

Status of Substance use among Undergraduate Medical Students in a Selected Government Medical College in Puducherry – An Explanatory Mixed Method Study

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Abstract

Background: Studies have shown increase in health-risking behavior and a decline in health-promoting behavior among medical students during their stay in medical school. This study aims to determine the prevalence and reason for substance abuse among the undergraduate medical students in a selected medical college in Puducherry. **Material and Methods:** This was a facility-based explanatory mixed method study conducted from May 2019 to July 2019. Assessment of their substance abuse was done using ASSIST questionnaire. Substance use was summarized as proportions with 95% CI. **Results:** A total of 379 participants were included in the study. The mean age of the study participants was 20 years (\pm 1.34). The most prevalent substance use was alcohol (10.8%). About 1.9% and 1.6% of students surveyed consume tobacco and cannabis, respectively. **Conclusion:** Facilitating factors for substance use as perceived by the participants were stress, peer pressure, easy availability of substances, socialization, curiosity, and awareness knowledge about safe limits of alcohol and tobacco.

Keywords: Alcohol, India, medical students, substance use, tobacco

INTRODUCTION

Over the past few years, a great deal of research has been done on the relationship between doctor's own health and how this influences the health care of their patients. It has become clear that healthy physicians set a strong example for their patients and have an improved ability to motivate their patients to change their unhealthy behaviors.^[1,2]

Substance abuse and its associated problems are also a rapidly growing concern globally. WHO estimates show that the burden of worldwide psychoactive substance use is around 2 billion alcohol users, 1.3 billion smokers, and 185 million drug users. Worldwide, 3 million deaths every year result from harmful use of alcohol; this represents 5.3% of all deaths.^[3] Alcohol consumption causes death and disability relatively early in life.^[3] In people aged 20–39 years, approximately 13.5% of the total deaths are attributable to alcohol.^[3] Tobacco kills more than 7 million people each year, and more than 6 million of those deaths are the result of direct tobacco use, while around 890 000 are the result of non-smokers being exposed to second-hand smoke.^[4]

Around 4.5% of the Indian males and 0.6% of females suffer from alcohol use disorder (AUD), while 3.8% of the males and 0.4% of the females are alcohol dependent.^[5] Various studies over the past have shown increase in health-risking behavior and a decline in health-promoting behavior among medical students during their stay in medical school.^[6-8] There is also paucity of data regarding level of substance use among undergraduate MBBS students in Puducherry. We thus want to assess the level of substance abuse among the undergraduate medical students in a selected medical college and also explore the reasons for substance abuse among them.

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METHODOLOGY

Study design

This was a facility-based explanatory mixed method study conducted among the undergraduate medical students in a selected medical college. Quantitative part of the study followed cross-sectional analytical design and qualitative part involved focus group discussion among the study participants.

The study was conducted for a period of three months commencing from May 2019 to July 2019 after receiving institute ethics committee approval. All undergraduate MBBS students (first year to final year), aged above 18 years of age, were included.

Sample Size calculation and sampling

The prevalence of substance use among the undergraduate medical students was 45.87% as per a study among the medical students.^[9] Considering the same 45.87% prevalence, the sample size calculated for the present study was 382 using 95% CI and 5% absolute precision using OpenEpi software Version 3. In the present study, we could only include 379 students. All the students aged 18 years and above from all the semesters were included, who were present in the class during data collection period. Almost 80% of the students of 1st year were excluded as they had not attained 18 years of age. The student's participation rate in the present study was around 88%. For qualitative study, a FGD was conducted involving 14 students. Around 2–3 students were included from each batch. There were a total of five batches of students between 1st and 4th year; there were two batches in 2nd year.

Study procedure

Undergraduate medical students from a government-run tertiary care facility were included in the study. The study was initiated after obtaining Institute Ethics Committee approval. All the available undergraduate medical students on the day of data collection, except the interns, were included. A total of 379 medical students, aged 18 years and above, were included in the study. We could include only 28 students from 1st year, as most of them were below 18 years. Self-administered questionnaire was used for data collection, following taking consent. The questionnaire included questions related to various substance uses along with socio-demographic information. Anonymous data collection was done.

Focus group discussion was carried out among various batches of MBBS students to identify the facilitating factors or limiting factors in reducing substance use among the students. A total of 14 students, 2–3 from each semester, were selected purposefully; among these 14 students, 4 were females and 7 stayed in hostel.

Data collection methods

Weight and height were measured using the weighing machine and stadiometer using standard procedure. Assessment of their substance abuse was done using self-administered Alcohol, Smoking and Substance Involvement Screening

Test (ASSIST) questionnaire which had eight questions.^[10] The questions include intake of any substance in their lifetime, their frequency, and recent intake in past 3 months. Levels of risk for alcohol use was categorized as low, moderate, or high risk based on the risk score ranging between 0–10, 11–26, and 27 and above, respectively. Similarly, level of risk for tobacco and other substance use were low, moderate, and high depending on risk score ranging between 0–3, 4–26, and 27 and above, respectively.^[10]

Statistical tests used for data analysis

Data entry was done in Epi Data Entry Client version 4.0, and analysis was performed using SPSS version 20. Prevalence of substance use was summarized as percentages and 95% confidence interval (CI). Bivariate analysis (Chi-square/Fisher test) was done to assess the association of alcohol consumption with age, gender, place of stay, semester, and BMI. For this, unadjusted prevalence ratios (PR) with 95% CI were calculated. Variables with $P \leq 0.02$ were included in the multivariable logistic regression model to obtain adjusted prevalence ratio.

For qualitative study, the obtained data was transcribed in verbatim format. The student's statements were taken as unit for analysis. Manual content analysis was done, and codes were generated. Coding was done using inductive approach. Results were shared with study participants for validation of the findings. Study was reported in accordance with the consolidated criteria for reporting qualitative research (COREQ).

RESULT

Quantitative study

The mean age of the study participants was 20 years (± 1.34). Majority of the participants were between 18 and 19 years (48%) of age [Table 1]. Among the study participants, 56.5% were males [Table 1]. Out of 379 students included in the study, majority were from 3rd and 5th semester consisting of 42.2% of total participants [Table 1]. Most of the participants (71.4%) were staying in hostel [Table 1]. Around 42.5% of the students had a family history of diabetes, and 40.9% had a family history of hypertension. Around 25.9% students had family history of both diabetes and hypertension [Table 1]. As per student's BMI status, 23.8% were obese, 16.1% were overweight, and 15% were underweight as per Asia-Pacific guidelines [Table 1]. Among the overweight and obese students, 63.6% students were males and 36.4% were females.

Out of the students surveyed, 41 (10.8%) were consuming alcohol and 7 (1.85%) were consuming tobacco. There were six (1.58%) students who gave history of consuming cannabis. There were four student drug users who were taking drugs intravenously; one of whom had taken the same within last 3 months and was categorized to be having moderate risk. Out of those 41 students who consumed alcohol, 4 (9.7%) were found to be having moderate risk of addiction and 3 (7.3%) had high risk of addiction for alcohol [Table 2]. Out of the seven

Table 1: Socio-demographic details and baseline details of undergraduate medical students (n=379)

Socio-demographic characteristics	n (%)
Age in years	
18-19	182 (48%)
20	84 (22.2%)
>20	113 (29.8%)
Gender	
Male	214 (56.5%)
Female	165 (43.5%)
Year of study	
1 st - 2 nd semester	28 (7.4%)
3 rd - 4 th semester	106 (27.9%)
5 th semester	92 (24.3%)
6 th - 7 th semester	86 (22.7%)
8 th - 9 th semester	67 (17.7%)
Place of stay	
Hostel	271 (71.4%)
Home with parents	103 (27.3%)
Home without parents and with/without friends	5 (1.3%)
Family history of diabetes or hypertension	
Diabetes	63 (16.6%)
Hypertension	57 (15%)
Both diabetes and hypertension	98 (25.9%)
None	161 (42.5%)
Water intake per day	
Up to 1 liter	34 (9%)
1-2 liters	129 (34%)
2-3 liters	131 (34.6%)
>3 liters	85 (22.4%)
BMI	
Underweight	57 (15%)
Normal	171 (45.1%)
Overweight	61 (16.1%)
Obese	90 (23.8%)

tobacco users, four (57.3%) had moderate risk; and out of the six cannabis users, three (50%) had moderate risk. There was one cocaine user with low risk, one inhalant drug users having moderate risk, and one opioid user with moderate risk [Table 2].

Association of socio-demographic characteristics with substance use is shown in Table 3. Majority of students who consumed alcohol were above 20 years of age, and there is no gender difference among the students who consumed alcohol. There were 10.3% males and 11.5% females who consumed alcohol. Among those who stayed in hostel and home, 13% and 5.6% of them consumed alcohol, respectively. All those who used tobacco and cannabis were also consuming alcohol. Age-group of more than 20 years (PR 1.93, $P = 0.04$), hostelites (PR – 2.32, $P = 0.04$), and students belonging to sixth to ninth semester (PR – 1.88, $P = 0.03$) were found to have higher prevalence of alcohol intake.

Qualitative study

Our study aimed at assessing the status of substance use and to explore the facilitating and hindering factors for substance

use and capture student's perspective regarding what needs to be done to address this issue of substance use among the medical students.

Table 4 represents the thematic qualitative analysis of facilitating factors, hindering factors and student's perspective for addressing the issue.

Facilitating factors: Students perceive that the prevalence obtained was an underestimate, and the real prevalence of alcohol and tobacco among undergraduate medical students will be around 20–40% and 5–10%, respectively. Students opined that major influencing factors for substance use among the students are stress, peer pressure, academic stress, easy availability of substances near campus, socialization, family issues, curiosity, and knowledge about safe limits of alcohol and tobacco.

“Socialization, when they go out as a group with friends and they also want to try out” (As expressed by a 19-year-old female student)

“People tend to exaggerate the benefits that they experienced out of the substances” (As expressed by a 19-year-old female)

“Some have the urge to experiment the thing” (As expressed by a 21-year-old male student)

“Sometimes, students think that they are just following what is being practiced in their family” (As expressed by a 20-year-old male student)

“They use the safe limit as an excuse to start it and then days go by, something else happens and as it's a long-term process, they tend to overlook it and start drinking which leads to alcoholism.” (As expressed by a 19-year-old female student)

“It heights during the cultural fests and functions” (As expressed by a 19-year-old female student)

“They feel hostel is a place where you feel like you are not monitored by parents” (As expressed by a 21-year-old male student)

“They won't listen even if we say” (As expressed by a 19-year-old female student)

“They are not very close to us” (As expressed by a 21-year-old male student)

“We don't want to be dragged into that just by involving with them” (As expressed by a 19-year-old female student)

“I have not seen anyone smoking, if I see someone that's a good person I'll go and tell him to not smoke but if he has attitude, I won't say, let him smoke, I won't bother” (As expressed by an 18-year-old male student)

Hindering factors

“If you see the results or the disease out of it” (As expressed by an 18-year-old male student)

“If the suffering of the person is close to us, we will feel more connected to it. If we see something happenings to a friend

Table 2: Prevalence and the risk level of substance use among the undergraduate medical students (n=379)

Substances	n (%)	Risk level based on Assist Questionnaire Score		
		Low risk (%)	Moderate risk (%)	High risk (%)
Alcohol	41 (10.8%) 95% CI: 7.87%-14.38%	372	4 (9.7%)	3 (7.3%)
Tobacco ^a	7 (1.85%) 95% CI: 0.74%-3.7%	375	4 (57.1%)	0
Cannabis ^b	6 (1.58%)	376	3 (50%)	0
Cocaine ^c	1 (0.26%)	379	0	0
Amphetamine-type stimulants ^d	NIL	379	0	0
Inhalants ^e	3 (0.79%)	378	1 (33%)	0
Sedatives ^f	NIL	379	0	0
Hallucinogens ^g	2 (0.52%)	379	0	0
Opioids ^h	1 (0.26%)	378	1	0
Other drugs	1 (0.26%)	379	0	0
Drugs through injection	4 (1.05%)	378	1 (25%)	0

^aCigarettes, Chewing tobacco, Cigars. ^bMarijuana, Pot, Grass, Hash, etc. ^cCoke, Crack, etc. ^dSpeed, Diet pills, Ecstasy, etc. ^eNitrous, Glue, Petrol, Paint thinner, etc. ^fValium, Serepax, Rohypnol, etc. ^gLSD, Acid, Mushrooms, PCP, Special K, etc. ^hHeroin, Morphine, Methadone, Codeine, etc.

Table 3: Distribution of alcohol consumption with respect to various factors among the undergraduate medical students

Characteristics	n (%)	Alcohol consumption present n (%)	Unadjusted PR (95% CI)	P	Adjusted PR (95% CI)	P
Age in category (in years)						
18-19	182 (48%)	15 (8.2%)	1.00 (Ref)	-	1.00 (Ref)	-
20	84 (22.2%)	8 (9.5%)	1.15 (0.50-2.61)	0.72	0.79 (0.27-2.28)	0.75
>20	113 (29.8%)	18 (16%)	1.93 (1.01-3.67)	0.04	1.17 (0.38-3.57)	0.71
Gender						
Male	214 (56.5%)	22 (10.3%)	1.00 (Ref)	-	1.00 (Ref)	-
Female	165 (43.5%)	19 (11.5%)	1.12 (0.63-1.99)	0.70	0.93 (0.52-1.68)	0.98
Place of stay						
Hostel	271 (71.5%)	35 (13%)	2.32 (1.01-5.37)	0.04	0.63 (0.32-1.25)	0.17
Home	108 (28.5%)	6 (5.6%)	1.00 (Ref)	-	1.00 (Ref)	-
Semester of study						
1 st – 5 th semester	226 (59.6%)	18 (8%)	1.00 (Ref)	-	1.00 (Ref)	-
6 th – 9 th semester	153 (40.4%)	23 (15%)	1.88 (1.05-3.37)	0.03	1.80 (0.65-4.96)	0.25
BMI						
Underweight/ normal	228 (60.2%)	22 (9.6%)	1.00 (Ref)	-	1.00 (Ref)	-
Overweight/obese	151 (39.8%)	19 (12.6%)	1.30 (0.73-2.32)	0.36	0.03 (0.002-0.40)	0.29

or family, we will be more affected than seeing a patient” (As expressed by a 19-year-old male student)

“It leads to money issues and accidents” (As expressed by a 21-year-old male student)

Suggestions: We feel that by ensuring that it is difficult to get and store substance, by close monitoring, regular check-up and attending the stress and depression among students by forming support groups. This will help to decrease dependency on substance use.

“Address and treat the root cause like depression and stress” (As expressed by a 20-year-old male student)

“Half of the students do this because they are not able to handle stress or emotions, so if we have a counselling for that, it may be helpful” (As expressed by a 19-year-old male student)

“Close monitoring should be done at the hostel level, like friends who know they can go and report to the warden. They

should arrange counselling for them even if they are not willing to have it” (As expressed by a 19-year-old male student)

“Make it hard to store it inside the campus” (As expressed by an 18-year-old female student)

“The people who recovered, they can come up and share their stories. Like support groups, telling stories of seniors or people who actually recovered.” (As expressed by an 18-year-old female student)

DISCUSSION

The most prevalent substance use among the undergraduate medical students was alcohol (10.8%). About 1.9% and 1.6% of students surveyed consumed tobacco and cannabis, respectively. The prevalence of alcohol and tobacco intake, as reported in the present study, was less compared to various other studies conducted among medical colleges in India; tobacco

Table 4: Thematic table of facilitating factors, hindering factors, and suggestions for substance use as perceived by undergraduate students

Themes	Facilitating factors	Hindering factors	Suggestions
Codes: Description	<p>Peer pressure and socialization: Some students felt that it's easy to socialize with peer group who drinks and smokes during college fests and in college</p> <p>Lack of supervision: Students perceived that alcoholism is more among hostelites because of lack of supervision by parents as they stay in hotel</p> <p>Curiosity: Students felt that urge to experiment smoking and alcohol after someone exaggerate their experience on substance use might be a reason</p> <p>Knowledge on safe limits: Students claim that they are knowledgeable about the safe limits of alcohol consumption and start it but later on, forget that facts and consume whenever they need</p> <p>Easy availability: Students felt that the availability of cigarettes and alcoholic beverages near the campus might be a reason</p> <p>Stress and depression: Students said they use them as a stress buster which builds on as the year progresses like family issues, academic stress, and relationship issues.</p> <p>Non-inhibition by family and peer groups: A student said that students perceive drinking and smoking as a normal or casual thing and usual among their family and general public</p>	<p>Social stigma: Some students feels that the fear of addiction and social stigmatization prevents them from starting and also from getting counseling for substance use and de-addiction</p> <p>Knowledge on outcome: Students said that they see patients suffering from smoking and alcoholism, and they know about the risks of substance use</p> <p>Addiction and financial issues Students felt that substance use might result in addiction and wasting of money over it.</p> <p>Accidents and public nuisance: Students said that it would lead to accidents, fights, and cause trouble to others</p> <p>Academic performance: Students said that alcoholism affects their academic performance</p>	<p>Attend to the root cause: stress and depression management</p> <p>Motivate students not to initiate any substance use in the beginning itself</p> <p>Support groups by students where they counsel among themselves, share their experience, and speak to the students who have overcome the addiction in the past</p> <p>Close monitoring and regular checking in hostel to prevent storage of substance During cultural fests, security checks and monitoring of students as it peaks on those times.</p>

prevalence ranged between 7% and 72% and that for alcohol ranged between 16.6% and 68%.^[6-9,11-14] As per GATS2 report, Union territory of Puducherry shows similar prevalence (10–20%) of tobacco use among people aged 15 and above.^[15] An extensive literature review by Smith D R *et al.*^[13] reported that the prevalence of smoking was less than 10% (4–7%) among Indian medical students, and it was decreasing over last 30 years. Prevalence of alcohol consumption in our study was almost same among both the genders, whereas it shows male predominance in other studies.^[6-9,11,12] Alcohol consumption is more among the senior students and those who stayed in hostel. Similar results also reported in a multicentric study conducted in Delhi by Rustagi *et al.*^[11] FGD findings reveal that the reported prevalence of substance abuse in the quantitative study is low. Students attending FGD opined that the prevalence of alcohol use is expected to range between 20% and 40% and that of tobacco use will be around 10%. Facilitating factors reported by medical students were stress, easy accessibility of substances, lack of supervision, knowledge of safety limit, and peer pressure. Similarly, psychological stress and curiosity were reported as primary reasons for substance abuse in various other studies.^[6-9,12,14] Social stigma among peers, knowledge of consequences like addiction, poor academic performance, and accidents were the major limiting factors for initiating

substance use. Having system in place for stress and depression management for students may help in decreasing substance use. Institutes' de-addiction and rehabilitation center can utilize student association for conducting sensitization sessions and subsequent cessation programs. Initiating support groups, close monitoring of the students, and strengthening surveillance of the students during college fests and in hostels may act as a deterrent for initiating substance use.

Strengths of our study are that we have used standardized assessment tool for quantifying substance use. We have included majority of the medical students; thus, our study findings may be generalizable to other medical institutions in public sector. In addition to quantifying alcohol and tobacco use, as done in most other studies, we have also assessed magnitude of other substances use among the study population. The limitation of quantitative part of our study is that we failed to include almost half of the students from final semester. This could have probably increased the prevalence of substance use even further. Social desirability bias could have affected reporting substance use, even if we have used anonymous unlinked self-reported questionnaire for data collection. This could have resulted in decrease in reported prevalence of substance uses as reported in FDG.

To conclude, more than one in ten students had positive history of alcohol use and around one in hundred used tobacco. Prevalence of substance use was more among the senior students. Stress, easy accessibility, and peer pressure were the major facilitators for substance use. System in place for stress management, IEC sessions, student support groups, frequent hostel check-ups, and close monitoring could decrease substance abuse among the medical students.

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Conflicts of interest

There are no conflicts of interest.

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