Original Article

Predictors of Smoking among the Secondary High School Boy Students Based on the Health Belief Model

Abstract

Background: Smoking is one of the most important risk factors for health and also health problems, such as heart diseases, especially for young people. This study aimed to investigate the effect of factors related to smoking among the secondary high school students in the city of Marivan (Kurdistan-Iran), in 2015, based on the constructs of health belief model (HBM). **Methods:** This cross-sectional study was conducted in 470 secondary high school students in Marivan in 2015. The samples were selected by random cluster sampling. A question with four sections was used to collect data (demographic questions, knowledge section, attitude section, and questions related to e constructs of HBM). **Results:** According to the results, the correlation of smoking was stronger with attitude ($r = 0.269$ and odds ratio $= 0.89$) but weaker with perceived barriers ($r = 0.101$). There was not a significant correlation between smoking behavior and knowledge of the harms of smoking ($r = -0.005$). Moreover, Cues to action was effective predictor of smoking behavior ($r = 0.259$). **Conclusions:** The findings of this study show that the prevalence of smoking in the studied sample is somewhat lower than other regions of Iran, but it should be noted that if no interventions are done to prevent smoking in this age group. The findings of the study also showed that the structure of attitudes, self-efficacy, and Cues to action are the strongest predictors of smoking among students. Albeit, attitude was strongest predictor of smoking that shows the prevalence of smoking can be reduced by focusing in this part. Considering the mean age of participants ($16/2 \pm 0.25$ years), that shows the riskiest period for smoking is 16 years and authorities can make change in policies of cigarette selling only for over 18 years.

Keywords: *Health belief model, smoking, students*

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Introduction

Smoking is one of the important risk factors and also one of the increasing factors of diseases in the world, especially chronic and noncommunicable diseases such as heart diseases, cardiovascular, respiratory, cancer, and stroke.[1] It is regarded as one of the health problems and an obstacle to be healthy in some developing countries.[2] As a result, one of the preventable causes of chronic disease is smoking.[1]

Tobacco epidemic is one of the most serious public health threats that the world has ever faced. It causes 9 million deaths/year.[3] It is estimated that, by 2030, the number of deaths caused by smoking will reach to more than ten million of which 70% will be in developing countries.[4] The prevalence of smoking in our country, based on a meta-analysis, is 13.9% (21.7% in male and 3.6% in female).[5] Smoking does not belong to a particular class, but the most vulnerable groups are adolescents and youth[6] and that problem targets children too.[7] This is one of the public health problems and it has become a principle problem in tobacco control, because there is a tendency of continuation or repetition of consumption behavior in adulthood[1] which highlights the need for preventing smoking.

Health belief model (HBM) is widely used in the research studies to predict health-related behaviors such as smoking[7] and is one of the most functional models of health education in the field of prevention.[8] This model shows the relationship between health beliefs and health behaviors. It is based on the assumption that preventive behaviors depend on the individuals' beliefs. According to this model, if people feel that they are exposed and sensitive to a situation (perceived susceptibility), and believe that the situation is potentially dangerous and it has negative consequences (perceived severity) and

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have this idea that through a series of operations, they can reduce the risks and side effects of the situation; and believe that the benefits of these actions (perceived benefits) are more than the barriers of doing that behavior (such as time and money) (perceived barriers), they will do the preventive behaviors in order to avoid the risk. Meantime, stimulus can act as a trigger for behavior and they can be regarded as a guide and motive for the action (cues to action), in this sense the individuals have a sense of efficiency and adequacy due to overcoming the barriers of behaviors (self-efficacy).[9] In fact, the HBM is a psychological model that attempts to explain and predict health behaviors.[10] This is done by focusing on the attitudes and beliefs of individuals. According to the history of the model that was used in many studies and the importance of its use in public health issues in order to predicting the health problems, this study was aimed to determine the predictors of smoking among the secondary high school students in Marivan (Kurdistan-Iran) in 2015, based on the constructs of HBM.

Methods

Study design

This study was a cross-sectional study. It was conducted among the secondary high school boys in the spring of 2015 in Marivan city of Kurdistan province of Iran. The samples were selected using multistage random cluster sampling among the six secondary high schools in the city. It was carried out as the following. Twelve secondary boy high schools of the city were considered as clusters of the study; six schools were selected among them; two to three classes were selected from each school in proportion to the number of students.

The criteria for inclusion in this study were being a 1st-, 2nd-, and 3rd-year students and filling a written consent to participate in the study. The exclusion criteria were incomplete fulfilling the questionnaire. In this study, sample size was 470 subjects.

Data collection instrument

To collect data, the questionnaire of Reisi *et al*.[11] was used. It consisted of 65 questions in four sections. The first part contained 11 questions to assess demographic variables; the second part contained 11 questions to assess knowledge about smoking disadvantages. The questions of this section were designed by means of three answers: Yes, no, and I do not know. Two scores were considered for each correct answer, and one point for each I do not know answer and any points for wrong answers (range of score 0–22). The third part consisted of 10 questions to measure the attitude (as a one structure of HBM) with five-level Likert scale (from absolutely agree to absolutely disagree) and the fourth part of the questionnaire consisted of 33 questions related to the constructs of HBM with five option (from strongly agree to strongly disagree).

Twelve questions were about perceived susceptibility (with a minimum score of 12 and a maximum score of 60), 6 questions about perceived benefits (with a minimum score of 6 and a maximum score of 30), 6 questions about perceived barriers (with a minimum score of 6 and a maximum score of 30), 4 self-efficacy question (with a minimum score of 4 and a maximum score of 20), and 5 questions about Cues to action (with a minimum score of 5 and a maximum score of 25).

The content validity of the questionnaire was calculated using the opinions of four experts in health education and health promotion from the University of Medical Sciences of Kurdistan and Isfahan in 2015. In addition, the reliability of the questionnaire was calculated by internal consistency Cronbach's alpha among 58 students, the reliability for knowledge questions was 0.75, perceived susceptibility 0.81, perceived barriers 0.77, perceived benefits 0.79, perceived self-efficacy 0.82 and tips for action 0.80. The alpha for whole questionnaire was 0.81.

After the approval of the proposal, the study was confirmed by the Research Committee of the University of Medical Sciences of Kurdistan. Then arrangements were made with education management of Marivan, school principals, teachers, and students, and the objectives of the study were explained to them clearly. Then, the participants completed the consent form to participate in the study. It took approximately 25 min to complete questionnaire.

Statistical analysis

Data were analyzed by SPSS software version 17 made by United States. Data were analyzed using descriptive statistics such as frequency and percentage, and analytical statistics such as Chi-square test, Spearman correlation coefficient, and logistic regression. The level of significance was considered as $P < 0.05$.

Results

In this study, all of 470 secondary high school students participated (163 people (34.7%) in the first grade, 140 (30%) in the second grade and 167 (35.3%) in the third grade). Mean age of student was 16.2 ± 0.25 (rang of age 14–17) years. The education of the majority of the parents of the samples was diploma and under high school diploma (78.1 and 81.9 respectively). There was not a significant relationship between the education of students' parents and smoking ($P = 0.637$). The mean birth order of students was 2.53%. It means that the birth order of them was at least second child.

The results of the study about smoking showed that 4.7% of the samples of the study ($n = 21$) smoke daily. About 6.4% ($n = 31$) had smoked in the last 30 days and 34.7% ($n = 163$) of them have experienced smoking at least once in their lifetime. Fifty-three percent of students had friends who smoke cigarette and 6.29% of the students

reported that there were smokers in their families, 80% of fathers, 18% of brothers, and 42/1% of their mothers were smoking.

Smoking had a significant difference in terms of mother's jobs, smokers in the family, having friends who smoke and living with their parents ($P < 0.05$). However, there was not a significant correlation between smoking status of the students and their grade of school, their fathers' jobs, the education of their parents, birth order, household size, and history of their failing ($P > 0.05$).

According to results of spearman correlation coefficient test, smoking had a significant correlation with the constructs of the model and the attitudes toward smoking. However, there was not a significant correlation between smoking behavior and awareness of its harms. Among the constructs that had a significant correlation, the correlation between cigarette smoking and Cues to action was stronger, but the correlation between cigarette smoking and perceived barriers is weaker [Table 1].

Based on the results of the analysis of the logistic regression method, the structure of attitudes, self-efficacy, and Cues to action were the significant predictors of smoking behavior and among these significant predictors, attitude (odds ratio [OR] = 0.87) is the strongest predictor of the smoking behavior [Table 2]. Severity did not evaluate

Discussion

This study aimed to investigate the prevalence of smokers in students and relationship among structures of health belief model in the 1st-, 2nd-, and 3rd-year students of Marivan city. Studies in Iran and around the world showed different results of the prevalence of smoking.[12-17] For example, smoking rates in the study of Mohammadpourasl *et al.* on the students of Tabriz are reported as 23%[15] and in Soria-Esojo *et al.* 27%.[16] These inconsistent results can be justified regarding the different conditions under study.

The results showed that there is a significant relationship between the mother's occupation and smoking in teenagers. Hence, the students whose mothers were housewives had higher rates of smoking. Similar to these findings, Kassiri *et al.* in their study on smoking in Ahvaz[17] and Namakinand *et al.* on high school students in Birjand[18] reported the highest prevalence of smoking in teenagers whose mothers were housewives. These findings may indicate low awareness of housewives from the harms of the risky behaviors such as smoking on their children or they have less control over their behavior. Conducting more comprehensive studies are

essential to investigate the reasons of this relationship more closely.

There is a significant positive correlation between positive attitude toward smoking and smoking behavior. Significant positive correlation means that as much the people have positive feelings toward cigarettes, their tendency to smoke also increases. In confirming the findings of this study, Karimi and *et al.* in their study on the students in Zarandieh,[19] Rise *et al.* in Norway[20] and Moini and *et al.* on the students in Hamedan[21] reported that positive attitude toward smoking can be a factor that increases this behavior among the students. According to the findings of this study, modification of students' attitudes toward smoking by educational programs can be a factor in preventing its use.

There is a significant negative correlation between smoking and its perceived benefits. Shahnaz *et al.* in their study on preuniversity students[7] between smokers and nonsmokers reported that there is a significant difference regarding the perceived benefits. This means that in nonsmokers, the perceived benefits (awareness about advantage of avoiding from cigarette) of smoking is higher. Thus, according to these findings, the emphasis on the advantages of not smoking in educational interventions can have an important role in preventing smoking. Another significant constructs that is negatively correlated with smoking behavior is the self-efficacy to nonsmoking. Bandura believed that self-efficacy, as an independent part of the individual's basic skills, is an important factor in behavior.[22,23] Moreover, self-efficacy is an important prerequisite to manage a learned behavior that can improve healthy behaviors.[24] Based on the findings of this study, self-efficacy to nonsmoking significantly reduces smoking behaviors. The findings of this study is aligned with Moeini *et al.*[21] and Bashirian *et al.*,[25] in terms of self-efficacy effect. Hence, paying attention to self-efficacy is necessary to reduce unhealthy behaviors such as smoking.

According to the findings of this study, a Cues to action compared to other HBMs has a stronger correlation with smoking. This means that a person's symptoms and triggers in the environment is an important factor in stimulating students to smoke. A person's friends and relatives are one of the stimuli that provoke smoking. As studies show, parents and friends who smoke can be an important factor that motivates students to smoke.[25,27] According to these results, it is recommended that educational interventions designed to prevent smoking in young adults also pay special attention to the people around them.

Perceived beliefs barriers of students have a significant negative correlation with smoking behavior. This means

Table 1: The relationship between smoking and health belief model constructs							
Variable	Knowledge	Attitude	Perceived benefits	Self-efficacy	Cues to action	Perceived barriers	Perceived susceptibility
Smoking (*r*)	−0.005	0.262**	−0.156**	−0.256**	0.259**	−0.101*	−0.158**

*P<0.01, **P<0.05

Table 2: Summary of regression analysis for the variables of knowledge, attitudes and constructs of health belief model as the predictors of smoking

Variable	OR	CI	P
Knowledge	1.07	0.83-1.37	0.59
Attitude	0.87	0.81-0.93	0.00
Perceived benefits	1.06	0.93-1.21	0.31
Self-efficacy	0.80	0.69-0.92	0.00
Cues to action	0.59	0.38-0.92	0.02
Perceived barriers	1.06	0.94-1.20	0.29
Perceived susceptibility	1.06	0.97-1.17	0.15

OR=Odds ratio, CI=Confidence interval

that barriers of smoking can reduce the rate of smoking. These results are similar to the results of Li and Kay,[28] Mokhtari *et al*.[29] and some other studies.[30-32] It is possible that potentially negative factors of a behavior such as the usefulness of action against the costs, risks, and time consuming can be a barriers to adopt healthy behavior. Thus, positive healthy behaviors can also be promoted by reducing the barriers of smoking.

The findings of this study is consistent with the study conducted by Gharghani *et al*. on secondary school male students of Shiraz.[33] These findings suggest that it may be possible to sensitize students about the consequences of risky behavior and increase adoption of healthy behaviors in them.

According to the results of logistic regression method, the significant and meaningful predictors of smoking behavior are as the followings: the constructs of attitudes, self-efficacy, and Cues to action. Among these predictors, attitudes (OR – 0.87) is the strongest one. In the study conducted by Bashiri *et al*.[25] attitude is considered as the most important Predictors factor in adolescent drug use behavior that is consistent with the findings of this study. In another study conducted by Umeh and Patel on Ecstasy, it is shown that attitudes toward drug, is a strong predictor of Ecstasy consuming behavior.[34] These results suggest that attitude must be considered as the first priority in educational programs for preventing the risky behaviors such as smoking.

Limitations

One of the limitations of this study was self-reporting. Self-reported behavior can cause bias in the data. Moreover, the protective behaviors were investigated in males; therefore, to compare smoking in both sexes, other studies on females are also required. It is suggested that smoking behavior among female students will also be examined in future studies.

Conclusions

The findings of this study show that the prevalence of smoking in the studied sample is somewhat lower than other

regions of Iran, but it should be noted that if no interventions are done to prevent smoking in this age group, it is possible that nonsmokers start smoking influenced by their friends in the future. As mentioned before, mean age of participants was $16/2 \pm 0.25$ years, considering that authorities can make change in policies of cigarette selling only for over 18 years. Thus, it seems necessary to design interventions to prevent smoking in students. The findings of the study also show that the structure of attitudes, self-efficacy, and Cues to action are the strongest predictors of smoking among students. Therefore, the educational programs designed to promote understanding of this health problem and prevent smoking should pay more attention to these variables.

Conflicts of interest

There are no conflicts of interest.

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