

Self-reported Tobacco Use, Exposure to Environmental Tobacco Smoke and Behavior among Health Professional Students in Bengaluru – A Cross-Sectional Study

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Abstract

Background: There is a paucity of studies reporting the prevalence of and attitudes to tobacco usage among the health professional students in Bengaluru, using the Global Health Professional Student Survey.

Aim: To assess the prevalence of tobacco use, exposure to environmental tobacco smoke, and behavior among 3rd year Medical, Dental, Nursing, Pharmacy, and Physiotherapy undergraduate students in Bengaluru.

Materials and Methods: A descriptive cross-sectional, questionnaire-based survey was conducted among 1400 health professional students requiring a sample of 280 students from each of the disciplines of 3rd year health professional students.

Results: Although, most of the respondents have reportedly not experimented with tobacco use, some ($n = 306$, 21.9%) of the health professional students had ever experimented with cigarette smoking and reported the use of chewing tobacco ($n = 111$, 7.9%); Nearly 39% ($n = 530$) of health professional students reported that an official policy banning smoking in their college buildings and clinics was present in their colleges. Three-fourths ($n = 1062$, 75.9%) of the health professional students agreed that health professionals who smoke and use other tobacco products are less likely to advise patients to stop smoking.

Conclusion: The use of both smoking and chewing forms of tobacco is prevalent among health professional students in Bengaluru. Therefore, it is necessary to promote effective cessation programs to reduce tobacco use among healthcare students.

Key words: Cross-sectional survey, Health professional students, Tobacco use

BACKGROUND

The Global Health Professionals Student Survey (GHPSS) was developed to track tobacco use among 3rd-year Dental, Medical, Nursing, and Pharmacy students across countries.^[1] Data from the Dental (2005), Medical (2006), Nursing (2007), and Pharmacy (2008) GHPSS conducted in India showed a high prevalence of tobacco use and a general

lack of training by health professionals in patient cessation counseling techniques.^[1] Hardly any studies have been done to assess the prevalence of and attitudes to tobacco usage among the health professional students in India using the GHPSS. This vast knowledgeable pool of manpower can be utilized to provide tobacco cessation services in future. The Ministry of Health and Family Welfare could use this information to monitor and evaluate the existing tobacco control program effort in India as well as to develop and implement new tobacco control program initiatives.

As a first step in this direction, it is important to assess the prevalence of and attitudes to tobacco use among health professional students in India. In order to fill the gap in knowledge in this regard, a study was carried out to assess the prevalence of tobacco usage, exposure to environmental

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tobacco smoke, and behavior among health professionals, i.e, Medical, Dental, Nursing, Pharmacy, and Physiotherapy students in Bangalore, based on the GHPSS methodology.

MATERIALS AND METHODS

A descriptive cross-sectional questionnaire-based study, based on the methodology of the GHPSS was carried out during May-August 2015, with due ethical clearance, among 3rd year undergraduate degree students of Medical, Dental, Nursing, Pharmacy, and Physiotherapy teaching institutions affiliated to the Rajiv Gandhi University of Health Sciences in Bangalore, during regular class hours. An anonymous, self-administered GHPSS core questionnaire with India-specific questions was used which consisted of questions regarding demographics, the prevalence of cigarette smoking and other tobacco use, knowledge and attitudes about tobacco use, exposure to secondhand smoke, desire for smoking cessation, and training received regarding patient counseling on smoking-cessation techniques, which required only 30–40 min to administer and who were present on the day of data collection and willing to provide informed consent were included in the study.

Sampling Technique

Multistage sample design with colleges selected proportional to enrollment size. All students in the 3rd year of the undergraduate course in the selected colleges were eligible for participation.

Sample Size Determination

Sample size had been calculated using a precision level of ±10%. The estimated total sample size (based on a 25% prevalence of tobacco usage among third and final year dental students in a study carried out in Jaipur^[2] and 20% non-response) was 1400 health professional students, requiring a sample of 280 students from each of the disciplines of 3rd year Medical, Dental, Nursing, Pharmacy, and Physiotherapy undergraduate degree courses. The sample size had been calculated using the formula:

$$n = \frac{z^2(1-\alpha \div 2)(1-p)}{E^2p}$$

Statistical Analysis

Data were analyzed using SPSS software version 21.0. Descriptive and inferential analysis was performed using frequency tables for categorical variables.

RESULTS

A total of 1400 respondents participated in the study, among them female and male health professional students

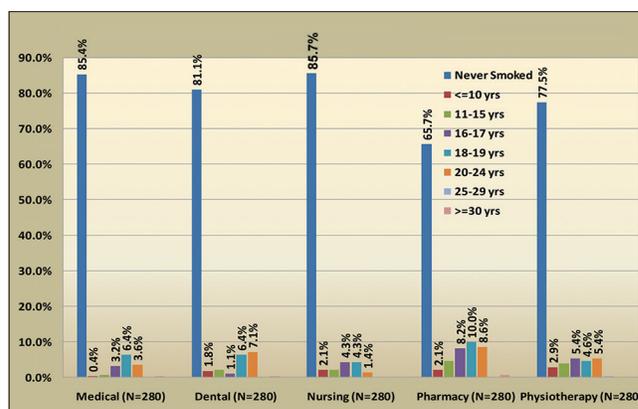


Figure 1: Distribution of health professional students age at first use of cigarette by professional

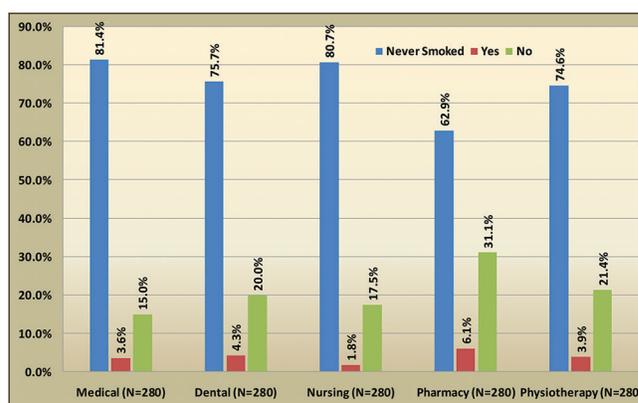


Figure 2: Distribution of number of health professional students who smoked cigarettes on college premises/property the past year by professional

were 901 (64.4%) and 499 (35.6%), respectively. Majority of respondents were in the age group of 19–24 years. From each faculty 280 (20%) health professional students were participated in the study.

Tobacco Use Prevalence

Majority ($n = 1094$, 78.1%) of the respondents have reportedly not experimented with cigarette smoking. Of the minority ($n = 306$, 21.9%) of health professional students who had experimented with cigarette smoking, the greatest percentage ($n = 98$, 7.0%) were from Pharmacy students and least percentage were from Medical students ($n = 44$, 3.4%). Among health professional students who reported their age at first use of smoking, the majority belonged to the 18–19 years age group. However, only about two percent ($n = 2$) of the respondents have reportedly used cigarettes at age ten or younger and among them, most respondents were from Physiotherapy courses ($n = 64$, 4.5%); Health professional students who reported the number of days when cigarettes were smoked by them in the last month (30 days), only two percent ($n = 21$) of students reported that they had smoked on all 30 days of the past month [Figure 1 and Table 1].

Table 1: Distribution of health professional students who had ever tried or experimented with cigarette smoking, even one or two puffs

Faculty	Q1		Total	X ² value	P-value
	Yes	No			
Medical	44 15.7%	236 84.3%	280 100.0%	40.583	<0.001
Dental	54 19.3%	226 80.7%	280 100.0%		
Nursing	46 16.4%	234 83.6%	280 100.0%		
Pharmacy	98 35.0%	182 65.0%	280 100.0%		
Physiotherapy	64 22.9%	216 77.1%	280 100.0%		
Total	306 21.9%	1094 78.1%	1400 100.0%		

Table 2: Number of health professional students who smoked cigarettes on college premises/property during the past year

Faculty	Q4			Total	X ² value	P-value
	Never Smoked	Yes	No			
Medical	228 81.4%	10 3.6%	42 15.0%	280 100.0%	35.125	<0.001
Dental	212 75.7%	12 4.3%	56 20.0%	280 100.0%		
Nursing	226 80.7%	5 1.8%	49 17.5%	280 100.0%		
Pharmacy	176 62.9%	17 6.1%	87 31.1%	280 100.0%		
Physiotherapy	209 74.6%	11 3.9%	60 21.4%	280 100.0%		
Total	1051 75.1%	55 3.9%	294 21.0%	1400 100.0%		

Use of Tobacco Products on College Premises/Property

Only a small percentage of those who smoked cigarettes ($n = 55$, 3.9%) reported to have had smoked on college premises or property during the past year and these students belonged to Pharmacy ($n = 17$, 6.1%) and Dental ($n = 12$, 4.3%) disciplines. More number of male health professional students ($n = 41$, 8.2%) had smoked on college premises or property during the past year as compared to female health professional students ($n = 14$, 1.6%) ($P < 0.001$) [Figure 2 and Table 2].

Majority ($n = 1288$, 92%) of health professional students reportedly did not use any of the chewing forms of tobacco. Among the health professional students who reported the use of chewing tobacco ($n = 111$, 7.9%), highest percentage ($n = 34$, 12.1%) belonged to Pharmacy and least percentage ($n = 11$, 3.9%) belonged to Medical science. Ten percent of male health professional students ($n = 50$, 10%) reported that the use of chewing tobacco

as compared to female health professional students ($n = 61$, 6.8%).

More than ninety-six percent ($n = 1348$, 96.3%) of health professional students reportedly did not use any of the chewing forms of tobacco in the last 1 month, before the day of data collection. Among the Health professional students who reported the use of chewing tobacco on all the 30 days ($n = 4$, 3%), only a small percentage of health professional students ($n = 1$, 0.4%) reported belonged to Medical, Nursing, Pharmacy, and Physiotherapy discipline.

About eighty three percent ($n = 1164$, 83.1%) of health professional students reportedly did not use any chewing forms of tobacco on college premises or property during the past year. Among the health professional students who reported the use of chewing tobacco ($n = 29$, 2.1%); highest percentage ($n = 9$, 3.2%) belonged to the Physiotherapy and least percentage ($n = 3$, 1.1%) belonged to Nursing discipline. Nearly about five percent of male health professional students ($n = 24$, 4.8%) reported the use of chewing tobacco on college premises or property during the past year was more as compared to the female health professional students ($n = 5$, 0.6%) ($P < 0.001$).

Environmental Tobacco Smoking

Majority ($n = 929$, 66.1%) of health professional students reported that people never smoked where they live, i.e., in the presence of the health professional students. Among the health professional students who reported that people smoked on all 7 days ($n = 164$, 11.7%), the highest percentage ($n = 56$, 20.0%) belonged to the Pharmacy and least percentage ($n = 21$, 7.5%) belonged to Nursing discipline. Most ($n = 782$, 55.9%) of the health professional students reported that people never smoked in their presence, in places other than where they lived. Among the health professional students who reported that people smoked in their presence, in places other than where they lived, on all 7 days, ($n = 200$, 14.3%) the highest percentage ($n = 63$, 22.5%) belonged to the Pharmacy and least percentage ($n = 27$, 9.6%) belonged to the Medical sciences discipline. Nearly about eighteen percent of male health professional students ($n = 89$, 17.8%) reported that people smoked in their presence, in places other than where they lived, on all 7 days as compared to female health professional students ($n = 111$, 12.3%) ($P < 0.001$) [Table 3].

Official Policy

About 39% ($n = 530$) of health professional students reported that an official policy banning smoking in their college buildings and clinics was present in their colleges. Among them highest percentage ($n = 140$, 50.0%) belonged

to Medical sciences and least percentage ($n = 68, 24.3\%$) belonged to Dental discipline. Minority ($n = 296, 21.1\%$) of health professional students reported that there is no official policy present on banning smoking in their college buildings and clinics; among them most respondents were from Pharmacy ($n = 80, 28.6\%$) and the least were from Dental sciences ($n = 34, 12.1\%$). About one-fourth of male health professional students (24.6%) reported that there is no official policy present on banning smoking in their college as compared to the female health professional students (19.2%) ($P < 0.001$).

Nearly sixty percent ($n = 835, 59.6\%$) of health professional students reported that the official policy banning smoking in their college buildings and clinics was enforced. Among them highest percentage ($n = 204, 72.9\%$) belonged to Dental sciences and least percentage ($n = 131, 46.8\%$) belonged to Medical discipline. Minority ($n = 266, 19.0\%$) of health professional students reported that there is no official policy enforced on banning smoking in their college buildings and clinics [Table 4].

Attempts to Quit/Behavior Cessation

Majority ($n = 1189, 84.9\%$) of health professional students agreed that they had never smoked their first cigarette as soon as they woke up. Among them highest percentage ($n = 256, 91.4\%$) belonged to Nursing and least percentage ($n = 205, 73.2\%$) belonged to Pharmacy discipline. Only two percent ($n = 27$) of health professional students agreed that they smoked their first cigarette <10 min as soon as they wake up. Among them highest percentage ($n = 10, 3.6\%$) belonged to Pharmacy and least percentage ($n = 1, 0.4\%$) belonged to Nursing discipline. Majority of male health professional students ($n = 17, 3.4\%$) agreed that they smoked their first cigarette <10 min as soon as they wake up as compared to the female health professional students ($n = 9, 1.0\%$) ($P < 0.001$).

Responsibility of Counseling to Quit Smoking

A little more than three-fourths ($n = 1072, 76.6\%$) of the health professional students agreed that health professionals who smoke are less likely to advise patients to stop smoking. Among them highest percentage ($n = 223, 79.6\%$) belonged to Dental and least percentage ($n = 196, 70.0\%$) belonged to Physiotherapy discipline.

About quarter of the health professional respondents ($n = 328, 23.4\%$) did not agree that health professionals who smoke are less likely to advise patients to stop smoking. Among them highest percentage ($n = 84, 30.0\%$) belonged to Physiotherapy and least percentage ($n = 57, 20.4\%$) belonged to Dental discipline.

Three-fourths ($n = 1062, 75.9\%$) of the health professional students agreed that health professionals who use other

tobacco products are less likely to advise patients to stop smoking. Among them highest percentage ($n = 222, 79.3\%$) belonged to Medical and least percentage ($n = 193, 68.9\%$) belonged to Nursing discipline. A little less than one-fourth ($n = 338, 24.1\%$) of health professional students did not agree that health professionals who use other tobacco products are less likely to advise patients to stop smoking. Among them highest percentage ($n = 87, 31.1\%$) belonged to Nursing and least percentage ($n = 58, 20.7\%$) belonged to Medical discipline [Table 3]. Approximately, three-fourths of both male (77.8%) and female health professional students (74.8%) agreed that health professionals who used other tobacco products are less likely to advise patients to stop smoking [Table 5].

DISCUSSION

Tobacco Use Prevalence among Health Professional Students *Ever tobacco use/experimenting with cigarette smoking*

From our study, we found that one-fifth ($n = 306, 21.9\%$) of health professional students have experimented with cigarette smoking in Bengaluru. In the current study a greater percentage of Pharmacy ($n = 98, 35.0\%$) students as compared to Physiotherapy ($n = 64, 22.9\%$), Dental ($n = 54, 19.3\%$), Nursing ($n = 46, 16.4\%$), and Medical ($n = 44, 15.7\%$) health professional students, had experimented with cigarette smoking. Compared with the prevalence of smoking rates among health professional students across all disciplines from other countries including GHPSS Nepal: 2011,^[3] Saudi Arabia: 2010-2011^[4] and central Greece^[5] the students in this samples reported a lower smoking rate. This decrease in the use of smoking tobacco in the present study as compared to earlier studies could possibly be due to increased awareness created by the antitobacco campaigns over the past decade [Table 6]. Tobacco use endangers the health of health professional students and negatively influences the future health professions workforce to deliver effective anti-tobacco counseling when they start seeing patients [Table 1].^[6]

Age at initiation of smoking

A small percentage of Pharmacy ($n = 13, 4.6\%$), Physiotherapy ($n = 11, 3.9\%$), Dental ($n = 6, 2.1\%$) and Nursing ($n = 6, 2.1\%$) and Medical ($n = 2, 0.7\%$) health professional students reported that they had experimented with cigarettes smoking at age 11–15 years and this result is very much less than that previously reported by health professional students in Greece: 2009-2011^[7] and India: 2005-2009^[8] across all disciplines. This decreased cigarette smoking at age 11–15 years could be due to implementation of “No Smoking” board in all education institution, ban of smoking and sale of tobacco products within 100 m of all education institution including schools and colleges as per

Table 3: Number of days have people smoked in health professional students' presence, in places other than where they live

Faculty	Q11					Total	X ² value	P-value
	0 days	1 or 2 days	3 to 4 days	5 to 6 days	All 7 days			
Medical	163	59	19	12	27	280	59.893	<0.001
	58.2%	21.1%	6.8%	4.3%	9.6%	100.0%		
Dental	148	62	20	9	41	280		
	52.9%	22.1%	7.1%	3.2%	14.6%	100.0%		
Nursing	187	42	11	6	34	280		
	66.8%	15.0%	3.9%	2.1%	12.1%	100.0%		
Pharmacy	135	35	30	17	63	280		
	48.2%	12.5%	10.7%	6.1%	22.5%	100.0%		
Physiotherapy	149	48	32	16	35	280		
	53.2%	17.1%	11.4%	5.7%	12.5%	100.0%		
Total	782	246	112	60	200	1400		
	55.9%	17.6%	8.0%	4.3%	14.3%	100.0%		

Table 4: Number of health professional students' response that any official policy of banning smoking in college buildings and clinics

Faculty	Q12				Total	X ² value	P-value
	Yes, for college buildings only	Yes, for clinics only	Yes, for both	No official policy			
Medical	140	10	60	70	280	149.340	<0.001
	50.0%	3.6%	21.4%	25.0%	100.0%		
Dental	68	8	170	34	280		
	24.3%	2.9%	60.7%	12.1%	100.0%		
Nursing	80	0	136	64	280		
	28.6%	.0%	48.6%	22.9%	100.0%		
Pharmacy	129	2	69	80	280		
	46.1%	.7%	24.6%	28.6%	100.0%		
Physiotherapy	113	6	113	48	280		
	40.4%	2.1%	40.4%	17.1%	100.0%		
Total	530	26	548	296	1400		
	37.9%	1.9%	39.1%	21.1%	100.0%		

Table 5: Number of health professional students who agreed that should health professionals routinely advises their patients who smoke to quit smoking

Faculty	Q21		Total	X ² value	P-value
	Yes	No			
Medical	230	50	280	20.733	<0.001
	82.1%	17.9%	100.0%		
Dental	261	19	280		
	93.2%	6.8%	100.0%		
Nursing	245	35	280		
	87.5%	12.5%	100.0%		
Pharmacy	257	23	280		
	91.8%	8.2%	100.0%		
Physiotherapy	244	36	280		
	87.1%	12.9%	100.0%		
Total	1237	163	1400		
	88.4%	11.6%	100.0%		

COTPA act 2003. The finding that some students-initiated smoking before the age of 16 years is a cause of concern. Several factors are known to motivate pre-teenagers and teenagers to initiate tobacco use. These factors can be

summed into social, physical, and environmental factors. These factors should be addressed accordingly and effectively during primary and secondary school education. Primary and secondary school education should cover the harms of tobacco use so that students will be aware of the hazards of tobacco from an early age.^[9]

Current use/cigarette smoking in the past month

Although some difference have been found in current cigarette smokers with highest percentage reported among Pharmacy ($n = 10, 3.6\%$) as compared to Medical ($n = 3, 1.1\%$), Dental ($n = 3, 1.1\%$), Nursing ($n = 3, 1.1\%$) and Physiotherapy ($n = 2, 0.7\%$) health professional students, this percentage of current smokers is very much less than that previously reported by current smokers of the GHPSS studies of Nepal: 2011,^[3] Saudi Arabia: 2010-11,^[4] and Baharain: 2009.^[10] However, percentage of Pharmacy current smokers in our study ($n = 10, 3.6\%$) is more than that reported by the current smokers in the Lao PDR:2009 study ($n = 4, 1.5\%$).^[11] The low prevalence of current smoking ($n = 4, 1.5\%$) might indicate that students quit smoking or have underreported tobacco use close to social

Table 6: Number of health professional students who agreed that when do the students smoke their first cigarette as soon as they wake up

Faculty	Q25					Total	X ² value	P-value
	Never Smoked	Currently not smoking	<10 min	10–30 min	31–60 min			
Medical	243 86.8%	22 7.9%	6 2.1%	3 1.1%	6 2.1%	280 100.0%	52.192	<0.001
Dental	247 88.2%	25 8.9%	5 1.8%	1 0.4%	2 0.7%	280 100.0%		
Nursing	256 91.4%	22 7.9%	1 0.4%	1 0.4%	0 0.0%	280 100.0%		
Pharmacy	205 73.2%	47 16.8%	10 3.6%	6 2.1%	12 4.3%	280 100.0%		
Physiotherapy	238 85.0%	27 9.6%	4 1.4%	4 1.4%	7 2.5%	280 100.0%		
Total	1189 84.9%	143 10.2%	26 1.9%	15 1.1%	27 1.9%	1400 100.0%		

desirable bias, However, confidentiality and anonymity were maintained during data collection by not recording the name of the student or their institution in the forms used in our study. It is possible that health professional students have become aware of the hazards of tobacco use during their study and have opted to quit tobacco use. This could also be due to effective anti-tobacco campaign and implementation of tobacco control rules in India than other countries.^[12]

Smoking on College Premises/Property/College Building Ever use of chewing tobacco

The prevalence of ever use of chewing tobacco among Medical ($n = 11$, 3.9%), Dental ($n = 15$, 5.4%), Nursing ($n = 26$, 9.3%), Pharmacy ($n = 34$, 12.1%), and Physiotherapy ($n = 25$, 8.9%) in the current study is very less when compared with the prevalence rates of ever chewing tobacco among health professionals from Saudi Arabia: 2010-11,^[4] as well as with previous report from India: 2005-09.^[8]

Use of chewing tobacco in the past month

In this study, we found that only a negligible percentage of Medical ($n = 1$, 0.4%), Nursing ($n = 1$, 0.4%) Pharmacy ($n = 1$, 0.4%) and Physiotherapy ($n = 1$, 0.4%) students were current tobacco chewers on all 30 days in the last month. These reported results are less when compared with the previous GHPSS surveys of Nepal: 2011,^[3] Saudi Arabia: 2010-11^[4] and Surani *et al.* in India: 2005-09.^[8]

Chewing tobacco on college premises/property/college building

The present study indicates that, ($n = 5$) 1.8% of Medical, ($n = 4$) 1.4% of Dental, ($n = 6$) 2.1% of Nursing and ($n = 6$) 2.1% of Pharmacy and ($n = 6$) 2.1% of Physiotherapy health professional students reported that they used the chewing tobacco on college building during the past year. This result is very less across all disciplines when compared with the GHPSS India: 2005-09^[8] and Baharain: 2009.^[10]

Tobacco use endangers the health of health professional students and negatively influences the future health professions workforce to deliver effective anti-tobacco counseling when they start seeing patients. This form of tobacco is commonly associated with oral cancers.^[13,14] It is possible that health professional students have become aware of the hazards of tobacco use during their study at the university and have opted to quit tobacco use or underreported their use.

Although the reported use of tobacco in the present study may be lesser than in other studies, social desirability bias could be a factor despite anonymity and confidentiality being maintained at the time of data collection. The issue of tobacco use among health professional students is a major cause of concern because it not only endangers their health but also reduces their ability to deliver effective anti-tobacco counseling when they start seeing patients.

Exposure to Environmental Smoke/Second Hand Smoke

Official policy banning smoking in college building, clinics

The data in our GHPSS Bengaluru 2016 report show that, ($n = 170$) 60.7% of Dental, ($n = 136$) 48.6% of Nursing, ($n = 113$) 40.4% of Physiotherapy, ($n = 69$) 24.6% Pharmacy and ($n = 60$) 21.4% of Medical health professional students report existence of official policy regulating smoking in their college as a result of the current legislation which completely ban smoking in any college building and premises. This result is very much less when compared with results of GHPSS Slovakia: 2005,^[9] Saudi Arabia: 2010-11,^[8] India: 2005-09^[11] and Central Greece.^[5] Not surprisingly the most of the students reported the existence of official policy regulating smoking in their health professional colleges as a result of the current legislation which completely ban smoking in any health professional colleges' buildings and

premises. The findings of the present study suggest that further effective enforcement of Indian Tobacco control Act 2003^[15] in health professional college buildings, clinics and in the entire campuses of health professional colleges is needed, to raise awareness of the ban on the use of tobacco products at institutional, health and educational facilities and the importance of enforcing the ban [Table 4].

Behavior/Cessation

A small percentage of [Pharmacy ($n = 41$, 14.6%), Physiotherapy ($n = 25$, 8.9%), Medical ($n = 18$, 6.4%), Dental ($n = 16$, 5.7%) and Nursing ($n = 13$, 4.6%)] current smokers have reportedly received help or advice to quit smoking among these respondents. In the current study result and it is very less when compared with the results of the GHPSS India: 2005-2009,^[8] Baharain:2009^[10] and GATS Survey in Greece 2016.^[16]

Doctors who are consumers of tobacco are less likely than doctors who are non-consumers to raise the issue of tobacco consumption with their patients^[17] and although there are insufficient data available on the issue, it seems likely that health professionals who are current consumers will lack credibility on tobacco cessation.

Limitations

Although efforts to maintain anonymity and confidentiality were made by not recording the name of the students and their institutions on the questionnaire there may have been some social desirability bias that led to the low prevalence of tobacco use reported by the health professional students. In fact, one institution denied permission to conduct the study as it did not want tobacco use among their students to be reported. The findings from the study are not Generalizable as regional differences among health professional students may be seen in different parts of India and therefore further national level GHPSS studies need to be carried out among the health professional students.

CONCLUSION

Despite efforts to control desirability bias through confidentiality and anonymity, it may have contributed to the low prevalence of tobacco use reported in the study.

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