

Factors affecting cigarette smoking based on health-belief model structures in pre-university students in Isfahan, Iran

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ABSTRACT

Introduction: The goal of this study was to determine the association between constructs of the Health Belief Model (HBM) (i.e., perceived susceptibility to health-related problems due to smoking, perceived barriers to non-smoking, perceived benefits of non-smoking, perceived self-efficacy to non-smoking, and cues to action of non-smoking) and cigarette smoking among male pre-college students. **Materials and Methods:** A cross-sectional survey of 382 pre-college students was conducted in Isfahan, in 2010. The method of sampling was systematic randomized and students were selected from eight schools. The instrument was developed by the researchers based on the Health Belief Model. Statistical analyses were carried out using SPSS.V.18, Chi-square, and independent t-tests. **Results:** The mean age of the students was 17.72 ± 0.62 years. Overall 7.2% of the subjects reported having smoked in the past 30 days and 32.7% % of the samples reported ever having smoked in their life time. Results of the *t*-test showed that there were significant differences in knowledge, perceived susceptibility ($P = 0.03$), benefits ($t(246) = -2.51, P = 0.01$), self-efficacy ($P < 0.001$), and cues to action ($P = 0.007$), between smokers and non-smokers **Conclusion:** These results suggested that the constructs of HBM can be incorporated when examining the predictors of cigarette smoking and developing smoking prevention programs among pre-college students. Furthermore, with a better understanding of the factors affecting this complex behavior (cigarette smoking), it can be a useful step to reduce the rate of death, costs, and also improve the community health outcomes.

Key words: Cigarette smoking, health belief model, students

INTRODUCTION

The health effects of smoking are well-documented and it is estimated that half of those who smoke and fail to stop will die from their habit.^[1] Cigarette smoking is the major cause of many chronic and deadly diseases, such as, heart disease, stroke, chronic obstructive pulmonary disease, peripheral vascular disease, periodontal disease, pneumonia, and many cancers.^[2-4] Tobacco smoking is the single most important preventable cause of morbidity and mortality from cancer and cardiovascular diseases. Although the greatest burden of disease in developing countries continues to be from infectious diseases, there is a growing recognition that non-communicable diseases are becoming significant public health concerns. Tobacco-attributable mortality is estimated to contribute to about 10% of the total global mortality by 2020.^[5]

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The World Health Organization attributes over four million deaths a year to tobacco. This figure is expected to rise to 10 million deaths a year by 2030, with 70% of these deaths occurring in developing countries.^[6] However, there are currently about one billion smokers in the world and it is estimated that by 2030, one billion people among the younger adults will start smoking and now 47% of the men and 12% of the women in the world smoke.^[7] According to the World Health Organization, the prevalence of smoking among students aged 15 and older is more than 24%.^[8] Per capita cigarette consumption of 930 cigarettes, for individuals 15 years and older, has been reported.^[9]

Despite a dramatic reduction in smoking prevalence in some countries,^[10] there is still a high prevalence among adults, young adults, and even adolescents, in Iran. Thus, in the study of Ramezankhani *et al.*, in Tehran, 27.5% of the boys and 23.5% of the girls had experienced cigarette smoking. In other words, three of every 10 students had the experience of smoking.^[11]

Given that most smokers take up the habit before they reach the age of 18 years, and because of the increasing levels of use and the dire public health implications, tobacco use among young people has been referred to as, both a 'pediatric disease'^[12] and a 'pediatrics epidemic'.^[13] Hence, one of the most important strategies in reducing smoking prevalence in the population has been to prevent young people from becoming smokers.^[14]

In this regard, special attention should be given to college and pre-college students, due to their vulnerability during this important transition. Those students who had never tried smoking in the past and started experimenting with cigarettes and those who smoked occasionally in high school were more likely to become frequent and heavy smokers when they were in this term.^[15]

In order to prevent students from potential adverse health consequences from smoking and to improve their lifestyles to healthier ones, it would be important to understand the factors that might impact the students' smoking behavior. Predictors and correlates of cigarette smoking among students have been studied and examined in the United States and other western countries. Many factors associated with cigarette smoking among college students have been studied, including depression, social normative beliefs, being men, high-risk behaviors (e.g., marijuana use), lifestyle choices (e.g., nonparticipation in athletics), family, and peer smoking, being students in public schools, low socioeconomic status (SES), and poor academic performance at school.^[10,16-18]

Despite the high and increasing prevalence of cigarette smoking in Iran, little attention has been paid to examination of the influential factors of cigarette smoking among students. In a Qualitative study by Alipour *et al.*, relieving anger, curiosity, a sense of dignity, fear of isolation, peer pressure,

imitation, sense of joy, obstinacy, opposition to parents, lack of compassion in family, early love, unwanted stimulation of parents, smoking of family members, fight with loneliness, opposition to social authorities, and loneliness have been reported as being associated with smoking initiation among high school students, in Orumia, Iran.^[19] There are several studies that have been conducted in other countries to define factors associated with cigarette smoking. In the most recent study the association between cigarette smoking and a number of individual and psychosocial correlates, including the subjective norms of family and peer smoking, personal attitudes, and perception toward smoking, depressive symptoms, social relations, and engagement in other health-risk behaviors, have been assessed. In this study, some constructs of the Health Belief Model (HBM), including perceived benefits of smoking, perceived cost (barriers) of non-smoking, and self-efficacy, have been assessed. More perceived benefits of smoking and a higher level of perceived cost of non-smoking have been positively associated with being a past or a current smoker, and there is no significant association between self-efficacy and smoking practice among college students.^[20] In the study of Strencher *et al.*, results showed that only a high level of perceived susceptibility along with high self-efficacy would be more likely to cause patients to reduce smoking.^[21]

The HBM is one of the most widely used health behavior model that has been used extensively to organize theoretical predictors of preventive health actions. The HBM is a method used to evaluate and explain individual differences in preventative health behavior.^[22,23] and it has been shown to be a good predictor for smoking behavior.^[22] Therefore, the current study is designed to assess the knowledge and examine the association between the constructs of the HBM (perceived susceptibility, perceived barriers, perceived benefits, perceived self-efficacy, and cues to action) with cigarette smoking among male pre-college students.

MATERIALS AND METHODS

This study was done among male pre-college students of Isfahan, Iran, in 2010. The instrument was developed by the researchers based on an existing questionnaire^[20] and previous studies.^[21,22] The questionnaire consisted of demographics and five HBM construct measures, namely perceived susceptibility of smoking-related health problems, perceived benefits of non-smoking, perceived barriers to non-smoking, perceived self-efficacy of non-smoking, and cues to action of non-smoking. The demographic variables included age, average annual household income, smoking status of the family members, parent's job, and age at the first smoking incident.

The reliability of the questionnaire was assessed by a panel of experts. To ensure the validity of the survey, a pilot study was conducted among a sample of 50 students. Some items were revised and refined based on results of the pilot study. The Cronbach's alpha values were 0.875 for perceived

susceptibility, 0.783 for perceived barriers, 0.790 for perceived benefits, 0.834 for self-efficacy, and 0.813 for cues to action, respectively. The variables included in the instrument are discussed below under Measures.

To classify the smoking status, the students were asked the question, 'have you ever smoked at least one cigarette in the last month'. The students who responded with a 'yes' were assigned as smokers and those who had not were assigned as non-smokers. Also students who had smoked at least one cigarette in their entire life were considered as experimenter smokers.

The method of sampling was random sampling, as follows: Eight high schools were selected from five educational areas of Isfahan. The participants were recruited randomly from these high schools. The trained survey administrators informed the students that their participation was voluntary, that their data would remain confidential, and would only be reported by group. The students were permitted to leave if they were not interested in participating in this study. Statistical analyses were carried out using SPSS v. 18. Cross-tabulation was first created to display characteristics of participants according to their smoking status. The Chi-square test was applied to identify any significant association between smoking status and demographic variables. The independent t-tests were used to compare the difference in measurements of the HBM constructs between smokers and non-smokers.

RESULTS

Sociodemographic characteristics of the samples and cigarette smoking status

A total of 382 students at the pre-university level were examined. The mean age of the students was 17.72 ± 0.62 years; 38.7% of their fathers were self-employed and 84.7% of their mothers were housewives. There were smokers in the family of 26% of the subjects; 7.2% of the subjects were smokers at the time of study and 32.7% of the samples reported ever having smoked in their life time [Table 1].

Chi-square analyses showed that the smoking status was significantly associated with the smoking status of the family members ($P < 0.05$). No significant associations were found between the smoking status and average household income.

Mean differences in five health belief model constructs between current smokers and non-smokers

As shown in Table 2, the current smokers had significantly higher scores on cues to action of smoking ($P = 0.007$), perceived susceptibility of smoking-related health problems ($P < 0.001$), perceived benefits of non-smoking ($P = 0.002$), and perceived self-efficacy to non-smoking ($P < 0.001$) compared to non-smokers. There was no significant difference between the score of perceived barrier to non-smoking between current smokers and non-smokers ($P = 0.531$).

DISCUSSION

Numerous studies have indicated that more than 80% of the adult current smokers started cigarette smoking before the age of 18 years. Early smoking initiation predicted longer duration of smoking, heavier daily consumption, and increased chance of nicotine dependence.^[24] According to the structure of the Iranian population and the high percentage of risk population, this study aim was to determine the factors that influence smoking in adolescents.

According to the findings of this research 7.2% of the pre-university students of Isfahan were smokers. Ramezankhani *et al.* in a survey to determine the 'Smoking patterns of young students in Tehran,' in 2009, stated that three per ten of the subjects had ever smoked and 13.1% of male high school students were current smokers and the rate of smoking in all of students was 7.4%.^[25] In a Global Youth Tobacco Survey (GYTS) the incidence rates were 4% in Sri Lanka, 9.1% in Singapore, 10.4% in Greece, and 16.6% in Jordan.^[17,26,27]

Table 1: Demographics of precollege students of Isfahan, 2010

| | Current smokers | Non-smokers |
|---|-----------------|-------------|
| Age (mean, SD) | 18 (0.76) | 17. (0.61) |
| Number of siblings (mean) | 2.4 | 2.2 |
| Educational average score of last year (mean) | 15.8 | 16.1 |
| Fail in school history | | |
| Yes (% age) | 12.5 | 10.9 |
| No (% age) | 87.5 | 89.1 |
| Father Job (% age) | | |
| Employee | 20.8 | 37.9 |
| Self-employed | 50 | 38.7 |
| Retired | 20.8 | 19.8 |
| Other | 8.4 | 3.6 |
| Mother Job | | |
| Employee | 4.2 | 12.3 |
| Housewife | 95.8 | 87.7 |
| A smokers in the family (% age) | | |
| Yes | 37.5 | 25.1 |
| No | 62.5 | 74.9 |

SD = Standard deviation

Table 2: Comparing the scores of the health belief model structures in smokers and non-smokers

| | Mean (SD) | | P value |
|--------------------------|-----------------|-------------|---------|
| | Current smokers | Non-smokers | |
| Perceived susceptibility | 66.8 (17.2) | 70.8 (17.5) | 0.037 |
| Perceived barrier | 40.8 (20.7) | 39.2 (19.8) | 0.452 |
| Perceived benefits | 56.2 (26.3) | 71.3 (24.4) | 0.002 |
| Perceived self-efficacy | 56.8 (28.3) | 71.8 (23.9) | <0.001 |
| Cues to action | 48.1 (29.9) | 34.7 (29.9) | 0.007 |

SD = Standard deviation

There was a significant relationship between the smoking status of the subjects and having a smoker person in the family, in this research. In accordance with the results of this study, other studies, such as, that of Mousavi F, in a research on smokers of Tehran, with the aim of determining the relationship between the smoking status of smokers and smoking parents and friends, stated that smokers were more likely to have smoker parents.^[28]

The average age of initiation to smoking was 14.8 years in this study. The trend of smoking at an early age can be a warning to public health. Previous studies had shown that the age of starting cigarette smoking was more likely to become a heavy smoker with a consumption rate was very high and smoking cessation was less likely.^[20,29]

The data analysis showed that there was a significant difference in perceived susceptibility about smoking-related health problems between current smokers and non-smokers, among students [Table 2]. This could indicate that students have good overall knowledge about the risk of cigarette smoking. These data confirmed the findings of a study that high school students who had received comprehensive smoking education had a higher perceived susceptibility to smoking-related health problems, as compared to their counterparts in the high school.^[30]

Also findings showed that there was no significant difference between the perceived barrier to non-smoking in current smokers and non-smokers. Sharifirad *et al.*, in the study of 'The effect of health education, based on the Health Belief Model, on preventive actions of smoking in grade one, middle school students,' in 2006, stated that after the educational intervention, there was no significant discrepancy in the perceived barrier in the educated group compared to the other group.^[30]

Rakhshani *et al.*, in the study of the 'Effect of education on smoking prevention in students of Zahedan,' concluded that after intervention, the means scores of all variables of the HBM increased significantly in the case group compared to the control group.^[31]

The perceived benefits of non-smoking in this study were related to being a current smoker, as shown in Table 2. Current smokers had a lower mean score of perceived benefits in comparison to non-smokers. Also smokers in this survey had a lower mean score of self-efficacy and cues to action, as a part of the HBM.

Mao R *et al.*, in the study of Chinese students, to determine the 'Psychosocial correlates of cigarette smoking,' concluded that the male gender, low family socioeconomic status, perception of more peer smoking, more perceived benefits of smoking, a higher level of pro-smoking attitude, a higher level of perceived cost of non-smoking, and more involvement in other health risks, were positively associated with being a past or current smoker. In the study of Mao *et al.*, there

was no significant association between self-efficacy and the smoking habit. As also, in the present study and in the existing literature in the United States^[17] and elsewhere,^[32] the data did show a strong relationship between self-efficacy and smoking practice among students.

There are a number of potential limitations in this study. First, the data are based on self-reporting by the college students and thus are subject to self-reporting bias. Second, smoking rates vary substantially across different populations and geographic locations in Iran.^[24,25]

CONCLUSION

To our knowledge this is the first study based on HBM constructs that was done to determine factors influencing cigarette smoking behavior of teenagers in Isfahan. On account of the complexity of smoking behavior, a theory-based study could explain the predictive factors systematically and would help us in better understanding this behavior.

The results of this study suggested that the constructs of HBM can be incorporated when examining the predictors of cigarette smoking and developing smoking prevention programs among pre-college students. Furthermore, with a better understanding of the factors affecting this complex behavior (cigarette smoking), it can be a useful step to reduce the rate of death, costs, and improve the community health outcomes.

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