

Association between Smoking and Undiagnosed Depression in Medical Students in a Tertiary Care Hospital in North India

Atreyo Chakraborty

Junior Resident, Department of pharmacology, All India Institute of Medical Sciences, (AIIMS), Virbhadra Marg, Rishikesh, Uttarakhand

Abstract: ***Background:** Smoking in medical students is a phenomenon with tremendous implications both for themselves and for society. Smoking is associated with depression. But whether such associations remain valid for medical students or not is not known. Studies are scarce investigating this association among medical students. With this aim I investigated the association between smoking and depression among medical students. **Methods:** A Cross sectional observational study was conducted where consenting medical students of 1st, 2nd, 3rd professional students and interns were administered a questionnaire about smoking status in them. A separate questionnaire about depression (Beck's depression rating inventory) was administered. Results were analyzed using statistical methods. **Results:** About 9.55% of the students currently smoked and a further 1.54% past smokers. 3.65% were moderately depressed, 1.69% severely depressed and 1.12% had extreme depression. Smoking was significantly associated with male sex, being a day scholar and most importantly, undiagnosed depression. **Conclusion:** Undiagnosed depression is significantly associated with smoking habit in medical students. Urgent screening of medical students for undiagnosed depression is warranted.*

Keywords: Smoking, medical, students, depression

1. Introduction

Cigarette smoking is a social bane that has been associated with a myriad of disorders ranging from Obstructive lung disease to Lung carcinoma. It has also been linked to a shortened life expectancy.

Of the many associations of smoking, Major Endogenous Depression is one of the most significant risk factors [1]. There have been a multitude of studies examining the association between smoking and depression [2]. Depression has been identified as a risk factor for both smoking initiation and transitioning into daily smoker. However, depression often remains undiagnosed, chiefly owing to the social stigma associated with psychiatric disease in India and many people hesitate to seek treatment even though they are depressed. Depression is an ice berg disease with a large chunk of population remaining undiagnosed.

However, literature regarding the association between smoking habits and undiagnosed depression in medical students is sparse. Medical students face higher depression rates as compared to general public and depression rates range from 21.5% to 12.7%. [3]. Many students also show sustained high scores [3], indicative of depression. Smoking rates among Indian medical students in some metropolis has already reached between 3.5% to 8.9% [4]

Whether this translates into high rates of smoking among medical students is not known. With this background, we investigated the association between smoking and depression among medical students.

2. Review of Literature

Studies documenting cigarette smoking among medical students are rare in India. A cross sectional study conducted

in Bangalore city in South India reported a rate of 3.5% in 2007 to 8.9% in 2013. It is worth noting that there was no statistically significant change in smoking rates from 2007 to 2013. [4]. Also the authors did not investigate the role of depression in smoking.

A similar cross sectional study conducted in Kosovo found that the prevalence of students who have ever smoked was 53.2%. However, only 8.9% (9.1% M vs. 8.7% F) of the general medicine students and 5.8% (4.8% M vs. 6.5% F) of dentistry students declared that smoke tobacco every day. [5]

Kutlu R et al found smoking to be significantly related to depression in first year medical students. [6].

Megh Fluharty et al conducted a review of 148 studies and found depression to be significantly related to smoking. However the direction of this correlation was not known. [7] A study conducted in Riyadh, Saudi Arabia showed Prevalence of depression, anxiety, and stress was high (43%, 63%, and 41%, respectively) before academic examination which reduced (to 30%, 47%, and 30%, respectively) to some extent after examinations. What is more interesting is the fact that Smoking and female sex predicted higher levels of "baseline" depression, anxiety, or stress. [8]

Problem Definition

- 1) To assess the sociodemographic profile of the students and Internees of Calcutta National Medical College.
- 2) To find out the magnitude of smoking among them.
- 3) To assess the levels of depression among them.
- 4) To determine the association of smoking with depression in the students and Internees if any.

3. Materials and Methods

Study Type: Observational and descriptive study.

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Study Design: Cross Sectional.

Place of study: A tertiary care hospital in North India (Uttarakhand)

Study Duration: 2 months

Study population: Medical Students and Interns enrolled in the institution

Sampling

All the students and internees who satisfied the Inclusion and Exclusion criteria were considered.

1. Inclusion criteria

- The students of 1st Professional MBBS course admitted in the year 2017 of the Institute
- The students of 2nd Professional MBBS course admitted in the year 2016 of the Institute
- The students in 3rd Professional part I MBBS course admitted in the year 2015 of the Institute
- Interns

2. Exclusion criteria

- Students who declined to give consent were left out.
- Students who have ever been diagnosed with "Depression" in their lifetime, were left out.

3. Sample size: 100 subjects in each of the above mentioned three batches. Out of the 400 students and interns, 44 did not meet the inclusion criteria and were left out. Thus the total sample size was 356.

Study Tools:

- A predesigned and pretested written questionnaire containing questions regarding sociodemographic profile and regarding smoking type, duration etc.
- Beck's Depression rating scale
- B G Prasad Socio-Economic scale, 2017

Technique:

- Topic selection and literature review.
- Ethical Committee approval was sought.
- Preparation of the questionnaire.
- Pretesting of the Questionnaire on ten students of 2nd MBBS batch and necessary correction.
- Consent form was given to each student to get their consent.
- Data collection by written questionnaire method after obtaining the consent.
- Results were analyzed using Microsoft Excel XP and EPI info 7 Software and various statistical methods and represented by charts, diagrams and tables.
- Quality Control:**
 - The questionnaire was verified by three experts of Community Medicine department of the College
 - To maintain confidentiality, the questionnaire was anonymous.
 - Depression was assessed by Standardized scale (Becks Depression Rating scale).

1) Study Variables

- Prevalence of Smoking

- Influence of Depression (if any) on smoking

- Sex and its influence

- SocioEconomic status its influence

- Influence of Surrounding of the student (that is home or hostel as applicable)

Statistical Analysis

The results were analyzed using software EpiInfo 7. Chi square test was used to assess significance between smoking and depression and other variables.

4. Results

4.1 Socio-demographic Profile Analysis

The results were analyzed and the following show the characteristics of our study population.

Table 1: Demographic Profile of students (N = 356)

<i>Age (in years)</i>	<i>Frequency</i>	<i>Percent</i>
18 – 20	116	32.58%
21 – 23	114	32.02%
24 – 26	124	34.83%
27 – 29	2	0.56%
Total	356	100%
<i>Sex</i>	<i>Number (%)</i>	<i>Percent</i>
Male	203	57.02%
Female	153	42.98%
Total	356	100%
<i>Religion</i>	<i>Frequency</i>	<i>Percent</i>
Hinduism	309	86.80%
Islam	35	9.83%
Christianity	8	2.25%
Buddhism	2	0.56%
Jainism	2	0.56%
Total	356	100%
<i>Residence</i>	<i>Number</i>	<i>Percent</i>
Day Scholar	136	38.20%
Hostel	191	53.65%
Rented Room	29	8.15%
Total	356	100%
<i>Socioeconomic group (*)</i>	<i>Number</i>	<i>Percent</i>
1	321	90.17%
2	20	5.62%
3	9	2.53%
4	6	1.69%
Total	356	100%

- * = Assessed by Modified BG Prasad scale, 2016.

The study revealed age range between 18 – 29 years with maximum participation between 24 – 26 years age group, and a male dominance (57%). As expected, majority of the population followed Hinduism but with all most all the major religions followed in India represented in the study group. Hostel accommodation was the dominant mode of residence with day scholars, presumably residing in nearby city areas constituting only 38% of the population. Majority of the population came from well to do family (BG Prasad class 1)

4.2 Depression Analysis

Table 2: Prevalence of Depression among medical students and interns as assessed by Becks depression rating inventory (N = 356)

Beck Score	Interpretation	Frequency	Percent (Of total population)
0 – 10	No depression	264	74.16%
11 – 16	Mild mood disturbance	58	16.29%
17 – 20	Borderline Depression	10	2.81%
21 – 30	Moderate Depression	13	3.65%
31 – 40	Severe Depression	7	1.97%
41 & above	Extreme Depression	4	1.12%
Total		356	100%

Our study revealed majority of the students were NOT depressed but 3.65% students experiencing Moderate and 1.97% students experiencing severe depression.

Smoking related Habit Analysis

Table 3: Distribution of Population according to their smoking habits (N = 356)

Smoking Habit	Number	Percent
Current	34	9.55%
Past	4	1.12%
Never	318	89.33%
Total	356	100%

Smoking habit was low, with 89.33% reporting to have “Never smoked”. There were 4 past smokers, of whom 2 had quit more than 2 years ago.

Table 4: Association of smoking with sex (N = 356)

Sex	Present	Past	Never	Total
Male	32 (15.76%)	3 (1.48%)	168 (82.76%)	203 (100%)
Female	2 (1.31%)	1 (0.65%)	150 (98.04%)	153 (100%)
TOTAL	34	4	318	356

Table 5: Distribution of the study population showing the association of Smoking with current place of staying (N = 356) Smoking

Place of Staying	Current	Past	Never	Total
Day Scholar	21 (15.44%)	3 (2.21%)	112 (82.35%)	136 (100%)
Hostel	11 (5.76%)	1 (0.52%)	179 (93.72%)	191 (100%)
Rented	2 (6.90%)	0 (0.00%)	27 (93.10%)	29 (100%)
TOTAL	34	4	318	356

The association between smoking and place of staying was significant as shown by the Chi squared test having a value of 11.76 for $p < 0.01$. The day scholars had significantly higher rate for smoking.

Table 6: Association between Depression and smoking: (N = 356)

Beck Score	Smoking Curently (%)	Smoked Past (%)	Never Smoked (%)	Total
0 – 10	18 (6.82%)	2 (0.76%)	244 (92.42%)	262 (100%)
11 -16	4 (6.90%)	0 (0%)	54 (93.10%)	58 (100%)
17 – 20	3 (30%)	0 (0%)	7 (70%)	10 (100%)
21 – 30	4 (30.77%)	0 (0%)	9 (60.23%)	13 (100%)
31 – 40	1 (14.29%)	2 (28.57%)	4 (57.14%)	7 (100%)
>40	4 (100%)	0 (0%)	0 (0%)	4 (100%)
Total	34	4	318	356

The Association between depression and smoking was **Significant** for Chi Square value = 101.3998 for $p < 0.05$. The association remained significant ($p < 0.05$) even after adjusting for potential confounders, gender and socioeconomic status.

Other significant associations of smoking were being **male** ($p < 0.001$) (vide Table 3) and being a **day scholar** ($p < 0.01$). While most smokers belonged to BG Prasad SES class 4, there was **NO statistically significant association between SocioEconomic scale and smoking status**. (Chi square value = 7.88838 for $p > 0.05$)

5. Discussion

Our study population consisted of 57.02% males in the age group of 18 to 29 years. This was slightly lower than that reported in a study in Kolkata.[9]. (Vide Table 1) But our study differed in the fact that the authors of the above mentioned study found 65.5% of the study population in the age group of 20 – 23 years, whereas we found students more equitably distributed across all age groups from 18 to 26 years. This could be due to the fact that we did our study according to the year of course and there were 100 students enrolled in each of 1st Professional, 2nd Professional, 3rd Professional and Internship.

Smoking was found in 9.55% of the study population currently (vide table 2). A study in South Indian medical undergraduate students found that the rate of smoking was 22.4% [10]. Our study found much lower rates. It could be attributed to the fact that the said study took place in South India, whereas our study was in Northern India. Cultural influences should also be taken into account. Our study took place in 2018, whereas the South Indian study took place in 2009. There could have been changes in the smoking behaviour in the meantime.

The reason why depression is so significantly associated with smoking is very difficult to explain. It could be both causal as well as an associated factor.

This study found smoking was associated **significantly** with being Male (Chi square value = 21.899 at $p < 0.0001$) The male predominance in our study can be explained by the cultural norms found in India, where it is customary and more usual for males to smoke than females. Role modelling by fathers might also play an important role. Female smoking is considered unacceptable in India and hence the lower prevalence among them in this study.

Being a day scholar (Chi Square 11.7656 for $p < 0.01$),) was also **Significantly** associated.

This might be related to easier access to cigarettes and more access to money at home than for hostel dwellers where one is under surveillance by authorities 24 hours a day.

It was also highly correlated with Depression (Chi square = 101.3998 at $p = 0$) (vide Table 3). Those having a score of 41 and above had a very high chance of Smoking (100% prevalence of smoking in that group).

It was however NOT significantly associated with Socioeconomic status as assessed by modified BG Prasad Scale. (Chi square value = 7.88838 for $p > 0.05$) However, most smokers belonged to Class 4 BG Prasad Scale. (33.33%).

6. Conclusion

Undiagnosed depression was very strongly associated with smoking in medical students in Northern India, as was male sex and being a day scholar. A comprehensive screening strategy for depression is recommended to protect these budding health care professionals from themselves falling a prey to this social evil called smoking.

7. Future Scope

This study demonstrated the link between depression and smoking in medical students. However the sample size was relatively small and more studies are needed to ascertain if this relationship holds true across all parts of India. Moreover, whether undiagnosed depression is also linked to other substance abuse, such as volatile substance abuse, alcoholism and opioid abuse remains to be seen. More studies are needed in this field.

More studies are recommended to find out if this association between Undiagnosed depression and smoking is causal or not.

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Author Profile



Dr Atreyo Chakraborty has been working as a Junior Resident in AIIMS, Rishikesh. He was a batch topper in his undergraduate courses in Calcutta, India. His areas of interest include public health, substance abuse problems, and mental health.