

Predictors of Smoking Preventive Behavior based on Empowerment Components among Male Students of High Schools,Iran

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Abstract

Background: Smoking among adolescents and young adults is one of the most important preventable health problems. The etiology of smoking is one of the most important activities in designing prevention programs. The aim of this study was to determine effective components of empowerment on smoking preventive behavior (SPB) in high school students in Urmia.

Methods: This descriptive-analytical study carried out on 422 high school students. The data collection tool of this study was a valid and reliable researcher-made questionnaire containing demographic characteristics, items related to various components of empowerment, and items related to the SPB. Data were analyzed using descriptive and inferential statistical methods (frequency, mean, standard deviation, Pearson correlation coefficient and linear regression) in SPSS software with version 22.

Results: The results showed that 10.42% of students were active smokers and 40.75% of them had the experience of smoking. The results also showed that there exists a positive and significant between among problem solving skill ($r=0.394$, $p<0.001$), self-efficacy ($r=0.340$, $p<0.001$), self-esteem ($r=0.310$, $p<0.001$) and attitude ($r=0.333$, $p<0.001$) with the SPB. In addition, a negative and significant correlation was shown between group dependence ($r=-0.313$, $p<0.001$) with the SPB. Overall, the components of empowerment were able to explain 26.5% of the variance in SPB. Among components, problem solving skills solely explained 15.5% of variance of SPB.

Conclusion: The present study suggests that the study results can be useful for researchers and health planners who want to design and implement appropriate health interventions to prevent and control smoking in students.

Background

Smoking behavior can be considered a serious and dangerous factor in society, and its major consequences include the destruction of efficient human resources and the creation of obstacles to human, social, cultural, and economic development.¹ Extensive use of tobacco is considered a health and epidemic problem in adolescents.²

The World Health Organization (WHO) estimates that 8 million people die each year from tobacco-related diseases by 2020.³ The WHO emphasizes that if the current trend of smoking continues, by 2030 the number of victims will be 10 million⁴, 70% of which will occur worldwide in developing countries.⁵

Smoking causes 90% of lung cancers, 40% of other cancers, 75% of respiratory diseases, 50% of cardiovascular diseases and 12% of all deaths.⁶ More than \$ 150 billion is spent annually on health problems caused by smoking.⁷ Despite the fact that the harms of smoking have been well established, many adolescents are still interested in smoking.⁸ The age of onset of smoking has decreased in developed as well as developing countries⁹ and approximately 90% of smokers experienced smoking at younger ages.¹⁰ The lower the age of onset of smoking, the more dependent it is and ultimately the stability of smoking.¹¹

The prevalence of smoking in different parts of the world varies from 14.2 to 39 percent.^{12,13} In Iran, the prevalence of smoking is 9.2 to 28.8 percent, which is estimated to be 14.2 percent in student adolescents.¹⁴ Adolescence is a critical period of development because during this period many positive health behaviors (such as diet and exercise) and dangerous health behaviors (such as smoking and alcohol consumption) are formed.¹⁵ One of the most important requirements for a country to achieve economic, social and political progress and stability is to pay attention to the health and developmental needs of this age group.¹⁶

One of the concerns of health / social policymakers in today's society is the increasing prevalence of addictive behaviors, especially smoking addiction in adolescents.^{17,18,19}

Cigarette addiction treatment is expensive and difficult, and requires a variety of treatment approaches, such as medication and psychotherapy. However, even the most effective treatments are associated with a high rate of recurrence of smoking. Because susceptible environments, ease of access to cigarettes, social networks, and supporting friends of smoking, reduce the progress of smoking treatment and cessation.²⁰

Therefore, prevention of smoking is easier than addiction treatment, and it is considered as the most appropriate and logical solution.²¹ Necessary requirements for the prevention of smoking include the analysis of smoking behavior among children, correcting misconceptions about smoking, empowerment of individuals against smoking since childhood, taking into account family pressures and crises of childhood and the role of social variables.^{22,23}

Today, empowerment is one of the most important concepts in community development.²⁴ The term empowerment was first used in texts of political and social sciences, and soon found its place in management and health issues.²⁵ From the perspective of the WHO, empowerment as the heart of health promotion²⁶ includes the process by which individuals gain more control over decisions and actions that affect their health.²⁷

Empowerment has different levels, empowerment at the individual level is the elimination of personal disabilities and the formation of a sense of personal power and self-efficacy. Interpersonal competence means having the capacity and ability to influence others.²⁸

To empower individuals, the previous studies have emphasized to improving components such as problem-solving skills, self-efficacy, self-control, self-esteem, emotional management, shifting attitudes toward smoking, and adaptation towards environmental conditions.^{22,29,30} In order to design appropriate prevention programs, it is necessary to be aware of the factors influencing the onset and persistence of smoking addiction. In recent years, one of the most important achievements in the field of theorizing and policy-making of prevention programs has been the emphasis on risky and protective factors as a descriptive and predictive framework.³¹

According to the above, this study seeks to answer the key question of what is the power of explaining the various components of empowerment related to the prevention of smoking in children and adolescents? By answering this question, we can design and implement appropriate interventions and strategies to avoid smoking behavior in adolescents and prevent and control the burden of diseases resulting from this problem.

Methods

This descriptive-analytical (cross-sectional) study was performed on 422 male students from high schools of the second period in Urmia, Northwest Iran. In this study, a multi-stage sampling method was used to select the sample, so that first step all high schools of the second period were extracted from the Education Department of Urmia and then listed. In second step, 24 high schools were selected by cluster sampling method. In the next step, according to the number of students studying in the three grades (first, second and third) in those high schools, the students were randomly selected and entered the study. Criteria for entering the study samples included students' voluntary participation in the study and obtaining written consent from the students' parents and school principals for the students' participation in the study. Students' non-participation in the study was considered as a criterion for leaving

the study. The youngest students was 15 years old and the oldest was 18 years old, Therefore a written parental informed consent, as well as written student assent, was obtained from all participants in this study.

Study Tools

The data collection tool of this study was a researcher-made questionnaire consisting of the following parts: The first part includes the student's demographic characteristics and his smoking status. The second part includes items about the different components of student empowerment: Sensation seeking with 10 items, for example: "I don't like to experience any substance that has strange or dangerous effects." ,

Problem-solving skills with 10 items: "When making decisions, I look at the consequences of all the ways and compare them with each other." Self-efficacy with 6 items: "I'm sure I can resist the temptation to smoke well." Self-esteem with 6 items: "I feel like I have a lot of good attributes." negative attitude towards smoking with 8 items: "If a person consumes a small amount of cigarettes and drugs, he will definitely become addicted." Belonging to the group with 7 items: "I like to be noticed when I'm together." There were a total of 47 items based on the 5-point Likert scale, which I strongly agree with a score of 5, I disagree with a score of 4, I have no opinion with a score of 3, I disagree with a score of 2, and I completely disagree with a score of 1.

The third part including items of The SPB (6 items), for example, "When someone smokes next to me, I try not to be exposed to secondhand smoke." These items are rated on a 4-point Likert scale, for always score of 3, for often score of 2, for rarely score of 1, for not at all score of zero. The score of subscales of the questionnaire was transformed linearly to a 0–100-point scale, with 100 indicating the best status and 0 the worst.

To determine the validity of the researcher-made questionnaire based on the study of valid sources^{22,29,32,33}, the qualitative method of content validity was used, ie the use of an experienced panel of experts (including health education specialists, psychologists, medicine and preventive medicine. In this method, experts were asked to examine the items of the questionnaires in terms of simplicity, clarity, relevance and necessity and to express their opinions and suggestions. After receiving feedback and suggestions from experts, the necessary amendments were made to the study tools. Finally, the validity of the tools was confirmed.

The reliability of the questionnaire was measured by Cronbach's alpha test method on 30 male students who were similar to the studied population in terms of demographic characteristics. The values were 0.71 for sensation seeking, 0.78 for problem solving skill, 0.82 for self-efficacy, 0.79 for self-esteem, 0.74 for negative attitude towards smoking, 0.82 for group dependence, 0.81 for SPB, and ultimately the instrument reliability was also confirmed.

Data analysis

The data collected in SPSS software version 22 were analyzed using descriptive statistics such as frequency, mean and standard deviation. And according to the results of Kolmogorov-Smirno test and the normality of data distribution, inferential statistics such as Pearson correlation coefficient test and linear regression analysis were also used to analyze the data. In all statistical analyses, the significance level below 0.05 was considered.

Results

In this study, 422 male students with an average age of 16.93 ± 0.76 were studied. The number of active smoking students was 44 (10.42%) and the number of experienced smokers was 172 (40.75). An overview of the demographic characteristics of the samples is given in Table 1.

Table 1
The characteristics of the study participants

Statistical Index	Variable	Mean/N	SD/%
Age	16.93	0.76	
Grade	First grade of high school	155	36.7
	Second grade of high school	164	38.9
	Third grade high school	103	24.4
Smoking status in students	Students who were active smokers	206	48.82
	Students who have experienced smoking	44	10.82
	Students were non-smokers	172	40.75

The average score of the components related to students' empowerment in relation to smoking prevention was not good. Based on the results of the study, the mean score of the components of self-efficacy, self-esteem, sensation seeking, negative attitude towards smoking, group dependence, and problem solving skills are 49.15 ± 7.68 , 53.09 ± 6.98 , 56.36 ± 5.25 , 57.74 ± 5.83 , 58.46 ± 6.98 and 59.57 ± 8.49 , respectively (Table 2). In addition, the mean score of the SPB in students was 55.56 ± 8.50 (Table 2).

Table 2
The mean scores of the various components of empowerment and the SPB in students

Statistical Index	Variable	Mean	Standard Diviation	Maximum	Minimum
Sensation Seeking		56.36	5.25	80	38
Problem-solving skills		59.57	8.49	78	34
Self-efficacy		54.81	7.68	75.2	33.3
Self-esteem		61.22	6.98	74.29	40
Dependence on group		58.46	6.12	77.14	34.2
Attitude towards smoking		57.01	6.98	72.5	40
Smoking preventive behavior		55.56	8.50	100	15.56

The results of Pearson correlation coefficient test showed a positive and significant relationship between problem solving skills, negative attitude towards smoking, self-efficacy and self-esteem with the SPB. In addition, a significant and inverse relationship was observed between group dependence and the SPB, but no significant relationship was found between students' sensation seeking and the SPB (Table 3).

Table 3

Pearson correlation coefficient between different components of empowerment with smoking preventive behavior in students

Variable		Sensation Seeking	Problem-solving skills	Self-efficacy	Self-esteem	Group dependence	Negative attitude towards smoking	Smoking preventive behavior
Smoking preventive behavior	r	0.082	0.394**	0.340**	0.310**	-0.313**	.333**	1
	p	0.091	0.000	0.000	0.000	0.000	0.000	

****.** Correlation is significant at the 0.01 level (2-tailed).

To determine the predictive power of empowerment components on the SPB, multiple linear regression analysis (stepwise method) was used. In this regression analysis, the components of problem-solving skills, self-efficacy, self-esteem, sensation seeking, group dependence, and negative attitude toward the SPB were entered the regression equation. Based on the results, problem-solving skills, negative attitude toward smoking, group dependence, and self-efficacy were identified as final predictors of the SPB in students. In general, these variables were able to explain about 26.5% ($R^2 = 0.264$) of the changes in the SPB (Tables 4 and 5).

Table 4

Steps of multivariate linear regression analysis in predicting smoking preventive behavior in students

Criterion variable	Predictive variable	Correlation value(R)	Explanatory coefficient(R^2)	Adjusted explanation coefficient
Empowerment components	Problem-solving skill	0.394	0.155	0.153
	Problem-solving skill, and negative attitude towards smoking	0.474	0.225	0.221
	Problem-solving skill, negative attitude towards smoking, and self-efficacy	0.502	0.252	0.247
	Problem-solving skill, negative attitude towards smoking, self-efficacy, and group dependence	0.514	0.264	0.257

Table 5
Regression coefficients related to empowerment structures on the SPB in students

Step	Source of changes	Non-Standardized coefficients		Standardized coefficients	t-value	p.value
		B	Std.Error	Beta		
1	Constant value	4.448	5.879	—	0.756	0.450
	Problem-solving skill	0.858	0.098	0.394	8.783	0.000*
2	Constant value	60.274	10.699	—	5.634	0.000
	Problem-solving skill	0.748	0.095	0.343	7.840	0.000*
	Problem-solving skill,negative attitude towards Smoking	0.853	0.139	0.269	6.140	0.000*
3	Constant value	33.36	12.557	—	2.657	0.000
	Problem-solving skill	0.638	0.098	0.293	6.514	0.000*
	Problem-solving skill,negative attitude towards smoking	0.719	0.141	0.227	5.109	0.000*
	Problem-solving skill,negative attitude towards smoking, and self-efficay	0.435	0.111	0.181	3.924	0.000*
4	Constant value	61/156	16.511	—	3.704	0.000
	Problem-solving skill	0.580	0.100	0.266	5.805	0.000*
	Problem-solving skill,negative attitude towards smoking	0.698	0.141	0.215	4.861	0.000*
	Problem-solving skill,negative attitude towards smoking, and self-efficay	0.350	0.115	0.146	3.046	0.000*
	Problem-solving skill,negative attitude towards smoking, self-efficacy, and group dependence	-0.366	0.142	-0.121	-2.569	0.011*

Discussion

In the study of any behavior, it is better to pay special attention to the cause and effect relationships. The behavior of individuals results in different factors that need to be scientifically examined. The aim of this study was to investigate the factors predicting the SPB based on different components of empowerment in students. According to the results of this study, 10.42% of students were active smokers and 40.75% of them had a smoking experience. A study by Sherizadeh et al. found that 12.1 percent of students were active smokers and 33.8 percent reported smoking experience³⁴, indicating a high prevalence of smoking among Urmia boys.

To increase the effectiveness of interventions to reduce smoking in adolescents, it is necessary to identify the determinants of the SPB in this segment of the population. Based on the results of the present study, a positive and significant relationship between problem solving skills, negative attitude towards smoking, self-efficacy and self-esteem with the SPB. In addition, a significant and inverse relationship was observed between group dependence

and the SPB, but no significant relationship was found between students' sensation seeking and the SPB. That is, those with problem-solving skills, self-efficacy, self-esteem, and a negative attitude toward smoking were more likely to engage in smoking preventive behaviors, and those who felt more dependent on group were less likely to engage in the SPB.

In the present study, problem-solving skill was the strongest and most influential component of the behavior and was alone able to predict 15.5% of the changes in the SPB in students. Problem-solving skill is a kind of goal-oriented thinking³⁵ and is a mental process and logical and systematic thinking that helps a person to find multiple solutions when dealing with problems such as addiction and smoking and then find the best solution.³⁶

The study of Parsian et al. revealed that adolescent problem-solving skills are a major predictor in the prevention of addiction and smoking, and their results are consistent with the results of the present study.³⁷ Hitchcock also points out that one of the key points in the discussion of substance abuse, such as smoking, etc., is to pay attention to skills such as problem-solving skills that enable people to deal with problems.³⁸

Negative attitudes toward smoking are the second component of empowerment that explained the SPB in students. The study of Morvati Sharifabad et al. revealed that creating negative attitudes toward smoking in adolescents through various educational programs regarding the individual and social effects of this dangerous behavior can be effective in adolescents' reluctance to smoke.³⁹ Various studies have shown that teens believe that smoking is a way to gain social status and comfort. This unhealthy behavior should be controlled by reducing their positive attitude towards smoking and creating a negative attitude towards smoking.^{40,41}

Self-efficacy was the third component of empowerment that predicted the SPB in students. Bandura considers self-efficacy to be the most important prerequisite for behavior change and predictor of behavior.⁴² In the study of Panahi et al., self-efficacy has been mentioned as an important component in predicting the behaviors that prevent smoking.³² According to Ghasemi et al.'s study, non-smoking students had a high ability not to consume, but in contrast, consumer students had a low ability to quit smoking due to problems such as peer pressure or loss of fun with friends.⁴³ On the one hand, this can be due to the connection and friendship with peers who consume tobacco, and on the other hand, belonging to a group as one of the important needs of adolescents.⁴⁴ Given the importance of self-efficacy in performing healthy behaviors, increasing the life skills of students, especially the skill of saying no and their resistance to peer pressure, can be used to improve their self-efficacy.

Learning is more effective between groups that are close to the individual, and so they both act as outstanding role models for the individual and control the individual.⁴⁵ In general, if the group to which a person belongs is involved in deviant actions, in fact the individual considers that group as a role model.⁴⁶ Hawkins' model of social development explains abnormal behaviors, including substance use (smoking and other addictive substances), based on social bonding. This model points to three effective factors in reducing a person's commitment to society: the pressures of a huge difference between goals and the individual's perception of the availability of the necessary conditions to achieve those goals, social disorder and the process of socialization. According to this theory, emotional attachment to groups and peers who use addictive substances is considered the main cause of substance abuse.⁴⁷ It should be noted that no single factor is a necessary and sufficient condition for substance abuse (smoking, etc.) and substance abuse is a combined result of various factors. Some of these factors increase the risk of consumption and others prevent and reduce drug use.

However, this study, like other studies, has its limitations: First, this study is a cross-sectional study and cannot be used to examine the cause-and-effect relationship, and it is recommended that stronger studies be used for this purpose. Second, results cannot be generalized beyond the study sample and therefore can be generalized only to populations with similar features. Finally, the data collection tool in this study is a self-report questionnaire, and participants may underestimate or overestimate their smoking preventive behavior, which may have affected the study findings.

Conclusion

Based on the results of this study, it was found that the empowerment components predicted 26.5% of the variance in smoking prevention behaviors in students. Problem-solving skills, negative attitudes toward smoking, self-efficacy, and group affiliation were the strongest predictors of smoking prevention behaviors, respectively. Therefore, the results of the present study can be used in planning, designing interventions and appropriate strategies to prevent and control smoking in students.

Abbreviations

SPB:Smoking Preventive Behavior ; SPSS: Statistical Package for Social Sciences; WHO: The World Health Organization.

Declarations

Ethical considerations

Research has been presented in the ethics committee of Urmia University of Medical Sciences and has received the code of ethics (IR.UMSU.REC.1398.007). A Written parental informed consent, as well as written student assent, was obtained from all participants in this study, and all provisions of the Helsinki Statement on Research Ethics were considered.

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Authors' contributions

Study design: NSh, AD

Data collection and analysis: NSh, AD,BR

Manuscript preparation: NSh

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Competing interests

The authors declare that they have no conflict of interest in this work.

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