Cigarette Smoking Based on Prototype Willingness Model in Male High School Students

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Abstract

Background: Cigarette smoking by adolescents is increasing and being popularized. However, when smoking is initiated at a young age, the risks of heavy smoking increases.

Objectives: The aim of this study was to predict smoking based on the prototype Willingness model in male high school students of Bandar Abbas, Iran.

Patients and Methods: In this cross-sectional study, 422 students were selected through the multistage sampling method. Constructs of Prototype Willingness Model were measured by a questionnaire. The items for measuring the prototype Willingness model constructs were designed on a Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Out of 422 questionnaires that were distributed among students, 394 questionnaires were filled out completely and analyzed (response rate = 93.4%). Data were analyzed by the SPSS 19 software. To analyze the chance of smoking experience through prototype/willingness model constructs, binary logistic regression was used.

Results: The mean age of the subjects was 16.4 years (SD = 1.1), ranging from 14 to 18 years. Overall, 15.2% of subjects had smoking experience. Intention to not smoke, willingness to smoke, and negative attitude toward smoking were predictors of smoking experience. Negative attitude toward smoking and intention to not smoke were negative predictors and willingness to smoke was a positive predictor of smoking experience. Willingness to smoke in comparison to other variables was a stronger predictor for smoking experience (P < 0.001).

Conclusions: Willingness to smoke increased the chance of smoking experience more than the intention of smoking. To prevent smoking in adolescents, it is recommended that they should be taught regarding refusal skills of cigarettes.

Keywords: Smoking, Student, Prototype Willingness Model

1. Background

Smoking is one of the most bizarre behaviors of humans that threatens the health of millions of people around the world. It is estimated that by year 2020, the number of people, who die due to tobacco-related diseases will be 8400000, annually (1). The age at which smoking starts is very important. The younger the age of smoking initiation, the greater the chance of becoming a regular smoker for the rest of one's life. Studies have shown that most smokers have started smoking under the age of 18 years (2, 3). In one study, the prevalence of smoking among male youth between the age of 15 to 19 years in Iran was reported to be 10.5% (4).

World-wide smoking-related data indicates the need for implementation of a comprehensive and effective program for prevention of smoking among adolescents (5). To design this program, it is needed to identify determinants, such as expectations and perceptions of youth about smoking, as well as factors, such as personality of youth or relationship with peers, who influence the identification, assessment, and decisions of youth about smoking (6). Many researchers believe that decisions about high-risk behaviors, such as smoking are likely to occur spontaneously and unintentionally. To affect unplanned or accidental decisions, Gibbons et al. developed a new concept called behavioral intention as part of a prototype Willingness model (7).

Based on this model, when an individual's attitude towards a specific behavior is positive and they feel that some significant factors drive them towards that behavior, their inclination to behave in that way is increased.

The paradigm's reasoning for this fact is that people have some beliefs, which play an important role in their risky behaviors, and their attitude towards a behavior is directly linked with these basic beliefs or fantacies (8, 9). Based on this model, for example, the mental social imagination of a smoker among youth may lead them towards committing this risky behavior in the case that they have inclinations for doing so and the conditions are favorable (10). Research shows that the social imagination of smoking or alcoholic peers plays an important role in the youth's decision making. The basic and main hypothesis of the imaginations/inclinations model is that setting up a health risky behavior among youth is not always planned or based on premeditation, rather, in most cases the start of such behaviors is a response to the conditions or situations that have caused the risky behavior (7).

2. Objectives

In Iran, many studies have reported the prevalence of smoking in adolescents and young adults, but a few studies have been conducted based on the prototype willingness model (11, 12) about smoking in adolescents. Therefore, this study was conducted to predict smoking based on the Prototype Willingness Model in male high school students in Bandar Abbas, Iran.

3. Patients and Methods

In this cross-sectional study, 422 students were selected through the multistage sampling method. In this regard, 10 schools from different areas of the Bandar Abbas city were selected randomly. Among different grades of each school, one grade was selected randomly. In each grade, according to the sample size, a certain number of students were selected randomly. Out of 422 questionnaires that were distributed among students, 394 questionnaires were filled out completely and analyzed (response rate = 93.4%).

Demographic characteristics of the students, such as age, grade, and course and constructs of the Prototype Willingness Model, were collected by a questionnaire. The items for measuring the Prototype willingness model constructs were designed on a Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree).

3.1. Attitudes Toward Smoking

Eight items were used to measure the attitudes towards smoking. For example, "Smoking is enjoyable for me." The score range of this construct was from 8 to 40. Cronbach's alpha of the attitudes toward smoking construct was 0.73.

3.2. Subjective Norms

Five items were used to measure the subjective norms. For example, "most of my friends believe that I shouldn't smoke." The score range of this construct was from 5 to 25. Cronbach's alpha of the subjective norms scale was 0.82.

3.3. Prototype Toward Smokers

Ten items were used to measure the prototype toward smokers. For example, "Smokers are sociable people." The score range of this construct was from 10 to 50. Cronbach's alpha of the prototype toward smokers construct was 0.87.

3.4. Willingness to Smoke

To study the willingness to smoke, a scenario was used. The scenario was as follows: "Imagine that you are at a party and a lot of your friends are smoking. One of your intimate friends offers you cigarettes. What is your reaction toward the proposal of your friend? 1. I will take the cigarette and smoke it, 2. I will take the cigarette and throw it away, 3. I will say no thank you and reject my friend's proposal, 4. I will leave the party". These items were designed based on a Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The score range of this construct was from 4 to 20. Cronbach's alpha of the willingness to smoke scale was 0.64.

3.5. Intention Toward Smoking

Four items were used to measure intention towards smoking. For example, "I never intend to start smoking." The score range of this scale was from 4 to 20. Cronbach's alpha of the intention toward smoking scale was 0.90.

3.6. Data Analysis

Data were analyzed with the SPSS 19 software. First, all reverse-scaled statements of the questionnaire were recorded in the same direction. Hence, in the prototype/willingness model constructs, a high score represented a negative attitude toward smoking, a high negative subjective norm to smoke, a high prototype toward smokers, a high willingness to smoke, and greater intention to not smoke. Multiple regression analysis was used to predict prototype/willingness model constructs for smoking. In this study, $P < 0.05$ was considered statistically significant.

4. Results

The mean age of the subjects was 16.4 years (SD = 1.1), ranging from 14 to 18 years. Overall, 11.9% were studying in grade one, 19.5% in grade two, 42.9% in grade three and 25.6% in pre-university. Furthermore, 25.9% of subjects had friends who were smokers and 22.3% of them had been offered to smoke by their friends, and 15.2% of subjects had smoking experience.

The highest percentage of the total score was for intention to not smoke, followed by negative subjective norms to smoking and negative attitude toward smoking. The least percentage of the total score was for positive prototype toward smokers and willingness to smoke (Table 1).

The results showed that willingness to smoke and positive prototype toward smokers were negatively correlated with intention to not smoke. There was a positive correlation between negative subjective norms to smoking and negative attitude toward smoking. Also there was a positive correlation between positive prototype toward smokers and intention to smoke. Negative subjective norms to smoking and negative attitude toward smoking were negatively correlated with willingness to smoke. Negative subjective norms to smoking and negative attitude toward smoking were also negatively correlated with positive prototype toward smokers. In addition, there was a positive correlation between negative subjective norms to smoking and negative attitude towards smoking (Table 2).

To study the chance of smoking experience through prototype/willingness model constructs, binary logistic regression with the backward method was used. Intention to not smoke, willingness to smoke, positive prototype toward smokers, negative subjective norms to smoking, and negative attitude toward smoking as independent variables and smoking experience as a dependent variable were entered in the model. Intention to not smoke, willingness to smoke, and negative attitude toward smoking were predictors of smoking experience. Negative attitude toward smoking and intention to not smoke were negative predictors and willingness to smoke was a positive predictor of smoking experience. Willingness to smoke in comparison to other variables was a stronger predictor for the likelihood of smoking experience (Table 3).

Binary logistic regression analysis also showed that willingness to smoke increased the chance of smoking experience more than the intention to smoke (OR = 1.4 in comparison with OR = 0.85) (Table 4).

5. Discussion

The aim of this study was to predict smoking based on the prototype Willingness model in male high school

students of Bandar Abbas city. The results showed that 15.2% of students had the experience of smoking that was in line with the result of Hukkelberg's study in Norvy (13), yet was in contrast to the results of Ramazankhani's study in Iran (14). One possible explanation for this difference is that in Ramazankhani's study, the sample size was 2272, which was much more than that of the current study. Many researches have performed studies regarding smoking in adolescents in different regions of the word and all of them have shown the problem of smoking among male adolescents (15). Since smoking is one of the most preventable causes of death, design and implementation of prevention programs could be useful and effective for improving public health.

In adolescents, some health risk behaviors, such as smoking, are not always planned or with a previous intention, yet youth often find themselves in situations that easily lead them to risky behaviors. When young people are in such situations, their willingness is a stronger predictor of risky behaviors when compared with their intention. Despite intention, willingness is less related to thinking about a behavior. In fact, willingness leads to avoidance of thinking about the negative consequences of behaviors. The person may engage in a risky behavior that they previously paid no attention to and had no intention of doing (10, 13). Many studies have shown that negative prototype about specific health risk behaviors is likely less associated with doing that behavior (13).

The results showed that willingness to smoke and positive prototype toward smokers had a negative correlation with intention to not smoke. This means that less willing to smoke and less positive prototype to smokers causes students to lack intention to smoke in the future. Moreover, the positive correlation between negative subjective norms to smoking and negative attitude toward smoking means that if parents, friends, and important community members forbid smoking, and on the other hand, if students have a negative attitude toward smoking, they will not intend to smoke and will not smoke in the future. These results are in line with the results of Morovatisharifabad et al. (11) and Barati (12, 16) studies. In a study by Wills et el. (17) regarding e-cigarette use and willingness to smoke, the results shows that students, who had used e-cigarettes, had greater willingness to smoke cigarettes compared to those, who had never used any tobacco product. The interpretation of this result was that E-cigarette advertising on mass media and portray of its users as attractive and popular people leads to willingness to smoke in adolescents (18, 19).

At schools, adolescents are influenced by their peers and the presence of a smoker among friends could be an incentive for smoking. In addition, peer pressure and the de-

Table 1. Mean and Range of Prototype Willingness Model Constructs

Variable	Mean (SD)	Percentage of the Total Score	Possible Score Range
Intention to not smoke	18.26 (3.6)	93.3	4 - 20
Willingness to smoke	9.58 (3.5)	47.9	4 - 20
Negative subjective norms to smoking	21.74 (4.1)	86.9	5 - 25
Negative attitude toward smoking	31.94 (6.2)	79.8	8 - 40
Positive prototype toward smokers	23.6 (8.3)	47.2	10 - 50

Table 2. Correlation Matrix of Prototype Willingness Model Constructs About Smoking

Variable	1	2	3	4	5
1. Intention to not smoke	-				
2. Willingness to smoke	-0.45[a]	-			
3. Positive Prototype toward smokers	-0.29[a]	0.29[a]	-		
4. Negative subjective norms to smoking	0.47[a]	-0.34[a]	-0.40[a]	-	
5. Negative attitude toward smoking	0.44[a]	-0.41[a]	-0.44[a]	0.54[a]	-

[a] $P < 0.001$.

Table 3. Binary Logistic Regression Analysis for Predicting Smoking Experience by Prototype Willingness Model Constructs

Variable	B	Wald	P Value	OR	CI
Constant	2.72	3.2	< 0.001	15.2	-
Intention to not smoke	-0.10	4.8	< 0.001	0.90	0.83 - 0.98
Willingness to smoke	0.22	13.7	< 0.001	1.2	1.11 - 1.40
Negative attitudes toward smoking	-0.17	24.1	< 0.001	0.84	0.78 - 0.90

Table 4. Binary Logistic Regression Analysis for Predicting Smoking Experience by Intention and Willingness Constructs

Variable	B	Wald	P Value	OR	CI
Constant	-2.25	4.5	< 0.03	0.1	-
Intention to not smoke	-0.15	14.6	< 0.001	0.85	0.78 - 0.92
Willingness to smoke	0.30	30.1	< 0.001	1.4	1.21 - 1.50

sire of the individuals to comply with the demands of their friends increases the tendency of adolescents for smoking (20). Teaching of refusal skills and rejecting cigarettes could be effective in prevention of smoking (21). Positive correlation between positive prototype toward smoking and willingness to smoke means that more positive prototype to smokers and more acceptable smokers result in greater intention for the person to smoke.

As the results showed intention to not smoke, willingness to smoke, and negative attitude toward smoking, were predictors of smoking experience. Willingness to smoke in comparison to other variables was a stronger pre-

dictor for smoking experience. These results are in agreement with the theory of Gibbons (8) and similar studies (11-13, 22, 23). It seems that adolescents are often found in situations that encourage them to be involved in high risk behaviors, such as smoking, and decision to refuse smoking is challenging for them (10). Negative subjective norms and negative attitude toward smoking and smokers, stop adolescents from easily experiencing smoking and if they are in situations that are encouraged to smoke, it could help them resist against their desire for smoking or to leave the environment. In this regard, the role of age should also be considered, because rational decision mak-

ing increases with age (24). The studied group of this research was adolescents and in this age group collective behavior was more determinant than logic for the experience of smoking. In other studies based on the Prototype Willingness Model, attitudes, subjective norms, and positive prototype toward smokers had a significant relationship with intention to and experience of smoking (25-27).

One of the limitations of this study was that only a group of adolescents, who went to school were studied. Considering that adolescents, who don't go to school are more probable to become smokers, the results of this study are generalizable only to school adolescents.

In general, willingness to smoke increases the chance of smoking experience more than the intention of smoking. Teaching refusal skills and rejecting cigarettes could be effective in prevention of smoking.

Acknowledgments

Footnotes

References

1. Rahnavard Z, Mohammadi M, Rajabi F, Zolfaghari M. An educational intervention using health belief model on smoking preventive behavior among female teenagers. *J Hayat*. 2011;**17**(3):15–26.
2. Warren CW, Lea V, Lee J, Jones NR, Asma S, McKenna M. Change in tobacco use among 13-15 year olds between 1999 and 2008: findings from the Global Youth Tobacco Survey. *Glob Health Promot*. 2009;**16**(2 Suppl):38–90. doi: 10.1177/1757975909342192. [PubMed: 19770234].
3. Nicklas TA, Johnson CC, Webber LS, Berenson GS. School-based programs for health-risk reduction. *Ann N Y Acad Sci*. 1997;**817**:208–24. [PubMed: 9239190].
4. WHO ROFTEM. *Tobacco free initiative*. 2012. Available from: http://www.emro.who.int/pak/programmes/tobacco-free-initiative.html/.
5. Karimy M, Niknami S, Heidarnia AR, Hajizadeh I, Montazeri A. Prevalence and determinants of male adolescents' smoking in iran: an explanation based on the theory of planned behavior. *Iran Red Crescent Med J*. 2013;**15**(3):187–93. doi: 10.5812/ircmj.3378. [PubMed: 23983996].
6. Tavousi M, Heidarnia AR, Montazeri A, Taremian F, Akbari H, Haeri AA. Distinction between two control constructs: An application of the theory of planned behavior for substance abuse avoidance in adolescents. *Green Mount Union High School J*. 2009;**15**(4):36–45.
7. Gibbons FX, Gerrard M, McCoy SB. Prototype perception predict (lack of) pregnancy prevention. *Pers Soc Psychol Bull*. 1995;**21**(1):85–93.
8. Gibbons FX, Gerrard M, Ouellette JA, Burzette R. Discriminating between behavioral intentions and behavioral willingness: Cognitive antecedents to adolescent health risk. In: Norman P, Abraham C, Conner M, editors. *Understanding and changing health behaviors: From health beliefs to self-regulation*. Amsterdam: Harwood Academic Press; 2000. p. 137–61.
9. Gerrard M, Gibbons FX, Reis-Bergan M, Trudeau L, Vande Lune LS, Buunk B. Inhibitory effects of drinker and nondrinker prototypes on adolescent alcohol consumption. *Health Psychol*. 2002;**21**(6):601–9. [PubMed: 12433013].
10. Gerrard M, Gibbons F, Houlihan A, Stock M, Pomery E. A dual-process approach to health risk decision making: The prototype willingness model. *Dev Rev*. 2008;**28**(1):29–61.
11. Morowatisharifabad MA, Fadaeevash N, Allahverdipour H, Fallahzadeh H. Study of smoking predictors based on prototype/willingness model among high school students in Maragheh. *J Tolooe Behdasht*. 2012;**11**(3):25–35.
12. Barati M, Allahverdipour H, Hidarnia A, Niknami S. Predicting tobacco smoking among male adolescents in Hamadan City, west of Iran in 2014: an application of the prototype willingness model. *J Res Health Sci*. 2015;**15**(2):113–8. [PubMed: 26175295].
13. Hukkelberg SS, Dykstra JL. Using the Prototype/Willingness model to predict smoking behaviour among Norwegian adolescents. *Addict Behav*. 2009;**34**(3):270–6. doi: 10.1016/j.addbeh.2008.10.024. [PubMed: 19095361].
14. Ramezankhani A, Sarbandi Zaboli F, Zarghi A, Heidari M, Masjedi M. Smoking pattern in adolecent students in Tehran. *Pejouhandeh J*. 2010;**3**(75):115–22.
15. Global Youth Tobacco Survey Collaborating G. Differences in worldwide tobacco use by gender: findings from the Global Youth Tobacco Survey. *J Sch Health*. 2003;**73**(6):207–15. [PubMed: 12899101].
16. Barati M. *Designing and implementing preventive educational program for avoiding psychoactive drug abuse based on prototype /willingness model among college students*. Hamadan university of medical sciences; 2009.
17. Wills TA, Sargent JD, Knight R, Pagano I, Gibbons FX. E-cigarette use and willingness to smoke: a sample of adolescent non-smokers. *Tob Control*. 2016;**25**(e1):52–9. doi: 10.1136/tobaccocontrol-2015-052349. [PubMed: 26261237].
18. Richardson A, Ganz O, Vallone D. Tobacco on the web: surveillance and characterisation of online tobacco and e-cigarette advertising. *Tob Control*. 2015;**24**(4):341–7. doi: 10.1136/tobaccocontrol-2013-051246. [PubMed: 24532710].
19. Duke JC, Lee YO, Kim AE, Watson KA, Arnold KY, Nonnemaker JM, et al. Exposure to electronic cigarette television advertisements among youth and young adults. *Pediatrics*. 2014;**134**(1):29–36. doi: 10.1542/peds.2014-0269. [PubMed: 24918224].
20. Barati M, Allahverdipour H, Moeini B, FarhadiNasab A, Mahjub H, Jalilian F. Assertiveness skills training efficiency on college students' persuasive subjective norms against substance abuse. *Sci J Hamadan Univ Med Sci*. 2011;**18**(3):40–9.
21. Zhu BP, Liu M, Shelton D, Liu S, Giovino GA. Cigarette smoking and its risk factors among elementary school students in Beijing. *Am J Public Health*. 1996;**86**(3):368–75. [PubMed: 8604762].
22. Dal Cin S, Worth KA, Gerrard M, Stoolmiller M, Sargent JD, Wills TA, et al. Watching and drinking: expectancies, prototypes, and friends' alcohol use mediate the effect of exposure to alcohol use in movies on adolescent drinking. *Health Psychol*. 2009;**28**(4):473–83. doi: 10.1037/a0014777. [PubMed: 19594272].
23. Hammer JH, Vogel DL. Assessing the utility of the willingness/prototype model in predicting help-seeking decisions. *J Couns Psychol*. 2013;**60**(1):83–97. doi: 10.1037/a0030449. [PubMed: 23106820].

24. Ajzen I. The theory of planned behaviour: reactions and reflections. *Psychol Health*. 2011;**26**(9):1113–27. doi: 10.1080/08870446.2011.613995. [PubMed: 21929476].

25. Stock ML, Litt DM, Arlt V, Peterson LM, Sommerville J. The proto-type/willingness model, academic versus health-risk information, and risk cognitions associated with nonmedical prescription stimulant use among college students. *Br J Health Psychol*. 2013;**18**(3):490–507. doi: 10.1111/j.2044-8287.2012.02087.x. [PubMed: 23013235].

26. Rivis A, Abraham C, Snook S. Understanding young and older male drivers' willingness to drive while intoxicated: the predictive utility of constructs specified by the theory of planned behaviour and the prototype willingness model. *Br J Health Psychol*. 2011;**16**(Pt 2):445–56. doi: 10.1348/135910710X522662. [PubMed: 21489069].

27. Hampson SE, Andrews JA, Barckley M. Childhood predictors of adolescent marijuana use: early sensation-seeking, deviant peer affiliation, and social images. *Addict Behav*. 2008;**33**(9):1140–7. doi: 10.1016/j.addbeh.2008.04.010. [PubMed: 18547739].