

# Factors Associated With Tobacco Smoking Among Male Adolescents: the Role of Psychologic, Behavioral, and Demographic Risk Factors

Majid Barati<sup>1</sup>; Alireza Hidarnia<sup>1,\*</sup>; Shamsoddin Niknami<sup>1</sup>; Hamid Allahverdipour<sup>2</sup>

<sup>1</sup>Department of Health Education, Faculty of Medical Sciences, Tarbiat Modares University, Tehran, IR Iran

<sup>2</sup>Department of Health Education, School of Health, Tabriz University of Medical Sciences, Tabriz, IR Iran

\*Corresponding author: Alireza Hidarnia, Department of Health Education, Faculty of Medical Sciences, Tarbiat Modares University, Tehran, IR Iran. Tel/Fax: +98-2182884555, E-mail: Hidarnia@modares.ac.ir

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**Background:** Tobacco smoking among adolescents has been a concern for researchers and health organizations in recent years. However, predisposing factors to smoking initiation among Iranian adolescents are not well recognized.

**Objectives:** This study aimed to determine the prevalence of tobacco smoking and to investigate the role of psychologic, behavioral, and demographic risk factors in adolescents' smoking status.

**Patients and Methods:** This cross-sectional study was performed on 810 male adolescents recruited through cluster random sampling method in Hamadan in 2014. The participants received a self-administered questionnaire that contained questions about tobacco smoking behavior and demographic, behavioral, and psychologic variables. Data were analyzed by SPSS16 through independent-samples t test, Chi square, and logistic regression.

**Results:** A total of 139 persons (17.1%) were tobacco smoker and the mean (SD) age at smoking initiation was 13.7 (2.2) years. Sense of need, decreasing stress, having a smoker friend, and inability to reject smoking suggestion were common reasons associated with tobacco smoking ( $P < 0.05$ ). In addition, statistically significant differences between tobacco smokers and nonsmokers were found in the age, grade, mother's job, and education ( $P < 0.05$ ). In comparison to non-smokers, tobacco smokers evaluated a typical smoker as less immature, more popular, more attractive, more self-confident, more independent, and less selfish person ( $P < 0.05$ ).

**Conclusions:** The results showed that the effect of several psychosocial, behavioral, and demographic risk factors on adolescents' smoking status. Thus, design and implementation of interventions based on the results of the present study may be effective in preventing tobacco smoking among adolescents.

**Keywords:** Adolescent; Risk Factors; Smoking; Students

## 1. Background

Adolescence is a period of life during which a person faces quick and sudden changes of the body and psychologic changes, where a wave of turbulence and mental anxiety is triggered. It seems that the unrest is caused by a conflict between family source, norms, and regulations governing it and the adolescents and their own value system (1). therefore, if there is no balance in this path and transition period, it may have negative consequences such as behavioral problems and social distortions such as tobacco smoking (2). A large number of vulnerable adolescents think they can just use tobacco as fun or to gain experience, but they soon realize that smoking becomes their psychologic support that cannot be set aside (3).

The age of smoking onset in Iran has been reported between 13 and 18 years (4). Study of Ramezankhani et al. on students of Tehran demonstrated that 25.5% of participants disclosed a history of smoking (5). Moreover, studies by Bashirian et al. (6) and Moeini et al. (7) among the students of Hamadan and Shiraz indicated that respectively 11.1% and 15% of the subjects had a history of smoking.

Most studies have demonstrated that smokers have started smoking in adolescence. When people start smoking at a younger age, they are more likely to continue using it during adulthood (8, 9). Smoking is a major cause of cancers and prepares the grounds for cardiac arrest, respiratory infections, peptic ulcers, and depression (10). In addition to physical damages, Smoking jeopardizes mental health and is the underlying cause of addiction to opiates. This emphasizes the significance of preventing, reducing, and eliminating this global problem (11).

Smoking is a psychosocial phenomenon that cannot be controlled only by relying on coercive approaches, and requires more scientific approaches (12). The available evidence indicates that the effect of various factors such as parental and peer behavior, family environment, and mimicking the teachers and artists predisposes teenagers to smoking (13, 14). Furthermore, the risk of psychologic factors such as positive mental images of a tobacco smoker has always been reported as a serious risk factor for smoking (15, 16). In this regard, the results of studies

show that a number of adolescents considered a tobacco smoker as an attractive, popular, confident, and independent individual person (17,18). In other studies performed on Iranian adolescents, factors such as low level of awareness, male sex, educational level, and high levels of family income are reported as predictors of smoking (7, 19).

Rapid spread of smoking and its detrimental consequences on the one hand, and various factors of smoking on the other hand, demonstrate the necessity for planning and developing preventive strategies for adolescents. However, a prerequisite for any kind of planning is the knowledge of existing conditions and the understanding of the current status of tobacco smoking and the risk factors associated with it. In this regard, experts believe that the studies of epidemiology are the first step in designing preventive programs (12).

## 2. Objectives

This study was performed to determine the prevalence of tobacco smoking among adolescents and to investigate the role of psychologic, behavioral, and demographic risk factors in adolescents' smoking.

## 3. Patients and Methods

### 3.1. Participants

This analytical cross-sectional study was performed on 810 high school male students (grade 10, 11, and 12), which were recruited through cluster random sampling method in the Hamadan City, west of Iran, in 2014. There are two educational regions in the city, each of which region was considered as a section. Fourteen male high schools students were randomly selected from two sections using random numbers table (7 out of 15 in sections 1 and 7 out of 13 in section 2). From each of the selected high schools, all grades were studied (grade 10, 11, and 12). Sixty students were selected from each of the fourteen schools. Totally, 840 students were selected but only 810 students completed the study, resulting in a response rate of 96.4%. This study was conducted with approval from Tarbiat Modares University' institutional review board and ethical committee. Informed consent was obtained from all students before the project began. Researchers educated participants to ensure that they can reach a truly informed decision about participating in the research.

### 3.2. Measures

The self-administered questionnaire included demographic and tobacco smoking-related variables, which required approximately 25 minutes to be completed. The questionnaire was comprised of four sections:

(a) Demographic factors: Including age, grade, major, father's and mother's job, living status, and father's and mother's education.

(b) Tobacco smoking behavior: Including age at smoking initiation, frequency of use (never, occasionally, or always), and place of first smoking.

(c) Behavioral risk factors: Including having friends who smoked (never, occasionally, or always), having friends who had experienced substance (never, occasionally, or always), having father who smoked (never, occasionally, or always), having sibling who smoked (never, occasionally, or always), internet usage (low, moderate, or high), and game usage (Yes/No).

(d) Psychological risk factors: Including reasons of tobacco smoking and prototype evaluations.

In order to assess the reasons of tobacco smoking, the participants were asked to report main motives to begin tobacco smoking among adolescents (sensation seeking, smoker friends, take pleasure, sense of need, decreasing stress, sense of self-identity, and inability to reject smoking suggestion). Prototype evaluations were measured using a prototype approach, as described by Gerrard et al. (16). For this purpose, students were asked to "think about the type of person at your age who smoke" and then to indicate, "How much each of the following words describes your image of that person" with response choices including immature, popular, attractive, self-confident, independent, cool, and selfish. Each item had a five-point response scale keyed to the descriptor, ranging from one (not at all) to five (very).

### 3.3. Data Analysis

All statistical analyses were performed using version SPSS 16.0 (SPSS Inc, Chicago, Illinois, the United States) and an alpha level of 0.05 for all statistical tests. A series of logistic regression, Chi square, independent-samples *t* test, and descriptive analysis were computed to determine prevalence of tobacco smoking and predictive factors.

## 4. Results

The mean (SD) age of respondents was 16.42 (0.89) years (range, 15-18 years). Adolescents with 17 years of age comprised the highest proportion of respondents (38.5%). Almost majority of the respondents (88.3%) were in eleventh and twelfth grades. Regarding the educational status, 38.8% of respondents were studying in the field of natural sciences, 18% in mathematics, and 16.6% in human sciences, and 26.6% in applied sciences. Regarding the housing status, 95.6% of participants were living with biological parents, 2.7% with one biological parent, and 1.7% with other relatives. Regarding frequency of tobacco smoking, 22 persons (2.7%) were always smoker, and 117 (14.4%) were occasionally smoker and the mean (SD) age at smoking initiation was 13.73 (2.22). On average, 84.2% of smokers smoked one to five, 11.5% smoked six to ten, and 4.3% smoked > 10 cigarettes per day. Regarding the first place of smoking, parks and streets were mentioned by majority of the smokers.

Table 1 presents the demographic risk factors for to-

bacco smoking in adolescents. No statistically significant difference between tobacco smokers and nonsmokers was found in the field of education. We also found no statistically significant differences in the living status of tobacco smokers compared to nonsmoker, and majority

of the participants in each group were living with biological parents. We found no differences in the father's education and job between tobacco smokers and nonsmokers. However, as shown in Table 1, we find significant differences in the age and grade between tobacco

**Table 1.** Demographic Characteristics of Tobacco Smokers and Nonsmokers

Variables	Tobacco Smokers (n=139) <sup>a</sup>	Nonsmokers (n= 671) <sup>a</sup>	Odds Ratio (95% CI)	P Value <sup>b</sup>
<b>Age, y</b>				0.001
15	13 (9.4)	126 (18.80)	1 (Ref.)	
16	39 (28.1)	236 (35.2)	1.60 (0.82- 3.11)	
17	63 (45.3)	249 (37.1)	2.45 (1.31- 4.62)	
18	24 (17.3)	60 (8.9)	3.87 (1.84-8.14)	
<b>High school grade</b>				0.002
Tenth	10 (7.2)	85 (12.7)	1 (Ref.)	
Eleventh	50 (36)	315 (46.9)	1.34 (0.65-2.77)	
Twelfth	79 (56.8)	271 (40.4)	2.47 (1.22-4.99)	
<b>Major</b>				0.203
Natural sciences	38 (27.3)	214 (35.9)	1 (Ref.)	
Mathematics	40 (28.8)	190 (28.3)	0.64 (0.39-1.09)	
Human sciences	31 (22.3)	117 (17.4)	0.86 (0.52-1.45)	
Technical	30 (21.6)	123 (18.3)	1.08 (0.62-1.91)	
<b>Father's job</b>				0.168
Unemployed	7 (5)	23 (3.4)	1 (Ref.)	
Self-employed	67 (48.2)	309 (46.1)	1.06 (0.41-2.73)	
Employee	33 (23.7)	205 (30.6)	0.75 (0.46-1.25)	
Retired	4 (2.9)	36 (5.4)	0.56 (0.32-0.98)	
Worker	28 (20.1)	98 (14.6)	0.38 (0.13-1.18)	
<b>Mother's job</b>				0.023
Employed	7 (5)	77 (11.5)	1 (Ref.)	
Housewife	132 (95)	594 (88.5)	2.44 (1.11-5.42)	
<b>Living (with)</b>				0.754
Both parents	135 (97.2)	639 (95.3)	1 (Ref.)	
Father	1 (0.7)	5 (0.7)	2.74 (0.36-21.17)	
Mother	2 (1.4)	14 (2.1)	2.60 (0.13- 50.04)	
Others	1 (0.7)	13 (1.9)	1.85 (0.15-22.99)	
<b>Father's education</b>				0.473
Illiterate	12 (8.6)	44 (6.6)	1 (Ref.)	
Primary	48 (34.5)	199 (29.6)	1.51 (0.71-3.26)	
High school	54 (38.7)	289 (43.1)	1.34 (0.79-2.27)	
Academic	25 (18)	139 (20.7)	1.03 (0.62-1.74)	
<b>Mother's education</b>				0.017
Illiterate	15 (10.8)	53 (7.9)	1 (Ref.)	
Primary	60 (43.2)	214 (31.9)	2.24 (1.03-4.87)	
High school	483 (4.5)	277 (41.3)	2.22 (1.22-4.03)	
Academic	16 (11.5)	127 (18.9)	1.37 (0.75-2.51)	

<sup>a</sup> All values are presented as NO. (%).

<sup>b</sup> Overall P value for crude analysis using logistic regression.

smokers and nonsmoker. Tobacco smokers were significantly older and were at higher grades. We also found significant differences in the mother's education between tobacco smokers and nonsmokers; overall, adolescents with illiterate mothers were significantly more likely to be smoker than others were. Finally, statistically significant differences were found in the mother's job between tobacco smokers and nonsmokers; ie, 95% and 88.5% of respectively tobacco smokers and non-smokers reported that their mothers were homemaker.

The effects of behavioral risk factors on tobacco smoking in adolescents were investigated (Table 2). According to the results, statistically significant differences between tobacco smokers and nonsmokers were found in the smoker father, smoker sibling, smoker friends, substance abuser friends, and internet usage (All < 0.05). The prevalence of tobacco smoking was 56.1% among those adolescents whose fathers were smokers, 21.6% among those whose siblings were smokers, 79.1% among those whose friends were smokers, 19.4% among those whose friends were substance abuser, and 33.1% among those who used the internet more than seven hours a day. The crude odds ratio (OR) estimates of becoming smoker are shown in Table 2.

The seven most frequently recorded reasons of tobacco smoking from Iranian adolescents' viewpoints are shown in Table 3. Based on these results, crude OR estimates of becoming a smoker was 2.41 for adolescents who mentioned sense of need as the main reason of tobacco smoking. In addition, crude OR estimates of becoming a smoker was 2.87 for adolescents who mentioned decreasing stress as the main reason of tobacco smoking. In addition, statistically significant differences between tobacco smokers and nonsmokers were found in the having a smoker friends and inability to reject smoking suggestion. Nonetheless, the likelihood of tobacco smoking was lower among those who mentioned these reasons as the main reasons of tobacco smoking. Table 4 presents the important positive and negative images of typical smoker in adolescents. It was hypothesized that adolescents' prototypes of daily smoking peers would differ among tobacco smokers and non-smokers. In this regard, results indicated that in comparison to non-smokers, tobacco smokers evaluated a typical smoker as less immature, more popular, more attractive, more self-confident, more independent, and less selfish person ( $P < 0.05$ , t test).

**Table 2.** Behavioral Risk Factors on Tobacco Smoking in Tobacco Smokers and Nonsmokers

Variables	Tobacco Smokers (n = 139) <sup>a</sup>	Nonsmokers (n = 671) <sup>a</sup>	Odds Ratio (95% CI)	P Value <sup>b</sup>
<b>Smoking father</b>				< 0.001
No	61 (43.9)	407 (60.7)	1 (Ref.)	
Yes	78 (56.1)	264 (39.3)	1.97 (1.36-2.28)	
<b>Smoking sibling</b>				0.005
No	109 (78.4)	587 (87.5)	1 (Ref.)	
Yes	30 (21.6)	84 (12.5)	1.92 (1.21-3.06)	
<b>Smoking friends</b>				< 0.001
No	29 (20.9)	437 (65.1)	1 (Ref.)	
Yes	110 (79.1)	234 (34.9)	7.08 (4.56-10.98)	
<b>Substance user friends</b>				0.011
No	112 (80.6)	594 (88.5)	1 (Ref.)	
Yes	27 (19.4)	77 (11.5)	1.86 (1.15-3.01)	
<b>Game usage</b>				0.307
No	32 (23)	129 (19.2)	1 (Ref.)	
Yes	107 (77)	542 (80.8)	0.79 (0.51-1.23)	
<b>Internet usage</b>				
Low (< 3 h/d)	81 (58.3)	476 (70.9)	1 (Ref.)	
Moderate (3-7 h/d)	12 (8.6)	82 (12.2)	0.86 (0.45-1.64)	0.649
High (> 7 h/d)	46 (33.1)	113 (16.8)	2.39 (1.57-3.62)	< 0.001

<sup>a</sup> All values are presented as No. (%).

<sup>b</sup> Overall P value for crude analysis using logistic regression.

**Table 3.** Reasons of Tobacco Smoking in the Adolescents

Causes of Smoking	Tobacco Smokers (n = 139) <sup>a</sup>	Nonsmokers (n = 671) <sup>a</sup>	Odds Ratio (95% CI)	P Value <sup>b</sup>
<b>Sense of need</b>				0.001
No	118 (84.9)	625 (93.1)	1 (Ref.)	
Yes	21 (15.1)	46 (6.9)	2.41 (1.39-4.20)	
<b>Take pleasure</b>				0.198
No	102 (73.4)	526 (78.4)	1 (Ref.)	
Yes	37 (26.6)	145 (21.6)	1.31 (0.86-2.00)	
<b>Decreasing stress</b>				< 0.001
No	90 (64.7)	564 (84.1)	1 (Ref.)	
Yes	49 (35.3)	107 (15.9)	2.87 (1.91-4.31)	
<b>Smoker friends</b>				< 0.001
No	108 (77.7)	417 (62.1)	1 (Ref.)	
Yes	31 (22.3)	254 (37.9)	0.47 (0.30-0.73)	
<b>Sensation seeking</b>				0.128
No	83 (59.7)	446 (66.5)	1 (Ref.)	
Yes	56 (40.3)	225 (33.5)	1.33 (0.91-1.95)	
<b>Reject-inability</b>				< 0.001
No	122 (87.8)	487 (72.6)	1 (Ref.)	
Yes	17 (12.2)	184 (27.4)	0.36 (0.21-0.63)	
<b>Sense of self-identity</b>				0.060
No	108 (77.7)	468 (69.7)	1 (Ref.)	
Yes	31 (22.3)	203 (30.3)	0.66 (0.43-1.02)	

<sup>a</sup> Values are presented as No.(%).

<sup>b</sup> Overall P value for crude analysis using logistic regression.

**Table 4.** Mean Scores of Smoker Prototypes Among Tobacco Smokers and Nonsmokers

Smoker Prototypes	Tobacco Smokers (n = 139) <sup>a</sup>	Nonsmokers (n = 671) <sup>a</sup>	P Value <sup>b</sup>
<b>Immature</b>	1.80 (1.1)	2.21 (1.2)	< 0.001
<b>Popular</b>	2.65 (1.2)	2.22 (1.2)	< 0.001
<b>Attractive</b>	2.64 (1.4)	2.13 (1.2)	0.001
<b>Self-confident</b>	2.73 (1.3)	2.23 (1.3)	< 0.001
<b>Independent</b>	2.71 (1.2)	2.39 (1.3)	0.013
<b>Cool</b>	2.87 (1.4)	2.69 (1.3)	0.148
<b>Selfish</b>	2.46 (1.3)	2.80 (1.2)	0.008

<sup>a</sup> All values are presented as Mean (SD).

<sup>b</sup> Overall P value for crude analysis using logistic regression.

## 5. Discussion

The current study aimed to investigate risk factors associated with tobacco smoking among adolescents as an introduction to design effective strategies in preventing drug abuse. Regarding the prevalence of tobacco smoking, 17.2% of the participants had reported the experience of tobacco smoking persistently or recreationally, which is higher than the findings of similar studies. Ghavidel et al. (20) revealed that 8.7% of high school students in Nazarabad city experienced smoking. In

addition, Bashirian et al. (6) and Bidel et al. (21) showed that 11.1% and 11.4% of high school students respectively in Hamadan and Ilam experienced smoking. Nonetheless, the result of current study is consistent with the findings of the studies of Mohammadkhani (22), Karimy et al. (11), and Mohammadi-Zeidi and Pakpour-Hajiagha (23) that reported the prevalence of tobacco smoking among Iranian adolescents to be 14.3% to 15.1%. It appears that the passage of time, change in the age pattern of

consumption, rate of access to cigarette, demographic and geographic differences, and cultural and economic differences are some of the reasons for the different reported rates between the present study and some of the other similar studies. Nevertheless, it appears that the findings of this study, because of having a sufficient sample size and appropriate sampling method, can more accurately reveal the prevalence of tobacco smoking among adolescents.

The findings of the present study demonstrated that a statistically significant difference between tobacco smokers and non-smokers in age, education level, occupation and their mother's education. In other words, the possibility of tobacco smoking among adolescents with upper levels of education and ages was higher; moreover, the possibility of tobacco smoking was higher among adolescents whose mothers had lower levels of education and were homemakers. These results are consistent with the findings of the studies by Akbari and Amoupour (24), Karimy et al. (11), and Moeini et al. (7), which have delineated age, education level, and parents' education as effective factors in the tobacco smoking and drug abuse. In this study, having a father or brother as smokers and having friends as tobacco smokers and substance abusers were some of the most significant behavioral risk factors associated with tobacco smoking among adolescents. These results are consistent with the findings of studies performed by Shams-Alizadeh et al. (25), Foroutani and Rezaeian (26), and Bahreynian et al. (27). It appears that relationship and friendship with peers who consume cigarette and drugs is one of the most essential factors affecting tobacco smoking, the strength and weakness of which effect has a close correlation with individuals' lifestyles. For instance, adolescents living in families with brothers or fathers who smoke are motivated to smoke more than their peers are (7, 28). These contents are indicative of the fact that adolescents, at this age are under a lot of peer pressure for tobacco smoking, which reveals the necessity of attention to this notion in educational programs.

In this research, the rate of tobacco smoking had been reported to be higher in adolescents who used the internet more than seven hours a day than in others. The results of the available studies in this area indicate that internet addiction is related to depression and serious damages in the individual and social performance of people. In this regard, the effect of excessive using of the internet on individuals' psychologic health and lifestyles has been delineated in previous studies (29-31). Therefore, the occurrence of high-risk behaviors such as tobacco smoking will not be far-fetched in individuals addicted to internet.

The findings of the study demonstrated that sense of need, stress, having a smoker friends, and inability to reject smoking suggestion are the most important reasons on starting tobacco smoking, which are consistent with the results of similar studies (32, 33). It seems that the be-

ginning of tobacco smoking among adolescents might be attributed to the lack of life skills such as assertiveness and stress management. Consequently, this requires further interventions and studies.

This study investigated the positive and negative images of typical smoker among the adolescents participating in the study. Results revealed that adolescents' prototypes of daily smoking peers differed between tobacco smokers and non-smokers. In this regard, results indicated that in comparison to non-smokers, tobacco smokers evaluated a typical smoker as less immature, more popular, more attractive, more self-confident, more independent, and less selfish person. These findings indicate that positive and negative images of typical smoker lead to tobacco smoking, which are consistent with the findings of previous studies (15, 16). In this regard, factors that play a role in the formation of positive images of smoker include tobacco smoking by parents, friends, and peers and living in areas where drugs are consumed abundantly. It seems that designing and implementing training interventions, with the purpose of sensitizing risk groups by emphasizing on effects and consequences of tobacco smoking, and improving life skills with the purpose of the formation of appropriate characteristic features have determining effect on reducing the rate of tobacco smoking.

Results from this study must be viewed with some limitations. First, only male adolescents engaged in the study and it is not clear whether including females in the study would lead to the same results. Second, the study participants were recruited from high schools who might not be representative of all adolescents in our country. The future studies are needed to overcome these problems.

We revealed the effect of several psychosocial, behavioral, and demographic risk factors on adolescents' smoking status. Thus, design and implementation of interventions based on the results of present study may be effective in prevention of tobacco smoking among adolescents.

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## Authors' Contributions

Majid Barati was the main investigator, collected the data, performed the statistical analysis, and drafted the manuscript. Alireza Hidarnia supervised the research and contributed to all aspects of the study. Hamid Allahverdipour and Shamsoddin Niknami were advisors of the study and contributed to study and questionnaire design and revised the final manuscript. All authors read and approved the final manuscript.

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