Assessment of prevalence, nature, and factors associated with substance abuse among medical undergraduate students in Northern India

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ABSTRACT

Background: In recent years, drug abuse among the student population has increased to an alarming rate in India and that too among medical students. Substance abuse among medical students has important implications for their personal health, training, and clinical practice. **Aims and Objectives:** To plan effective interventions, it is essential to have information on the extent, type, and factors associated with substance abuse among medical students. Hence this study was undertaken to find the prevalence and pattern of substance abuse. **Materials and Methods:** A cross-sectional study was conducted among undergraduate medical college students of all professional years. Students were assessed for their pattern and prevalence of substance abuse with the help of a structured self-administered questionnaire entitled "Pattern of substance abuse among medical students" as a tool for data collection. The questionnaire had three domains viz. demographic characteristics, short Michigan alcohol screening test, and Fagerstrom test for assessment of level of nicotine dependence. The World Health Organization-Alcohol, Smoking, and Substance Involvement Screening Test Scale was also used to increase the validity of results. **Results:** Alcohol and Nicotine were the most commonly abused substances among medical students. The trend of abusing a substance increases as per increase in the ladder of professionalism. The majority of students initiated abuse because of peer pressure and mental stress during their academic life. The problem was more among hostellers. Most of the students continued the abuse because of the feeling of enjoyment and to increase their performance in the exams. **Conclusion:** Awareness creation and academic counseling camps along with stress interventions are recommended and needed to curb drug abuse among medical students.

Key words: Alcohol; Nicotine; Substance abuse; Medical students; Short Michigan alcohol screening test; Fagerstrom test; The World Health Organization-Alcohol, Smoking, and Substance Involvement Screening Test scale

INTRODUCTION

Substance abuse, according to the World Health Organization (WHO) is defined as "Persistent or sporadic drug use inconsistent with or unrelated to acceptable medical practice".[1] Not less than a few years, substance abuse was implanted deep into the young population worldwide and has become a matter of concern.[2]

A recent estimate shows a burden of worldwide psychoactive substance abuse of around 2 billion alcohol users, 1.3 billion smokers, and 185 million drug users.[3] Use of illicit and controlled substances, in addition to excessive

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use of alcohol, is strongly influenced by many factors, including age, gender, family history, and the presence of co-occurring psychiatric disorders.[4] In recent years, drug abuse among the student population is increasing to an alarming rate in India as witnessed by numerous reports, which also state that the age of initiation of abuse is progressively falling.[5] Medical students follow the same trend as of general population toward substance abuse when it comes to the age factor. It is believed that early initiation of substance abuse in their careers may be due to higher stress levels in their respective field.[6] Medical students are more vulnerable to substance abuse due to their ready accessibility to the substance of abuse,[7] high levels of work-related stress, frequent contact with illness and death, relative isolation of medical school, and disrupted sleep and social life.[6] Substance abuse among medical students has important implications for their personal health, training, and clinical practice.[8] Medical students, hold a unique place in society and earn privileges and responsibilities different from those of other students so their evaluation of risk factors and control is the need of the hour as they are future medical practitioners and have a potential role in treating and counseling the patients.[9]

To plan effective interventions, it is essential to have information on the extent, type, and factors associated with substance abuse among medical students and their attitude toward its control. Hence, this study was undertaken to find the pattern and prevalence of substance abuse along with factors associated with substance abuse, such that appropriate controlling measures should be put on to save our budding physicians from physical and psychological impairments so that they can handle other's life with good sight and care.

Aims and objectives

To estimate the prevalence and pattern of substance abuse among medical undergraduate students at a tertiary care hospital. The main objective is to find the factors associated with substance abuse according to their professional years.

MATERIALS AND METHODS

Study design

A cross-sectional study was conducted by the Department of Pharmacology, among undergraduate medical college students of Pt. B.D. Sharma, PGIMS Rohtak, Haryana, India during 2023. The study was conducted between May and July 2023 after approval from the Scientific and Ethics Institutional Committee with No. BREC/23/39.

Study sample and recruitment

The undergraduate MBBS students were approached for participation in the study after approval from IEC. The

inclusion criteria were students pursuing MBBS (including all professional years) and gave consent to participate in the study. They were assured that their responses will be kept anonymous and confidentiality was maintained. Non-attending and non-consenting students were excluded.

Study questionnaire

Students were assessed for their pattern and prevalence of substance abuse with the help of a structured self-administered questionnaire entitled "Pattern of substance abuse among medical students" as a tool for data collection, which was validated by five experts in the field of research to identify ambiguity and content validity. This was then pre-tested among 20 medical students who were not part of the study to assess its duration, clarity, and sequence. Necessary modifications were made before administering the final questionnaires to study participants. The final questionnaire had three domains viz. (1) Demographic Characteristics of the participants such as details of substance abuse and age, gender, name, and year of pursuing the course. (2) Short Michigan alcohol screening test (SMAST) related to assessment of severity of Alcohol abuse among students. It consisted of 13 items and all were to be answered with "YES" or "NO" answers only. Each "YES" answer was scored as 1 point while "NO" was scored as 0. If the score lied between 0 and 2, no intervention was required, further investigation was done if students scored 3. If the score was 4 or more students had potential alcohol abuse and a full assessment was done. (3) The level of nicotine dependence was done by the Fagerstrom test in which students were assessed with 6 items and scoring was done between 0, 1, 2, and 3. A score of 1–2 depicted low dependence while 3–4 depicted low to moderate and 5–7 showed moderate dependence. A score of 8 or more indicated high nicotine dependence. The WHO-Alcohol, Smoking, and Substance Involvement Screening Test (ASSIST) V.3 scale was also used as a battery of tests to know the student's experience of using these substances across their lifetime and in the past three months. The scale comprised of 8 questions containing experiences according to the substance used. Assessment was done by adding the score of each question from question no. 2 to 7. If the score came between 0 and 3, no intervention was required, brief intervention was required if the score came between 4 and 26 while for >27 score more intense treatment was required.

Statistical analysis

All data were compiled, entered in Microsoft Excel, and summarized as proportion using tables. Data were analyzed by using Statistical Package for Social Sciences 23.0. Descriptive statistics of socio-demographic information and frequency and pattern of substance use was determined. The chi-square test was used to examine associations between substance use and various variables.

For all purposes, a P<0.05 was considered as statistically significant.

RESULTS

Domain 1

A total of 940 students responded to the questionnaire out of which 252 were from 1st year, 250 were from 2nd year, 190 from 3rd year and 248 were from the final year of their professional MBBS curriculum. Substance abuse prevalence among all the respondents was found to be in 31.8% of students. Among them, hosteller students abuse more number of substances as compared to day scholars. Alcohol and smoking were found to be the most commonly abused substance in all the undergraduate medical students. Most of the students were abused to single substance while few of them were used both alcohol and smoking as a substance of abuse. The most common age of initiation of substance abuse was between 18 and 20 years and its prevalence increased with the increasing educational years viz. 14.7% in 1st year, 22.4% in 2nd year, 43.2% in 3rd year and 50% in final year (Table 1).

Most of the students among the substance abusers, 19 (51.3%) in 1st year, 12 (21.4%) in 2nd year, 20 (24.3%) in 3rd year, 40 (32.3%) in 4th year initiated the substance because of unbearable mental stress (30.4%) during their educational life but the majority of students picked up due to their peer pressure (41%). A family history of substance abuse was also a predictive factor for initiation. Among the substance abusers, a number of students 35 (28.2%) in their final year continued to take the substances to increase their performance in the exams while most of the students i.e. 56.75% (1st year), 69.64% (2nd year), 62.19% (3rd year), and 53.2% (final year) of the respondents consume the substance out of enjoyment.

Substance abuse had various ill-effects with their addiction which increases gradually, 16.21% (1st year), 14.28% (2nd year), 12.19% (3rd year), and 20.2% (final year) of the respondents among substance abusers felt self-guilt from being addicted, while 5.4% (1st year), 21.4% (2nd year), 20.73% (3rd year), and 12.9% (final year) of the respondents experienced low image among peers and family members. The majority of the students (30.4%) had poor performance in academics as well as extra-curricular activities and it was faced by 24.32% (1st year), 35.71% (2nd year), 34.14% (3rd year), and 27.41% (final year) of the respondents (Table 2).

Students among substance abusers i.e. 29.72% (1st year), 44.64% (2nd year), 48.78% (3rd year), and 46.77% (final year) tried to quit the addicted substance, out of which mostly failed to quit because of lack of will power, missing of fear of withdrawal symptoms as well as few among them missed the motivating factor to quit the substance they were used to.

Domain 2 - SMAST

The majority of the students had a score between 0 and 2, so the degree of problem in them with alcohol was little to no, hence no further action was required. Whereas 5 (2.6%) students from the 3rd year and 8 (3.3%) students from the final year of their undergraduation had a score of 3 on SMAST. These respondents who had borderline alcohol problems were further investigated for the betterment of their health and professional life (Table 3).

Domain 3 - level of nicotine dependence by Fagerstrom test

The majority of the respondents had low dependence of nicotine who scored between 1 and 2, while a few students scored between 5 and 7 who were found to have moderate levels of dependence with nicotine (Table 4).

Table 1: Demographic profile and pattern of substance use among all the phases of MBBS students				
Medical student variables	1st year (n [%])	2nd year (n [%])	3rd year (n [%])	4th year (n [%])
Academic Year (N)	252	250	190	248
Male	145 (57.5)	128 (51.2)	88 (46.3)	135 (54.4)
Female	107 (42.5)	122 (48.8)	102 (53.7)	113 (53.6)
Type of family				
Nuclear	212 (84.1)	138 (55.2)	96 (50.5)	186 (75)
Joint	40 (15.8)	112 (44.8)	94 (49.5)	62 (25)
Present address				
Hosteller	232 (92.1)	208 (83.2)	152 (80.00)	198 (79.8)
Day scholar	20 (7.9)	42 (16.8)	38 (20.00)	50 (20.2)
Type of substance abuse				
Alcohol	12 (4.7)	26 (10.4)	33 (17.4)	58 (23.4)
Smoking	25 (9.9)	30 (12.0)	49 (25.7)	66 (26.6)
Both alcohol+smoking	04 (1.6)	10 (4.0)	16 (8.4)	22 (8.8)
Others	00	00	00	00
Total (n*)	37 (14.7)	56 (22.4)	82 (43.2)	124 (50.00)
Note: n: no. of respondents				

Table 2: Factors affecting substance use among all the phases of MBBS students

Medical student variables	1st year (n) (%n/N*)	2nd year (n) (%n/N*)	3rd year (n) (%n/N*)	4th year (n) (%n/N*)
Age of initiation				
15–18 year	08 (21.62)	12 (21.42)	09 (10.97)	18 (14.51)
18–20 year	29 (78.37)	20 (35.71)	22 (26.82)	39 (31.45)
20–24 year	0 (00.00)	14 (25.00)	35 (42.68)	45 (36.29)
Reasons for using the substance at initiation				
Peer pressure	5 (13.5)	22 (39.28)	42 (51.2)	56 (45.16)
Mental stress	19 (51.30)	12 (21.42)	20 (24.3)	40 (32.25)
Role model inspiration	3 (08.10)	9 (16.07)	8 (09.75)	12 (09.62)
Family addiction	6 (16.21)	8 (14.28)	2 (02.4)	7 (05.62)
Status symbol	4 (10.81)	5 (08.92)	10 (12.19)	9 (07.25)
Reason for using the substance now				
Feeling of enjoyment	21 (56.75)	39 (69.64)	51 (62.19)	66 (53.20)
Can't tolerate withdrawal effects	3 (08.10)	6 (10.71)	12 (14.63)	23 (18.52)
Increase your performance	13 (35.13)	11 (19.64)	19 (23.17)	35 (28.20)
Ill-effects perceived with this addiction				
Hospitalization/prolonged illness	00 (00.00)	00 (00.00)	3 (3.65)	2 (1.51)
Self-guilt	6 (16.21)	8 (14.28)	10 (12.19)	25 (20.16)
Low image in family and peers	2 (5.40)	12 (21.40)	17 (20.73)	16 (12.90)
Financial weakness	0 (00.00)	2 (03.57)	4 (04.87)	8 (06.45)
Poor performance	9 (24.32)	20 (35.71)	28 (34.14)	34 (27.41)
Social cut off	0 (00.00)	2 (03.57)	3 (03.65)	7 (05.64)
Attempt to quit				
Yes	11 (29.72)	25 (44.64)	40 (48.78)	58 (46.77)
No	23 (62.16)	22 (39.28)	18 (21.95)	43 (34.67)
Still trying	3 (08.10)	9 (16.07)	24 (29.26)	23 (18.54)
Reason for Failure to Quit (Multiple answers)				
Lack of willpower	8 (21.62)	23 (41.07)	39 (47.56)	55 (44.35)
Not sure how to quit	1 (02.70)	6 (10.71)	5 (06.09)	19 (15.32)
Fear of withdrawal symptoms	4 (10.81)	8 (14.28)	13 (15.85)	24 (19.35)
Due to easy accessibility/friend circle	0 (00.00)	10 (17.85)	12 (14.63)	8 (06.45)
Motivation factor is missing	22 (59.45)	33 (58.92)	31 (37.80)	34 (27.41)
Thinks no harm in continuing the substance	13 (35.13)	17 (30.35)	10 (12.19)	26 (20.96)

N*: Total substance abusers, n: no. of respondents

Table 3: Assessment of SMAST score among medical students

SMAST score	1st year (n)	2nd year (n)	3rd year (n)	4th year (n)
0–2	12	26	28	50
3	00	00	05	08
4 or more	00	00	00	00

n: no. of respondents, SMAST: Short Michigan alcohol screening test

Table 4: Assessment of Fagerstrom score among medical students

Score	1st year (n)	2nd year (n)	3rd year (n)	4th year (n)
1–2	19	21	30	33
3–4	06	3	9	18
5–7	00	6	10	15
8 or more	00	00	00	00

n: no. of respondents

WHO-ASSIST scale

Along with the SMAST and Fagerstrom test, the WHO-ASSIST V.3 scale was also used as a battery of tests to know the student's experience of using these substances across their lifetime and in the past three months. The majority of students scored between 0 and 3 for tobacco abuse and 0–10 for alcohol abuse; hence, no such intervention was required to treat them. Few students scored 11–26 who consumed alcohol and few students scored 4–26 who consumed nicotine in any form and that too in their final years, hence brief intervention was required for them (Table 5).

DISCUSSION

Substance abuse is widely recognized as a critical area of concern when it comes to medical students. The present study was undertaken to determine the prevalence and pattern of substance use in medical undergraduate students of different academic stages. The study revealed that moving up the educational ladder can have an impact on the use of various substances. i.e. during 1st year of MBBS, 14.7% of students were substance abusers which increased to 22.4% in 2nd year of MBBS, 43.2% in 3rd year of MBBS, and almost 50% of students got abused to different substances during their final year of MBBS. Our study findings are congruent with the findings of another Indian study by Kumar et al., which observed the same trend of 22.4% substance abusers in 3rd year MBBS students,

Table 5: Assessment of ASSIST score among medical students				
ASSIST score	1st year (n)	2nd year (n)	3rd year (n)	4th year (n)
Alcohol				
0–10	10	24	21	44
11–26	00	00	6	10
27 or more	00	00	00	00
Tobacco				
0–3	24	22	41	45
4–26	00	4	12	18
27 or more	00	00	00	00
Other substances				
0–3	00	00	00	00
4–26	00	00	00	00
27 or more				

n: no. of respondents, ASSIST: Alcohol, Smoking, and Substance Involvement Screening Test

25.4% in 4th year MBBS, and 28.3% substance abusers in interns. A study by Jagnany et al., also stated that the risk of substance abuse increased with an increase in seniority.[10]

In this study, the prevalence of substance abuse was more among students who were staying in hostels than those who stayed at home. This is congruent to a study done by Padhy et al., which concluded that the risk of substance abuse was more among hostellers and those coming from joint families, which could be due to easily availability of abused substances in hostels and enjoyment with their peers.[11]

The present study concluded that alcohol and nicotine were the most common substances to be abused by the students. This finding was comparable with the study of Arora et al.,[12] which also found alcohol as the most common type of substance abuse (19.13%) and cigarettes (10%). A study by Singh et al., also concluded with the same findings among professional college students.[13] Another study from India also found cigarettes (80.6%) and alcohol (59.7%) were the preferred substances among students as well as Babalola et al., found that alcohol was the most commonly used substance (63.4%).[14] It may be explained on the basis of perception among medical students that cigarette smoking being helpful to remain awake and active, to improve attention and concentration, especially during exams, and lack of awareness of its potential side effects. In the present study, it was seen that the majority of the students initiated using substance abuse at the age of 18–20 years, followed by 20–24 years of age. Kumar et al., also reported that more than half number of students (58.2%) had started to use substances between 21 and 30 years and 35.8% of students between 11 and 20 years.[6] However, in the study done by Imran et al., 32% of respondents had started experimenting these substances before the age of 15 years and almost 40% of students between the ages of 15–20 years.[15] Jaiswal et al., found that the majority of the substance users in the final

year admitted that they started using substances either in the 1st year or during medical education.[16] This suggests that there can be various common factors playing a crucial role in the development of substance-seeking behavior including increasing stress during their professional career and the current medical education system. Among the reasons sought for substance use are peer pressure, academic stress, feeling of enjoyment, status symbols, and family history of substance use were a predictive factor in all the substance users and the available literature confirmed the same.[17] In a study by Baba et al.,[18] 26.3% of students initiated due to peer group pressure while in a study by Datta et al., 39.21% of substance abusers initiated due to curiosity for drugs.[19] Academic pressure was also a major reason behind abuse which was also seen in similar other studies in India by Halder et al.,[3] Mannapur et al.,[20] Singh et al.

The students had mixed experiences toward the ill-effects perceived with the addiction viz. self-guilt, low image in the family, and the majority encounter poor performances in professional as well as personal tasks. Jagnany et al.,[9] also found congruent findings that the majority of students do not enjoy, approximately half had ill effects on health and few had low family images. In our study, almost half of substance users tried to quit at one or the other time but many failed to quit due to multiple factors, such as lack of willpower, motivation factor was missing, fear of withdrawal symptoms and few thought that there was no harm in continuing the substance. A previous Indian study also found that the majority of the students (74.6%) did not feel that the use of these substances would have any ill effects. Only <11.9% of the students thought that it can have an ill effect on their physical/mental health and in <10% on family and social relationships. A similar result was also found in the study done by Jagnany et al.[9]

The present study consists of multiple scales for the battery of tests to find the exact nature, pattern, and factors associated with substance use among undergraduate medical students. The SMAST score and the WHO-ASSIST scale for the assessment of alcohol found that in the majority of the students alcohol abuse was of mild severity and didn't need any further medical intervention to control or treat them. Only a few students in all the years of MBBS had a moderate score and needed future intervention. The same findings were with nicotine abuse and dependence among all the MBBS phases as per the Fagerstrom test and the WHO-ASSIST scale where the majority of students didn't need any intervention and their dependence was found to be mild. This could be because most of the students use substances occasionally, out of stress during exams to relieve their stress and increase their performance academically.

Recommendations

1. Awareness talks about substance abuse and their ill-effects should be delivered to newly admitted students as that is the age they get exposed easily
2. Persistent monitoring by the mentors concerned should be carried out regularly as peer pressure is one of the most important factors
3. Counseling and treatment facilities should be provided with proper privacy regulations as students are most hesitant to approach their own teachers.

Limitations of the study

Our study had fewer limitations like viz. the study used a descriptive single cross-sectional design that limits the results because cause-effect could not be inferred. The data were collected based on the self-report of the participants and may be subjected to recall bias and under-reporting of substance use due to social inveiglement bias. Prospective or meta-analysis studies are needed to determine the associated factors of the prevalence of alcohol and substance use problems among medical students. Furthermore, a multicenter study should be conducted by medical schools to compare the differences between multicultural areas. Despite the limitations, these findings put forward an unmet need to educate medical students regarding substance use and its consequences.

CONCLUSION

The majority of students initiated substance abuse because of peer pressure and mental stress during their education carrier. It was more prevalent in the senior class students and among hostellers. The major drawback observed was the poor performance in academics. This high level of prevalence of stress and drug abuse among medical students needs antecedent attention, as it can impair their academic performances and learning ability, which may ultimately affect the quality of patient care since they will be future doctors after their course completion. Awareness creation about the adverse effects of substance use and academic counseling in the first 2–3 years of course and putative stress reduction interventions are recommended and needed.

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