

Intention to Start Smoking and its Related Factors in Never Smoked Adolescents in Tabriz, 2010

Asghar Mohammadpoorasl, Saharnaz Nedjat¹, Kamran Yazdani², Ali Fakhari³, Abbas Rahimi Foroushani², Akbar Fotouhi²

Department of Public Health, School of Public Health, Qazvin University of Medical Sciences, Qazvin, Iran, ¹Department of Epidemiology and Biostatistics, School of Public Health, Knowledge Utilization Research Center, Tehran University of Medical Sciences, Tehran, Iran, ²Department of Epidemiology and Biostatistics, School of Public Health, Tehran University of Medical Sciences, Tehran, Iran, ³Clinical Psychiatry Research Center, Tabriz University of Medical Sciences, Tabriz, Iran.

Correspondence to:

Prof. Akbar Fotouhi,
Department of Epidemiology and
Biostatistics, School of Public Health,
Tehran University of Medical Sciences,
Tehran, Iran.
E-mail: afotouhi@tums.ac.ir

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ABSTRACT

Background: Intention to smoking is a strong predictor of future smoking behavior. The aim of this study is identifying the personal, environmental, and psychological factors relating to intention to smoking in adolescents of Tabriz city (Northwest of Iran).

Methods: Four thousand nine hundred and three (4903) students were randomly selected and completed a self-administered questionnaire about cigarette smoking, intention to smoking, and the related risk factors through multi-stage sampling. The association of independent variables with intention to smoking was evaluated using the multi-variable logistic regression model.

Results: The mean age of student was 15.7 ± 0.73 years, and 42.9% of the samples were male. The results showed that 95.0% of students were in committer stage (students who had never smoked and were sure never start smoking). Having general risk-taking behavior (OR = 2.90; 95% confidence interval [CI]: 1.21-6.97), smoker in the family (OR = 2.60; 95% CI: 1.20-5.61), and positive attitude towards cigarette smoking (OR = 1.30; 95% CI: 1.18-1.43) had statistically significant association with intention to start smoking in future.

Conclusion: Majority of non-smokers have firm decision to not start smoking in the future. Having general risk-taking behavior, smoker in the family, and positive attitude towards smoking are associated with intention to smoking in adolescents.

Key words: Adolescents, attitude to smoking, intention to smoking, risk-taking behavior, smoking stages

INTRODUCTION

There are over 60 known cancer-causing chemicals in tobacco smoke. Smoking harms nearly every organ in the body, especially respiratory system, circulatory system, and immune system, causing many diseases and reducing health in general.^[1] Most smokers become nicotine-addicted in their teenage years.^[2] Teenagers can become addicted to cigarettes at very low levels consumption, even after smoking only a few cigarettes.^[3] Studies

have shown that smoking just one cigarette at the age of 11 can become a person susceptible to smoking, even in a period of 3 years or more.^[4] Therefore, reducing smoking in adolescents is one of the public health priorities for smoking reduction.

Smoking behavior in adolescents and the development of nicotine addiction is a process with discrete and defined stages, which start from receptivity to smoking.^[5] Pre-contemplation, contemplation, and preparation are first stages that usually are defined in never-smoked adolescents.^[6] Individual in pre-contemplation stage has no desire to start smoking in the near future.^[6] Kremers *et al.*^[7,8] showed that never smoked adolescents in pre-contemplation stage are not homogeneous, and they can be categorized in 3 discrete groups as committers, progressives, and immotives. The committers are sure that they will not smoke in the future. The immotives do not plan to start smoking in the future (they do not have any definite program to do so), and the progressives want to smoke but not in the next 6 months. It is clear that the difference between above groups is in intention to smoking in the future.

Intention to cigarette smoking is a strong predictor of future smoking behavior. Therefore, it has consistently been used as proximal outcome measures in adolescent smoking researches.^[9-11] It means that adolescents who express the conviction that they are not going to take up smoking are much less susceptible to start smoking than those who have not made any firm decision.

Assessing intention to smoking as a strong predictor of future behavior may be important than other factors such as proximity to smokers in the social environment. Wakefield *et al.*^[12] have shown that high school student, who had expressed firm decision to have no smoking in the next 5 years in comparison with other student, were less likely to smoke at follow up, regardless of their level of involvement with smoking at baseline.

Limited information exists about intention to start smoking in Iran. The aim of present paper is to present the results of comparing two never smoked adolescents groups with and without firm decision to not smoke in the future, with regard to demographical, personal, environmental, and psychological factors.

METHODS

In this cross-sectional analytical study, 196 classes (82 and 114 boys and girls classes, respectively) in 57 high schools were selected as clusters randomly and proportionally by considering sex of students, type of school, number of students in each school, and the education major of students. The total number of students in these classes was 5106, which in day of study, 196 (3.8%) students were absent and 7 students (0.15%) had not willingness to participate in the study. Therefore, 4903 students completed a self-administered multiple choice questionnaire during November and December 2010. The reason for limiting the subjects to 10th-grade students was more potential to track individuals in the second phase of the study.

To enhance the validity of student's self-reports, they were assured strict confidentiality of their responses and they could not be recognized by their answers. Also, they were informed about the voluntary nature of their participation in the study and their right to refuse or skip any questions.

The Ethics Committee of Tabriz University of Medical Sciences and Research Committee of the East Azarbaijan Province Education Organization approved the questionnaire. The questions of the questionnaire aimed to obtain information on demographical characteristics, socio-economical information, cigarette smoking behavior, general risk-taking behavior, substance abuse, cigarette smoking norms of the family members and close friend, self-esteem, attitude towards cigarette smoking, and positive thinking about cigarette smoking.

In this study, smoking stages measured by using a valid algorithm.^[13] By using this algorithm, 9 stages can be determined for adolescent smoking behavior. The algorithm was presented to the 154 students twice with a 2-week interval, and the intra-class correlation coefficient of 0.929 (95% CI: 0.903-0.948) was obtained for its reliability. The first 5 stages are for never smoked adolescents and the rest 4 stages are for smoked adolescents. Table 1 presents the names and definitions of 5 stages for never smoked adolescents. For assessing relation of independent variables with intention to start smoking in the future, students categorized into two committer (students who had never smoked and were sure never start smoking)

Table 1: Names and definitions of smoking acquisition stages in never smoked adolescents

Smoking acquisition stage	Definition
Committer	Never smoked and were sure never start smoking
Immotive	Never smoked and have no planning to start smoking in the next 5 years
Progressive	Never smoked and have planning to start smoking in the next 5 years, but not within next 6 months
Contemplatory	Never smoked and have planning to start smoking in the next 6 months
Preparatory	Never smoked and have planning to start smoking in the next month

and other (including immotive, progressive, contemplator, and preparatory (students who had never smoked and have no planning to start smoking or want to start smoking in the future) categories.^[7,8]

General risk-taking behavior was assessed like Kaplan *et al.*^[14] by answering “yes” or “no” to the following question: “Do you enjoy doing things that are a little dangerous or risky?”

Self-esteem was assessed by the Persian version of the 10-items Rosenberg self-esteem questionnaire.^[15] This variable ranged from 10 to 40, with lower scores indicating higher self-esteem. Test–retest Pearson correlation of the Persian version of this test in 23 grade-10 students, with 2-week interval, was 0.80 (Cronbach’s alpha 0.81).

Attitude toward cigarette smoking was assessed by 6 pairs of adjectives forming semantic differential scales according to Hill *et al.*^[16] This test produced a potential range of -12 to +12, where higher scores indicating positive attitude. Test–retest Pearson correlation of the Persian version of this test in 23 grade-10 students, with 2-week interval, was 0.78 (Cronbach’s alpha 0.89).

The cigarette smoking norm regarding the students’ opinion about their relatives’ (father, mother, brother, and sister) and the closest friend reaction about their smoking was assessed by 5 same questions; “If you lit up a cigarette in front of your father/mother/brother/sister/closest friend, how do you think he/or she would react?” Two severe and mild reactions were considered for the questions.

Positive thinking about cigarette smoking was measured through asking 5 questions. These

questions ask about positive effects of the cigarette smoking (increasing concentration, decreasing the anger, decreasing the sorrow, sign of maturity, and sign of independence). The answers for each question included “completely agree,” “agree,” “no idea,” “disagree,” and “completely disagree.” Replies ranged from 5 to 1 respectively. Therefore, the potential range of this test was 5 to 25, in which the higher scores indicated more positive thinking about cigarette smoking. In a pilot sample of 23 students, the Cronbach’s alpha coefficient for the internal consistency was 0.84, and the Pearson correlation coefficient for reliability of the measurement with 2 weeks interval was obtained as 0.88.

Principal component analysis was applied to calculate socio-economic status by using father’s education, mother’s education, family assets, and family income. Considering the high correlation between such variables, this variable was built using the principal component analysis for preventing from co-linearity in the model. This measure graded students into very high, high, middle, lower, and much lower socio-economic status levels.

Considering cluster sampling, survey analysis has been used in all analyzes. The Chi-square test, Fisher exact test, one-way analysis of variance, and multi-variables logistic regression model were used for evaluating intention to smoking factors.

RESULTS

The mean age of student was 15.69 ± 0.73 years (min: 14 and max: 19). The samples were relatively equally distributed in terms of gender as 2104 (42.9%) of the samples were male and 2799 (57.1%) were female. Totally 1008 students (20.7%) had smoking experience (ever smoked), and 3866 students (79.3%) had never smoked. Table 2 shows the distribution of smoking initiation stages in the students by gender. As shown in this table, 95.0% of students were in committer stage (students who had never smoked and were sure never start smoking), and 195 (5.0 %) students were in the other stages (students who had never smoked and have no planning to start smoking or want to start smoking in the future).

[Table 3] shows Demographic and other characteristics of the never smoked adolescents with regard to intention to start smoking in the

Table 2: Prevalence of smoking initiation stages by gender

Smoking acquisition stage	Boys n (%)	Girls n (%)	Total n (%)
Committer	1353 (94.4)	2318 (95.3)	3671 (95.0)
Immotive	57 (4.0)	48 (2.0)	105 (2.7)
Progressive	19 (1.3)	40 (1.6)	59 (1.5)
Contemplatory	2 (0.15)	8 (0.3)	10 (0.3)
Preparatory	2 (0.15)	19 (0.8)	21 (0.5)
Total	1433 (37.1)	2433 (62.9)	3866 (100)

future. As shown in this table, in the bivariate analysis, living with parents, general risk-taking behaviors, peer smoking norm, number of smoker friends, farther norm, mother norm, brother norm, sister norm, friend norm, self-esteem score, attitude toward cigarette smoking score, and positive thinking about smoking score have significant association with intention to start smoking in the future.

In the multi-variables analysis of associated factors with intention to start smoking in the future, all significant variables at level of 0.2 in univariate analyzes were entered into logistic regression model. The results of this analysis indicate that having general risk-taking behavior (OR = 2.90; 95% CI: 1.21-6.97), smoker in the family (OR = 2.60; 95% CI: 1.20-5.61), and positive attitude towards cigarette smoking (OR = 1.30; 95% CI: 1.18-1.43) have statistically significant association with intention to start smoking in the future.

DISCUSSION

The results of present study showed that 95.0% of never smoked students were in committer stage and only 5.0% of them had no firm decision to not start smoking in the future. Similarly, Hong *et al.* found that 90.9% of non-smoker high school students were placed in the without smoking intention group.^[17] In another study, 55% of non-smoker (ages of 12-18 years) had low intention to smoke.^[11] The results of Kremers *et al.* study in a large sample with mean age of 13.3 years showed that 34.9% of never smoked subjects were in committer stage.^[8] The observed differences can be due to differences of definition and measurement tool and age of study samples.

Previous studies have showed that risk-taking behavior is not only associated with smoking stages,^[14,18] but is also linked with the transition

from lower to higher smoking stages.^[19] The results of our study showed that having general risk-taking behavior (enjoying of doing things that are a little dangerous or risky) related to intention to smoking. Therefore, the risk of intention to smoking increase 2.9 times in students who have general risk-taking behavior than the students who do not have general risk-taking behavior.

The results of Heydari *et al.*, study in Tehran showed that having a brother or sister who smokes and having more than 1 family member who smokes were significant risk factors for daily smoking in high school students.^[20] Also a number of studies report that living in a family with cigarette smoker member(s) in the family inked with higher rates of adolescent initiation and transition to regular smoking.^[18,21-24] The results of present study suggested that presence of smoker member(s) in the family has impact on intention to smoke, and increased its risk to 2.6 times. This may be attributed to a number of reasons, such as adolescent’s modeling of the parent and older sibling behavior, beliefs, expectations, and attitudes.

Not surprisingly and similar with several other studies,^[3,18,19,25,26] the results of our study showed that having a positive attitude toward cigarette smoking was related to intention to smoking (OR = 1.30). Believing that smoking has benefits, such as enhancing popularity and improving mood, can increase the likelihood of intention to smoking and taking up it.

Limitation in causality due to the cross-sectional nature of the research and limitation in generalizability of the results due to the study itself being limited to 10th grade students of Tabriz city are limitations of present study. Also, the study relied on self-reported data. Although we went to great lengths to ensure confidentiality and anonymity, we had no way of assessing correct answers.

CONCLUSION

Majority of non-smokers had firm decision to not start smoking in the future. Considering that intention to smoking is important predictor for smoking uptake in adolescents, reducing intention to start smoking with considering it’s associated factors such as having general risk-taking behavior,

Table 3: Demographic and other characteristics of the never smoked adolescents with regard to intention to start smoking in the future

Characteristics	Committer**n (%)	Others**n (%)	Overall***n (%)	P value
Gender				
Boys	1353 (94.4)	80 (5.6)	1433 (37.1)	0.24
Girls	2318 (95.3)	115 (4.7)	2433 (62.9)	
Total	3671 (95.0)	195 (5.0)	3866 (100)	
Age				
14 and 15 years	1673 (94.5)	97 (5.5)	1770 (46.1)	0.69
16 years	1688 (95.2)	85 (4.8)	1773 (46.2)	
17 years	225 (95.3)	11 (4.7)	236 (6.1)	
18 and 19 years	61 (96.8)	2 (3.2)	63 (1.6)	
Socio-economic status				
Very low	668 (96.1)	27 (3.9)	695 (19.4)	0.08
Low	681 (96.2)	27 (3.8)	708 (19.8)	
Middle	691 (94.4)	41 (5.6)	732 (20.5)	
High	687 (94.8)	38 (5.2)	725 (20.3)	
Very high	667 (93.4)	47 (6.6)	714 (20.0)	
Living with parents				
Yes	3482 (94.8)	191 (5.2)	3673 (95.4)	0.04
No	176 (98.3)	3 (1.7)	179 (4.6)	
General risk-taking behaviors				
No	1746 (98.2)	32 (1.8)	1778 (46.2)	<0.001
Yes	1911 (92.3)	159 (7.7)	2070 (53.8)	
Peer smoking norm				
Not high	2485 (95.7)	113 (4.3)	2598 (67.7)	0.003
High and very high	1159 (93.4)	82 (6.6)	1241 (32.3)	
Smoker in the family				
No	2306 (95.3)	113 (4.7)	2419 (63.4)	0.13
Yes	1316 (94.2)	81 (5.8)	1397 (36.6)	
Number of smoker friend				
0	3285 (95.7)	147 (4.3)	3432 (88.8)	<0.001
≥1	386 (88.9)	48 (11.1)	434 (11.2)	
Father norm				
Mild reaction	103 (85.8)	17 (14.2)	120 (3.2)	<0.001
Severe reaction	3465 (95.2)	176 (4.8)	3641 (96.8)	
Mother norm				
Mild reaction	98 (83.8)	19 (16.2)	117 (3.1)	<0.001
Severe reaction	3537 (95.3)	176 (4.7)	3713 (96.9)	
Brother norm				
Mild reaction	157 (90.8)	16 (9.2)	173 (10.2)	0.001
Severe reaction	1467 (96.3)	57 (3.7)	1524 (89.8)	
Sister norm				
Mild reaction	176 (88.4)	23 (11.6)	199 (11.2)	<0.001
Severe reaction	1521 (96.3)	58 (3.7)	1579 (88.8)	
Friend norm				
Mild reaction	1179 (91.5)	110 (8.5)	1289 (33.4)	<0.001
Severe reaction	2486 (96.7)	84 (3.3)	2570 (66.6)	
Substance abuse				
No	3635 (95.0)	190 (5.0)	3825 (99.6)	0.19
Yes	14 (87.5)	2 (12.5)	16 (0.4)	

Contd...

Table 3: Contd...

Characteristics	Committer**n (%)	Others**n (%)	Overall***n (%)	P value
Self-esteem	17.36±4.65	19.84±4.87	17.82±4.79	<0.001
Attitude toward cigarette smoking	-11.11±1.85	-7.54±4.03	-10.17±3.24	<0.001
Positive thinking about smoking	8.09±3.28	11.17±4.01	8.89±3.80	<0.001
Previous year average grades	16.82±2.14	16.72±2.24	16.56±2.23	0.525

* Students who had never smoked and were sure never start smoking; ** Including immotive, progressive, contemplator, and preparatory (students who had never smoked and do not have planning to start smoking or want to start smoking in the future); *** Total of subjects with no regard of intention to smoking status

presence of smoker in the family, and attitude toward smoking related to intention to smoking can be an important outcome of interventions to reduce smoking in this group.

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REFERENCES

1. Agha Molaei T, Zare S. Cigarette and hookah using pattern in over-15 population of Bandar Abbas, a population based study. *Med J Hormozgan Univ* 2008;11:241-6.
2. Novotny TE. Tobacco use. In: Brownson RC, Davis JR, editors. *Chronic Disease Epidemiology and Control*. Baltimore: American Public Health Association; 1993. p. 199-220.
3. Sargent JD, DiFranza JR. Tobacco control for clinicians who treat adolescents. *CA Cancer J Clin* 2003;53:102-23.
4. Fidler JA, Wardle J, Brodersen NH, Jarvis MJ, West R. Vulnerability to smoking after trying a single cigarette can lie dormant for three years or more. *Tob Control* 2006;15:205-9.
5. Flay BR. Youth tobacco use: Risk patterns and control. In: Slade J, Orleans CT, editors. *Nicotine Addiction: Principles and Management*. New York: Oxford University Press; 1993. p. 653-61.
6. Mayhew KP, Flay BR, Mott JA. Stages in the development of adolescent smoking. *Drug Alcohol Depend* 2000;59:S61-81.
7. Kremers SP, Mudde AN, de Vries H. Subtypes within the precontemplation stage of adolescent smoking acquisition. *Addict Behav* 2001;26:237-51.
8. Kremers SP, de Vries H, Mudde AN, Candel M. Motivational stages of adolescent smoking initiation: Predictive validity and predictors of transitions. *Addict Behav* 2004;29:781-9.
9. Conrad KM, Flay BR, Hill D. Why children start smoking cigarettes: Predictors of onset. *Br J Addict* 1992;87:1711-24.
10. Eckhardt L, Woodruff SI, Elder JP. A longitudinal analysis of adolescent smoking and its correlates. *J Sch Health* 1994;64:67-72.
11. Tyc VL, Hadley W, Allen D, Varnell S, Ey S, Rai SN, *et al.* Predictors of smoking intentions and smoking status among nonsmoking and smoking adolescents. *Addict Behav* 2004;29:1143-7.
12. Wakefield M, Kloska DD, O'Malley PM, Johnston LD, Chaloupka F, Pierce J, *et al.* The role of smoking intentions in predicting future smoking among youth: Findings from Monitoring the Future data. *Addiction* 2004;99:914-22.
13. Mohammadpoorasl A, Nedjat S, Kamran Yazdani K, Fakhari A, Rahimi Foroushani A, Fotouhi A. An algorithm of smoking stages assessment in adolescents: A validation study using the latent class analysis model. *Int J Prev Med* 2012 [In press].
14. Kaplan CP, Napoles-Springer A, Stewart SL, Perez-Stable EJ. Smoking acquisition among adolescents and young Latinas: The role of socioenvironmental and personal factors. *Addict Behav* 2001;26:531-50.
15. Rosenberg M. *Society and the Adolescent Self-Image*. Princeton, NJ: Princeton University Press; 1965.
16. Hill AJ, Boudreau F, Amyot E, Dery D, Godin G. Predicting the stages of smoking acquisition according to the theory of planned behavior. *J Adolesc Health* 1997;21:107-15.
17. Hong JY, Lee MS, Na BJ, Kim KY. Related factors for the initiation of smoking in high school students based on the transtheoretical model. *J Prev Med Public Health* 2006;39:67-73.
18. Alireza Ayatollahi S, Mohammadpoorasl A, Rajaeifard A. Predicting the stages of smoking acquisition in the male students of Shiraz's high schools, 2003. *Nicotine Tob Res* 2005;7:845-51.

19. Mohammadpoorasl A, Fakhari A, Shamsipour M, Rostami F, Rashidian H. Transitions between the stages of smoking in Iranian adolescents. *Prev Med* 2011;52:136-8.
20. Armitage CJ, Arden MA. How useful are the stages of change for targeting interventions? Randomized test of a brief intervention to reduce smoking. *Health Psychol* 2008;27:789-98.
21. Komro KA, McCarty MC, Forster JL, Blaine TM, Chen V. Parental, family, and home characteristics associated with cigarette smoking among adolescents. *Am J Health Promot* 2003;17:291-9.
22. Simons-Morton B, Chen R, Abrams L, Haynie DL. Latent growth curve analyses of peer and parent influences on smoking progression among early adolescents. *Health Psychol* 2004;23:612-21.
23. Kalesan B, Stine J, Alberg AJ. The joint influence of parental modeling and positive parental concern on cigarette smoking in middle and high school students. *J Sch Health* 2006;76:402-7; quiz 38-9.
24. Bricker JB, Peterson AV, Robyn Andersen M, Leroux BG, Bharat Rajan K, Sarason IG. Close friends', parents', and older siblings' smoking: Reevaluating their influence on children's smoking. *Nicotine Tob Res* 2006;8:217-26.
25. Andrews JA, Duncan SC. The effect of attitude on the development of adolescent cigarette use. *J Subst Abuse* 1998;10:1-7.
26. Tyas SL, Pederson LL. Psychosocial factors related to adolescent smoking: A critical review of the literature. *Tob Control* 1998;7:409-20.

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