, divided into subscales with similar content. The depression scale assesses dysphoria, hopelessness, devaluation of life, self-deprecation, lack of interest / involvement, anhedonia and inertia. The anxiety scale assesses autonomic arousal, skeletal muscle effects, situational anxiety, and subjective experience of anxious affect. The stress scale is sensitive to levels of chronic non-specific arousal. It assesses difficulty relaxing, nervous arousal and being easily upset / agitated, irritable / over-reactive and impatient. Scores for depression, anxiety and stress are calculated by summing the scores for the relevant items.

Data Analysis: Descriptive statistics to summarize prevalence and demographic characteristics. Inferential statistics to identify correlates of alcohol dependence.

RESULTS

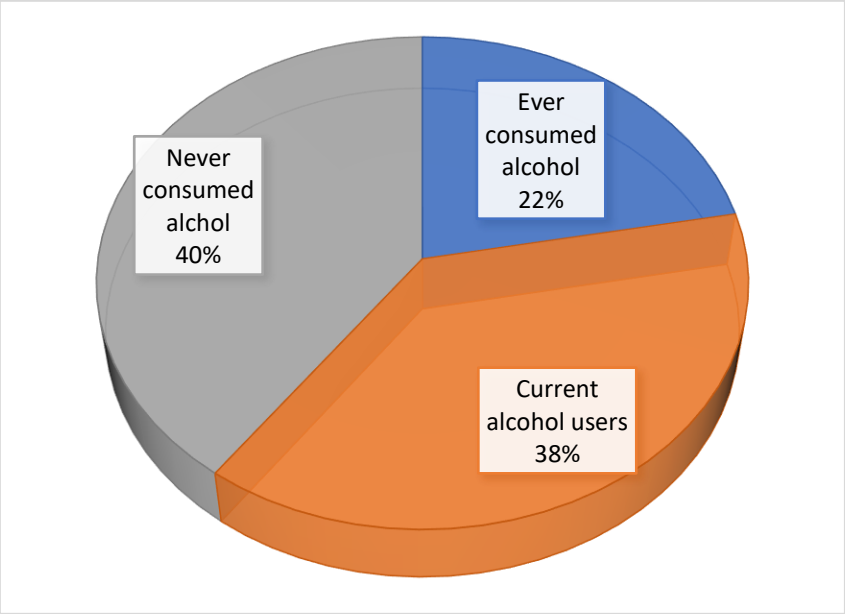
Approximately 230 undergraduate medical students registered using the Google Form link, submitted their answers, and the analysis of those responses revealed the following findings:

Table I - Socio-demographic characteristics of medical undergraduate students (N = 230)

Variables	Category	Frequency	Percentage
Age (years)	18– 20	88	38%
	21– 23	124	54%
	>23	18	8%
Gender	Male	129	56%
	Female	101	44%
Year of study	First	46	20%
	Second	60	26%
	Third	64	28%
	Fourth	60	26%
Residence	Hostel	166	72%
	Home	64	28%

According to the table I, majority of the participants belongs to the age group of 21 to 23 years (54%) and very few numbers were above the age of 23 years (8%).

Figure I - Prevalence of Alcohol Use and Alcohol Dependence (n=230)



Analysis of the responses by the students showed around 88 (38%) were currently alcohol users whereas 52 (22%) never consumed alcohol and 90 (38%) never consumed alcohol as shown in figure I.

Table II - Alcohol Use Patterns Among Current Alcohol Users (n= 88)

Drinking pattern	Frequency	Percentage
Frequency ≥ 1 time/week	23	26.5%
Drinks ≥ 4 per session	15	17.6%
Binge episodes (past month)	29	32.4%
Peer pressure as main reason	36	41.2%
Stress relief as main reason	26	29.4%

Among the current users of alcohol 26.5% consume alcohol more than one time per week and 17.6% consume four or more drinks per session. 32.4% accepted of having binge episodes in past one month. About 41.2% students expressed peer pressure as main reason to start alcohol consumption whereas 29.4% consume alcohol for stress relief (table II).

Table III – DASS-21 scores distribution among students (n=230)

Scale	Normal (%)	Mild (%)	Moderate (%)	Severe (%)	Extremely sever (%)
Depression	143 (62%)	32 (14%)	37 (16%)	14 (6%)	05 (2%)
Anxiety	110 (48%)	46 (20%)	51 (22%)	18 (8%)	05 (2%)
Stress	133 (58%)	41 (18%)	37 (16%)	14 (6%)	05 (2%)

Depression: Mild to severe depression symptoms were reported by about 38% of pupils. 16% had moderate depression, 14% had mild symptoms, and 8% had severe to extremely severe symptoms. This demonstrates that clinically significant depression symptoms are experienced by almost two out of every five students (table III).

Anxiety: With 52% of pupils classified as having mild to extremely severe anxiety, anxiety levels were much higher. The biggest percentages were mild anxiety (20%) and moderate anxiety (22%), with 10% reporting severe or extremely severe anxiety. This suggests that among the research population, anxiety is more common than depression (table III).

Stress: Similar trends were seen in stress levels, with 42% of students reporting medium to extremely severe stress. 16% of respondents experienced mild stress, 18% reported severe stress, and 6% reported moderate stress. Just 2% of people reported experiencing extremely severe stress (table III).

Table IV – Factors association of alcohol use and DASS-21 scores

Variables	Category	Users of Alcohol (n=88)	Non-users of alcohol (n=142)	χ^2 value (p-value)
Gender	Male	59 (67%)	70 (49%)	6.590 (0.0004)
	Female	29 (33%)	72 (51%)	
Residence	Hostel	76 (86%)	90 (63%)	14.290 (0.0002)
	Home	12 (14%)	52 (37%)	
Depression (DASS-21)	Normal	23 (26%)	120 (84%)	77.68 (0.0001)
	Mild	25 (28%)	07 (5%)	
	Moderate	26 (30%)	11 (8%)	
	Severe	10 (11%)	04 (2.5%)	
	Extremely sever	04 (5%)	01 (0.1%)	
Anxiety (DASS-21)	Normal	11 (123%)	99 (70%)	72.89 (0.0001)
	Mild	27 (30%)	19 (13%)	
	Moderate	35 (40%)	16 (11%)	
	Severe	11 (12.5%)	07 (5%)	
	Extremely sever	04 (5%)	01 (0.1%)	
Stress (DASS-21)	Normal	14 (16%)	119 (84%)	104.48 (0.0001)
	Mild	33 (38%)	08 (5%)	
	Moderate	29 (33%)	08 (5%)	
	Severe	09 (10%)	05 (3%)	
	Extremely sever	03 (3%)	02 (3%)	

The results of table 4 demonstrate a strong correlation between alcohol consumption and psychological and demographic factors. Males and hostel dwellers were found to use more alcohol than females and people living at home, with both categories exhibiting significantly larger percentage of alcohol users. Alcohol consumption was also

strongly correlated with mental health markers as determined by the DASS-21. Compared to non-users, students who drank alcohol showed significantly higher levels of stress, anxiety, and depression. Alcohol users exhibited significantly greater proportions in the mild, moderate, severe, and extremely severe categories, although the majority of non-alcohol users fell within the normal range on all three scales. Gender, place of residence, and psychological discomfort are all strongly associated with alcohol consumption in this study sample, according to all statistically significant correlations.

DISCUSSION

The majority of participants (54%) are between the ages of 21 and 23. Approximately 88 (38%) of them now drank alcohol, while 52 (22%) and 90 (38%) never did. Nearly half of the participants' DASS-21 scores fall into the normal group, while the remaining pupils fall into one or more categories related to stress, anxiety, or depression. Less than 10% of students had severe or extremely severe types. Compared to female students and those remaining at home, a much higher percentage of male students (67%) and those living in hostels (86%) were found to be drinking alcohol. All statistically significant correlations show a considerable association between alcohol use in this study group and gender, place of residence, and psychological discomfort.

Karn M et al.,[6] found alcohol was the most frequently used substance among 420 eligible participants, with a lifetime prevalence of 58%. Cigarette smoking and illegal drug misuse came in second and third, respectively, at 21.9% and 13.7%. Substance misuse was considerably higher ($p<0.05$) among research participants who worked with an intoxicated coworker and among males who were provided substances by friends. "For pleasure, curiosity, or to go along with friends" was the most frequent cause of substance abuse (23%, n=18). Eight (3.7%) and thirty-three (15.1%) participants reported major and minor dysfunction as a result of alcohol misuse, whereas 1 (0.5%) and 14 (6.4%) participants reported the same dysfunctions as a result of drug usage.

In Debnath A et al.[3] study, 413 students took part in our study. Anxiety was prevalent at 24.2%, sadness at 31.5%, and AUD at 13.6%. Significant correlations between AUD and variables like gender, present living space, tobacco usage, and anxiety were found using univariate and multivariate logistic regression. The current study reveals concerning levels of anxiety, sadness, and AUD among New Delhi medical students. Additionally, our research shows links between AUD and variables such as anxiety, tobacco usage, living circumstance, and gender.

Ibrahim D et al.,[7] study showed of the 340 medical students, 3.8% had a GAD diagnosis, and 29.1% had a GAD-2 score of at least 3, suggesting a potential diagnosis. According to the study, 42% of the subjects had high GAD-2 scores, and 9.7% of them utilized addictive substances. High stress scores were linked to high anxiety levels. Additionally, students who had an unhealthy diet, spent more time on entertainment using smart gadgets, and spent less than 10,000 SDG (18 USD) each week were much more likely to have high GAD-2 scores. Reduced anxiety was linked to increased leisure/hobby time (p-value = 0.018), improved sleep quality (p-value = 0.00), and satisfaction with religious activities (p-value = 0.00). High levels of stress were seen in females (p-value = 0.035), those who were less satisfied with their academic achievement, and those who spent more time using smart devices for pleasure.

Peltzer K et al.[8] showed MDDs and GADs were measured using the PHQ-9 and GAD-7, respectively, in a national cross-sectional population-based survey of female adolescents (N = 1379; 15–19 years) in Nepal. Predictors of MDDs and GADs were estimated using logistic and Poisson regression. MDD prevalence was 7.8% (4.5% with a cut-off of ≥ 10 scores), while GAD prevalence was 13.4% (5.6% with a cut-off of ≥ 10 scores). In multivariable models, MDDs and/or MDD scores were

positively correlated with older age (17–19 years), higher education, wealth status, poor self-rated health status, genital sore or ulcer, current pregnancy, pregnancy loss, alcohol consumption, and early sexual debut.

Gao C et al.[9] study had 1,017 participants in all. Anxiety and depression, ranging from mild to severe, were prevalent at 40.3% and 45.3%, respectively. Anxiety was linked to religion (belief in Buddhism, OR = 2.438, 95%CI: 1.097–5.421; believe in Christianity, OR = 5.886, 95%CI: 1.604–21.597), gender (Female, OR = 1.405, 95%CI: 1.001–1.971), exposure to second-hand smoke (OR = 1.089, 95%CI: 1.001–1.184), and eating regular meals (OR = 0.513, 95%CI: 0.346–0.759). Depression was linked to family income (OR = 0.732, 95%CI: 0.596–0.898), eating regular meals (OR = 0.641, 95%CI: 0.415–0.990), breakfast frequency (OR = 0.813, 95%CI: 0.690–0.959), having a chronic illness (OR = 1.902, 95%CI: 1.335–2.712), and nocturnal snack consumption (OR = 1.337, 95%CI: 1.108–1.612).

CONCLUSION

According to the DASS-21 scale, alcohol consumption was strongly and consistently linked to greater levels of stress, anxiety, and depression. Additionally, there was a higher likelihood of moderate to severe psychological discomfort among male students and those living in dorms. The study highlights the critical need for focused treatments on medical college campuses, such as peer support programs, counselling services, mental health screenings, and awareness campaigns about alcohol abuse. Reducing alcohol-related harms and enhancing the wellbeing of aspiring medical professionals can be greatly aided by implementing early and integrated psychosocial support.

Declaration by Authors

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Conflict of Interest: The authors declare no conflict of interest.

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