

Perceived factors related to cigarette and waterpipe (ghelyan) initiation and maintenance in university students of Iran

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Abstract

Objectives To investigate the perceived factors leading to cigarette and waterpipe (ghelyan) smoking initiation and maintenance in Iranian university students.

Method A cross-sectional study was conducted on 233 students aged 20–25 enrolled in Isfahan University and Kashan University in 2007. Demographic factors as well as cigarette and ghelyan status, and perceived factors related to cigarette or ghelyan smoking initiation and maintenance were recorded. Principal component analysis was carried out to cluster perceived smoking initiation and maintenance factors.

Result In a multiple logistic regression model, perceived psychological factors were more significant to cigarette smoking initiation and maintenance than ghelyan smoking among girls (odds ratio, OR = 1.90; $P < 0.04$) although perceived psychological factors (OR = 2.20; $P < 0.001$) and social factors (OR = 2.42; $P < 0.001$) were more significant in cigarette smoking initiation than ghelyan smoking initiation among boys (OR = 2.42; $P < 0.001$). Moreover, study appears that in boys, perceived entertainment factors could play more significant role in ghelyan smoking initiation compared with cigarette smoking initiation (OR = 0.42; $P < 0.001$).

Conclusion Whereas the factors related to smoking initiation and maintenance are different in both genders and in both tobacco products, identification of cigarette and ghelyan smoking may guide policy makers to develop comprehensive interventions.

Keywords Cigarette · Ghelyan · Smoking initiation factors · University student

Introduction

Worldwide every day, 80,000–100,000 adolescents become smokers at a very young age. The use of tobacco is considered as the single most important cause of preventable morbidity and early mortality especially if it was initiated during the youth period. Tobacco use causes at least 4.9 million deaths annually, and it is estimated to rise to about 10 million by 2030 (World Health Organization 2005).

Although cigarette smoking among adolescents has been known as an important public health problem since many years, ghelyan (Persian name of waterpipe) smoking has been considered as a new global public health warning (Chaouachi 2006). Ghelyan smoking is a traditional way of tobacco use that is common among adolescents in Middle Eastern countries, with evidence of enhanced prevalence in recent years (Maziak et al. 2004a). The introduction of Maassel as a new flavored and aromatic tobacco for ghelyan smoking, the propagation of satellite and electronic media in the twentieth century and the little information about health effects of ghelyan, may have facilitated the spread of this new hype (Rastam et al. 2004).

In several countries of Eastern Mediterranean Region, almost 10–18% of 13- to 15-year-olds prefer using other tobacco products to cigarettes, most likely ghelyan (Maziak

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et al. 2004b). A report from Lebanon showed that the prevalence rate of ghelyan and cigarette smoking among university students of Beirut was 7.6 and 21%, respectively (Tamim et al. 2003). In Iran, a survey of 4,361 adolescents living in Tehran indicated that 27% (boys 30.7, girls 20.6) had smoked ghelyan (Momenan et al. 2007). In addition, another study in Iran presented that cigarette smoker prevalence was 14% among high-school students (Keli-shadi et al. 2006). In the current decade, the increased trend of smoking in Iranian youth and adolescents is worrisome. Numerous studies argued that social pressure, peer pressure and dealing with stress are significant factors for smoking initiation and maintenance (Van Loon et al. 2005). In addition, personal resources such as peer and family support, self-esteem and mastery could play a significant role in smoking behaviour initiation (Koval et al. 2000). There is also relationship between socioeconomic status and smoking initiation (Fernandez et al. 2001). In regard to much evidence about factors leading to smoking, identifying the factors related to smoking initiation and maintenance is very important to determine differences between cigarette and ghelyan that may help to underpin strategies for decreasing smoking prevalence in both products. The purpose of the current study was to investigate the perceived factors leading to cigarette and ghelyan smoking initiation and maintenance in Iranian youth.

Method

A cross-sectional study was carried out on a population of all students aged 20–25 who entered Isfahan University and Kashan University in 2007. A total of 812 students were recruited by random selection on the basis of university ID number from a pool of all students enrolled in both universities. Isfahan University is the first largest university in Isfahan province and Kashan University is the second one. Both universities consist of various majors such as health related, science related, law science and humanities science. An interviewer-administered questionnaire was used for data collection anonymously. Initially, informed consent for this study was obtained from participants after complete explanation. Then during a 30-min interview, trained health professionals recorded sociodemographic characteristics, smoking behaviors and factors related to smoking initiation and maintenance. Ethical approvals were provided with ethical committee of the Isfahan University of medical sciences. The response rate of this study was 95%. The sample comprised 451 girls and 361 boys, but data for the analyses presented in this report included 63 females and 170 males who were smokers.

We asked about the age and gender of the participants to describe the sample characteristics. In

addition, participants were asked about the pocket money [$>1,000,000$ and $\geq 1,000,000$ rials (Iranian currency)]. Because 95% of them did not have any job and income, they received pocket money from their parents. Cigarette and ghelyan status were defined on the basis of the question ‘at present, do you smoke cigarette or ghelyan?’ (yes/no). If the answer was positive, then they were asked about the type of the product they used (only cigarette, only ghelyan or both). Then those who smoked both products were asked about the main product they smoked (cigarette/ghelyan). In the current study, nonsmokers were those who did not smoke at the time of investigation, cigarette smokers were those who smoked cigarette merely or mainly and ghelyan smokers were those who smoked ghelyan merely or mainly.

The father and friend smoking statuses were assessed by these questions ‘does your father smoke?’ (yes/no), ‘do you have any friend who smokes ghelyan?’ (yes/no) and ‘do you have any friend who smokes cigarette?’ (yes/no).

Factors related to cigarette or ghelyan smoking initiation and maintenance were identified on the basis of the question ‘why did you start or continue smoking?’ For answering to this question, participants explained main factors which led to smoking initiation and maintenance. Consequently, 11 items were provided among all answers that each participant expressed one or more than one of them. The perceived factors related to smoking initiation and maintenance included the following items: ‘I began or continued smoking to decline anxiety, to facilitate greater concentration, to decline depressed mood, to relieve stress, to improve self-efficacy, to achieve social acceptability, to be beloved, to become mature, to enjoy from tobacco odor, as hobby and fun, to feel pleasant sensation’.

Statistical analyses

Data were analyzed by SPSS (SPSS Inc., Chicago, IL, USA; V15). All statistical tests reported are two-sided, and $P < 0.05$ is considered to be statistically significant. Analysis was stratified by gender. Continuous variables are presented as mean (one standard deviation) while qualitative variables are presented as absolute and relative frequencies.

Various determinants were considered in the analyses including peer cigarette smoker, peer ghelyan smoker, having father who smokes cigarette or ghelyan and perceived factors related to smoking initiation and maintenance. Principal component analyses were performed on the basis of 11 perceived items to derive factors related to smoking initiation and maintenance. Principal component analysis is a mathematical method that uses linear relationships among variables to decrease the collected variables into a smaller amount of summary factors that

preserve as much of the variance in the original variables as possible. We use eigenvalues greater than 1.0 and the scree test to determine the number of factors to retain.

Finally, multivariate logistic regression model was carried out to examine the association between perceived factors related to smoking initiation and maintenance on the likelihood of being cigarette smoker compared to ghelyan smoker; odds ratios (ORs) are reported with the corresponding 95% confidence intervals (CIs). Independent variables included perceived factors related to smoking initiation and maintenance (perceived psychological, social and entertainment factors) were based on factor analysis, peer and father smoking and demographic characteristics (age and pocket money). Dependent variables were cigarettes and ghelyan smoking.

Results

Out of the total number of students ($n = 812$), 2.5% of girls and 18.3% of boys smoked cigarette while 11.5% of girls and 28.7% of boys smoked ghelyan. Data analyzed in this report included 63 girls (11 cigarette and 52 ghelyan smokers) and 170 boys (66 cigarette and 104 ghelyan smokers) in that which 150 were from Isfahan University and 83 were from Kashan University. The average ages of

cigarette smokers were 21.93 ± 1.09 years in girls and 22.05 ± 1.32 years in boys whereas among ghelyan smokers 22.12 ± 1.32 and 22.45 ± 1.26 years, respectively. About pocket money, 35% of students received more than 1,000,000 rials per month.

Table 1 presents a summary of the results obtained from the univariate model. Cigarette, when compared to ghelyan smoking initiation, was associated with greater likelihood of having friends who smoke cigarette and ghelyan respectively in both genders. Regardless of tobacco use method, father smoking had no significant role in smoking initiation and maintenance.

In addition, smoking to decline anxiety and to relieve stress was related more likely to cigarette in comparison with ghelyan smoking initiation or maintenance in both genders. Smoking to decline depressed mood and to improve self-efficacy was more significant in cigarette smokers than ghelyan smokers just among boys, and to facilitate greater concentration was more important in cigarette smoking initiation and maintenance than ghelyan smoking only among girls. Achieving social acceptability and becoming mature are more probable for cigarette smoking initiation than ghelyan smoking in boys. Furthermore, there is more significant relationship between hobby and fun, enjoying from tobacco odor and ghelyan smoking versus cigarette smoking in both sexes.

Table 1 Determinant of smoking initiation and maintaining—univariate logistic regression analysis

	Female			Male		
	Cigarette <i>n</i> (%)	Ghelyan <i>n</i> (%)	OR (95% CI)	Cigarette <i>n</i> (%)	Ghelyan <i>n</i> (%)	OR (95% CI)
Social context						
Friend cigarette smoker	8 (72.7)	12 (23.0)	9.26 (3.31, 25.92)	60 (90.9)	64 (61.5)	5.32 (2.35, 12.07)
Friend ghelyan smoker	5 (45.5)	37 (71.1)	0.33 (0.05, 0.79)	54 (81.8)	99 (95.2)	0.14 (0.04, 0.46)
Father smoker	5 (45.4)	23 (44.2)	1.16 (0.47, 2.85)	27 (40.9)	35 (33.6)	1.36 (0.77, 2.48)
Perceived factors related to smoking initiation and maintenance						
Perceived psychological factors						
Decline anxiety	3 (27.3)	2 (3.8)	10.25 (2.32, 45.29)	18 (27.2)	5 (4.8)	7.24 (2.59, 20.23)
Relief of stress	5 (45.5)	6 (11.5)	6.25 (2.14, 18.17)	24 (36.3)	23 (12.4)	4.02 (1.92, 8.42)
Decline depressed mood	1 (9.1)	1 (1.9)	1.10 (0.37, 8.12)	15 (22.7)	4 (3.8)	7.33 (2.27, 22.66)
Facilitating greater concentration	3 (27.3)	3 (5.7)	7.59 (1.92, 30.00)	7 (10.6)	5 (4.8)	2.53 (0.81, 7.88)
Self-efficacy improvement	1 (9.1)	3 (5.7)	1.30 (0.01, 13.15)	9 (13.6)	2 (1.9)	16.58 (2.09, 51.34)
Perceived social factors						
Achieving social acceptability	1 (9.1)	3 (5.7)	2.52 (0.55, 11.50)	27 (40.90)	20 (19.2)	2.98 (1.54, 5.77)
Becoming mature	1 (9.1)	3 (5.7)	2.02 (0.34, 11.84)	18 (27.28)	10 (9.6)	3.83 (1.70, 8.63)
Being beloved	1 (9.1)	4 (8.2)	1.75 (0.41, 7.44)	6 (9.1)	6 (5.7)	1.50 (0.51, 4.90)
Perceived entertainment factors						
Hobby and fun	5 (45.5)	42 (80.7)	0.20 (0.07, 0.56)	37 (56.1)	84 (80.7)	0.32 (0.16, 0.61)
Pleasant sensation	4 (36.4)	15 (28.8)	1.45 (0.54, 3.90)	21 (31.8)	31 (29.8)	1.14 (0.61, 2.15)
Enjoying from tobacco odor	3 (27.28)	31 (96.5)	0.37 (0.22, 0.90)	20 (30.3)	60 (57.7)	0.42 (0.25, 0.95)

Table 2 Results of factor analysis of perceived factors related to smoking initiation and maintenance (varimax rotation of principal component analysis)

Variable	Factor 1: psychological	Factor 2: social factors	Factor 3: entertainment
Decline anxiety	0.823	0.051	0.048
Relief of stress	0.776	0.078	0.026
Decline depressed mood	0.759	-0.041	-0.087
Facilitating greater concentration	0.707	0.014	0.111
Self-efficacy improvement	0.563	0.302	0.363
Achieving social acceptability	-0.007	0.843	-0.043
Becoming mature	0.053	0.837	0.096
Being beloved	0.156	0.524	0.274
Enjoying from tobacco odor	0.315	0.184	0.461
Hobby and fun	-0.328	-0.072	0.734
Pleasant sensation	0.401	0.118	0.630
Percentage variance explained	33.43	16.37	10.28
Cumulative variance	33.43	49.80	60.08

Three factors related to smoking initiation and maintenance were identified by principal component analysis (Table 2). Factor 1 was characterized by decline anxiety, relief of stress, decline depressed mood, facilitating greater concentration and self-efficacy improvement and thus it was labeled as perceived psychological factors and explained 33.43% of the variance. Factor 2 represented achieving social acceptability, becoming mature and being beloved and was labeled as perceived social factors. These factors explained 16.37% of the variance. Factor 3 showed enjoying from tobacco odor, hobby and fun and pleasant sensation which were labeled as perceived entertainment factors and explained 10.28% of the variance. The total variance explained by the analysis was 60.08%.

In a multiple logistic regression model, several perceived determinants of smoking initiation remained significant even after adjusting for the effect of having a friend who smokes cigarette, smokes ghelyan, father smoking, age and pocket money (Table 3). In both genders, having friend who smokes cigarette and having friend who smokes ghelyan are the most significant risk factors for cigarette (OR = 18.26, $P \leq 0.001$ in girls; OR = 16.01, $P \leq 0.001$ in boys) and ghelyan (OR = 0.05, $P < 0.001$ in girls; OR = 0.04; $P < 0.001$ in boys) smoking initiations, respectively.

Perceived psychological factors (OR = 1.90; $P < 0.04$) were more significant leading to cigarette versus ghelyan smoking initiation among girls although perceived psychological factors (OR = 2.20; $P < 0.001$) and social factors (OR = 2.42; $P < 0.001$) were more significant in cigarette smoking initiation than ghelyan smoking initiation among boys. Moreover, this study suggests that in boys, perceived entertainment factors could play more significant role in ghelyan smoking initiation compared with cigarette smoking initiation (OR = 0.42; $P < 0.001$).

Table 3 Determinant of smoking initiation and maintaining—multivariate logistic regression analysis (adjusted for age and pocket money)

	OR (95% CI)
Female	
Perceived psychological factors	1.90 (1.04, 3.46)
Perceived social factors	1.74 (0.67, 4.49)
Perceived entertainment factors	0.55 (0.17, 1.76)
Friend cigarette smoker	18.26 (4.26, 78.23)
Friend ghelyan smoker	0.05 (0.04, 0.74)
Father smoker	0.73 (0.17, 3.06)
Male	
Perceived psychological factors	2.20 (1.42, 3.42)
Perceived social factors	2.42 (1.39, 4.20)
Perceived entertainment factors	0.42 (0.25, 0.71)
Friend cigarette smoker	16.01 (4.07, 63.01)
Friend ghelyan smoker	0.04 (0.005, 0.26)
Father smoker	1.43 (0.63, 3.24)

Discussion

In this study, perceived factors related to smoking initiation and maintenance were categorized in three groups as perceived psychological factors, social factors and entertainment factors. Finally, our finding presented that perceived psychological factors were more significant in cigarette smoking initiation and maintenance than ghelyan smoking initiation and maintenance in both genders; whereas perceived social factors were associated more significantly with cigarette smoking than ghelyan smoking only in boys. Perceived entertainment factors had more important role in ghelyan when compared to cigarette smoking initiation among boys. In addition, cigarette

smoking initiation was significantly associated with having friend who smokes cigarette, also having a friend who smokes ghelyan was significant in ghelyan smoking initiation in both genders.

A review article in 2003 pointed that in some studies, peer pressure compared with family has more effect on smoking initiation, but others suggest that the role of parents is greater (Kobus 2003). Peers are considered as friends, best friends, opposite or same sex friend and classmates in various studies. Regardless of the meaning used, peer smoking can play a significant role in smoking initiation and maintenance (Botvin et al. 1992). In this study, we found that ghelyan smokers have more friends who smoke ghelyan and cigarette smokers have more friends who smoke cigarette in both genders, and father smoking did not have a significant role in smoking initiation. We believed that in Iran, as a developing country, extensive and rapid social changes have occurred in recent decades thereby youth and adolescents become different from their parents and subsequently peers could affect each other more.

The association between psychological problem and tobacco smoking initiation among youth and adolescents has been presented in numerous studies (Chassin et al. 2005) as the relationship between cigarette smoking and symptoms of stress and depression are documented (Koval et al. 2000). In both youth and adolescents, tobacco use has been positively related to stressful situations (He et al. 2004). One qualitative study recognized that students smoke to facilitate concentration (Nichter et al. 2007). The results of our study shows that perceived psychological problems are associated more likely with cigarette smoking versus ghelyan smoking in both genders. Authors believed that in Iranian community cigarette smoking served as an idiom of distress and individuals smoke cigarette for stress management. In this society, smoking cigarette was considered as a Western behaviour to improve affairs and to relax. A substantial point about female smoking is that although cigarette smoking is a denouncing behaviour for females in society and cigarette smoker prevalence is low in this group but psychological problems are so deep that enforce them to initiate smoking.

Ghelyan smoking indicated social occasion in which everyone can participate and provide a pleasant sense. The Arab–American adolescent study presented that ghelyan smoking is an enjoyable familial leisure and their parents approved it (Rice et al. 2003). Our finding demonstrated that entertainment, leisure and enjoyment are the factors that have been associated more likely with ghelyan smoking initiation in males. However, cultural view for ghelyan smoking in female leads to more prevalence in this group but perceived entertainment factors were not different in both tobacco products. It seems that the social restriction for tobacco use in females lead to this result.

Social factors of cigarette smoking initiation are different from ghelyan smoking. A qualitative study showed that in males, cigarette smoking compared with ghelyan smoking is more appropriate for social acceptability among their friends (Hammal et al. 2008). In addition, boys considered cigarette smoking as a symbol of being a real man. Different studies showed that youths and adolescents especially boys consider cigarette smoking as means of transition from childhood to adolescence period and to achieve social acceptability (Corbett 2001). Global Youth Tobacco Survey presented the social factors influencing cigarette smoking in 25 European countries (Baska et al. 2009). In the current study, achieving social acceptability and becoming mature were associated with greater likelihood of cigarette smoking initiation and maintenance in boys. But lower smoking prevalence in girls and perceived social norms about girls smoking indicated that they seldom smoke to achieve social acceptability and to be beloved.

This study has some limitations. The results of this study are relational and not causal; therefore, it cannot be concluded from this study whether perceived initiation factors are causes or results of university students smoking. Also, this study relied exclusively on questionnaires to assess perceived initiation factors and smoking which need to be investigated further. The sample was restricted to students in Isfahan University and Kashan University and this limits our results to be generalized, too.

The result of this study showed that factors related to smoking initiation and maintenance are significantly different in ghelyan and cigarette smoker. In boys, cigarette smoking initiation and maintenance was associated more likely with perceived psychological factors and perceived social factors while perceived entertainment factors were stronger for ghelyan smoking. In girls, perceived psychological factors were more important for cigarette smoking initiation and maintenance compared with ghelyan smoking and perceived social factors and perceived entertainment factors were significant neither for cigarette smoking nor for ghelyan smoking in this group. Since identification of cigarette and ghelyan smoking in both genders may guide policy makers to develop comprehensive interventions, further investigations are necessary to understand other factors that may increase the cigarette and ghelyan smoking prevalence. Also various programs may be planned on the basis of tobacco products and gender in region where both tobacco products are available.

References

- Baska T, Warren CW, Baskova M, Jones NR (2009) Prevalence of youth cigarette smoking and selected social factors in 25

- European countries: findings from the Global Youth Tobacco Survey. *Int J Public Health*. doi:10.1007/s00038-009-0051-9
- Botvin GJ, Baker E, Goldberg CJ, Dusenbury L, Botvin EM (1992) Correlates and predictors of smoking among black adolescents. *Addict Behav* 17:97–103
- Chaouachi K (2006) A critique of the WHO report TobReg's "Advisory Note" entitled: "waterpipe tobacco smoking: health effects, research needs and recommended actions by regulators". *J Negat Results Biomed* 5:17. doi:10.1186/1477-5751-5-17
- Chassin L, Presson CC, Sherman SJ (2005) Adolescent cigarette smoking: a commentary and issues for pediatric psychology. *J Pediatr Psychol* 30:299–303
- Corbett KK (2001) Susceptibility of youth to tobacco: a social ecological framework for prevention. *Respir Physiol* 128:103–118
- Fernandez E, Garcia M, Schiaffino A, Borrás JM, Nebot M, Segura A (2001) Smoking initiation and cessation by gender and educational level in Catalonia, Spain. *Prev Med* 32:218–223
- Hammal F, Mock J, Ward KD, Eissenberg T, Maziak W (2008) A pleasure among friends: how narghile (waterpipe) smoking differs from cigarette smoking in Syria. *Tob Control* 17:e3
- He K, Kramer E, Houser RF, Chomitz VR, Hacker KA (2004) Defining and understanding healthy lifestyles choices for adolescents. *J Adolesc Health* 35:26–33
- Kelishadi R, Ardalan G, Gheiratmand R, Majdzadeh R, Delavari A, Heshmat R et al (2006) Smoking behavior and its influencing factors in a national-representative sample of Iranian adolescents: CASPIAN study. *Prev Med* 42:423–426
- Kobus K (2003) Peers and adolescent smoking. *Addiction* 98:37–55
- Koval JJ, Pederson LL, Mills CA, McGrady GA, Carvajal SC (2000) Models of the relationship of stress, depression, and other psychosocial factors to smoking behavior: a comparison of a cohort of students in grades 6 and 8. *Prev Med* 30:463–477
- Maziak W, Rastam S, Eissenberg T, Asfar T, Hammal F, Bachir ME et al (2004a) Gender and smoking status-based analysis of views regarding waterpipe and cigarette smoking in Aleppo, Syria. *Prev Med* 38:479–484
- Maziak W, Ward KD, Afifi Soweid RA, Eissenberg T (2004b) Tobacco smoking using a waterpipe: a re-emerging strain in a global epidemic. *Tob Control* 13:327–333
- Momenan AA, Sarbandizaboli F, Etemadi A, Azizi F (2007) Pattern of waterpipe (ghelyan) use among intermediate and high school students: a cross-sectional study in Tehran, Iran. *Payesh* 6:135–144
- Nichter M, Nichter M, Carkoglu A, Network TobaccoEtiologyResearch (2007) Reconsidering stress and smoking: a qualitative study among college students. *Tob Control* 16:211–214
- Rastam S, Ward KD, Eissenberg T, Maziak W (2004) Estimating the beginning of the waterpipe epidemic in Syria. *BMC Public Health* 4:32
- Rice VH, Templin T, Kulwicksi A (2003) Arab-American adolescent tobacco use: four pilot studies. *Prev Med* 37:492–498
- Tamim H, Terro A, Kassem H, Ghazi A, Khamis TA, Hay MM et al (2003) Tobacco use by university students, Lebanon, 2001. *Addiction* 98:933–939
- Van Loon AJ, Tjihuis M, Surtees PG, Ormel J (2005) Determinants of smoking status: cross-sectional data on smoking initiation and cessation. *Eur J Public Health* 15:256–261
- World Health Organization (2005) Tobacco free initiative: why is tobacco a public health priority? Geneva, Switzerland. World Health Organization. Available at <http://www.who.int/tobacco/healthpriority/en/index.html>. Accessed 19 July 2005