

Prevalence of Hookah Smoking and Its Related Factors Among Students of Tehran University of Medical Sciences, 2012 - 2013

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Abstract

Background: Hookah smoking has increased worldwide, especially among young people.

Objectives: The aim of the present study was to determine the prevalence of hookah use and related factors in a sample of Iranian students of medical sciences.

Materials and Methods: A cross-sectional study was conducted on 1992 randomly selected sample of students of Tehran University of Medical Sciences during 2012 - 2013. A multistage sampling method was used and anonymous structured questionnaires were distributed to the students of each selected class. Chi-square test, Fisher's exact test and multiple binary logistic regression analyses were performed and $P < 0.05$ was considered as a significance level.

Results: Lifetime, last year and last month prevalence rates of hookah smoking were 26.6% (95% CI: 24.7 - 28.6), 17.8% (95% CI: 16.1 - 19.5) and 8.9% (95% CI: 7.7 - 10.2), respectively. The results of logistic regression model showed that male gender [odds ratio (OR) = 2.8, 95% CI: 1.86 - 4.21], cigarette smoking in the past year (OR = 5.6, 95% CI: 3.21 - 9.83), alcohol use in the past year (OR = 7.4, 95% CI: 4.01 - 13.06), cigarette or hookah smoking in the family members (OR = 1.7, 95% CI: 1.13 - 2.51), cigarette or hookah smoking among friends (OR = 4.4, 95% CI: 2.69 - 7.33), alcohol use by friends in the past year (OR = 1.9, 95% CI: 1.20 - 3.14), and illicit substance use among friends (OR = 2.2, 95% CI: 1.22 - 4.05) were associated with hookah smoking.

Conclusions: The results of our study indicate a relatively high prevalence of hookah smoking among Iranian students. The findings emphasize the importance of planning preventive interventions by considering different high-risk behaviors simultaneously.

Keywords: College, Hubble-bubble, predictors, Risky behaviors, Waterpipe

1. Background

Hookah which also is known as shisha, hubble-bubble, kalia, narghile and waterpipe is a traditional device for smoking tobacco in the middle east region (1). The size, shape, and tobacco used in the hookah device vary in different regions (2).

Hookah smoking has increased worldwide and there has been a revival of its use in general population, especially among young people (3, 4). Emergence of flavored and sweetened tobacco has added to this popularity (5). Moreover, there is a common misconception about hookah smoking that it is safer than other tobacco products (6). In some countries (like Iran) there is no legal prohibition of hookah smoking. Such situation, as well as lack of product-specific interventions and policies have led to popular beliefs among youth and young adults that

hookah smoking is neither addictive nor hazardous (5, 7). Studies have reported that hookah smoking has been associated with lung cancer and other respiratory diseases (8), periodontal diseases, low birth weight (9) and some effects on cardiovascular system (7, 10, 11).

Several studies from different regions and countries, like eastern Europe (12), United States (13), Jordan (14), and Syria (15) indicate an increasing and alarming trend of hookah smoking among university students. It should be noted that although hookah has been used traditionally in middle eastern countries (1), Akl et al. in a systematic review concluded that the prevalence of hookah smoking appears to be alarmingly high among school and university students not only in Middle Eastern regions, but also in western countries (16). It should be noted that due to pressure of heavy workload, and in other hand higher medical knowledge, the prevalence of any substance use in medical

university students may be different from the general population or other students (17). Despite the importance of hookah smoking among university students, there is little information about it in this high-risk group (18).

2. Objectives

The aim of this study was to determine the status of hookah smoking and its correlates in the students of Tehran University of Medical Sciences during 2012 - 2013.

3. Materials and Methods

The present cross-sectional study was conducted from autumn 2012 until winter 2013 using a multistage sampling method. Students were chosen as follows; in each college (strata), a number of classes (clusters) - proportion to size - were randomly selected and all students of the selected classes were included in the study. Proportion of females in the Iranian universities of medical sciences in Iran is about twice of males and this ratio was considered in our sample for ensuring the representativeness.

The questionnaire was aimed at obtaining information on hookah and cigarette smoking, alcohol use, use of prescription-type drugs (including medications that contain opioid components, methylphenidate and sedatives or tranquilizers), and illicit drug use (including cannabis, opium and its residue, heroin, stimulants such as methamphetamine, ecstasy and cocaine), as well as demographic information. In addition, the questionnaire inquired about cigarette or hookah smoking, alcohol use, substance use and use of prescription-type drugs in the family members and close friends. The questionnaire was developed earlier in another study (19). More details about items and validity of the questionnaire have been presented elsewhere (17).

The last year use was considered as a basis for statistical analyses of hookah, cigarette and alcohol use. For illicit substances, lifetime use was defined as a risk behavior. Prescription-type drug use was defined as the use of opioid drugs and sedatives (tranquilizers) at least 3 times a week for the last month or last year use of methylphenidate.

The precision of prevalence was showed by 95% confidence intervals (CI). Chi-square test and multiple binary logistic regression analysis (backward method) were used for univariate and multivariate analyses, respectively. A P value < 0.05 was considered as statistically significant.

The questionnaires were anonymous and self-administered. Before distribution of questionnaires, students were informed about the voluntary nature of the participation in the study and their right to reject

participation in the study or skip any questions. Study was approved by the ethics committee of Tehran University of Medical Sciences.

4. Results

The response rate was 90.5% in the present study (1992 out of the 2212 distributed questionnaires). The mean age of the participants was 21.16 ± 3.15 years (range: 16 - 44). The majority of the sample were females (69.2%) and 7.9% were married. Among 1992 students, 26.6%, 17.8% and 8.9% had used hookah in the lifetime, last year and last month, respectively. Frequency distribution of the hookah smoking by gender was shown in Table 1. Demographic and key characteristics of the sample, as well as the conditional distribution of hookah smoking at each level of the variables are also shown in Table 2. According to this table, all variables had a significant association with last year hookah smoking except age, marital status and prescription-type drug use in the family. Results of the binary logistic regression are shown in Table 3. The results of these analyses showed that male gender (OR = 2.8, 95% CI: 1.86 - 4.21), cigarette smoking in the past year (OR = 5.6, 95% CI: 3.21 - 9.83), alcohol use in the past year (OR = 7.4, 95% CI: 4.01 - 13.06), cigarette or hookah smoking in the family members (OR = 1.7, 95% CI: 1.13 - 2.51), cigarette or hookah smoking among friends (OR = 4.4, 95% CI: 2.69 - 7.33), alcohol use among friends in the past year (OR = 1.9, 95% CI: 1.20 - 3.14), and illicit substance use among friends (OR = 2.2, 95% CI: 1.22 - 4.05) were associated with hookah smoking.

5. Discussion

In the present study, the lifetime, last year and past 30 day prevalence of hookah smoking were determined to be 26.6%, 17.8% and 8.9%, respectively. The prevalence of hookah smoking in the present study is similar to other studies conducted among university students in Iran (20, 21). For example, the prevalence of lifetime and last year smoking of hookah were reported to be 30% and 20.7%, respectively, in one study (20) and in another study 28.7% of males and 11.5% of females reported current hookah smoking (21). In addition, the prevalence of hookah smoking among students of Zanjan (occasionally and regular use) and Tabriz (last use) Universities, Iran, were reported as 13%, 4.2% and 8.5%, respectively (22, 23). This rate is even lower than that reported in some other Islamic countries. For example, the lifetime and past-30- day prevalence of hookah smoking have been reported to be 61.1% and 42.7%, respectively for university students of Jordan (14). Also, in a study among medical and nonmedical university students

Table 1. Prevalence of Hookah Smoking by Gender

Hookah Smoking	Males		Females		Total	
	No. (%)	95% CI	No. (%)	95% CI	No. (%)	95% CI
lifetime use	262 (42.8)	38.9 - 46.7	268 (19.4)	17.7 - 21.5	530 (26.6)	24.7 - 28.6
Last year use	182 (29.7)	26.1 - 33.4	172 (12.5)	10.7 - 14.2	354 (17.8)	16.1 - 19.5
Last month use	97 (15.8)	12.9 - 18.7	81 (5.9)	4.6 - 7.1	178 (8.9)	7.7 - 10.2

Abbreviation: CI, confidence interval.

in Turkey, the total prevalence rate of hookah smoking was found to be 32.7% (24). In Eastern Mediterranean countries, it seems that hookah smoking has been surged considerably (25).

Our findings are also relatively low in comparison with studies conducted in western countries. The prevalence of last year hookah smoking among university students has been reported as 25.7% in monitoring the future (MTF) study in US (26). In north Carolina this rate have been reported as 40% (life time prevalence) and 17% (last 30 day prevalence) (27). Among students of a university in United States, the lifetime, last year and past 30 day prevalence rates of hookah smoking was reported as 40.5%, 30.6% and 9.5%, respectively (28). In a British university prevalence of hookah smoking was found to be 38% (lifetime) and 8% (regularly smoking) (29). The results of a review showed that the prevalence of last month hookah smoking range from 6% to 34% among Middle Eastern adolescents and from 5% to 17% among American adolescents (25). This high prevalence has been attributed to its social acceptance (30, 31). In addition, another factor that influences the spread of hookah smoking is that it is perceived to be less lethal and addicting than cigarette smoking (5, 6). Our findings, like previous studies from Iran and other countries (4, 29, 32, 33), showed that hookah smoking is more prevalent in men than in women. The logistic regression models demonstrated that odds of hookah smoking are 2.8 for males compared to females. It should be noted that this difference is much higher in the case of cigarette smoking, alcohol and other illegal drug use. It highlights this fact that female students show higher tendency to hookah smoking than to other substances. This might be resulted from high social acceptance of hookah. In Iran, even many religious families do not consider hookah use by women as abnormal.

We found that students who had smoked cigarettes and those who had used alcohol in the last year were more likely to use hookah compared with nonsmokers. Due to the cross-sectional nature of the study, we were not able to identify the temporal sequence of hookah smoking and the use of other substances. However, consider-

ing co-occurrence is one of the most effective approaches in prevention of high-risk behaviours. Numerous studies have emphasized the co-occurrence of hookah smoking and other risky behaviours (34-36). Several studies indicated that involvement in one risky behavior is related with engagement in other risky behaviours (37, 38). This may be especially important for the hookah and cigarette smoking; because in both tobacco is used by means of smoking (39).

Our findings indicated that hookah smoking was strongly associated with cigarette or hookah smoking by friends. One of the most important factors that can affect the spread of hookah smoking is peers' influence (3). Heinz et al. showed that participants who were hookah users, as compared to nonusers, had a greater number of friends who had tried and approved hookah use (35). In addition, several studies indicate that if substance use is common in majority of friends, these youths probably will be pushed to consumption (40, 41). It is also found that alcohol use and illicit substance use in friends are associated with hookah use among students. Hookah smoking is often a social phenomenon that occurs between friends and predominantly in cafes and bars (2, 5). Ghafouri et al. in a study among students of health sciences, stated that hookah smoking was perceived as a social activity among friends (42). Because of religious and legal prohibition of alcohol use in Iran, there is no social drinking in cafes and bars. In such a case, hookah smoking has considerable importance and acts as a mean of socialization for the youth.

In the present study, it was found that hookah smoking is higher in those students with hookah smoking in family. Some studies have emphasized on parents' substance abuse and increased chance of illicit substance use in children (43, 44). The role of family members in hookah smoking is complex and notable. The result of a study among Michigan adults found that having a father, mother, or sibling who smoke hookah at home is a significant risk factor for hookah smoking (45).

Table 2. Demographic Characteristics of the Students by Last Year Hookah Smoking^a

Characteristics	Hookah Smoking			P Value
	No	Yes	Total	
Age, y				0.156
≤ 25	1501 (81.8)	333 (18.2)	1834	
> 25	128 (86.5)	20 (13.5)	148	
Gender				< 0.001
Male	431 (70.3)	182 (29.7)	613	
Female	1207 (87.5)	172 (12.5)	1379	
Marital status				0.653
Single	1504 (82.3)	323 (17.7)	1827	
Married	127 (80.9)	30 (19.1)	157	
Living in				< 0.001
Parental home	547 (79.4)	142 (20.6)	689	
Dormitory	1018 (84.8)	183 (15.2)	1201	
Single house	45 (65.2)	24 (34.8)	69	
Cigarette smoking (last year)				< 0.001
No	1555 (85.6)	261 (14.4)	1816	
Yes	83 (47.2)	93 (52.8)	176	
Alcohol use (last year)				< 0.001
No	1601 (86.4)	253 (13.6)	1854	
Yes	37 (26.8)	101 (73.2)	138	
Prescription-type drug use^b				< 0.001
No	1574 (83.3)	315 (16.7)	1889	
Yes	61 (62.2)	37 (37.8)	98	
Ever illicit substance use				< 0.001
No	1613 (83.4)	322 (16.6)	1935	
Yes	25 (43.9)	32 (56.1)	57	
Cigarette or hookah smoking in family (last year)				< 0.001
No	961 (88.8)	121 (11.2)	1082	
Yes	657 (74.0)	231 (26.0)	888	
Alcohol use in family (last year)				< 0.001
No	1441 (85.2)	251 (14.8)	1692	
Yes	171 (62.9)	101 (37.1)	272	
Prescription-type drug use in family (last year)				0.606
No	1101 (81.9)	244 (18.1)	1345	
Yes	511 (82.8)	106 (17.2)	617	
Illicit substance use in family (last year)				0.001
No	1498 (82.9)	308 (17.1)	1806	
Yes	114 (72.6)	43 (27.4)	157	
Cigarette or hookah smoking in friends (last year)				< 0.001
No	976 (94.4)	58 (5.6)	1034	
Yes	640 (68.7)	291 (31.3)	931	
Alcohol use in friends (last year)				< 0.001
No	1333 (89.2)	161 (10.8)	1494	
Yes	283 (60.1)	188 (39.9)	471	
Prescription-type drug use in friends (last year)				< 0.001
No	1161 (84.6)	211 (15.4)	1372	
Yes	453 (76.9)	136 (23.1)	589	
Illicit substance use in friends (ever)				< 0.001
No	1541 (84.5)	283 (15.5)	1824	
Yes	73 (53.3)	64 (46.7)	137	

^aValues are expressed as No. (%).^bUse of opioid medications or sedatives (tranquilizers) at least 3 times a week for the last month or last year use of methylphenidate.

Table 3. Logistic Regression Analysis of the Association Between Hookah Smoking and High-Risk Variables in a Sample of Iranian Students in Tehran (2012 - 2013)^a

Variables	Hookah Smoking		
	OR	95%CI	P Value
Gender (male/female)	2.80	1.86 - 4.21	< 0.001
Cigarette smoking (last year)	5.62	3.21-9.83	< 0.001
Alcohol use (last year)	7.24	4.01-13.06	< 0.001
Cigarette or hookah smoking in family (last year)	1.69	1.13-2.51	0.009
Cigarette or hookah smoking in friends (last year)	4.44	2.69-7.33	< 0.001
Alcohol use in friends (last year)	1.94	1.20-3.14	0.007
Illicit substance use in friends (ever)	2.22	1.22-4.05	0.009

Abbreviations: CI, confidence interval; OR, odds ratio.

^aVariables entered on step 1: gender, age, marital status, living place, cigarette smoking, alcohol use, illicit substance use, illicit substance use in family, illicit substance use in friends, prescription-type drug use in family and prescription-type drug use in friends, cigarette or hookah smoking in family, cigarette or hookah smoking in friends, alcohol use in family, alcohol use in friends and prescription-type drug use.

5.1. Limitations

This study has some limitations. Due to the cross-sectional design of the study, causal inference of our results cannot be identified. Furthermore, findings of the study are relied on self-report data and it was assumed that the students were honest in answering the questions. For future studies, longitudinal studies are required to determine and monitor the incidence rate of hookah use and its correlates among medical university students.

5.2. Conclusions

The results of this study indicate lifetime, last year and last month use of hookah smoking among students of Tehran University of Medical Sciences. Our findings show a relatively low prevalence of hookah smoking among Iranian students in comparison to other studies. Some factors associated with hookah smoking were identified in this study. The findings of this study can be used for planning and evaluating interventions by considering co-occurrence of hookah smoking with other risky behaviours.

Footnotes

Authors' Contribution: All the authors were involved in study conceptualization, design, quality control and interpretation of the results. Abbas Abbasi-Ghahramanloo directed the field work, performed statistical analysis and drafted the manuscript. All the authors contributed to the final version and approved the manuscript.

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Declaration of Interests: The authors declare that there are no conflicts of interests.

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