

Prevalence of waterpipe smoking and awareness of related orodental complications in university students in Kerman, Iran

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Original Article

Abstract

BACKGROUND AND AIM: Waterpipe smoking causes many negative side effects on the oral health. Our objective was to describe the prevalence of waterpipe smoking and awareness of related orodental complications in Iranian university students.

METHODS: This cross-sectional study was carried out on 384 students of Shahid Bahonar University, Kerman, Iran, studying in Kerman in 2018-2019, who were selected by simple random sampling. The data were collected through a questionnaire containing demographic characteristics, waterpipe smoking information, and 18 questions about awareness of related orodental complications. The data were analyzed by SPSS software, using t-test, Tukey's test, regression, and analysis of variance (ANOVA) at the significance level of 0.05.

RESULTS: 184 (48.0%) subjects were men. The mean age of participants and the mean age for beginning waterpipe smoking was 22.10 ± 2.47 and 18.05 ± 2.61 years, respectively. 168 (43.8%) subjects used waterpipe, 105 (62.5%) used waterpipe just for fun, and 120 (71.4%) smoked the waterpipe in cafes. The mean score of their awareness was 10.47 ± 4.45 out of 18. The ranking of the scores in terms of awareness was good (33.4%), moderate (45.4%), and poor (19.3%). There was a significant relationship between gender, marital status (men and married subjects had more knowledge), lack of waterpipe smoking, and awareness.

CONCLUSION: Waterpipe smoking among the students was relatively high, and the awareness of the negative influences of waterpipe on oral health was moderate. The awareness of students concerning the consequences of waterpipe smoking on oral health should be taken into consideration emphatically.

KEYWORDS: Waterpipe Smoking; Cigarette Smoking; Oral Health; Students; Awareness

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Waterpipe smoking, especially among youth, has become widespread in recent years throughout the world.¹⁻⁷ A study conducted by Sabahy et al. in 2011 reported that the age of waterpipe smoking initiation in adolescents was 16.3 ± 3.2 years; the spread of waterpipe smoking in the recent 30 days was 42.5% and 18.7%, respectively, in Iran.²⁴

Ghafouri et al. showed that 51.0% of Iranian students used the waterpipe smoking and girls also almost as much as boys.⁸ Awan

et al. found that 37.0% of Saudi medical students had used the waterpipe smoking and 62.1% of them were still smoking. The rate of waterpipe smoking was higher among dental students.⁹

Obeidat et al. in a study on waterpipe smoking among the students of School of Dentistry, University of Jordan, Jordan, showed that the cigarette smoking in this group of students was lower than the waterpipe smoking and was reported higher in women.⁵ Lifetime, last year, and last

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month prevalence rates of the waterpipe smoking in Iranian students were reported to be 26.6%, 17.8%, and 8.9%, respectively.¹⁰

Some of the causes of waterpipe smoking in the world are misconceptions about its safety, social acceptance, availability, relatively low cost, and its various desirable flavors.¹¹ In addition to these reasons, this growing trend among students can be attributed to factors such as reducing stress, hobbies, peer pressure, and family history of tobacco use.¹²

The waterpipe smoking predisposes people to the cigarette smoking that could lead to some types of cancer, respiratory diseases, cardiovascular diseases (CVDs), and periodontal diseases.¹³ A 6-fold increase in the risk for lung cancer has been reported for waterpipe smokers in Lebanon and India.¹⁴ It has been shown that carbon monoxide (CO) levels due to waterpipe smoking can be up to 30 times higher than cigarettes.¹⁵ The results of a research in Turkish students demonstrated that they had misinformation about the health risks of waterpipe smoking. In addition, the prevalence of its consumption was high among them.¹⁶ It has been shown that waterpipe smoking has many negative effects on the oral health, including the effect on beauty by staining on teeth and dental restorations and reducing the power of tasting and smelling. The waterpipe smoking is one of the major factors in bone atrophy in periodontal disease, dry socket, and oral squamous cell carcinoma (OSCC). A strong correlation has been observed between waterpipe smoking and high platelet aggregation, gingival indexes, significant bone atrophy, attachment loss, and progression in periodontal pockets.¹⁷⁻¹⁹ Another study showed a significant association of waterpipe smoking with keratoacanthoma (KA) of the lower lip and squamous cell carcinoma (SCC).²⁰

In recent years, cafes with waterpipe appear to have risen in Kerman, Iran, and almost all of them have clients. Therefore, we decided to carry out a study to assess the prevalence of waterpipe smoking and its

related socioeconomic factors among students of Shahid Bahonar University of Kerman, where is one of the biggest Iranian universities and covers a diverse population from across Iran, and to evaluate the awareness of individuals about orodental complications due to the waterpipe smoking.

Methods

This descriptive-analytical cross-sectional study was conducted in 2018-2019 on 384 students of Shahid Bahonar University of Kerman, from different majors at bachelor's degree. A full explanation of the research aims was provided to all students before data collection, and written informed consent was obtained.

A trained senior dental student distributed and collected the questionnaires. All questionnaires were completed anonymously. The questionnaire contained demographic information (age, gender, field of study, years of waterpipe smoking initiation, frequency of use, place of consumption) and 18 questions for assessing the students' awareness of orodental complications of waterpipe smoking. The total validity of the questionnaire was 0.94 and reliability coefficient of all questions was obtained using Cronbach's alpha coefficient of 0.91. Scores range of questionnaire was from 0 to 18. The approximate time of completing the questionnaire was 10 minutes. Data were analyzed in SPSS software (version 21, IBM Corporation, Armonk, NY, USA) with linear regression, analysis of variance (ANOVA), and t-test at a significance level of 0.05. The present study was approved with the ethical code of IR.KMU.REC.1396.1373.

Results

The findings of this study performed on 385 participants were as follows: 184 (48.0%) were men and 199 (52.0%) were women, 60 (15.7%) were married, and 226 (59.0%) subjects were living with their parents. The mean age of the research participants was 22.10 ± 2.47 years. The mean age of initiating waterpipe smoking was 18.05 ± 2.61 years (Table 1).

Table 1. Socio-demographic and personal characteristics of the participants

Variables		n (%)
Sex	Men	184 (48.0)
	Women	200 (52.0)
Academic year	First	68 (17.7)
	Second	104 (27.0)
	Third	92 (24.0)
	Forth	110 (28.6)
	Fifth	11 (28.6)
Marital status	Single	323 (84.1)
	Married	61 (15.9)
Location of living	Dormitory	105 (27.3)
	With parents	226 (59.0)
	With friends	9 (2.3)
	Personal house	44 (11.4)

In addition, 305 (79.6%) were non-smokers (did not use cigarettes), and 215 (56.1%) did not use waterpipe smoking (Table 2).

Table 2. Questions related to the behaviors of waterpipe smokers

Variables		n (%)
Cigarette smoking	Yes	77 (20.1)
	No	305 (79.4)
	No response	2 (0.5)
Waterpipe smoking	Yes	168 (43.8)
	No	216 (56.2)
Frequency of waterpipe smoking	Just once	28 (16.6)
	Occasionally	77 (45.8)
	Once a month	24 (14.2)
	Once a week	39 (23.2)
Cause of waterpipe smoking	Fun	105 (62.5)
	Curiosity	41 (24.4)
	Habit	21 (12.5)
	Reducing stress	1 (3.0)
Waterpipe smoking with whom?	Alone	52 (30.9)
	Friends	95 (56.5)
	Relatives	10 (5.9)
	Family	11 (6.5)
Place of waterpipe smoking	Home in the presence of parents	6 (0.5)
	Dormitory	15 (5.9)
	Waterpipe cafe	120 (71.4)
	Others	27 (16.1)
Family members smoking waterpipe	No one	101 (60.1)
	Father	8 (4.8)
	Mother	3 (1.8)
	Brother	47 (28.0)
	Sister	6 (3.5)
	Partner	3 (1.7)
Tendency to quit waterpipe smoking	Yes	111 (66.0)
	No	57 (33.9)

The least percentage of the correct answer to the phrase of "the waterpipe smoking because of fruit-flavored tobacco has less risk than the cigarette smoking" was the correct answer (2.6%). The highest percentage of the correct answer to the phrase of "the waterpipe smoking is one of the risk factors for oral cancer" was the right option (84.5%).

The mean score of knowledge was 10.47 ± 4.55 out of 18. The ranking of the scores in terms of awareness was good (33.4%), moderate (45.4%), and poor (19.3%).

There was a statistically significant difference between gender ($P < 0.001$), married participants ($P = 0.029$), and awareness. Those who did not use waterpipe smoking had significantly more awareness ($P < 0.001$) (Table 3).

A significant difference was observed by Tukey's test in the awareness between those living in a student dormitory and those living in their own home ($P = 0.053$), as well as between those living with parents and those living independently of parents ($P = 0.028$).

There was no significant relationship between the rate of waterpipe smoking ($P = 0.294$), the cause of waterpipe smoking ($P = 0.212$), and awareness ($P = 0.294$), as well as between the place of waterpipe smoking and the score of awareness ($P = 0.192$). Regression analysis showed significant correlation between gender and residence location (Table 4).

Discussion

The public health authorities have recently considered the waterpipe smoking as a global epidemic of tobacco.²¹ Increasing waterpipe smoking rate is a serious health concern in communities.²² In this study, 43.9% of the participants used the waterpipe. The prevalence of waterpipe smoking was reported in Iranian students as 11.5% in women and 28.5% in men,²³ and 51.0% of students used waterpipe smoking and girls as much as boys.⁸ As it is seen, waterpipe smoking has increased over the past years.

Table 3. Correlation between knowledge related to the demographic characteristics and behaviors of waterpipe smoking

Variables		Mean \pm SD	P
Sex	Men	11.38 \pm 4.78	< 0.001
	Women	9.67 \pm 4.22	
Marital status	Married	11.77 \pm 4.51	0.029
	Single	10.36 \pm 4.54	
Domestic	Yes	10.64 \pm 4.66	0.330
	No	10.14 \pm 4.37	
Cigarette smoking	Yes	10.52 \pm 4.52	0.912
	No	10.46 \pm 4.56	
Waterpipe smoking	Yes	9.45 \pm 4.96	< 0.001
	No	11.34 \pm 4.29	
Frequency of waterpipe smoking	Just once	10.00 \pm 5.15	0.294
	Occasionally	9.71 \pm 4.66	
	Once a month	7.79 \pm 4.66	
	Once a week	9.10 \pm 4.71	
Cause of waterpipe smoking	Curiosity	9.00 \pm 5.48	0.212
	Fun	9.49 \pm 4.14	
	Habit	8.47 \pm 4.12	
	Cigarette smoking	14.50 \pm 4.12	
Location of waterpipe smoking	Stress reduction	10.00 \pm 1.23	0.192
	Waterpipe cafe	9.54 \pm 4.79	
	Home with parents	8.66 \pm 1.86	
	Dormitory	6.66 \pm 3.24	
	Home	7.28 \pm 4.64	
	Others	10.44 \pm 4.71	
Appetency to quit waterpipe smoking	Yes	9.36 \pm 4.75	0.948
	No	9.41 \pm 4.55	

SD: Standard deviation

The study on waterpipe smoking among the students of School of Dentistry, University of Jordan, indicated that only 12.6% of these people used waterpipe smoking,⁵ which is less than the current study. The reason for this difference is that the dental students are less likely to use waterpipe smoking due to further awareness.

The mean age for initiating waterpipe smoking in our study was 18.05 \pm 2.61 years, which is in accordance with Obeidat et al.⁵ and Sabahy et al.²⁴ studies which showed mean age for starting waterpipe smoking of 16.3 \pm 3.2 and 16-18 years, respectively. The

beginning age of waterpipe smoking in 31.0% of medical sciences students in Lebanon was 16 and 17 years; also, in university students of Jordan, it was reported 18.1 years.^{25,26}

It seems that the awareness of the orodental complications and the body health should be given from childhood, so that it is possible to prevent the onset of waterpipe smoking during adolescence. In the present study, the main reason for starting the waterpipe smoking in 62.5% of waterpipe smokers was just for fun, consistent with the studies of Obeidat et al.⁵ (60.6%) and Ghafouri et al.⁸ (75.5%).

Table 4. Correlation between demographic variables and awareness (regression analysis)

Dependent variable		B	Beta	t	P
Awareness	Sex	-2.236	-0.239	-3.076	0.003
	Age	-0.264	-0.136	-1.759	0.081
	Residence in home	1.478	0.270	3.492	0.001
	Cigarette smoking	1.358	0.145	1.821	0.071

In our study, 45.8% of the subjects used waterpipe smoking sometimes. The results of the study by Ghafouri et al. in Isfahan, Iran, showed that 55.3% of the subjects smoked waterpipe sometimes,⁸ which is in accordance with the findings of this study. In the current study, 71.4% of smokers used waterpipe in the cafes. The results are in line with the study of Obeidat et al. in Jordan in which 70.0% of men and 42.5% of women smoked the waterpipe in the cafes.⁵

The highest percentage of correct answer in this study was related to awareness to the phrase of "waterpipe smoking is one of the risk factors for oral cancer" with 84.5% correct answer. This conclusion is consistent with the study on dental students that most students had the awareness of the risk of oral cancer due to the waterpipe smoking.⁵ In the current study, 72.1% of the people were aware of the effect of the waterpipe smoking on the discoloration of teeth. The result is in line with the study by Obeidat et al.⁵

It has been shown that the common belief on less adverse side effects of waterpipe smoking than cigarette smoking is one of the reasons contributing to the increased prevalence of waterpipe smoking.^{27,28} In this research, 10.7% of people believed that the cigarette was more harmful than the waterpipe smoking, that is similar to some studies.^{5,9,13}

In the current study, 6.0% of people said that since waterpipe smoke passed through the water, so its risk was lower, but studies have shown that many people mistakenly believe that the water filters waterpipe smoke.^{27,29} In our study, 2.6% believed that the fruit-flavored waterpipe was less risky. In the study of Sahin and Cinar, most people agreed that none of fruit-flavored waterpipe than the other type of tobacco.³⁰ Flavored tobacco use is a growing public health concern and is greatly popular among Canadian adolescents.³¹ Following the addition of new flavors and also misconceptions about waterpipe smoking, many young people know that the waterpipe smoking is an accessible and socially

acceptable tool and a way to socialize with friends.^{32,33}

In the current study, 33.4% of participants were well aware of the effect of waterpipe smoking on oral health. It is shown that the knowledge of dental patients about the risks of tobacco use on the oral health was good.³⁴ A study showed a poor awareness of health sciences university students regarding the risks of waterpipe smoking.⁹ Maziaki and et al. suggested community acceptance of waterpipe smoking among women.³⁵ In our study, there was no significant relationship between the waterpipe smoking and family history of waterpipe smoking, which is inconsistent with the similar study.¹⁰ The role of family members in smoking the waterpipe is complex and significant. A study in Michigan, United States (US) showed that the presence of a parent or one of the relatives smoking the waterpipe is a risk factor for consumption.³⁶ There was a statistically significant difference in the mean score of awareness between the waterpipe smokers and non-smokers. The awareness of non-smokers was higher. It is shown that the waterpipe non-smokers had a further awareness of its side effects on the health.¹⁶ In the current study, a few students had knowledge about the effect of waterpipe smoking on dental implants. The reason for this is that they were young and therefore, had no implant treatment experience.

Conclusion

The waterpipe smoking between university students was relatively high and was significantly higher among women. The knowledge of participants about the consequences of waterpipe smoking on the oral health was moderate. It seems that educational and motivational courses in this field will be needed.

Conflict of Interests

Authors have no conflict of interest.

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Committee of Kerman University of Medical Sciences (ethical code: K/94/227) and with the 1964 Declaration of Helsinki and its later amendments or comparable ethical standards.

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