



# Knowledge and Attitudes of University Students Towards Hookah Smoking in Fasa, Iran

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Received 2017 April 10; Revised 2017 August 25; Accepted 2017 September 05.

## Abstract

**Background:** The habit of hookah smoking is increasing among the youth, which requires more attention.

**Objectives:** This study aimed to assess knowledge and attitudes of university students towards hookah smoking in Fasa, Iran, based on the theory of planned behavior (TPB).

**Methods:** This study was conducted on 157 university students in Fasa, Fars Province, Iran, in 2015. The data were collected using a questionnaire including demographic information and TPB constructs. Then, the data were entered into the SPSS version 19 statistical software and analyzed using descriptive and inferential statistics.

**Results:** The results showed that 80% of the students had plans for the cessation of hookah smoking. Additionally, a significant difference was found among the students of different universities regarding the scores of attitude ( $P = 0.003$ ) and behavioral intention ( $P = 0.005$ ). Moreover, the results of Mann-Whitney test showed that the scores of behavioral intention and attitude were higher among male participants ( $P = 0.0001$  and  $P = 0.004$ , respectively). However, females obtained significantly higher scores regarding peer opinion ( $P < 0.001$ ). Although the students believed that quitting smoking could help prevent many diseases, they continued hookah smoking because they thought it was non-addictive, relieved anxiety and fatigue, and its cessation might lead to the loss of contact with friends.

**Conclusions:** Interventions for the cessation of hookah smoking should be based on elimination of positive attitudes toward hookah smoking and promotion of refusal skills, relaxation, and skills to cope with the temptation of hookah smoking.

**Keywords:** Attitude, Hookah Smoking, Students, Theory of Planned Behavior

## 1. Background

Today, smoking is considered a health problem all over the civilized world. The number of deaths resulting from tobacco consumption has increased from 4.5 million to 4.6 million in 2015 and it is expected to reach 3.8 million accounting for one out of every three deaths among adults by 2020 (1, 2). Hookah smoking is an old method of tobacco use and has different names in different regions. Nowadays, this phenomenon has gained a widespread popularity among the youth (3, 4). In the recent years, hookah smoking has increased among adults in Asian and African societies, particularly Middle-Eastern and Arab countries (5). In most countries, the rising trend of tobacco consumption has been associated with an increase in the use of fruit-flavored tobacco (6). Hookah smoke contains large amounts of carcinogenic compounds, such as hydrocar-

bons and heavy metals (7, 8). Different studies have suggested that different factors, such as attitudes and beliefs regarding the lower risk of hookah compared to cigarettes, easy access, and low costs, were involved in the prevalence of hookah smoking (9).

Health education experts use relevant theories and models to design effective prevention programs and promote health. In other words, in studies in which researchers look for a way to raise awareness and change participants' attitudes and behaviors, application of theories and models of behavior and choice change and use of a systematic method are essential (10). Health education researchers have proposed different psychological and social models for behavior change (11). The theoretical framework used in this study to assess students' beliefs about smoking cessation is the theory of planned behavior (TPB),

which is one of the prevailing theories of behavior change and prediction. According to this theory, behavioral intention is the most important determinant of behavior. Constructs of behavioral intention include attitude, subjective norms, and perceived behavioral control. Perceived behavioral control and intention are the direct measures of behavior, while attitude, subjective norms, and perceived behavioral control are independent predictors of intentions (12). TPB is a social-cognitive model of decision-making that provides a useful framework for predicting and explaining health behaviors (13). This theory was proposed in 1885 and developed in 1991 by Fishbin and Ajzen (14). TPB is a motivational model that includes the concept of subjective norms. According to this concept, the behavior depends on social and expectation networks. Various researchers have discovered the importance of subjective norms in juvenile behavior. Another advantage of TPB is that it considers the impact of social factors (15).

In a study conducted by Almeria et al. in Russia, the prevalence of hookah smoking was 23.5% among medical students (16). Moreover, the results of the study by Dehdari et al. in Tehran University of Medical Sciences showed that the most important causes of hookah smoking among students were cost-effectiveness, easy access to hookah, friends who smoked hookah, and the belief that it can fill leisure time and reduce anxiety and fatigue (3). The results of another study indicated that poor refusal skills in relation to friends' offers, inability to deal with the temptation of hookah smoking, and the difficulty of giving up hookah smoking in friendly recreational environments were among the reasons for continued hookah smoking among students (6). In another study conducted in female students in state universities in Iran, the prevalence of hookah smoking was 40.3% (17). According to Shakib et al. (18) and Khubaib et al. (19), a positive attitude towards the use of cigarette and hookah was significantly related to smoking, while negative attitudes towards smoking and the belief that it was not a socially acceptable practice reduced the probability of cigarette and hookah smoking among students.

Given the prevalence of hookah smoking among students and the necessity of knowing the components and dimensions of this behavior in order to design appropriate and effective interventions, this study aimed to determine the knowledge and attitude of university students in Fasa regarding the risk factors associated with hookah smoking according to TPB.

## 2. Objectives

The current research aimed to assess knowledge and attitudes of university students towards hookah smoking

in Fasa, Iran, based on TPB.

## 3. Materials and Methods

This descriptive, cross-sectional study was conducted in 2015. Based on previous studies and considering  $\alpha = 0.05$  and the maximum acceptable difference of 0.05, a 157-subject sample size was determined for the study. The participants were selected from Fasa University of Medical Sciences, Fasa University, Payam Noor University, and Islamic Azad University using stratified random sampling. First, the number of students per university was determined. Next, 157 students were randomly selected from different universities in proportion to their population. The inclusion criteria of the study were being a student at universities in Fasa and being willing to participate in the study. On the other hand, the exclusion criterion was an unwillingness to cooperate in the study. After approval of the research project in Fasa University of Medical Sciences, the study questionnaires were administered to the participants and the required data were collected. The data were collected using the TPB questionnaire used by Dehdari et al. in an Iranian context. The validity and reliability of the questionnaire had been confirmed previously. Using the test-retest method with a 10-day interval among 16 students, the reliability coefficient of 0.078 was obtained for intention, 0.75 for attitude (including the constructs of behavioral beliefs and outcome evaluations), 0.76 for subjective norms (including the constructs of normative beliefs and motivation to comply), and 0.92 for perceived behavioral control (including the constructs of control beliefs and perceived power), which were all significant. The content validity ratio and content validity index of the questionnaire were 0.98 and 0.81, respectively (6).

After all, the collected data were entered into the SPSS version 19 statistical software and were analyzed via descriptive and inferential statistics. Independent samples t-test was used to compare the constructs mean scores. In addition, one-way ANOVA and chi-square tests were used to assess the associations between qualitative variables. In case the prerequisites for parametric tests were not met, Mann-Whitney and Kruskal-Wallis non-parametric tests were used. All analyses were carried out at the significance level of 0.05.

## 4. Results

This study was conducted in 157 university students in Fasa. The subjects were aged 18 - 33 years and their mean age was  $23.14 \pm 2.49$  years. Besides, 109 participants were male (69.42%) and 48 were female (30.57%). In terms of education level, most of the participants were Ph.D. candidates

(33%), while the lowest number belonged to master students (2%). Considering parents' education level, most fathers and mothers had academic degrees (47.8% and 37.8%, respectively), while the lowest number was related to illiterate parents (7% and 11.5, respectively). With respect to job status, the most frequent jobs were self-employment for fathers (28.8%) and homemaker for mothers (66.2%). The participants were reimbursed for participation in the study (Table 1).

According to the results, 80% of the students said that they smoked hookah with their friends for the first time. Additionally, 35% of the students stated that they smoked hookah in cafes for the first time. The prevalence rates of smoking and drug consumption were 32.3% and 4.5%, respectively. The highest level of hookah and cigarette smoking was reported in Islamic Azad University (45% and 57%, respectively). Besides, the highest and the lowest rates of drug abuse were related to Fasa University (7%) and Islamic Azad University (2.5%), respectively.

To compare different constructs of TPB, first, the normality of the data was tested using Kolmogorov-Smirnov test. Because the normality test was rejected, Mann-Whitney and Kruskal-Wallis tests were used for comparisons. The results of Mann-Whitney test showed that the scores of behavioral intention and attitude were higher among male subjects ( $P = 0.0001$  and  $P = 0.004$ , respectively), while the score of peer opinion was significantly higher among females ( $P < 0.001$ ).

The results of Kruskal-Wallis test showed a significant difference between the students of different universities regarding the scores of attitude ( $P = 0.003$ ) and behavioral intention ( $P = 0.005$ ). Moreover, the results of Mann-Whitney test indicated a significant relationship between marital status and attitude ( $P = 0.004$ ), peer opinion ( $P = 0.001$ ), and behavioral intention ( $P = 0.001$ ). However, no significant differences were observed between married and single subjects concerning other constructs ( $P > 0.05$ ).

## 5. Discussion

The prevalence of hookah smoking among students, who are the educated class of the society and a model for other young people, has increased in recent years. Generally, students' physical and mental health and productivity are of great importance because countries need healthy and happy human resources in future. Thus, many material and spiritual assets are used to keep the young population healthy and educated. In this context, factors with negative impacts on students' physical and psychological health and performance have to be identified and prevented or eliminated.

Akl et al. (20) conducted a research and found that hookah smoking was on the rise among students in Eastern Mediterranean countries (EMRO) and Asian students studying in Western countries.

The results of the present study on attitudes of the students who smoked hookah indicated that their belief that hookah smoking was not addictive formed a positive attitude and encouraged them to continue smoking. However, the belief that hookah smoking is not addictive is false. After some time, which is different for each person, the rate of hookah smoking increases exponentially and dependence on hookah appears. Emrich et al. showed a direct relationship between attitude and behavior (21). Taraghijah et al. also reported a significant relationship between positive attitudes toward hookah and smoking among university students (17). Moreover, Maziak et al. concluded that aromatic and fruit-flavored tobacco played an important role in increasing the popularity of smoking among young Syrian people (22). Another positive attitude toward hookah smoking among the students was that it could reduce anxiety and fatigue. Similar studies have also shown that the pleasure of smoking cigarette and its effect on reducing anxiety were the most important factors that increased students' tendency towards smoking (19). In the same line, various studies have shown that psychological problems, such as anxiety and depression, were the most important factors in increasing the youth's tendency to use drugs (23). In order to prevent smoking tobacco including hookah, causes of stress and anxiety among students have to be evaluated and, at the same time, students have to be trained regarding the necessary skills to solve their psychological problems.

The results of the present study showed that 80% of the students smoked hookah with their friends for the first time. Therefore, meetings with friends when smoking a hookah was a positive attitude leading to continued smoking. Studies have shown that the rate of smoking was 10 folds higher among students with smoker friends or classmates compared to those who did not have such friends or classmates (24, 25). Moreover, the likelihood of cessation of hookah smoking reduces among students with positive attitudes towards smoking. Our study findings also indicated a significant relationship between attitude and intention to quit or continue smoking in future. In other words, intention to quit smoking decreased with an increase in positive attitude towards smoking. This shows the necessity to train students, especially even in high schools, at dormitories in order to change their positive attitudes. Such training should be focused on raising awareness about addiction to hookah, reducing anxiety and stress, discouraging socializing with hookah-smoking friends, and increasing refusal skills in face of offers to

**Table 1.** Comparison of the Scores of Different Constructs Based on Gender, University, and Marital Status

| Variable             | Gender        |                  |         | University |                 |                                     |              | Marital Status |        |         |         |
|----------------------|---------------|------------------|---------|------------|-----------------|-------------------------------------|--------------|----------------|--------|---------|---------|
|                      | Male (n = 48) | Female (n = 109) | P Value | Payam Noor | Fasa University | Fasa University of Medical Sciences | Islamic Azad | P Value        | Single | Married | P Value |
| Knowledge            | 082.8         | 77.33            | 0.417   | 80.96      | 65.20           | 77.01                               | 61.60        | 0.115          | 082.8  | 77.33   | 0.417   |
| Attitude             | 063.33        | 85.9             | 0.004   | 55.12      | 67.13           | 67.12                               | 94.50        | 0.003          | 063.33 | 85.9    | 0.004   |
| Peer opinion         | 101.38        | 69.15            | 0.001   | 95.85      | 76.70           | 72.65                               | 61.35        | 0.079          | 101.38 | 69.15   | 0.001   |
| Behavioral control   | 075.83        | 80.39            | 0.560   | 74.96      | 64.23           | 70.65                               | 79.66        | 0.610          | 075.83 | 80.39   | 0.560   |
| Behavioral intention | 61.4          | 86.7             | 0.001   | 63.38      | 78.47           | 64.69                               | 92.19        | 0.005          | 61.4   | 86.75   | 0.001   |

smoke hookah. Momen Abadi et al. (26) showed the effect of an educational intervention on the behavioral intention for smoking hookah among students.

The results of the current study on subjective norms of hookah-smoking students regarding cessation of hookah smoking showed that the opinions of family and friends were very important for students in their decision to quit hookah smoking. This reflects the significant role of families in reduction and cessation of tobacco use, including hookah, among the youth. Kardia et al. introduced parental substance abuse as a predictor of drug dependence among young people (27). Azami et al. also found a significant association between family history of drug use and the youth's tendency towards drugs (28). In the same line, Tilson et al. reported that good communication between parents and children along with a calm and tension-free family life played a protective role against tobacco use among the youth (29). Majidpour et al. also reported that 17% of the families of medical students in Ardabil smoked cigarettes (30). Another study by Wang et al. demonstrated that existence of certain conditions, including living in dormitories, being away from family, and lack of parental supervision, increased students' vulnerability to smoking cigarettes and tobacco (31). Given that students' families play a fundamental role in controlling their relationships with friends and satisfying their emotional and material needs, training families about their pivotal role in their children's tendency towards smoking through mass media requires more attention.

The results of our study also highlighted the role of friends in starting or quitting hookah smoking. It is noteworthy that hookah is easily accessible for all people, especially the youth. The results of this study showed that 35% of the students smoked hookah at traditional restaurants and cafes for the first time. The study conducted by Maziaket al. in Syria also revealed that hookah smoking among the youth occurred mainly when they spent their leisure time outdoors (32). It should be noted that a regulation banning smoking in public places, such as restaurants, was passed in Iran in 1995 and was reauthorized in 2002. Nonetheless, Heidari et al. carried out a study on

more than 458 restaurants and cafes in Tehran in 2002 and indicated that 13% of these places did not have any smoking signs, 30% had ashtrays, and 12% had a place for smoking. Indeed, in 29% of the cases, managers showed no reactions against smoking customers, while they were all aware of the regulation and 50% of them deemed the law useful. Studies on demands for cigarettes showed that authorities' sensitivity to implement and enforce regulations for smoke-free spaces and their attempts to increase public awareness on the right of nonsmokers to breathe smoke-free air could help achieve the ultimate goal of tobacco control programs in public places (33).

Price volatility has also been found to be among the factors influencing the demand for tobacco products, such as cigarettes (34). For example, studies carried out in Iran showed that an increase in cigarette prices could reduce its consumption significantly (35). Rezai et al. also disclosed that availability and low price of cigarettes were important factors in increasing smoking among the youth (36). Thus, increasing tobacco prices and raising taxes on its production are among the important measures for reducing the use of tobacco products, such as hookah.

The results of the present study revealed that poor refusal skills in relation to friends' offers or encouragement, inability to deal with the temptation of hookah smoking, and difficulty of giving up hookah smoking in friendly recreational environments were among the reasons for addiction among the students. Similarly, Kear found that poor refusal skill was an important factor in the youth's tendency towards smoking (37). Additionally, evidence has indicated that individuals with low self-esteem and personal control were more easily encouraged for smoking by others (38, 39). Therefore, possessing skills that enhance individuals' ability to refuse others' invitation to smoke hookah can reduce the rate of vulnerability to social effects and the likelihood of being caught in drug addiction. Indeed, learning anxiety and stress reduction strategies can increase students' self-efficacy for the cessation of hookah smoking. It is noteworthy that filling students' leisure time with healthy activities, such as sports, and taking measures by university authorities to provide the nec-



essary infrastructures, such as building adequate exercise spaces in dormitories, holding events, planning collaborative activities, and establishing recreation camps, are among practical steps to increase hookah cessation among students.

One of the limitations of this study was its small sample size. Hence, further studies are recommended to investigate the relationship between cessation of hookah smoking and intention, attitude, subjective norms, and perceived behavioral control in larger populations. Future studies are also suggested to investigate the predictors of continuation or cessation of hookah smoking based on other constructs of behavior change, such as those of health belief model (HBM), trans-theoretical model, and protection motivation theory. Another limitation of this study was the possibility of incorrect answers by some participants due to personal reasons. Yet, this problem was largely resolved through applying anonymity.

### 5.1. Conclusion

The results of this study showed that the structure of the theory of planned behavior properly describes the intended use of hookah. In this regard, the attitude is the strongest predictor of hookah smoking among students. Thus, creating a negative attitude regarding hookah smoking can reduce and eventually eliminate this behavior in the students. Considering the impact of the perceptions and attitudes of individuals intending to use hookah, it is recommended that experts and officials focus on changing attitudes towards smoking hookah, strengthening control behaviors, enhancing efficacy in the prevention of smoking hookah, and coping with temptation in hookah smoking.

### Acknowledgments

The researchers appreciate officials of Fasa University of Medical Sciences that sponsored this study under proposal number 94090 (ethical committee approval code: IR.FUMS.REC.1394.199). In addition, the authors would like to thank Ms. A. Keivanshekouh at the research improvement center of Shiraz University of Medical Sciences for improving the use of English in the manuscript.

### Footnotes

**Authors' Contribution:** Ali Khani Jeihooni, Zahra Khiyali, Seyyed Mansour Kashfi, Seyyed Hannan Kashfi, Mohammad Zakeri and Mehdi Amirkhani served as the main investigator, performed the literature review, managed the study, and contributed to writing the paper. Ali

Khani Jeihooni, Zahra Khiyali, Seyyed Mansour Kashfi, and Mehdi Amirkhani managed the acquisition of data and contributed to the study design and writing the draft. Ali Khani Jeihooni, Zahra Khiyali, Seyyed Mansour Kashfi, Seyyed Hannan Kashfi, Mohammad Zakeri, Mehdi Amirkhani contributed to the analysis and interpretation of data. All authors read and approved the final manuscript.

**Declaration of Interest:** None declared.

**Funding/Support:** The present study was approved by Fasa University of Medical Sciences (Grant No. 94090).

### References

1. Sinha DN, Suliankatchi RA, Gupta PC, Thamarangsi T, Agarwal N, Parascandola M, et al. Global burden of all cause and cause-specific mortality due to smokeless tobacco use: systematic review and meta analysis. *Tob Control*. 2018;27(1):35-42. doi: [10.1136/tobaccocontrol-2016-053302](#). [PubMed: [27903956](#)].
2. Mathers CD, Loncar D. Projections of global mortality and burden of disease from 2002 to 2030. *PLoS Med*. 2006;3(11):442. doi: [10.1371/journal.pmed.0030442](#). [PubMed: [17132052](#)].
3. Dehdari T, Jafari A, Joveyni H. Students perspectives in Tehran University of medical sciences about factors affecting smoking hookah. *Razi J Med Sci*. 2012;19(95):17-24. Persian.
4. Hadidi KA, Mohammed FI. Nicotine content in tobacco used in bubble smoking. *Saudi Med J*. 2004;25(7):912-7. [PubMed: [15235699](#)].
5. Maziak W, Ward KD, Afifi Soweid RA, Eissenberg T. Tobacco smoking using a waterpipe, a reemerging strain in a global epidemic. *Tob Control*. 2004;13(4):327-33. doi: [10.1136/tc.2004.008169](#). [PubMed: [15564614](#)].
6. Jradi H, Wewers ME, Pirie PP, Binkley PF, Ferketich AK. Lebanese medical students intention to deliver smoking cessation advice. *J Epidemiol Glob Health*. 2015;5(2):117-23. doi: [10.1016/j.jegh.2014.05.003](#). [PubMed: [25922320](#)].
7. Shihadeh A. Investigation of mainstream smoke aerosol of the argileh water pipe. *Food Chem Toxicol*. 2003;41(1):143-52. [PubMed: [12453738](#)].
8. Sepetdjian E, Shihadeh A, Saliba NA. Measurement of 16 polycyclic aromatic hydrocarbons in narghile waterpipe tobacco smoke. *Food Chem Toxicol*. 2008;46(5):1582-90. doi: [10.1016/j.fct.2007.12.028](#). [PubMed: [18308445](#)].
9. Martinasek MP, McDermott RJ, Martini L. Waterpipe, (hookah) tobacco smoking among youth. *Curr Probl Pediatr Adolesc Health Care*. 2011;41(2):34-57. doi: [10.1016/j.cppeds.2010.10.001](#). [PubMed: [21232693](#)].
10. Cote F, Godin G, Gagne C. Identification of factors promoting abstinence from smoking in a cohort of elementary schoolchildren. *Prev Med*. 2004;39(4):695-703. doi: [10.1016/j.ypmed.2004.02.037](#). [PubMed: [15351535](#)].
11. Karimy M, Zareban I, Araban M, Montazeri A. An extended theory of planned behavior, (TPB) used to predict smoking behavior among a sample of Iranian medical students. *Int J High Risk Behav Addict*. 2015;4(3):24715. doi: [10.5812/ijhrba.24715](#). [PubMed: [26495261](#)].
12. Vederhus JK, Zetmore SE, Rise J, Clausen T, Hoie M. Predicting patient post detoxification engagement in 12 step groups with an extended version of the theory of planned behavior. *Addict Sci Clin Pract*. 2015;10:15. doi: [10.1186/s13722-015-0036-3](#). [PubMed: [26092327](#)].
13. Hamilton K, Spinks T, White KM, Kavanagh DJ, Walsh AM. A psychosocial analysis of parents decisions for limiting their young child's screen time: An examination of attitudes, social norms and roles,

- and control perceptions. *Br J Health Psychol.* 2016;**21**(2):285-301. doi: [10.1111/bjhp.12168](#). [PubMed: [26462456](#)].
14. Dumitrescu AL, Waggle M, Dogaru BC, Manolescu B. Modeling the theory of planned behavior for intention to improve oral health behaviors: the impact of attitudes, knowledge, and current behavior. *J Oral Sci.* 2011;**53**(3):369-77. [PubMed: [21959666](#)].
15. St Pierre RA, Temcheff CE, Derevensky JL, Gupta R. Theory of planned behavior in school based adolescent problem gambling prevention, a conceptual framework. *J Prim Prev.* 2015;**36**(6):361-85. doi: [10.1007/s10935-015-0404-5](#). [PubMed: [26480847](#)].
16. Almerie MQ, Matar HE, Salam M, Morad A, Abdulaal M, Koudsi A, et al. Cigarettes and waterpipe smoking among medical students in Syria, a cross sectional study. *Int J Tuberc Lung Dis.* 2008;**12**(9):1085-91. [PubMed: [18713509](#)].
17. Taraghi Jah S, Hamdiye M, Yaghubi M. Predictor factors of smoking and hookah use in governmental universities. *Res Med.* 2011;**34**(4):249-56. Persian.
18. Shakib S, Zheng H, Johnson CA, Chen X, Sun P, Palmer PH, et al. Family characteristics and smoking among urban and rural adolescents living in China. *Prev Med.* 2005;**40**(1):83-91. doi: [10.1016/j.ypmed.2004.05.029](#). [PubMed: [15530584](#)].
19. Khubaib MU, Shahid ZY, Lodhi SK, Malik H, Jan MM. Prevalence and associated factors of smoking among final year medical students, a multicentric survey from Pakistan. *Cureus.* 2016;**8**(7):701. doi: [10.7759/cureus.701](#). [PubMed: [27588223](#)].
20. Akl EA, Gunukula SK, Aleem S, Obeid R, Jaoude PA, Honeine R, et al. The prevalence of waterpipe tobacco smoking among the general and specific populations, a systematic review. *BMC Public Health.* 2011;**11**:244. doi: [10.1186/1471-2458-11-244](#). [PubMed: [21504559](#)].
21. Emrich K, Thompson TC, Moore G. Positive attitude, an essential element for effective care of people with mental illnesses. *J Psychosoc Nurs Ment Health Serv.* 2003;**41**(5):18-25. [PubMed: [12743963](#)].
22. Maziak W, Eissenberg T, Rastam S, Hammal F, Asfar T, Bachir ME, et al. Beliefs and attitudes related to narghile, (waterpipe) smoking among university students in Syria. *Ann Epidemiol.* 2004;**14**(9):646-54. doi: [10.1016/j.annepidem.2003.11.003](#). [PubMed: [15380795](#)].
23. Amin Esmaeili M, Rahimi Movaghar A, Sharifi V, Hajeji A, Radgoodarzi R, Mojtabei R, et al. Epidemiology of illicit drug use disorders in Iran: prevalence, correlates, comorbidity and service utilization results from the Iranian mental health survey. *Addiction.* 2016;**111**(10):1836-47. doi: [10.1111/add.13453](#). [PubMed: [27177849](#)].
24. Xu X, Chen C, Abdullah AS, Liu L, Sharma M, Li Y, et al. Smoking related attitudes, motives, and behaviors of male secondary school students in an urban setting of China. *Springerplus.* 2016;**5**(1):2021. doi: [10.1186/s40064-016-3694-z](#). [PubMed: [27994998](#)].
25. Chen KT, Chen CJ, Fagot-Campagna A, Narayan KM. Tobacco, betel quid, alcohol, and illicit drug use among 13 to 35 year olds in I Lan, rural Taiwan, prevalence and risk factors. *Am J Public Health.* 2001;**91**(7):1130-4. [PubMed: [11441745](#)].
26. Momenabadi V, Iranpour A, Khanjani N, Mohseni M. Effect of educational intervention on water pipe behaviour of students in dormitories of Kerman Medical University, BASNEF model. *J Health Promot Manag.* 2015;**4**(3):12-22. Persian.
27. Kardia SL, Pomerleau CS, Rozek LS, Marks JL. Association of parental smoking history with nicotine dependence, smoking rate, and psychological cofactors in adult smokers. *Addict Behav.* 2003;**28**(8):1447-52. [PubMed: [14512067](#)].
28. Azami A, Mohammadi MA, Masoomi R. Tendency to narcotics among people over ten years of age in ardabil province, 2002. *J Ardabil Univ Med Sci.* 2005;**5**(1):16-21. Persian.
29. Tilson EC, McBride CM, Lipkus IM, Catalano RF. Testing the interaction between parent child relationship factors and parent smoking to predict youth smoking. *J Adolesc Health.* 2004;**35**(3):182-9. doi: [10.1016/j.jadohealth.2003.09.014](#). [PubMed: [15313499](#)].
30. Majidpour A, Hamidzadeh Arbab Y, Abbasgholizadeh N, Salehy E. Prevalence and causes of tendency to cigarette smoking among students in Ardabil University of medical sciences. *J Ardabil Univ Med Sci.* 2005;**5**(3):266-70. Persian.
31. Reed MB, Wang R, Shillington AM, Clapp JD, Lange JE. The relationship between alcohol use and cigarette smoking in a sample of undergraduate college students. *Addict Behav.* 2007;**32**(3):449-64. doi: [10.1016/j.addbeh.2006.05.016](#). [PubMed: [16844313](#)].
32. Maziak W, Eissenberg T, Ward KD. Patterns of waterpipe use and dependence: implications for intervention development. *Pharmacol Biochem Behav.* 2005;**80**(1):173-9. doi: [10.1016/j.pbb.2004.10.026](#). [PubMed: [15652393](#)].
33. Heydari GH, Ramazankhany A, Talis Chei F, Masjedi M. Evaluation of the smoking ban in public places (restaurants) in Tehran in 2009. *J Med Couns I R Iran.* 2009;**27**(4):423-30. Persian.
34. Dehdari T, Ramazankhany A, Zarghi A. *Principles of health promotion.* 1 ed. Tehran, Iran: Nazari Publication; 2010. Persian.
35. Gorji HA, Mohammadi T, Hosseini L. Cigarette price and smoking rate in 1983, 2005 period in Iran. *J Health Admin.* 2010;**12**(38):31-6. Persian.
36. Kostova D, Ross H, Blecher E, Markowitz S. Is youth smoking responsive to cigarette prices? Evidence from low- and middle-income countries. *Tob Control.* 2011;**20**(6):419-24. doi: [10.1136/tc.2010.038786](#). [PubMed: [21737858](#)].
37. Kear ME. Psychosocial determinants of cigarette smoking among college students. *J Community Health Nurs.* 2002;**19**(4):245-57. doi: [10.1207/S15327655JCHN1904\\_05](#). [PubMed: [12494745](#)].
38. Botvin GJ, Baker E, Dusenbury L, Tortu S, Botvin EM. Preventing adolescent drug abuse through a multimodal cognitive behavioral approach: results of a 3 year study. *J Consult Clin Psychol.* 1990;**58**(4):437-46. [PubMed: [2212181](#)].
39. Khosravi A, Mohammadpoorasl A, Holakouie Naieni K, Mahmoodi M, Pouyan AA, Mansournia MA. Causal effect of self esteem on cigarette smoking stages in adolescents, coarsened exact matching in a longitudinal study. *Osong Public Health Res Perspect.* 2016;**7**(6):341-5. doi: [10.1016/j.phrp.2016.10.003](#). [PubMed: [28053837](#)].