

# Knowledge and Awareness of Smoking Effects and Its Cessation Methods among Medical Students in Telangana: A Questionnaire Study

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## ABSTRACT

**Aim:** To assess the knowledge and awareness of smoking-related health risks and smoking cessation methods among medical students in Telangana, India.

**Materials and methods:** A cross-sectional study was conducted in two medical colleges and a self-designed questionnaire consisting of 14 questions was deployed to 455 medical students in their 1st (52%), 2nd (24%), and 3rd years (24%) of study. Except for questions about age, sex, and education which were open-ended, the rest of the 11 questions were categorized into basic knowledge, effects of smoking on different systems, and awareness of cessation methods, and were close-ended with yes/no responses. These responses were analyzed using descriptive statistics.

**Results:** The study found that, on average, medical students were well aware of the risks of tobacco smoking on cancer incidence (98.96%), chronic obstructive pulmonary disease (COPD) (98.33%), immune system (95.66%), fetus development (98%), and mental health (96%). However, knowledge concerning its potential impacts on gastritis (77%), cataract formation (58%), and metabolic diseases like diabetes (61%) was poor. Furthermore, participants had only limited knowledge about smoking cessation methods like counseling (66.30%), and nicotinic drugs (66.83%). Furthermore, participants had poor knowledge of smoking cessation aids such as nonnicotinic drugs (29.28%), telephonic support (20.66%), and mobile applications (24.75%). The 1st-year students had the overall lowest levels of knowledge, while 3rd-year students had higher knowledge levels of all smoking cessation methods.

**Conclusion:** The present study highlights the need for further educational programs among medical students. Including specific modules on tobacco in the medical curriculum can have a potential impact. In particular, efforts should be made to increase awareness of smoking cessation methods for actionable.

**Clinical significance:** Increasing awareness about tobacco and its detrimental effects among medical students, clinicians, and healthcare workers can significantly improve tobacco control at a national scale.

**Keywords:** Awareness, Cessation methods, Medical students, Smoking, Tobacco.

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## INTRODUCTION

Tobacco use remains a significant global problem and is responsible for the death of nearly 8.71 million individuals annually, with 1.2 million of those deaths attributed to second-hand smoke exposure.<sup>1,2</sup> Furthermore, a significant fraction of tobacco users live in low-middle income countries. According to the World Health Organization (WHO) fact sheet updated in 2018, tobacco accounts for >1 million deaths each year in India.<sup>3</sup>

As per recent evidence, tobacco and its smoke contain as many as 950,0 chemicals, of which approximately 83 are well-established International Agency for Research on Cancer-classified carcinogens.<sup>4</sup> Tobacco use is a well-known risk factor for numerous noncommunicable diseases, including (and not limited to) cancer, cardiovascular diseases (like ischemic heart disease, atherosclerosis, and hypertension), cerebrovascular diseases, chronic lung diseases, diabetes, and stroke, as well as adverse reproductive outcomes such as abortions, ectopic pregnancy, infertility, and erectile dysfunction.<sup>5,6</sup> Other health implications of smoking tobacco include cataract formation, early vision loss, and gastrointestinal inflammatory diseases like gastritis.<sup>7</sup> Smoking can negatively impact mental health, leading to conditions such as attention-deficit/hyperactivity disorder and memory decline.<sup>8,9</sup> Smoking has been associated with accelerated

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cortex thinning, a biomarker of general cognitive decline frequently observed in aging.<sup>9</sup>

According to the Global Adult Tobacco Survey (GATS) conducted between 2009–2010 (GATS-1) and 2016–2017 (GATS-2), only 6% (modest) reductions in tobacco use occurred. When the smoker's data is compared, there was only a 23.57% relative reduction

**Table 1:** Self-designed questionnaire deployed to the medical students

Q1	Age
Q2	Sex
Q3	Education
Q4	Based on your knowledge, does smoking cause serious illness (yes/no)
Q5	Do you know that tobacco is a concoction of >5,000 chemicals (yes/no)
Q6	Do you know what is passive smoking (or second-hand smoking) (yes/no)
Q7	Do you know that passive smoking causes significant health effects (yes/no)
Q8	Do you know that smoking causes >10 types of cancers
Q9	Do you know that smoking causes (yes/no)
	(1) COPD (yes/no)
	(2) Gastritis (yes/no)
	(3) Cataract (yes/no)
	(4) Diabetes (yes/no)
Q10	Do you know that smoking can negatively impact the immune system (yes/no)
Q11	Do you know that smoking could affect the baby if the mother smokes during pregnancy (yes/no)
Q12	Do you know that smoking could negatively impact health (causing anxiety, memory issues, low intelligence quotient, poor learning and retention, and attention deficit)? (yes/no)
Q13	Do you know about smoking cessation methods (yes/no)
Q14	Which of these smoking cessation aids are you aware of?
	Counseling at a cessation clinic (yes/no)
	Nicotine replacement therapy such as patches or gums (yes/no)
	Other nonnicotinic medications (yes/no)
	Telephonic support line (yes/no)
	Mobile apps (yes/no)

from 14 to 10.7%. Furthermore, the GATS-2 data indicates a nearly threefold elevated use of tobacco in rural places (199 million) compared to urban (68 million) areas. The youth data has shown a 33% relative reduction from 18.4 to 12.4% and therefore remains a potentially targetable population.<sup>10-12</sup>

Medical students are particularly vulnerable to developing unhealthy habits, given that they belong to the age-group with the highest prevalence of tobacco use. Moreover, medical students form the backbone of the healthcare system, as they are responsible for providing health education and awareness to patients, and the general public. As such, it is essential to evaluate the awareness of smoking-related health risks and available cessation methods among medical students. Against this backdrop, the present study was conducted to assess the knowledge and awareness of smoking-related health risks, and cessation methods among medical students from two medical colleges in Telangana state, India.

## MATERIALS AND METHODS

This questionnaire study was conducted in two medical colleges, namely Malla Reddy Institute of Medical Sciences and Malla Reddy Medical College for Women, located in Hyderabad, Telangana, India, after obtaining permission from the institute authorities. Printed

forms of a self-designed questionnaire consisting of 14 questions (Table 1) were distributed to medical students in-person during the 1st, 2nd, and 3rd years of study in September 2022. The 14 questions were prepared with the aim to unravel awareness about smoking and it was not based on other published questionnaires. Of the 14 questions included in the self-designed questionnaire, questions one, two, and three were open-ended and collected information on age, sex, and education. The remaining 11 questions were close-ended and required a yes/no response. Of these 11 questions, four were designed to assess basic knowledge about smoking (questions 4-7), five questions were related to knowledge about smoking effects on different systems (questions 8-12), and two questions were related to smoking cessation methods (questions 13-14). Prior to the survey, participants were briefed about the questionnaire's contents and the study's objectives, and participants' identities were kept anonymous. A total of 455 medical students completed the survey. Data pertaining to yes/no responses were collected and entered into a Microsoft Excel spreadsheet, and descriptive analyses were performed. The results were presented in the form of tables and interpreted. Incomplete forms with more than one answer marked were considered for evaluation.

## RESULTS

### Demographic Data

Out of the 455 medical students who participated in the survey, 238 (52%) were 1st-year students, 108 (24%) were 2nd-year students, and 109 (24%) were 3rd-year students. Of the total sample, 398 (87.5%) were females and 57 (12.5%) were males. The age range of participants in our medical student survey was 17-23 years. While one participant was 17-year-old, 43 (9.5%) were 18 years, 126 (27.7%) were 19 years, 153 (33.6%) were 20 years, 101 (22.2%) were 21 years, 27 (5.9%) were 22 years, and four (0.9%) were 23 years. Most participants fell in the 19-21-year age-group, with a total of 380 students, accounting for approximately 83.5% of the total sample. The number of participants gradually decreased with increasing age beyond 21-year-old, with only a small number of students over 22.

### Awareness of Tobacco and Smoking Effects on Different Systems

The student's awareness of the basic information about tobacco and smoking effects was reported as follows—98.7% (n = 235) of 1st-year students, 99% (n = 107) of 2nd-year students, and 99% (n = 108) were aware that smoking caused significant illness. Around 76% (n = 182) of 1st-year students, 71% (n = 77) of 2nd-year students, and 73.4% (n = 80) of 3rd-year students were aware that tobacco contains about 5,000 chemicals. Furthermore, 76.4% (n = 182) of 1st-year students, 84% (n = 91) of 2nd-year students, and 90.8% (n = 99) of 3rd-year students were aware of passive smoking. The awareness of the health risks associated with smoking was high among the students, with 77% (n = 183) of 1st-year students, 82.4% (n = 89) of 2nd-year students, and 91.7% (n = 100) of 3rd-year students knowing that passive smoking causes significant health effects.

The student's awareness of various health effects associated with smoking was reported as follows—80.87% were aware of its association with cancers, 98.24% of COPD, 74.27% of gastritis, 55.59% of cataracts, and 57.32% of diabetes mellitus. The 3rd-year medical students had better awareness compared to their junior colleagues. These findings suggest that the medical curriculum may contribute to increasing students' awareness of smoking-related



health risks. Additionally, 95.4% (n = 434) of the students were aware that smoking negatively impacts the immune system, 98.22% (n = 446) knew that smoking could affect the baby when pregnant mothers smoke, 96.48% (n = 439) were aware that smoking leads to mental health (anxiety, memory issues, low IQ, poor learning and retention, and attention deficit) (Table 2).

**Awareness of Smoking Cessation Methods**

In the 1st-year, 63% of participants were aware of smoking cessation methods, while 78.7% in the 2nd-year, and 88.1% in the 3rd-year were aware of them. When asked about specific cessation aids, 65% of 1st-year students, 72% of 2nd-year students, and 86% of 3rd-year students were aware of counseling centers. Similarly, 64% of 1st-year students, 73% of 2nd-year students, and 87% of 3rd-year students were aware of nicotine replacement therapy, while 37% of 1st-year students, 31% of 2nd-year students, and 64% of 3rd-year students were aware of nonnicotinic drugs. In terms of telephonic support lines, 25% of 1st-year students, 25% of 2nd-year students, and 48% of 3rd-year students were aware of their availability. Finally, 29% of 1st-year students, 31% of 2nd-year students, and 46% of 3rd-year students were aware of mobile applications. Overall, the 3rd-year medical students had a higher level of awareness of smoking cessation methods compared to their junior colleagues (Table 3).

**DISCUSSION**

As expected, 3rd-year medical students had better knowledge about smoking effects compared to their junior colleagues. For example, 88% of 3rd-year students were aware that smoking is a risk factor for 10 types of cancer, compared to 81% and 74% of 1st, and 2nd-year students, respectively. Similarly, 100% of 3rd-year students were aware that smoking is a risk factor for COPD, while 98 and 97% of 1st and 2nd-year students were aware of this, respectively. Furthermore, over 95% of all students were aware that smoking negatively impacts the immune system and 98% were aware that fetus growth could be affected if mothers smoke during pregnancy. Additionally, over 93% of all students knew that smoking affects mental health. Regarding the impact of smoking, our results indicate that most students were aware of the general adverse effects of smoking.

However, the present study found that nearly half of the students were unaware that tobacco is a risk factor for cataracts and metabolic diseases like diabetes mellitus. Given the commonality of these conditions, further awareness campaigns must be implemented in this domain.

Overall, our results suggest that medical students have good knowledge and awareness of the ill effects of smoking. However, there is still room for improvement, especially among junior medical students who may benefit from additional education and awareness

**Table 2:** Awareness of smoking and its effects among medical students

	1st-year students		2nd-year students		3rd-year students		Total
	Yes	No	Yes	No	Yes	No	
<i>Basic awareness of tobacco smoking</i>							
Smoking causes serious illness	235 (98.73%)	3 (1.26%)	107 (99.07%)	1 (0.92%)	108 (99.08%)	1 (0.91%)	455
Tobacco contains >5,000 chemicals	182 (76%)	56 (24%)	77 (71%)	31 (29%)	80 (73.4%)	28 (25.7%)	454
Aware of passive smoking	182 (76.4%)	56 (23.6%)	91 (84%)	17 (16%)	99 (90.8)	10 (9.2%)	455
Passive smoking causes significant health effects	183 (77%)	55 (23.1%)	89 (82.4%)	19 (17.6%)	100 (91.7%)	9 (8.3%)	455
<i>Smoking is a risk factor for</i>							
Cancer	192 (81%)	46 (19%)	80 (74%)	28 (26%)	96 (88%)	13 (12%)	455
COPD	233 (98%)	5 (2%)	105 (97%)	3 (3%)	109 (100%)	0 (0%)	455
Gastritis	160 (67%)	78 (33%)	83 (77%)	25 (23%)	95 (87%)	14 (13%)	455
Cataract	119 (50%)	119 (50%)	57 (53%)	51 (47%)	77 (71%)	32 (29%)	455
Diabetes mellitus	115 (48%)	123 (52%)	60 (56%)	48 (44%)	86 (79%)	23 (21%)	455
<i>Smoking has an impact on</i>							
Immune system	225 (95%)	13 (5%)	102 (94%)	6 (6%)	107 (98%)	2 (2%)	455
Fetus	232 (97%)	6 (3%)	105 (97%)	2 (3%)	109 (100%)	0 (0%)	454
Mental health	231 (97%)	7 (3%)	101 (93%)	7 (7%)	107 (98%)	2 (2%)	455

**Table 3:** Awareness of smoking cessation methods among medical students

Smoking cessation methods	1st-year students		2nd-year students		3rd-year students		Total
	Yes	No	Yes	No	Yes	No	
Aware of cessation methods	150 (63%)	88 (37%)	85 (78.7%)	23 (21.3%)	96 (88.1%)	13 (11.9%)	455
Counseling	157 (65%)	81 (34%)	78 (72%)	30 (28%)	94 (86%)	15 (14%)	455
Nicotinic drugs	152 (64%)	86 (36%)	79 (73%)	29 (27%)	95 (87%)	14 (13%)	455
Nonnicotinic drugs	89 (37%)	149 (63%)	33 (31%)	75 (69%)	70 (64%)	39 (36%)	455
Telephonic support	60 (25%)	178 (75%)	28 (25%)	80 (75%)	52 (48%)	57 (52%)	455
Mobile apps	69 (29%)	169 (71%)	33 (31%)	75 (69%)	50 (46%)	59 (54%)	455

programs about smoking-related risks. Counseling was the most familiar smoking cessation technique among all three groups, with awareness levels rising from 65% in 1st-year students to 86% in 3rd-year students. Nicotinic drugs are the second most well-known method, with awareness increasing from 64% in 1st-year students to 87% in 3rd-year students. Nonnicotinic drugs, telephonic support, and mobile apps are less well-known, but their awareness has increased across all three groups.

The majority of students in the present study were unaware of various smoking cessation methods. Our results suggest that orientation programs should be integrated into the medical curriculum to enhance students' knowledge of these methods. In particular, students in their 3rd-year have better knowledge than 1st and 2nd-year students, and there is an apparent increase in knowledge.

These results indicate that medical education plays a vital role in increasing knowledge and awareness of smoking cessation methods among students. It also highlights the need for continued education and promotion of all smoking cessation methods, including less well-known options such as nonnicotinic drugs, telephonic support, and mobile apps. In this context, it is worth noting that a wide range of cessation methods are currently available, ranging from counseling, nicotine replacement therapy, and nonnicotinic pharmacological agents like bupropion, varenicline, mobile applications, and other means.<sup>13,14</sup> There are also exciting studies,<sup>15</sup> and interesting hypothesis papers,<sup>16</sup> in the literature that highlights that mindfulness meditation can support smoking cessation by mitigating craving.

Low and middle-income countries like India display a maximum impact from tobacco and its products and awareness measures can go a long way. Although there are ongoing campaigns, the level of consciousness that healthcare professionals could trigger can be immense. As medical professionals, it is the duty of doctors to raise awareness among patients regarding its harmful effects and to eventually support them in quitting smoking. Medical colleges see a large volume of cases where numerous habit users visit regularly and medical professionals can thus play a critical role in influencing them to promote healthy behavior and lifestyle. If this particular group is imparted with this knowledge through workshops and seminars, there is a positive ramification for the millions of habit users in India.

A study by Boopathirajan and Muthunayanan, conducted on 400 medical students from Chennai showed that 10.9% of students had attempted to smoke cigarettes, and 34.2% reported being exposed to tobacco smoke at home. Among the students, only 23.6% claimed to have received formal training in smoking cessation methods.<sup>17</sup> Besides this article, a few other noteworthy surveys were pursued to evaluate smoking behavior among medical students in different countries. Sreeramareddy et al. conducted a cross-sectional survey on final-year medical undergraduates in Malaysia, India, Nepal, Pakistan, and Bangladesh with a total count of 922 students.<sup>18</sup> Their work revealed that a majority asked patients about their smoking habits, but only a minor fraction of students (1st/3rd) went further to counsel the patients. About 50% of students believe there is a need for a separate module for more profound education in this area.<sup>18</sup> In another study by Kabbash et al. conducted on 1715 students from the 2nd to 6th year of medicine in Egypt.<sup>19</sup> In their study around 5.6% revealed that they are smokers and 1.2% revealed smoking history.<sup>11</sup> Armstrong et al. also conducted a cross-sectional study on 174 medical students from the United States and 527 medical students from Italy.<sup>20</sup> In their study, it was observed that Italian students are

more likely to smoke compared to their American counterparts.<sup>20</sup> The present study reveals that country-specific differences do exist when it comes to smoking. This inclination for smoking could be a result of cultural influence. Furthermore, there is literature that points to the highest prevalence (23.5%) of hardcore smoking in Italians.<sup>21</sup> A relatively larger study was conducted on 604,4 Inner Mongolia medical students in China.<sup>22</sup> The prevalence rate of daily smoking was 9.8%, with a significant difference among males (29.4%) and females (1.7%).<sup>22</sup>

The limitation of the present study is that only awareness of smoking habits in the medical student population was assessed and the smoking status of students could not be explored due to the stigmatic nature of the topic. More extensive studies involving medical students, clinicians, and other health workers are warranted as they provide a deeper understanding of the knowledge levels and could highlight the knowledge gaps about smoking in the curriculum. Healthcare personnel must be bestowed with the knowledge needed to educate and the skills to treat patients enslaved to tobacco and related products. The newer innovations like mobile apps, social networks, and artificial intelligence-based models like WHO's Florence,<sup>23</sup> should also be capitalized on in our fight against tobacco.

## CONCLUSION

The study found that medical students were generally more aware of the general effects of smoking, such as its contribution to carcinogenic events and respiratory conditions like COPD. However, there was only moderate awareness about the consequences of smoking on cataract formation, gastritis, and metabolic diseases like diabetes. The reasons could be due to a lack of public health and educational campaigns about these conditions. More importantly, the present study shows suboptimal awareness about methods for smoking cessation, such as telephonic support and mobile apps. Therefore, educational programs should focus on increasing awareness about available methods for smoking cessation. As India has a large youth population, it should become a major focus of awareness programs to combat the tobacco epidemic.

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