

## Original Article

# Comparison of Substance Abuse among Medical Students in Eastern India with Other Undergraduates : An Analytical Study

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**Background :** Substance abuse is a global concern in today's world. Substances like tobacco, alcohol, cannabis, hashish and various modern medicines have been greatly abused by students and youngsters in all the realms of the world despite being aware of its ill effects.

**Objectives :** To determine the prevalence of substance abuse among the medical students and compare the data with an esteemed non-medical college in Kolkata.

**Materials and Methods :** It is a cross-sectional analytical study conducted via online survey. We conducted this study among students of medical colleges and an esteemed non-medical college in Kolkata. Data was collected after obtaining approval from the Institutional Ethics Committee.

Students pursuing MBBS and other professional courses constitute our study population. Using Google forms, a structured questionnaire was created, designed and validated in-house and was distributed online via emails and WhatsApp links to obtain the desired information.

**Results :** Through demographic analysis of the study shows out of a total study sample of 229, 65% (148) of them were from medical colleges and rest were non-medicos. Sixty-eight percent of the non-medical and forty-eight percent of the medical students were females and the remainder were male students. Studying the pattern of substance abuse, non-medicos are significantly more likely to abuse smoking and alcohol than medicos. We might conclude from this that medical students who are well versed in drug abuse are less likely to become addicted than non-medical students. Since marijuana, inhalants and other lesser-known drugs are less common, their abuse patterns did not differ much between study groups.

**Conclusion :** We need further research to get an idea about the patterns of substance abuse in Eastern India and recognize the protective means so as to end the menace of substance abuse in the youngsters.

[*J Indian Med Assoc* 2023; **121**(7): 49-53]

**Key words :** Drugs, Substance Abuse, Medical students, Alcohol, Addiction.

The youth are becoming the soft target of drug dependence in all over the world, which is mainly due to the exposure and easy access of drugs for the youngsters, especially college going students<sup>1-3</sup>. It has become a worldwide curse and more and more college-goers are becoming addicted to drugs. Medical students, though are helping patients to come out of drug dependency, at times are themselves getting addicted to drugs unfortunately<sup>1</sup>, as if getting infected by the disease itself, against which they are fighting.

### Editor's Comment :

- Substance abuse rates among undergraduate medical students in Eastern India are relatively lower compared to undergraduate students in other streams. This suggests that medical students may have a better understanding of the harmful effects of substance abuse due to their education and exposure to healthcare practices.
- The rigorous and demanding nature of medical education may act as a deterrent to substance abuse among undergraduate medical students. The heavy workload and the need for focus and dedication in their studies leave them with less time and inclination for engaging in substance abuse behaviors.

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Received on : 22/01/2023

Accepted on : 12/02/2023

They are exposed to very high levels of work-related stress<sup>1</sup>, facing the sickness, pain, death, gore and gruesome parts of the life at a regular basis, disturbed sleep and social life and thus are prone to fall for the trap of getting addicted easily. Moreover, Milkman 1999 explained how the knowledge of pharmacology, medicine and biochemistry of drugs cause them to be comfortable with the usage of the same. Thus, we are doing a comparative study to test this hypothesis about

whether medical students are prone to fall for drug addiction than non-medical college goers for having a sound knowledge about drugs in the former pupils. In addition to harmful effects of drug dependency on an individual's life, it might parallelly affect proper learning and patient care by young to-be doctors<sup>1</sup> and increase the dangers exponentially. There are not much research work done to prove this and how the medical and non-medical students of eastern zone of India are falling easy prey to the clutches of addiction and who has the upper hand. This study will be a detailed comparison and snapshot of the prevalence of the menace called drug abuse among the youth of two esteemed institutions in Eastern India. According to WHO there is a worldwide psychoactive substance use of around 2 billion alcohol users, 1.3 billion smokers and 185 million drug users<sup>1</sup>. Also, studies around the world including India have been found to have a prevalence rate of 20-40% among students of various fields including MBBS<sup>4,5</sup>. Studies have also shown that they have an inclination towards tobacco and alcohol use then other drugs and male are more prone to abuse than females<sup>6-12</sup>.

#### AIMS AND OBJECTIVES

To determine the prevalence of substance abuse among the medical students in a medical college of Kolkata.

To compare and analyse the extent of substance abuse with an esteemed non-medical college in Kolkata.

#### MATERIALS AND METHODS

It is an observational, cross-sectional, analytical study. The data was collected over a period of 2 months from August to October by online questionnaire in Google forms provided to the official college groups in WhatsApp. After obtaining approval from the Institutional Ethics Committee of the institutes, the study was conducted for a period of 5 months. Only students pursuing undergraduate courses were included in the study and doctors, faculty members, interneers and other staff members of the college were excluded from the study, since we mainly wanted to focus on the collegetgoers. A pre-designed and pre-validated structured proforma was used to collect the required information. Briefly, the themes under which the questions were included demographic details and patterns of substance abuse (name, duration, frequency and amount). Proper confidentiality of subjects was maintained and identity of the students were never disclosed. Chi-square test and logistic regression analysis was used to analyze the

association of various categories and overcome the bias of multiple variables.

**Statistical Analysis** : Analysis of the data was done in JAMOVI software (Version 2.318.0). Descriptive statistical methods were used to demonstrate demographic pattern of two populations. Appropriate statistical test like Wilcoxon rank sum test was used to compare numerical variables. Chi square test was used to compare the categorical variables. A Receiver Operator Characteristic (ROC) curve is plotted to demonstrate the true positive rate against the false positive rate.

#### RESULTS

This study was carried out in two institutions, one being a tertiary care hospital and medical college (ESI, Joka) and other being an esteemed non-medical institution based in Kolkata. A total of 229 students participated in this analytical study of which 148 were medical and 81 were non-medical students (Table 1). Demographic pattern showed majority of Non-medical students being female (68%) in contrast with medical where female was almost equal in proportion with male (48%). Median age was slightly higher in Non-medical participants than Medical (p-value <0.001, Wilcoxon rank sum test). Family income of the medical students was comparatively lower. 66% medical students had family income of less than 5 Lakh in comparison with 20.6% in non-medical group (p-value <0.001, Pearson Chi-Square Test). Most students from both the groups resided in cities. Upon studying the pattern of substance abuse, there is a significantly high inclination of non-medicos over medicos, especially

Table 1 — Demographic parameters of study participants

Characteristic	Medical N = 148	Non-medical N = 90	p-value
Gender :			
Female	71 (48%)	57 (63%)	0.038 <sup>1</sup>
Male	75 (51%)	33 (37%)	
Other	2 (1.4%)	0 (0%)	
Age :			
Median (25 <sup>th</sup> , 75 <sup>th</sup> Percentile)	20 (19, 21)	22 (20, 24)	<0.001 <sup>2</sup>
Annual Income :			<0.001 <sup>3</sup>
Less than 2.5 lakhs	51 (34%)	10 (12%)	
2.5- 5 L	33 (22%)	7 (8.6%)	
5 - 10 L	29 (20%)	24 (30%)	
More than 10 L	33 (22%)	36 (44%)	
Don't know	2 (1.4%)	4 (4.9%)	
Not willing to disclose (excluded from analysis)	0	9	
Home Location :			0.068 <sup>1</sup>
Rural	34 (23%)	12 (13%)	
Urban	114 (77%)	78 (87%)	
Statistical Tests Used : <sup>1</sup> Fisher's exact test;			
<sup>2</sup> Wilcoxon rank sum test; <sup>3</sup> Pearson's Chi-squared test			

towards smoking and alcohol. ( $p < 0.001$ ).

Family income of the students in both colleges varied between 2.5L to >10L. Maximum students from both the population resided in cities. Substance abuse was significantly notified ( $< 0.05$ ) in higher income group population in both the colleges (Table 1). Number of students with frequency of substance use in last 30 days A) Smoking Tobacco, B) Alcohol, C) Marijuana and D) Inhalant in all groups was depicted in Fig 1. But in both the populations, majority of substance abusers were male students except in one where female predominance is observed among non medical student population (Fig 2).

Most students from both the groups resided in cities. Upon studying the pattern of substance abuse, there is a significantly high inclination of non-medicos over medicos, especially towards smoking and alcohol ( $p < 0.001$ ).

However, drugs like marijuana, inhalants and other lesser-known drugs do not have much difference in abuse patterns between the study groups (Table 2). Chi square test and Fisher Exact T test was used to demonstrate that.

Significantly high pattern of dependency on smoking and alcohol ( $p < 0.001$ ) was seen in the non-

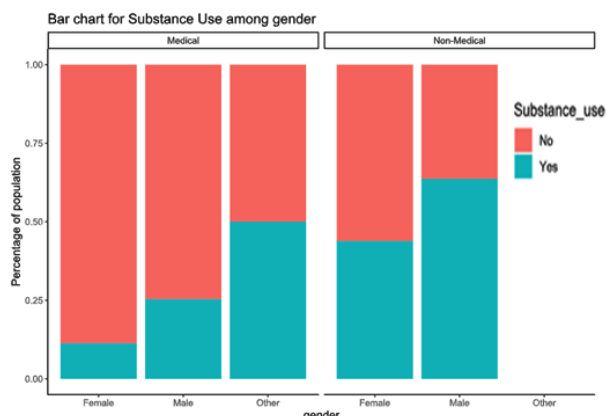


Fig 2 — Gender wise distribution of students with substance use in Medical and Non-medical group.

medical students while the pattern of marijuana, inhalants and other drugs (cocaine, speed, LSD, zaladine, ecstasy, angel dusts, downers, heroin, opium) was more or less equal in both the study groups (Table 2). Compared to medical students, prevalence of substance use among both males and females were higher in non-medical students. Number of medical students not having any addictions were more in all types of drugs than non-medical students. More non-medical students had the habit of occasional smoking and taking inhalants for 1-

2 days per month than medical students, while the latter were prone to be occasional users of alcohol and marijuana for 1-2 days a month than the non-medicos.

Table 3 shows a Logistic Regression model where age, gender, annual income and group (Medical/Non-medical) were statistically significant predictors. Similar finding was evident in earlier tables and figures also. Males are more likely to use substance (OR = 2.47, 95% CI = 1.15 – 5.28) than female counterpart. Students with family income more than 10 lakh are more likely to use substance than below 2.5 lakh group (OR = 4.26, 95% CI = 1.6 – 11.28).

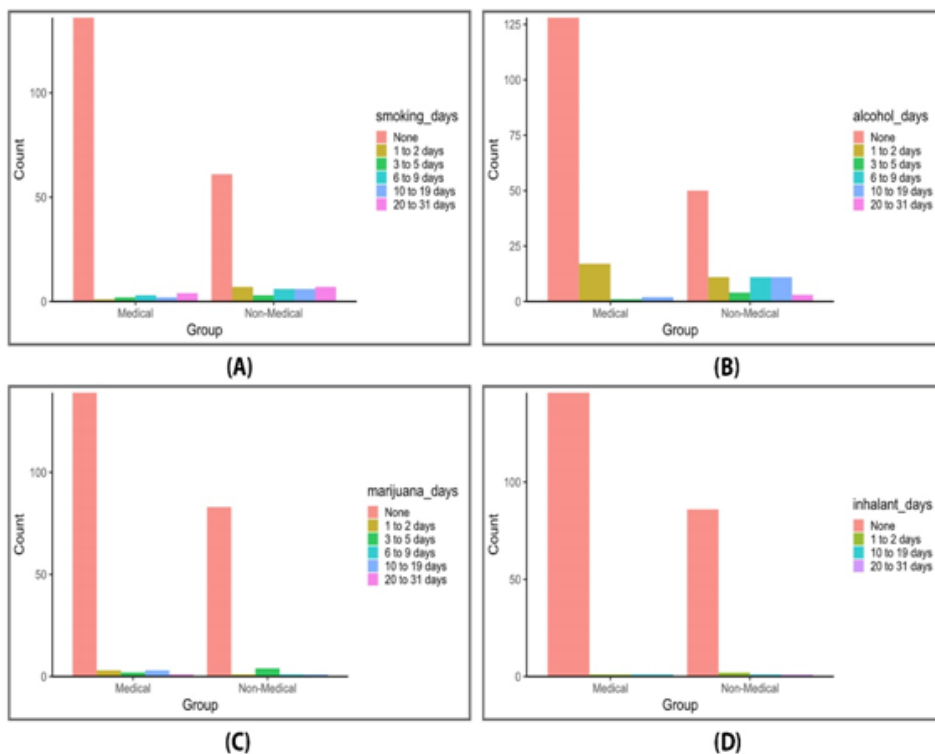


Fig 1 — Number of students with frequency of substance use in last 30 days: (A) Smoking Tobacco, (B) Alcohol, (C) Marijuana and (D) Inhalant

Substance	Medical N = 148	Non-Medical N = 90	p-value
Any Substance use	28 (19%)	46 (51%)	<0.001 <sup>1</sup>
Tobacco (Smoking)	12 (8.1%)	29 (32%)	<0.001 <sup>1</sup>
Alcohol	20 (14%)	40 (44%)	<0.001 <sup>1</sup>
Marijuana	9 (6.1%)	7 (7.8%)	0.610 <sup>2</sup>
Inhalant	2 (1.4%)	4 (4.4%)	0.203 <sup>2</sup>
Any Other substance	0 (0%)	4 (4.4%)	0.020 <sup>2</sup>
Statistical Tests Used :			
<sup>1</sup> Pearson's Chi-squared test; <sup>2</sup> Fisher's exact test			

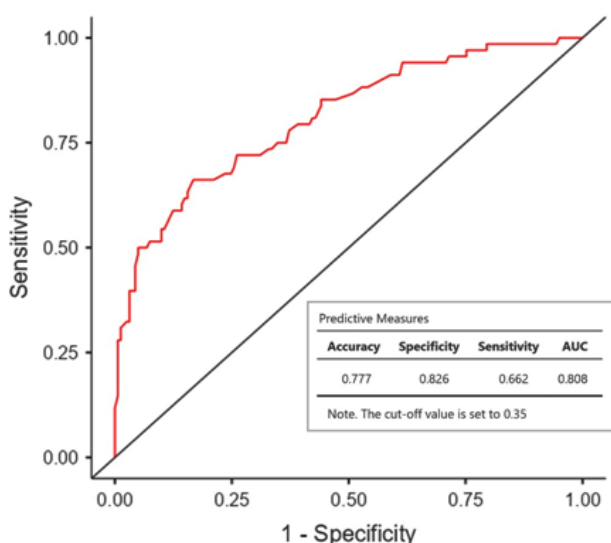


Fig 3 — ROC Curve of Logistic Regression model (AUC = 0.808)

Overall Accuracy of the model was 0.777 with Sensitivity of 0.66 and Specificity of 0.826. ROC curve of the model (AUC = 0.808). Receiver Operator Characteristic (ROC) curve was constructed to demonstrate the true positive rate against the false positive rate. ROC curve of the model (AUC = 0.808) (Fig 3).

**DISCUSSIONS**

Drug abuse is a global concern, and the younger generation are the most vulnerable to fall in its clutches. Substance abuse has grown its roots down to all the professions, age groups and gender, be it medical students who have an idea of its ill effects or no-medical ones who are not that enlightened about it. In our study, the average age was found to be 20 to 24 in the two groups which

almost corresponds to that of Nasirzadeh, *et al* in which it was found to be 25.04±3.29 in a study group of population aged 18 to 29 in the year 2013<sup>13</sup>. Nasirzadeh, *et al* also included the educational qualifications of drug users to shed a light on the effect of education and knowledge to aware people of its consequences and it simulates with our research since we have included study groups pursuing undergraduate courses. Another study by Gupta, *et al* showed that maximum students (53.5%) of study population in their study were alcohol abusers followed by smoking whereas our study shows similar kind of pattern<sup>12</sup>. Gupta, *et al* included only male students where our studies differed since both the colleges from which we included our study population were co-educational institutions. Their study also included other factors like parent's occupation, familial addiction, and perceived reason of substance abuse etc. but unfortunately it could not be included in our study because of limitation of time and resources. Similar pattern of high alcohol dependency has also been shown in study by Rai D, *et al* having up to 90% current alcohol abuse in Western countries which much higher than in students of Indian subcontinent and proposed it might be mostly due to western influence in our country<sup>14</sup>. They also concluded that in UK, Medical Schools Council (MSC) and General Medical Council (GMC) have overseen the development of guidance towards medical students and unfortunately there is still no clear provision in Indian medical school system to positively rehabilitate impaired students and physicians<sup>14</sup>. But in simulation with studies of both Rai D, *et al* and De Debasmita, *et al* it can be safely concluded that male dominance is there in almost all college going students addicted to

Model Coefficients – Substance Use							
						95% Confidence Interval	
Predictor	Estimate	SE	Z	p	Odds ratio	Lower	Upper
Age (+1 year)	0.419	0.0983	4.263	<0.001	1.520	1.254	1.84
<b>Gender : (Reference – Female)</b>							
Male	0.904	0.3872	2.336	0.020	2.471	1.157	5.28
Other	1.285	1.4911	0.862	0.389	3.615	0.195	67.20
<b>Home location : (Reference – Rural)</b>							
Urban-Rural	0.806	0.5060	1.592	0.111	2.238	0.830	6.03
<b>Annual Income: (Reference – Less than 2.5 Lakh)</b>							
2.5- 5 L	0.560	0.5742	0.975	0.330	1.750	0.568	5.39
5 - 10 L	-0.213	0.5496	-0.387	0.699	0.808	0.275	2.37
>10 L	1.450	0.4967	2.918	0.004	4.261	1.610	11.28
Don't know	1.265	1.0354	1.222	0.222	3.543	0.466	26.96
<b>Group : (Reference – Medical)</b>							
Non-Medical	0.951	0.4052	2.346	0.019	2.587	1.169	5.72

drugs, especially alcohol and smoking and is even consistent with other reports from India<sup>1,14</sup>. Our study also corroborates with Gupta, *et al* that non-medicos are more inclined to drug abuse than medical students and it strengthens our hypothesis that the knowledge of drug and its harmful effects curb the expectancy of getting addicted.

**Limitations of the study :** Further study of drug abuse patterns in eastern India and North-East (where injectables are more common) is needed to get an idea of its prevalence among the youngsters of India and to recognize and identify the important determinants so as to nip it in the bud. Also, the study sample of the two populations had much differences which might fail to give a clearer idea. Leading questions were also unavoidable since it was done on online basis based on google forms.

### CONCLUSION

The study findings have exposed that the non-medicos are more prone to the abuse than medicos, though the latter are not totally immune to the effects of addiction. This is a major public health concern. Further research has to be done in eastern India to know about the professional courses and even the post-graduation courses and to identify the determinants and risk factors.

**Ethical Clearance :** Taken from institutional ethics committee

**Source of Funding :** Nil

**Conflict of Interest :** Nil

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