Predictors of Smoking Cessation and Duration: Implication for Smoking Prevention

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Original Article

ABSTRACT

Background: There are few articles studding the factors associated with successful smoking cessation in Iranian smokers. The aim of this study is to clarify the association between socio-demographic factors and smoking behavior, such as number of failed smoking cessation and duration of abstinence in Iranian population.

Methods: A self-administered questionnaire survey of 673 participants was conducted in a local government health-care center. The questionnaire included items on socio-demographic information including, age, marital status, education, income, and job. Furthermore, information on smoking cigarettes including number of smoking per day, duration of smoking, cigarettes brand, nicotine concentration, and history of cessation was obtained.

Results: Mean ± SD of age and daily cigarette consumption were 39.7 ± 1.1 and 22.1 ± 1.1 respectively. Failure rate of smoking cessation was higher in the lower age group (odds ratios [OR] 2.9; 95% confidence intervals [CI] 1.1, 7.7) and less than 10 numbers smoking per day (OR 2.4; 95% CI 1.3, 4.5) and duration of smoking more than 30 years (OR 3.4; 95% CI 1.2, 9.3) and foreign cigarette brand (OR 1.8; 95% CI 1.1, 2.7). Length time of cessation was prominent in participants with lower age group (OR 5.4; 95% CI 1.3, 22.1), and less than 10 numbers smoking per day (OR 2.7; 95% CI 1.5, 4.9) and lower in smokers with duration of smoking more than 10 and 10-19 years (OR 0.32; 95% CI 0.12, 0.89), (OR 0.34; 95% CI 0.17, 0.76), respectively.

Conclusions: The above results suggest that there are a significant association between socio-demographic factors and smoking-related behaviors in the Iranian population, consistent with previous reports world-wide. These factors should be considered to have appropriate public-health and policy response.

Keywords: Cessation, cigarette smoking, smoking duration, socio-demographic

INTRODUCTION

Despite the preventive measures that have been implemented by various governments resulting in a reduction of cigarette smoking, tobacco smoking is still a major cause of both fatal

and non-fatal diseases.[1,2] The smoking epidemic is rapidly shifting to the developing countries with steady increases in cigarette consumption especially, among men reaching prevalence rates about 50%, even though a smaller proportion of women (9%) smoke world-wide.[3,4] WHO reported in 2009 that age-standardized estimated prevalence of smoking among Iranians aged 15 years or more according to sex, is 21% in males and <1% in females.[5]

Smoking cessation is an important health priority world-wide and for individual smokers, who otherwise suffer a 50% chance of dying prematurely due to smoking.[6] The cost per life-year-saved for smoking cessation is estimated to be between $2000 and $4000; it is the most cost-effective preventive intervention available to clinicians.[7-9] To aid smokers to quit successfully, effective smoking cessation interventions are essential.

Addressing the socio-economic status gap in smoking will be critical for achieving further reductions in smoking at the population level;[10,11] towards this end, it is important to understand the development of socio-economic inequalities in smoking behavior and the ability to quit smoking. According to findings of relevant studies conducted in Western countries, there are some socio-demographic and smoking-related factors, which can impress as good predictors of successful quitting.[12,13] For more successful cessation, it seems critical to understand the association between socio-economic status and cessation success in different countries.

To our knowledge, this is one of the first studies describing the socio-demographic characteristics and smoking behavior in Iran. The aim of this study is to clarify the association between socio-demographic factors and smoking behavior, such as number of smoking cigarette per day, number of failed smoking cessation and duration of abstinence. One of the most widely researched questions for smoking cessation is determining what pre-intervention variables will predict outcome. Knowledge of these variables can be used as a basis for tailoring intervention materials.

METHODS

Study design and sample

This cross-sectional study was performed from 2009 to 2011. Health Center number two in Isfahan, Iran carried out scientific and technical coordination of the study. A sample of 673 people was selected and the selection was based on the data obtained from people who referred to the Health Center for smoking cessation.

We conducted a quantitative research study with descriptive and analytical aims. Inclusion criteria were only cigarette smoking persons referred to cessation center. Exclusion criteria were all of smokers who were treated with methadone or psychiatric treatment or addiction history to other addictive drugs. Participants were informed about the aims of the study and provided consent. We adopted measures to safeguard privacy. An expert practitioner performed the interview.

Study variables

We asked patients to fill the questionnaire. The questionnaire consisted of individual questionnaire about socio-demographic information including age, marital status, education, income, and job. Educational level was categorized as: Illiterate, primary, undergraduate, and graduate; primary including, all sessions before high school that undergo high school even without reception of diploma, undergraduate including person who pass the high school and continue their education in undergraduate position but not in a university and graduate including people who passed the entrance exam of university or graduated from university. Income was categorized in three groups: Lower than 2000,000 (as low), between 2000,000 and 10,000,000 (as medium) and more than 10,000.000 Rials (as high)/month. Rial is the public currency of Iran. One American dollar equals 27,000 Iranian Rials. We distinguished several groups for job: Employee means people who work in office and other like this, unemployed person does not have a job and self-employee means persons who have themselves jobs and worker, which mean persons who work in industrial and so on. Information on smoking cigarettes including, the number of smoking per day, duration of smoking, cigarettes brand, nicotine concentration, and history of cessation was obtained. Then, we allowed taking a vast range of data on consumption and related issues like past medical history (heart, lung, gastrointestinal, cancer, mood, food, stress, enjoy, entertainment), which filled by the patients' answers (only yes/no).

Statistical analysis

Data were analyzed using SPSS v. 18 to demonstrate the initial results, univariate odds ratios (ORs) with 95% confidence intervals (CIs) were conducted for demographic variables andrisk-factors of smoking cessation. A multiple logistic regression and multiple order logistic regression analysiswere executed to detect smoking cessation and length time of cessation based on the ORs with 95% CIs.

RESULTS

Our study revealed that 99.2%of participant was men and only 0.8% was women. Mean ± SD of age and age of starting smoking in smokers were 39.7 ± 1.1 and 18.6 ± 5.5, respectively. Mean ± SD daily cigarette consumption was 22.1 ± 1.1. Table 1 demonstrates differences in socio-demographic characteristics based on number of failed smoking cessation. Initial analysis revealed that there were statistically significant relationship between marital status and failure rate of smoking cessation. Failure rate of smoking cessation was higher in participants with lower mean number of cigarettes smoked per day, foreign brand cigarette, and higher nicotine concentration in pack.

According to the Table 2, length of cessation more than 6 month was associated with higher cigarettes consumption per day. A trend towards more than 30 cigarettes using per day and Iranian brand cigarette was found with length of cessation status.

Table 3 presents effect of socio-demographic on failed cessation status and length time of cessation (month) in the smoking participants.

Table 1: Summary results of the crud relationship between failed cessation status and demographic and some other characteristics in the smoking participants

Characteristics	Failed cessation status		*P* value
	No (%)	Yes (%)	
Age			
<25	16 (4.2)	26 (9)	0.087
25-34	106 (27.5)	90 (31)	
35-44	129 (33.5)	88 (30.3)	
45-54	94 (24.4)	58 (20)	
55≤	40 (10.4)	28 (9.7)	
Marital status			
Single	60 (15.6)	65 (22.5)	0.022
Married	325 (84.4)	224 (77.5)	
Education status			
Illiterate	202 (52.9)	151 (52.1)	0.556
Primary	122 (31.9)	84 (29)	
Under graduate	22 (5.8)	23 (7.9)	
Graduate	36 (9.4)	32 (11)	
Income			
Low	47 (12.8)	45 (16.5)	0.304
Medium	271 (73.6)	198 (72.5)	
High	50 (13.6)	30 (11)	
Job			
Employee	116 (31.2)	79 (28.2)	0.799
Unemployed	195 (52.4)	149 (53.2)	
Self-employed	30 (8.1)	27 (9.6)	
Worker	31 (8.3)	25 (8.9)	
Number of smoking per day			
<10	46 (11.9)	58 (20.1)	0.014
10-19	42 (10.9)	34 (11.8)	
20-29	190 (49.4)	136 (47.2)	
≥30	107 (27.8)	60 (20.8)	
Duration of smoking (year)			
<10	43 (11.2)	37 (12.8)	0.934
10-19	136 (35.3)	100 (34.5)	
20-29	118 (30.6)	89 (30.7)	
≥30	88 (22.9)	64 (22.1)	
Cigarette brand			
Iranian	192 (50.0)	116 (40.1)	0.011
Foreign	192 (50.0)	173 (59.9)	
Nicotine concentration mg/pack			
<0.5	133 (38.3)	133 (48.4)	0.008
0.5-0.8	176 (50.7)	15 (5.5)	
>0.8	38 (11.0)	127 (46.2)	
Past medical history (yes)			
Heart	75 (19.5)	55 (19)	0.884
Lung	239 (62.1)	186 (64.1)	0.583
Gastrointestinal	52 (13.5)	39 (13.6)	0.961
Cancer	50 (13.1)	39 (13.6)	0.830
Other problems (yes)			
Sleep	157 (40.8)	117 (40.3)	0.909
Mood	265 (69.2)	209 (72.6)	0.341
Food	74 (19.2)	51 (17.6)	0.588
Stress	289 (75.1)	226 (77.9)	0.386
Enjoy	133 (34.5)	106 (36.7)	0.567
Entertainment	131 (34.0)	91 (31.5)	0.488

Table 2: Summary results of the crud relationship between length time of cessation (month) and demographic and some other characteristics in the smoking participants

Characteristics	Length time of cessation (month)			*P* value
	No *N* (%)	<6 *N* (%)	≥6 *N* (%)	
Age				
<25	23 (5.6)	11 (9.2)	5 (4.2)	0.559
25-34	114 (27.5)	41 (34.2)	36 (30.3)	
35-44	140 (33.8)	38 (31.7)	34 (28.6)	
45-54	97 (23.4)	16 (13.3)	31 (26.1)	
55≤	40 (9.7)	14 (11.7)	13 (10.9)	
Marital status				
Single	73 (17.6)	26 (21.8)	21 (17.6)	0.563
Married	341 (82.4)	93 (78.2)	98 (82.4)	
Education status				
Illiterate	213 (51.8)	67 (55.8)	63 (52.8)	0.914
Primary	132 (32.1)	34 (28.3)	30 (25.2)	
Under graduate	23 (5.6)	8 (6.7)	13 (10.9)	
Graduate	43 (10.5)	11 (9.2)	13 (10.9)	
Income				
Low	53 (13.4)	18 (15.8)	15 (13.5)	0.488
Medium	291 (73.5)	81 (71.1)	85 (76.6)	
High	52 (13.1)	15 (13.2)	11 (9.9)	
Job				
Employee	122 (30.3)	29 (25.2)	41 (36.6)	0.440
Unemployed	210 (52.1)	62 (53.9)	57 (50.4)	
Self-employed	35 (8.7)	11 (9.6)	10 (8.8)	
Worker	36 (8.9)	13 (11.3)	5 (4.4)	
Number of smoking per day				
<10	47 (11.4)	26 (22.0)	27 (22.7)	0.002
10-19	47 (11.4)	13 (11.0)	14 (11.8)	
20-29	206 (49.8)	50 (42.4)	55 (46.2)	
≥30	114 (27.5)	29 (24.6)	23 (19.3)	
Duration of smoking (year)				
<10	46 (11.1)	16 (13.3)	14 (11.8)	0.470
10-19	152 (36.7)	39 (32.5)	38 (31.9)	
20-29	127 (30.7)	40 (33.3)	35 (29.4)	
≥30	89 (21.5)	25 (20.8)	32 (26.9)	
Cigarette brand				
Iranian	199 (48.2)	49 (41.2)	49 (41.2)	0.224
Foreign	214 (51.8)	70 (58.8)	70 (58.8)	
Nicotine concentration mg/pack				
<0.5	153 (40.6)	43 (39.4)	59 (51.7)	0.209
0.5-0.8	37 (9.8)	10 (9.2)	6 (5.3)	
>0.8	187 (49.6)	56 (51.4)	49 (43)	
Past medical history (yes)				
Heart	78 (18.8)	24 (20.0)	25 (21.2)	0.840
Lung	262 (63.3)	75 (62.5)	74 (62.2)	0.970
Cancer	52 (12.7)	14 (11.8)	19 (16.2)	0.531
Other problems (yes)				
Sleep	162 (39.1)	52 (43.3)	49 (41.2)	0.693
Mood	284 (68.9)	85 (71.4)	87 (73.7)	0.576
Food	79 (19.1)	22 (18.3)	22 (18.5)	0.977
Stress	310 (74.9)	96 (80.0)	89 (74.8)	0.494
Enjoy	141 (34.1)	51 (42.5)	40 (33.9)	0.215
Entertainment	136 (32.9)	47 (39.2)	34 (28.8)	0.227

The OR (95% CI) of failed cessation status using logistic regression was as follows: In the 25-34 year age group 2.9 (1.1, 7.7) and less than10 numbers smoking per day 2.4 (1.3, 4.5) and duration of smoking more than 30 years 3.4 (1.2, 9.3) and foreign cigarette brand 1.8 (1.1, 2.7). The OR (95% CI) of length time of cessation using ordered logistic regression was as follows: In the 25-34 year age group 5.4 (1.3, 22.1), and less than 10 numbers smoking per day 2.7 (1.5, 4.9) and duration of smoking more than 10 and 10-19 years 0.32 (0.12, 0.89), 0.34 (0.17, 0.76) respectively.

DISCUSSION

There are not many publications in Iran, showing the relations between different socio-demographic features and the fact of nicotine abstinence maintenance. In our study, younger smoker and low number of smoking per day, higher years of smoking cigarettes, and foreign brand of cigarette were factors associated with short-term and increasing number of failing in smoking abstinence.

Several studies have found that the socio-demographic predictors of determination to quit in adult smokers were higher income, younger age, lower daily cigarette consumption, and being married.[14-16]

Some studies have found that a lesser number of cigarettes smoked are a main factor describing the likelihood of successful cessation.[17,18]

Our findings were not consistent with those studies; it seems that, there is more trend for greater success quit among those at younger ages but older smokers were more likely to stay abstinent.[19] Similar to our results, Anderson *et al.*[20] and Levy

Table 3: Effect of demographic and some other characteristics on failed cessation status and length time of cessation (month) in the smoking participants using logistic regression and order logistic regression

Characteristics	Failed cessation status logistic regression		Length time of cessation (month) order logistic regression	
	OR (95%CI)	*P* value	OR (95%CI)	*P* value
Age				
<25	3.2 (0.8, 12.6)	0.100	1.9 (0.47, 8.2)	0.343
25-34	2.9 (1.1, 7.7)	0.036	5.4 (1.3, 22.1)	0.021
35-44	1.8 (0.8, 4.3)	0.176	1.4 (0.37, 6.1)	0.593
45-54	1.2 (0.6, 2.5)	0.600	1.3 (0.64, 2.6)	0.475
≤55	1		1	
Marital status				
Single	1.4 (0.8, 2.4)	0.278	1.1 (0.56, 1.8)	0.973
Married	1		1	
Education status				
Illiterate	0.97 (0.51, 1.9)	0.934	1.1 (0.56, 2.1)	0.840
Primary	0.97 (0.51, 1.9)	0.934	0.98 (0.51, 1.9)	0.961
Under graduate	0.95 (0.39, 2.3)	0.912	1.1 (0.44, 2.4)	0.939
Graduate	1		1	
Income				
Low	1.7 (0.82, 3.6)	0.153	1.4 (0.66, 3.1)	0.397
Medium	1.6 (0.93, 2.9)	0.087	1.5 (0.84, 2.7)	0.168
High	1		1	
Number of smoking per day				
<10	2.4 (1.3, 4.5)	0.008	2.7 (1.5, 4.9)	0.001
10-19	1.8 (0.95, 3.6)	0.069	1.5 (0.76, 3.1)	0.243
20-29	1.5 (0.93, 2.4)	0.095	1.2 (0.75, 1.9)	0.447
≥30	1		1	
Duration of smoking (year)				
<10	1		0.32 (0.12,0.89)	0.031
10-19	1.5 (0.71, 3.1)	0.296	0.34 (0.17,0.76)	0.009
20-29	2.3 (0.96, 5.4)	0.061	0.58 (0.30, 1.12)	0.104
≥30	3.4 (1.2, 9.3)	0.019	1	
Cigarette brand				
Iranian	1		0.68 (0.44, 1.06)	0.087
Foreign	1.8 (1.1, 2.7)	0.011	1	
Nicotine concentration mg/pack				
<0.5	1		0.92 (0.59, 1.4)	0.737
0.5-0.8	1.1 (0.68, 1.6)	0.831	0.68 (0.30, 1.46)	0.319
>0.8	0.47 (0.21, 1.03)	0.059	1	
Past medical history (yes)				
Heart	0.91 (0.57, 1.5)	0.688	0.94 (0.59, 1.5)	0.789
Lung	1.1 (0.7, 1.5)	0.879	1.1 (0.73, 1.57)	0.746
Gastrointestinal	0.96 (0.56, 1.6)	0.870	1.2 (0.66, 1.99)	0.617
Cancer	0.89 (0.52, 1.5)	0.665	1.2 (0.68, 2.05)	0.541
Other problems (yes)				
Sleep	1.3 (0.85, 1.9)	0.246	0.75 (0.50, 1.12)	0.149
Mood	1.2 (0.77, 1.8)	0.453	0.97 (0.64, 1.48)	0.893
Food	0.81 (0.48, 1.3)	0.394	1.1 (0.66, 1.8)	0.734
Stress	1.2 (0.77, 1.9)	0.419	1.1 (0.68, 1.65)	0.796
Enjoy	1.5 (0.88, 2.7)	0.136	0.63 (0.33, 1.09)	0.100
Entertainment	0.71 (0.4, 1.3)	0.235	1.3 (0.74, 2.29)	0.360

CI=Confidence interval, OR=Odds ratio

et al.[19] also reported that likelihood of remaining abstinent was greater for older, and heavy daily smokers (25 or more cigarettes per day).

One explanation is smoking-related beliefs such as self-efficacy and perceived damage to health from smoking and was more likely to receive physician advice to quit smoking. It seems that in our elderly people is more concern about health problems.

Higher educated participants are less likely to be current smokers, since they are less likely to begin smoking and are more likely to be successful in smoking cessation.[21] However, in our study we did not observe any relationship between education with smoking cessation and cause of discrepancy is most of smoker in our population was low educated level in every group and we couldn't compare properly.

We explored a number of baseline psychosocial factors (mood, stress, sleep, enjoy, and entertainment) in this current evaluation of Iranian smokers and none of these factors was a significant predictor of cessation, although, they have been presented as an important predictors of cessation in other populations.[22,23] Possible explanations is, gathering data in our study was self-report and without scientific supervision.

Our result showed that the men attending smoking cessation clinic were far more than woman probably because of social, cultural, religious, or economic factors and Inequality in access to health services including smoking cessation programs, women tend to have lower rates of smoking, start smoking in older age, and consume fewer daily cigarettes (mostly in developing countries)[24] hence they lower suffer from diseases caused by smoking and lower need to quit smoking.

The highest prevalence of smoking was observed between 25 and 34 years and the mean age of initiation of smoking is 18.6 ± 5.5 and it is accordance with another study in Middle-East[25] hence a major force should be directed towards health education programs for teenagers and adolescents. Participants with duration of smoking of 10-29 years were more eager to quit smoking may be due to health related problems of smoking. It is clear that smoking cessation is a complex undertaking, which requires specific skills.[26] Providing smoking cessation advice to smokers is a major component of all efforts to control and limit smoking.[27]

The appropriate public-health and policy response depends on knowing the factors progressing to heavier smoking and subsequent health problems in smokers. The average number of cigarettes per day revealed from our study is 22.3, which are significantly higher than similar studies.[28,29] Results show that the number of cigarettes smoked per day increases with age to mid-life and then declines with advancing age. The result is consistent with Birth Cohort Analysis using NHIS.[29]

CONCLUSIONS

This study provides insight into factors associated with successful smoking cessation in Iranian smokers. A potential limitation of this data is the possible biases introduced by self-reporting. Second, because the number of adult female smokers enrolled in the study was small, the statistical power of the data on women was too low to investigate the present variables. Despite these limitations, these findings have clinical implications. Unlike developed countries, in many developing countries, smoking cessation counseling services are less frequently available or actively offered by health professionals. This problem needs consideration in developing countries like Iran.

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