Perception of fear and adoption of risk control for hookah use among male students: using the extended parallel process model

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Abstract

The prevalence of hookah uses increasing in the world, such that its sharper incremental trend compared to cigarette use has been observed in recent years. This study was conducted to assess hookah use by the extended parallel process model (EPPM) among male students in Mashhad. In this descriptive cross-sectional study which was conducted, 400 undergraduate students in two different universities of Mashhad participated based on stratified simple random sampling. Data were collected by a self-report questionnaire and analyzed by regression analysis. 30.8% of the students reported that they had used hookah in the last two months. The mean score of the perceived susceptibility, perceived severity and self-efficacy to hookah use consequences was more in hookah non-user students than in hookah users. Mean score of the perceived effectiveness in hookah user students was less than that in hookah non-user students. Our findings showed that messages with efficient solutions to counter the threat are efficient when they are associated with perceived threat. Generally, lower scores of the variables of extended parallel process model in relation to students 'health threat indicated increased probability of hookah use.

Keywords: Health Education, Health Promotion, Hookah Smoking, Student

Introduction

According to a report released by World Health Organization, everyday between eighty thousand to one hundred thousand young people start to use tobacco products [1], the majority of whom live in developing countries [2]. Also, it is estimated that about 100 million people use hookah daily [3]. Using hookah is growing in younger generation which can be due to the belief that hookah is less harmful

than cigarette, its easy access, lower cost and other factors. Using hookah increases heart rate as well as systolic and diastolic blood pressure [4]. When hookah is used by an individual, the volume of smoke that enters the lungs is about 10 times more than when cigarette is used [5]. Nicotine found in hookah smoke is 36 times greater than nicotine in cigarette smoke and contains higher concentrations of heavy metals [6]. It has become clear that there is a relationship between hookah smoke and increased risk of cancers of oral cavity, stomach, esophagus, lung; reduced respiratory system function and reduced fertility [3]. The prevalence of hookah use among young university students varies from 32% to 62.6% [7]. Other studies on students in public universities of Iran reported the prevalence of hookah use 40.3% [8]. Based on scientific documents, training is one of the basic tools and methods to prevent smoking [9] and the most efficient training program is based on theory-based approaches that are rooted in patterns of behavior change. Health education is an instrument that enables people to have more control on their health and factors affecting their health [10,11]. Because of their complicated nature and cultural, social and individual factors involved in their development, hookah use need educational programs to promote skills to resist hookah use by emphasizing behavior change theories and based on effective educational planning [12]. Theories based on fear, specially Extended Parallel Process Model (EPPM), are one of the most effective solutions to prevent the adoption of unhealthy behaviors [13,14]. EPPM proposes three conclusions by considering threat assessment process and efficiency: A) Failure to respond when the perceived threat is the minimum value, B) The cognitive risk control process that leads to adoption of health warning messages, when there perceived threat and perceived efficacy are in their maximum value, C) The cognitive fear control process which leads to the rejection of the health warning messages when the perceived threat is high, but the perceived efficacy is low. In fact, fear of threat makes people adopt solutions for dealing with health risk [12]. If the threat assessment and its consequent solution efficacy evaluation are realized, the possibility of attitude change, behavioral intention and behavior will increase [15]. White evaluated the cognitive and emotional mechanisms in success, failure and fear motivation on the prevention of cigarette smoking. The results of the study supported EPPM generally and showed that there is a relationship between fear and fear control responses and it has no direct relationship with risk control response. Due to the high prevalence of hookah use among students and serious complications attributed to it and the importance of implementing interventions such as educational interventions (with theoretical framework) to reduce the prevalence of hookah use in students, the current research was performed with the aim of determining the perception of fear and adoption of risk control process of hookah use among male students in Mashhad.

Method

This descriptive cross-sectional study was conducted on undergraduate male students in Mashhad in academic year 2012-13. To determine the research sample, two universities with similar geographical and demographic conditions were selected randomly from 5 universities in Mashhad and sampling was performed among undergraduate students. Students were placed in two groups: hookah users (those who experienced hookah use at least once in the past two months) and hookah non-users (the students who had not experienced hookah use even once). The designed questionnaires based on EPPM were given to 400 students to evaluate the existing conditions. The students were assured of confidentiality. Data collection was conducted in classes and dormitories. The questionnaire was designed according to White et al. questionnaire and the subject of the study and included fourteen sections: demographic and background information with 22 items, behavioral intention and attitude with 6

items and items related to EPPM theoretical variables including perceived susceptibility, perceived severity, perceived effectiveness and perceived self-efficacy [12]. The perceived susceptibility and perceived severity each had 6 items, perceived effectivenesshad5 items and perceived efficacy had 6 items. To determine its validity, face and content validity were used by a panel of experts (10 health education specialists) and to determine reliability, a pilot study was conducted on 30 students and Cronbach's alpha coefficient was obtained for the constructs of the perceived susceptibility 0.75, perceived severity 0.74, perceived effectiveness0.79 and perceived self-efficacy0.81. If a variable obtains risk ratio Exp (B)>1 in regression analysis, there is a risk for the behavior and the risk increases when this figure is higher. While, if it is less than one, this factor has a protective role for the behavior, i.e. the higher is the score; the likelihood of the behavior will be weaker. Data collected by logistic regression method and student's t-test were analyzed by SPSS software.

Results

The results showed that 30.8% of students (n=123) had used hookah in the last two months. Also, the mean age of their first hookah use experience was 16 years old. Furthermore, 74.5%of students (n=298) reported that their friends had used hookah and 59.8% of them were currently hookah users. 20%of the students (n=80) mentioned that their fathers were hookah users. Also, 91.2% of the students (n=365) stated that hookah was offered to them by their hookah user friends. The results of the current research showed that 86.7% of the hookah user students (n=104) used fruity tobacco and only 13.3% of the hookah user students (n=16) used classic tobacco. Also, 40.2% of the hookah user students (n=161) stated that they started hookah smoking in traditional restaurants for the first time. Findings showed that 63.2%of the hookah user students (n=253) used hookah for the first time with their friends and 25.5% (n=102) started hookah smoking alone.

Total mean score of the students 'perceived susceptibility was moderate (52.9±9.93). Mean score of the students 'perceived severity to the consequences of hookah use was moderate (54.6±12.06). Students 'mean perceived effectiveness to the recommended solutions was ‘not hookah smoking’ 61.3±9.76 and perceived self efficacy 73.83±11.13 in all students under study. Perceived susceptibility obtained the lowest and perceived self-efficacy obtained the highest score among constructs of the model.

Information presented in Table 1 indicates that the mean age difference in two groups is not statistically significant. Also, the mean of the perceived sensitivity and effectiveness in hookah user students was significantly lower than hookah non-users students group (P=≤0.001, P=0.007), while there was no difference between the mean constructs of the perceived severity of hookah use complications and consequences and perceived self-efficacy (P=0.98, P=0.08).

Table 1 *Mean score of model constructs in the study population*

Variables	hookah user students		hookah non-user students		Mann-Whitney test result
	M±SD	Median	M±SD	Median	P-value
Age	22.2±2.07	22	22.5±2.28	23	P=0.2
Perceived sensitivity	12.9±5.08	12	15.07±3.42	15	P=0.002
Perceived severity	16.37±2.09	16	16.4±2.7	16	P=0.98
Perceived effectiveness	19.36±3.82	20	18.55±3.12	19	P=0.008
Perceived self efficacy	20.93±5.09	24	22.5±3.48	23	P=0.08

Figure 1 indicates that the mean score of the perceived severity in hookah user students was lower than that in the other group and the mean score of variables of the perceived effectiveness and perceived self-efficacy in hookah user students was lower than that of hookah non-user students.

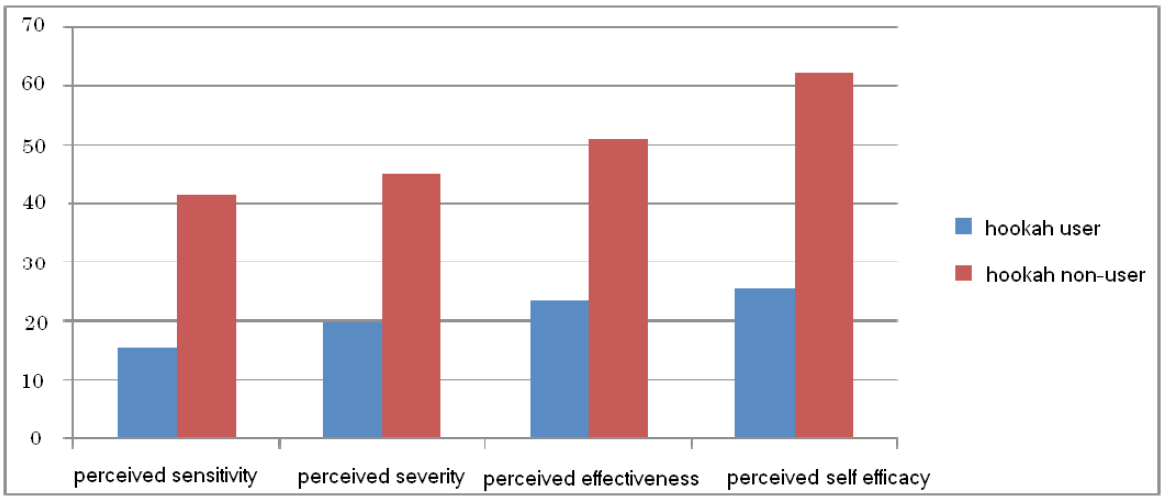

Figure 1 *Comparison of the mean score of variables under study on two groups of hookah user and hookah non-user students*

Also, frequency distribution of the students under study showed that the fathers of 30% of hookah user students and 16% of hookah non-user students were self-employed. In addition, 14.1% of the hookah user students reported that their fathers were unemployed while this figure was 0.1%forhookah non-user students (P<0.001, =26.61). Also, there was a significant relationship (P=0.05, =38.8) between mother's employment and child hookah use in future. 52.2% of the hookah user students and 18.7% of the hookah non-user students reported that their mothers were employed. The results showed that there is a direct and significant relationship between hookah using of students with hookah user father, having

Table 2 *Comparison of the factors affecting the individuals to use hookah in two groups of hookah user and hookah non- user students*

Variables affecting hookah use behavior	Beta	SD	Wald test	Risk ratio	Significance level
Perceived sensitivity	-0.58	0.133	0.187	0.944	0.006
Perceived severity	-0.93	0.04	3.53	1.94	0.002
Perceived effectiveness	0.194	0.194	0.997	1.214	0.0318
Perceived self efficacy	-0.10	0.028	14.32	0.89	0.053
Fear control process	0.06	0.03	3.75	1.06	0.04
Risk control process	-0.12	0.02	31.3	0.00	0.02
Father’s job			6.087		0.107
Father’s job (employee)	-1.049	1.312	0.640	0.350	0.424
Father’s job (unemployed)	3.221	1.743	3.413	25.042	0.065
Father’s job (self-employed)	-0.621	1.509	0.169	0.537	0.681
mother’s job (employed)	0.492	0.947	0.270	1.636	0.603
Hookah user father	2.344	1.174	3.986	10.419	0.046
Hookah user friends	6.170	1.486	17.250	478.126	0.001
Offer for hookah use	6.463	1.723	14.075	640.735	0.001
Single status	3.106	1.754	3.134	22.334	0.077
Not to be exposed to hookah smoke	-4.603	1.441	10.205	0.010	0.001
Reply to hookah use offered by friends			7.495		0.058
I took the hookah and used it	20.718	1.572E	0.001	9.943	0.099
I stayed with them, but did not use hookah	0.603	1.7944E	0.001	1.828	0.001
Constant value	-31.980	1.5724E	0.001	0.001	0.998

hookah user friends and the individual hookah user marital status (P<0.001, =13.42).

Regression test showed higher students' perceived susceptibility decreases the possibility of hookah use. Furthermore, higher mean score of students' perceived effectiveness reduces the possibility of hookah use. Also, father's office work has a protective role for hookah use and if father is self-employed or unemployed, it is a risk factor for the students 'behavior. If mother is employed, it is a risk factor for student's hookah use. Having hookah user father, hookah user friends, student's single status, hookah use suggestion by friends and presence among hookah user people even if they do not use hookah are potential risk factors for the individuals to try hookah in future when desired conditions are met.

To determine the critical point regarding the fact that participants are in which stage of the threat control process (risk control or fear control), the mean scores of the perceived efficacy were subtracted from the mean scores of the perceived threat. If the obtained diagnostic value is a positive number (more than zero) it indicates that the individual is dealing with the risk control process and if the number is negative (less than zero), it shows that the individual is in fear control process [12]. The diagnostic value in all students under study was more than zero (1.15±0.3) which indicates that most students are in risk control process. Also the diagnostic value of hookah user students was obtained more than zero (1.23±0.06) which indicates that hookah user students are dealing with risk control process and their mean scores of the perceived threat is low.

Discussion

Development of hookah use and youth eagerness particularly students to use hookah is one of the recent problems. Given the importance of students 'physical and mental health, and their professional role and the need for healthy workforce to run the country in future, this research was conducted on students. Several studies have been conducted on hookah use and its related factors in student population [8, 16]. But few studies have been conducted on the development and application of hookah use prevention approaches. In the current study, 30.8% of the students had hookah use experience in the last two months. Taraghijah et al. reported40.3% of the students in public universities had hookah use experience [8]. The self-report nature of the study might have caused bias due to student's fear to declare using hookah. Also 74.5% of the students stated that they had friends with hookah use history. Study of Bajracharya et al. also confirms this issue [17]. This study showed that there is a significant relationship between having hookah user friends and the possibility of using hookah. In other words, relationship and communication with such people as friends increase the possibility of using hookah by the individual in future. According to the results of the logistic regression and the value of Wald test and the odds ratio, the most important factor for hookah use in the students is having hookah user friends. The research results of Fritti et al. confirm this issue [18]. In the current research, most students had experienced hookah use at age 16 for the first time. The study of Gharlipour et al. also confirms this issue [19]. Also 91.2% of the students stated that hookah was offered to them by their friends. The results of a research conducted by Nakash ET al.showed that 83.2% of the studentshad hookah user friends [20]. In the current study, there was a significant relationship between hookah user father, employed mother and student's hookah uses. In addition, having hookah user friends, hookah offer by friends as well as single status were strong predictors of students' hookah use. This result is consistent with that of Tamin et al. and Taraghijah et al. [8, 21]. Also the logistic regression analysis showed that response to friends' insisting on hookah use is a predictor for it.Accepting the request of friends for hookah use and even not using hookah despite observing the friends are using hookah can be important risk factors to use hookah. In this study, perceived susceptibility and severity of hookah user students were less

than hookah non-user students. The fact that the critical point in all hookah user students was obtained a positive number shows that most students are dealing with risk control process. Therefore, for people who are dealing with risk control process, health messages should emphasize on the harmful effects in addition to increasing perceived efficacy. Allahverdi Pour et al. reported students' low mean perceived threat [16].Low perceived susceptibility and severity of the students can make them susceptible to use hookah. In this study, all students 'mean score of the perceived efficacy wasmoderate.But the mean score of the perceived threat was low. Studies have shown that messages with efficient solutions to counter the threat are efficient when they are associated with increased perceived threat [13, 22].Mean score of the self-efficacy in all students under study was moderate to high. Self efficacy resistance to use hookah can be useful in prevention of hookah use. Therefore, students who have low perceived threat should be convinced to severity and susceptibility of the threat. To increase perceived susceptibility and severity of the threat, messages and trainings should include information about the consequences and complications of the threat or health risk, the possibility of infection, or experience threat or health risk as well as raising awareness and improved attitude of students about complications and consequences of hookah use. Also, mean behavior intention in all students was reported high. Allahverdi pour et al.reported the increase of behavior intention as pre stage of behavior can be a strong risk factor for not rejecting drug abuse [16]. Mean perceived susceptibility and perceived effectiveness were significantly lower in hookah user students than hookah non-user students. Mean perceived susceptibility and perceived effectiveness to the suggested solutions were significantly lower in hookah user students than the other group. The increase of the mean of these two constructs will lead to weaker behavior and it has a stronger protective role toward perceived severity and perceived self-efficacy to apply resistance skills for hookah use in students. Fear control process had a higher risk ratio than the risk control process. Risk control process has a stronger protective role than fear control processing hookah use. Generally, lower score of the variables in the extended parallel process model related to health threat in the students increases the possibility of hookah use and affects their health to a greater extent. The study of Gharlipour et al. confirms this issue [19].

Conclusion

Training skills to resist peer pressure and skills to detect risky situations with emphasis on perceived threat can be useful in prevention of hookah use. Hence many risk factors for hookah use can be prevented by this model. Using messages arousing fear and increasing students 'perception and belief related to the importance of the issue and efficient factors in addition to increasing perceived self-efficacy and effectiveness can have an efficient role in prevention of hookah use.

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Contributions

Study design: HE, HA, MVS
Data collection and analysis: RI, AV, HE
Manuscript preparation: RI, AV, HE

Conflict of interest

"The authors declare that they have no competing interests."

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