

# Smoking and exposure to environmental tobacco smoke among health occupations students in Iran

Mohammad Hossein Khoshnevisan<sup>1,2</sup>, Marzie Deghatipour<sup>2</sup>, Arezoo EbnAhmady<sup>3</sup>, Hooman Keshavarz<sup>4</sup>

<sup>1</sup>Preventive Dentistry Research Centre, Research Institute of Dental Sciences, Shahid Beheshti University of Medical Sciences, Tehran, Iran

<sup>2</sup>Community Oral Health Department, School of Dentistry, Shahid Beheshti University of Medical Sciences, Tehran, Iran

<sup>3</sup>Dental Public Health, Faculty of Dentistry, University of Toronto, Toronto, Canada

<sup>4</sup>Department of Community Oral Health, School of Dentistry, Mashhad University of Medical Sciences, Mashhad, Iran

Corresponding author: Hooman Keshavarz (E-mail: keshavarzh@mums.ac.ir)

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**Objective** The purpose of this study was to evaluate the smoking behaviour and exposure to environmental tobacco smoke (ETS) among the students of Shahid Beheshti University of Medical Sciences (SBUMS).

**Methods** This survey was conducted using a self-administered anonymous questionnaire mainly based on the Persian version of the Global Health Professions Student Survey (GHPSS) questionnaire. The students of eight disciplines (Dentistry, Environmental health engineering, Medicine, Nursing, Nutrition, Pharmacy, Physiotherapy, and Public health) of SBUMS were invited to participate in this study. Chi-square test, Mann-Whitney U test, and logistic regression served for statistical analyses. The P-value of  $\leq 0.05$  was considered statistically significant.

**Results** A total of 290 students (151 male) participated in the study. About 1.4% of the participants were 15-18 years old, 85.5% were 19-24, 8.6% were 25-29, 3.4% were 30 or older, and 1.0% of them did not report their age. Among all the disciplines, dental students reported the highest prevalence (52.0%) for current cigarette smoking while public health students reported the lowest (0.0%). Regarding the prevalence of exposure to ETS, nutrition students reported the highest (96.4%), and nursing students reported the lowest (57.1%). Current cigarette smoking was reported by 34.4% of the participants. This rate was significantly higher in men when compared to women ( $P < 0.001$ ). Among participants, 78.6% had been exposed to ETS. The frequency distribution of exposure to ETS was statistically significantly different between males and females ( $P < 0.001$ ).

**Conclusion** This study showed that the prevalence of current cigarette smoking and/or the prevalence of exposure to ETS among the students of SBUMS were alarming. These results have further highlighted the importance and necessity of planning to reduce tobacco use and increase awareness of the harmful effects of tobacco products on overall health among the students of SBUMS.

**Keywords** Smoking, environmental tobacco smoke, Students, Iran

## Introduction

Smoking as a common risk factor has been known to be one of the most important health problems in the current century worldwide. Native Americans first started using tobacco in ritual ceremonies. In addition, they found some medical benefits for controlling pain when chewing tobacco (e.g. reducing toothache)<sup>1</sup>. However, it is now well-recognized that smoking is one of the main causes of preventable death especially in developing countries<sup>2</sup>. About 29% of the total world population are tobacco users<sup>3</sup>, and Smoking-related diseases kill more than five million people globally<sup>4</sup> and 75000 people in Iran every year<sup>5</sup>. Tobacco use is also considered as the main reason for aggravating deadly *non-communicable diseases* such as cardiovascular diseases, cancer, asthma, and etc. Moreover, there is the high potential for a contagious disease like tuberculosis to be activated and exacerbated by first- or second-hand smoking<sup>2</sup>.

According to the US Centres for Disease Control and Prevention (CDC), smoking can directly increase the risk of cardiovascular diseases, brain stroke, lung cancer, chronic obstructive pulmonary disease, peripheral vascular disease, infertility, premature birth and low birth weight<sup>6</sup>. In addition to the direct impacts of smoking, exposure to second-hand smoke can cause significant health risks for non-smokers. Based on the 2010 CDC report, cigarette smoke contains over 7000 harmful chemicals with hundreds being toxic and about 70 of them being carcinogenic. Likewise, available evidence shows that cigarette smoke is one of the causing factors for

coronary artery disease and lung cancer in adults as well as middle ear infection, respiratory disease, sudden infant death syndrome (SIDS), low birth weight, brain tumours, leukaemia and asthma in children<sup>7</sup>. Death caused by passive smoking is mainly due to Ischemic heart disease in adults and lower respiratory infections in children<sup>8</sup>. Smoking has been reported to be related to different oral diseases like oral and pharyngeal cancers, advanced periodontitis, disorders in oral cavity wound healing, increasing the risk of root decay and soft tissue changes e.g. nicotine induced stomatitis as well as oral pre-malignant lesions<sup>9,10</sup>.

Health professionals are expected to play an active role in controlling tobacco and cigarette consumption at the individual and community levels<sup>11</sup>. Both direct and indirect interventions by health professionals can greatly reduce exposure to environmental tobacco smoke (ETS)<sup>12</sup>. Dentists are in a unique position to control smoking for many reasons such as 1) they are preventive oriented, 2) can provide age-specific preventive care and education, 3) meet patients regularly in several sessions and keep good communication with them in a short and long term period to influence on their smoking habit<sup>13</sup>. Beside health professionals, special attention must be paid to health occupations students because they will be the key players of health promotion in society<sup>14</sup>. Before improving the role of our future health professionals in controlling tobacco use, we need to have information about their smoking behaviour.

The purpose of this study was to evaluate the smoking behaviour and exposure to ETS among the students of Shahid Beheshti University of Medical Sciences (SBUMS).

## Materials & Methods

The present study was done as a questionnaire survey using a self-administered anonymous questionnaire. All the fourth-year medical and dental students of SBUMS as well as all the third-year students of six other disciplines (Environmental health engineering, Nursing, Nutrition, Pharmacy, Physiotherapy, and Public health) were invited to participate in the study. Similar to previous studies done on dental students<sup>15-17</sup>, in contrast to the other disciplines fourth-year medical and dental students were evaluated because the duration of medical, and dental education is longer in Iran compared to most other countries. The difference applied in the case selection, in the authors' opinion, makes comparison of the results with the results of other studies more valid. The questionnaires were distributed among the students in ordinary classroom settings after explaining study objectives and assuring them of the voluntary participation and confidentiality of collected data.

The questionnaire was mainly based on the Persian version of the Global Health Professions Student Survey (GHPSS) questionnaire used in previous studies<sup>15-17</sup>, but according to opinions of an expert panel some questions were added. The final questionnaire was composed of six parts. Part 1 with 16 questions assessed tobacco use prevalence among the study participants. Part 2 with four questions evaluated exposure to ETS. Part 3 with 13 questions collected data on attitudes. Part 4 with six questions asked participants about their smoking habits or quit status. In part 5, seven questions were used for assessment of available educational programs; and in the last part four questions were used for obtaining demographic information. Using a test-retest method with a two-week interval, a pilot study in the School of Dentistry, Shahed University showed the acceptable reliability of the questionnaire.

The collected data were analysed with SPSS for Windows, version 16 (SPSS Inc., Chicago, IL, USA). The Chi-square test was applied to compare the proportion of having experience of smoking (smoking at least once during lifetime), and current smoking (smoking at least once during the previous 30 days) between males and females. The Chi-square test was also applied to assess the association between current cigarette smoking and being exposed to ETS (exposure to ETS at least in one of the previous seven days). Mann-Whitney U test was used to assess the difference in the distribution of ETS exposure frequency between males and females, and also to compare the total scores (range from zero to 13) of smoking control attitudes between male and female subjects, and between current smokers and non-smokers. Multivariable logistic regression analysis was applied to evaluate the association between current cigarette smoking, and independent variables including gender, exposure to ETS, the total score of smoking control attitudes, and marital status. The P-value of  $\leq 0.05$  was considered statistically significant. This study was approved by the Ethics Committee of the Shahid Beheshti Research Institute of Dental Sciences. Because the questionnaire used was anonymous and the invited students were completely free to decline participation in the study, the need for consent was waived by the Ethics Committee.

## Results

A total of 290 students participated in this study. Table 1 shows the response rates, overall and by disciplines. Among all the

participants who reported their gender, 151 (52.8%) were male. About 4 (1.4%) of the participants were 15-18 years old, 248 (85.5%) were 19-24, 25 (8.6%) were 25-29, 10 (3.4%) were 30 or older, and 3 (1.0%) of them did not report their age. Among all the participants who answered the question on marital status, 234 (82.4%) were single and 50 (17.6%) were married.

Among all the disciplines, dental students reported the highest prevalence (52.0%) for current cigarette smoking while public health students reported the lowest (0.0%). (Table 1) Regarding the prevalence of exposure to ETS, nutrition students reported the highest (96.4%), and nursing students reported the lowest (57.1%). (Table 1)

Among all, 149 (51.4%) reported having experience of smoking cigarettes, and in this regard, there was a statistically significant difference between the two genders ( $P < 0.001$ ). (Table 2) Current cigarette smoking was reported by 99 (34.4%) of the participants. This rate was again significantly higher in men when compared to women ( $P < 0.001$ ). (Table 2)

Among all participants, 221 (78.6%) had been exposed to ETS. Out of which, 11 students (5.0%) had been exposed only at home, 56 (25.3%) only in other places, and 151 (68.3%) both at home and in other places. The frequency distribution

Table 1. Prevalence of current cigarette smoking and exposure to environmental tobacco smoke (ETS) among all the participating students.

Disciplines	Prevalence of current cigarette smoking (%)	Prevalence of exposure to ETS (%)	Response rate (%)
Dentistry (n=25)	52.0	79.2	65.8
Environmental health engineering (n=26)	46.2	88.0	47.3
Medicine (n=54)	41.5	75.9	42.2
Nursing (n=44)	15.9	57.1	72.1
Nutrition (n=31)	25.8	96.4	60.8
Pharmacy (n=28)	32.1	88.9	48.3
Physiotherapy (n=64)	43.8	82.8	65.3
Public health (n=18)	0.0	64.7	26.5
Total (n=290)	34.4	78.6	52.1

Table 2. Comparison of having experience of smoking cigarettes, and current cigarette smoking between the two genders.

	Male N(%)	Female N(%)	P-value <sup>†</sup>
Experience of smoking cigarettes	Yes 106(70.2)	42(31.1)	$P < 0.001^*$
	No 45(29.8)	93(68.9)	
Current cigarette smoking	Yes 80(53.0)	18(13.5)	$P < 0.001^*$
	No 71(47.0)	115(86.5)	

<sup>†</sup>P-values derived from  $\chi^2$  test. (\*=statistically significant)

of exposure to ETS during the previous seven days was statistically significantly different between males and females. Men were more frequently exposed to ETS at home and in other places than women. (Table 3) Out of the current cigarette smokers, 95 students (96.0%) were exposed to ETS while 125 (69.4%) of non-smokers reported such exposure ( $P < 0.001$ ).

The mean total score ( $\pm$ SD) for smoking control attitudes was 10.6( $\pm$ 3.0). The mean total score ( $\pm$ SD) was 9.9 ( $\pm$ 3.3) and 11.4 ( $\pm$ 2.4) for men and women, respectively ( $P < 0.001$ ). Female students presented statistically significantly more positive approach toward smoking control, when compared to their male counterparts. The mean total score ( $\pm$ SD) for smoking control attitudes was also significantly higher ( $P < 0.001$ ) among non-smokers (11.7 $\pm$ 1.9) in comparison with current cigarette smokers (8.8 $\pm$ 3.6).

The binary logistic regression model showed that current cigarette smoking was significantly associated with gender, exposure to ETS, and the total score of smoking control attitudes. (Table 4)

The majority of students (253 students, 87.2%) recognized that health professionals are role models for their patients and the public, and also believed that health professionals should receive special training on smoking cessation counselling. Approximately, 78% of the students expressed their agreement on the fact that it would be less likely for health professionals to advise patients on refraining from smoking if they were cigarette smokers themselves.

## Discussion

This study evaluated the smoking behaviour among the students of eight disciplines of SBUMS. The results showed that the highest prevalence of current cigarette smoking with 52.0% was reported by dental students while the lowest rate (0.0%) was reported by public health students. In line with our results, Warren et al. also showed that current cigarette smoking among Iranian dental students (10.3%) was more common than among their Iranian medical (5.6%) and nursing (4.4%) peers<sup>18-20</sup>.

Table 4. Association of current cigarette smoking with gender, marital status, exposure to environmental tobacco smoke (ETS), and total score of smoking control attitudes in a binary logistic regression model.

Independent variables	$\beta$	OR	95% CI for OR	P-value
Gender (0: Female, 1: Male)	1.6	4.8	(2.3-10.2)	<0.001*
Marital status (0: Single, 1: Married)	0.4	1.5	(0.6-3.9)	0.439
Exposure to ETS (0: No exposure to ETS, 1: Exposed)	2.2	8.8	(2.2-35.2)	0.002*
Total score of smoking control attitudes	-0.4	0.7	(0.6-0.8)	<0.001*

Reference category is indicated by zero.  
(\* = statistically significant)

The present study reported that the prevalence of exposure to ETS among nutrition students (96.4%) was considerably more than the prevalence among medical and dental students. Warren et al. reported that dental students' exposure to ETS at home was higher (41%) than the exposure among medical (31%) and nursing (37%) counterparts<sup>18-20</sup>. Health professionals, including oral health professionals in a team-work, should work hand in hand in controlling any form of tobacco use. Everyone, including lay people and specially health professionals, should also have the required knowledge about the harmful effects of tobacco smoke on health, and should never ignore inhaling the second- hand smoke unintentionally.

In this study, having experience of smoking cigarettes was reported by about half of the participants with a remarkable gender difference. Keshavarz et al. reported that about one-third of Iranian dental students had ever smoked cigarettes. Similar to our study, however, they found a significant gender difference for ever use of tobacco products<sup>15</sup>. Our results also showed that more than one-third of the participating students were current cigarette smokers, and the rate among male students was significantly higher than that among their

Table 3. The frequency distribution of exposure to environmental tobacco smoke (ETS) during the previous seven days, by gender.

Exposure to ETS	Number of days during the previous seven days	Men N(%)	Women N(%)	Total N(%)	P-value†
Home	0	41(28.3%)	74(56.9%)	115(41.8%)	<0.001*
	1-2	19(13.1%)	14(10.8%)	33(12.0%)	
	3-4	20(13.8%)	19(14.6%)	39(14.2%)	
	5-6	18(12.4%)	3(2.3%)	21(7.6%)	
	7	47(32.4%)	20(15.4%)	67(24.4%)	
Other places	0	21(14.4%)	52(39.4%)	73(26.3%)	<0.001*
	1-2	29(19.9%)	26(19.7%)	55(19.8%)	
	3-4	31(21.2%)	26(19.7%)	57(20.5%)	
	5-6	21(14.4%)	10(7.6%)	31(11.2%)	
	7	44(30.1%)	18(13.6%)	62(22.3%)	

†P-values derived from Mann-Whitney U test. (\* = statistically significant)

female counterparts. In this regard, our findings are compatible with the results of the study conducted by Meysamie et al<sup>21</sup>. Meanwhile, it is common to observe such a difference between male and female students in other countries as well<sup>22,23</sup>. Focusing on dental students, the status of current cigarette smoking seems much more alarming at SBUMS (52.0%) compared to the status reported at the national level (10.8%) by Keshavarz et al<sup>15</sup>. These results may be extrapolated as a sign of failure or lack of effective smoking control programs among all and especially the male students.

Our findings on dental students' exposure to ETS are similar to the findings of Keshavarz et al.<sup>16</sup>; both studies showed that about three-fourths of the participating dental students were exposed to ETS at home or in other places, and that regarding exposure to ETS there is a considerable gender difference. Despite the interval between the two studies, at least one can say that there has been no significant improvement in the status of exposure to ETS among dental students. It should be noted that more than 18 years before the implementation of this study, the law on banning smoking in public places was adopted in Iran. However, it seems that the rule has not been well enforced so far. Perhaps the collective efforts of people and professionals are needed to make the world a better place to live.

Regarding attitudes towards tobacco control policies, our results reflect the fact that most of the participating students were in favour of the policies. These findings are in line with those of many previous studies conducted on health occupations students<sup>16-20, 24-27</sup>. Similar to many previous studies<sup>17,24,26</sup>, as an example, more than two-thirds of the students in the present study believed that health professionals serve as role models for their patients and the public. As another example, more than two-thirds of the students in this study, in line with many previous studies<sup>18-20</sup>, believed that health professionals should receive specific training on smoking cessation counselling. In interpreting the statistically significant relationship between gender and the total score for smoking control attitudes, as one of the findings of this study, it should be noted that this relationship was not significant in some previous studies<sup>16</sup>.

This study was a questionnaire cross-sectional study. It was therefore not free from the inherent limitations of such studies. One of the limitations is the relatively high likelihood of a low response rate, which has shown itself in spite of all efforts, especially in some disciplines, in this study. In order to interpret the results of this study, in addition to those who did not participate in the study, the likelihood that some of the participants would not reflect their actual attitudes and behaviours should also be considered. The importance of this point becomes clearer when the social unacceptability of smoking in Iranian society, especially for women, is taken into consideration.

In this study, we used a questionnaire, as a data collection tool, that has been used in many previous studies. Using this questionnaire gives more validity to the comparison between our results and the results of previous similar studies. As another strength of this study, it should be noted that this study has been conducted at one of the largest medical sciences universities in Iran and, unlike most previous studies, has evaluated the students of several disciplines of medical sciences.

## Conclusion

This study presented that the students' attitudes towards smoking control policies were generally positive. However, the prevalence of current cigarette smoking and/or the prevalence of exposure to ETS among the students were alarming and in some disciplines even much higher than the prevalence reported at the national level for their counterparts. These results have further highlighted the importance and necessity of planning to reduce tobacco use and increase awareness of the harmful effects of tobacco products on health among the students of SBUMS.

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## Conflicts of Interest Disclosure

The authors declare that there are no conflicts of interest.

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