



Original Article

Profile of Cigarette and Drug Use Status in Population of Tabari Cohort Study

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Abstract

Background: The study of the smoking and drug use profile of the Tabari cohort enrolment phase, the outcomes of which will be evaluated in the coming years, has proper comprehensiveness. Therefore, the present study aimed to determine the cigarette and drug use status in the population of the Tabari cohort study (TCS).

Methods: In this study, the profile of cigarette and drug use in the TCS was evaluated. Data analysis was performed in SPSS version 24 using percentage, mean, and standard deviation, chi-square, and independent *t* test.

Findings: The frequency of daily smoking in the entire population was 9.1%, and the frequencies in men and women were 21.5% and 0.6%, respectively ($P < 0.001$). The frequency of exposure to smoking in the home, at present or in the past, in the entire population was 30.5%, and in the populations living in urban and mountainous areas were 35.4% and 19.8%, respectively ($P < 0.001$). The mean age at first use of cigarettes in the entire population was 20.50 ± 7.61 , whereas the mean age of regular smoking was 23.19 ± 8.02 . Furthermore, the frequency of experiencing drug abuse in the total population was 6.1%, and the frequencies in men and women were 14.1% and 0.7%, respectively.

Conclusion: According to the results of this study, cigarette smoking and drug use are significant in men, and overall exposure of the Tabari cohort population to tobacco and drugs in the home is high. If effective prevention is not on the agenda, a significant proportion of the future outcomes in this population may be attributable to these risk factors.

Keywords: Cigarette; Drug use; Tabari cohort; PERSIAN cohort

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Introduction

On January 1964, Surgeon General's Advisory Committee on Smoking and Health released its first report on cigarette smoking health issues.¹ Almost one-third (33.3%) of the world population over 15 years old were tobacco users which declined to 24.9% in 2015, and it has been estimated to be 20.9% by 2025.² According to the report of the World Health Organization (WHO) in 2012, 12% of all deaths in adults over 30 years old was attributed to tobacco use.³ Cigarette smoking plays a significant role in serious diseases, directly or indirectly, including cardiovascular diseases⁴ and various cancers.⁵ Aside from the high burden of health-related issues of cigarette smoking, the economic cost (including health-related costs and productivity loss) of smoking has been estimated 1436 billion US\$ equivalent to 1.8% of the world's annual gross domestic product (GDP),⁶ which induces high economic burden to society and health system.⁷

In 2016, 14.2% of Iranian adult population were tobacco smokers.⁸ The average of 20.9 cigarettes are being consumed daily by each smoker in Iran, which leads to 53955 million cigarettes per a year,⁹ and subsequently, costs 1.46 billion US\$, attributed to smoking-related diseases, consists 0.26% of Iran's GDP in 2014.¹⁰ Iran has signed the WHO Tobacco control program in 2005 and reached its highest level of achievement in 2007, however, reports have shown downgrading of cessation programs and taxation on tobacco since 2016.¹¹

Studying factors related to cigarette smoking and drug abuse in sub-national level can help identifying contributing factors more precisely and designing control programs. Previous comprehensive reports on Iranian smoking status^{8,12} were made, however, new studies are needed along with growing population in Iran. Tabari Cohort Study (TCS) is an enriched platform for studying these factors in sub-national level and help identifying



gaps. The aim of this study was to study the profile of cigarette smoking and drug use status in the population of TCS.

Methods

This study included the data collected in a cohort based on the Tabari population in the enrolment phase. The Tabari cohort is a part of the national cohort entitled "Prospective Epidemiological Research Studies in Iran (PERSIAN).^{13,14} More details of the Tabari cohort have been pointed out in the profile of cohort study.¹⁵ In the enrolment phase of the Tabari cohort, 10 255 individuals (7012 people from urban areas and 3243 people from mountainous regions) from the 35-70-year-old citizens in the urban and mountainous regions of Sari (the capital city of Mazandaran, a region in the north of Iran) were entered into the study. The census sampling method was used in this study. The questionnaire used in this study was a standardized questionnaire, details and characteristics of which are described in the methodology articles and cohort profile.¹³⁻¹⁵

The measurement of some of the important variables that are presented in this study is mentioned below:

Anthropometric indices (e.g., height and weight) were measured by trained individuals in accordance with a standard protocol. In this regard, the SECA 226 (SECA, Hamburg, Germany) was applied to measure height (in meter) by asking the individuals to lean on the wall after taking out their shoes and putting feet together in a way that the head was straight and in line with body and the hands were next to the body. Moreover, the weight of the individuals was measured using the SECA 755 mechanical scale (SECA, Hamburg, Germany).¹⁶

The socioeconomic level is also divided into five classes, where levels one and five have the lowest and highest socioeconomic states, respectively. The variables assessed in the study included smoking at least 100 cigarettes during life time (yes/no), the mean age at the first-use of cigarettes, age of initiation of regular smoking, current smoking status, number of cigarettes smoked per day, being a passive smoker at home in the past and in the present (yes/no and duration of exposure if the answer is yes), exposure to cigarette smoke at work in the past or in the present (yes/no and duration of exposure if the answer is yes), and using drugs in the past or in the present (yes/no).

Data were analyzed using percentage, mean and standard deviation (to describe the data), chi-square (to compare the participants in terms of smoking and drug use based on the variables of gender, age group, marital status, level of education, socioeconomic level, and body mass index), and independent t-test (to compare the mean age of smokers and non-smokers) by SPSS version

24. Statistical significant level was considered at $P < 0.05$.

Results

Tabari cohort enrollment phase included 10 255 individuals (7012 people from urban areas and 3243 people from mountainous regions). Smoking prevalence in males was significantly higher than that in females (21.5% vs. 0.6%, $P < 0.001$). Smoking prevalence in urban and mountainous populations was estimated 9.1% and 8.9%, respectively ($P = 0.723$). Considering education level of participants, individuals with 6-8 years of schooling and above had significantly higher smoking prevalence than those with no or 1-5 years of schooling ($P < 0.001$). Smoking prevalence in married individuals was also significantly higher than that in divorced, single or widowed ones. However, there were no significant differences in smoking prevalence in different age groups and socioeconomic levels. The prevalence of smoking by residence place and other variables are also presented in Table 1.

The smoking profile of TCS is shown in Table 2. There were 926 (9.1%) daily smokers and 146 (1.4%) sometimes smokers in total population, which was significantly lower than 9180 (89.5%) non-smokers. The current or previous frequency of smoking in day or night was more than 20 in 620 (35.9%) individuals. The number of individuals who were exposed to smoking in home or workplace were significantly lower than non-exposed ones in home or workplace (30.5% vs. 69.5% & 35.7% vs. 7.8%, $P < 0.001$), and 3201 (31.2%) individuals experienced smoking in family during childhood. The initiation of the first smoking was significantly higher in 15-19- and 20-24-year-old age groups (38.7% and 26.7% $P < 0.001$, respectively). Similarly, the regular starting age of the first cigarette smoking was significantly higher in 15-19- and 20-24-year-old age groups, which were 28.5% and 35.0%, respectively. Current daily smoking was higher in urban population than mountainous population (9.1% vs. 8.9%, $P < 0.001$). Smoking in family during childhood was also higher in urban population (38.5% vs. 15.4%, $P < 0.001$). Number of individuals with starting age of regular smoking in 15-19- and 20-24-year-old age groups was higher in mountainous population than urban population (34.5% vs. 26.4% & 38.9% vs. 33.6%, $P < 0.001$; respectively). Mean age of starting regular smoking was higher in urban population than mountainous population (23.59 ± 8.11 vs. 22.14 ± 7.68 , $P < 0.001$).

Drug abuse was significantly higher among male participants than female ones (14.1% vs. 0.7%, $P < 0.001$). Individuals with 6-8 years education had significantly higher drug abuse rate (9.8%) than other groups. The prevalence of drug abuse was also higher among married individuals than single, widowed or divorced ones

Table 1. Prevalence of smoking by residence area and other variables

Variables		Total		Urban		Mountainous	
		No. (%)	P value	No. (%)	P value	No. (%)	P value
Gender	Male	893 (21.5)	<0.001	607 (20.6)	<0.001	286 (23.8)	<0.001
	Female	36 (0.6)		33 (0.8)		3 (0.1)	
Age group (y)	35-44	325 (9.8)	0.138	224 (8.9)	0.393	101 (12.2)	<0.001
	45-54	307 (9.1)		217 (8.7)		90 (10.1)	
	55-70	297 (8.4)		199 (9.9)		98 (6.4)	
Education level	No education	40 (2.6)	<0.001	8 (2.4)	<0.001	32 (2.7)	<0.001
	1-5 years in school	167 (7.2)		61 (5.0)		106 (9.6)	
	6-8 years in school	135 (12.0)		84 (10.1)		51 (17.6)	
	9-12 years in school	346 (11.9)		267 (11.1)		79 (16.4)	
	University/college	241 (10.2)		220 (10.0)		21 (12.7)	
Marital status	Single-widow-divorced	33 (4.0)	<0.001	27 (5.3)	0.002	6 (1.8)	<0.001
	Married	896 (9.5)		613 (9.4)		283 (9.7)	
Socioeconomic level	1 (The lowest)	167 (8.1)	0.195	33 (8.1)	0.209	134 (8.2)	0.544
	2	180 (8.8)		91 (7.9)		89 (9.9)	
	3	181 (8.8)		148 (8.8)		33 (8.8)	
	4	191 (9.3)		165 (9.1)		26 (10.7)	
	5 (The highest)	210 (10.2)		203 (10.3)		7 (9.2)	
BMI	<25	398 (16.1)	<0.001	216 (15.7)	<0.001	182 (16.6)	<0.001
	25-29	367 (8.5)		284 (9.2)		83 (6.6)	
	≥30	164 (4.8)		140 (5.5)		24 (2.7)	

Abbreviation: BMI, body mass index.

(6.4% vs. 2.8%, $P < 0.001$) and individuals with lower socioeconomic status (Table 3).

Discussion

In this study, Tabari Cohort platform has provided reliable information on smoking status and related factors in sub-national level. It was found that less than 10% of Tabari Cohort population was daily smokers. This study showed that more than one-fifth of the Tabari cohort male population are cigarette smokers. More than one-third of smokers were currently or previously smoked more than 20 times a day. Almost one-third of population were exposed to smoking in their homes and less than 10% in their workplace. Age of initiation of the first smoking was 15-19 years old in 38.7% and age of starting regular smoking was 20-24 years old in 35%. The mean age of the first smoking and regular smoking was significantly higher in urban population than mountainous population. Males had higher smoking and drug abuse prevalence than females in both populations. Individuals with higher socioeconomic levels had higher prevalence of smoking, however, it was not statistically significant. Conversely, individuals with lower socioeconomic levels had significantly higher prevalence of drug abuse.

Prevalence of current daily cigarette smoking in Mazandaran has been estimated 12.08% in 2005-2009.¹⁷ According to the results of this study, this number was

decreased to 9.1% in 2015-2017 in this province, which is lower than the national prevalence of current daily cigarette smoking (10.1%) in 2016.⁸ The number of male smokers was significantly higher than that of female smokers in the present study, which was the same in 2005-2009.¹⁷ However, the number of both male and female cigarette smokers were decreased. Lower number of female smokers could be because of religious beliefs and stigmatization, which prevents women to smoke cigarettes.^{18,19} Drug abuse was also higher among males in this study. A rapid situation assessment shows that 93.4% of drug abusers in Iran are male,²⁰ which could be also because of social stigma against women addiction.

In the present study, smoking and drug abuse was significantly higher among those with 6-8 and 9-12 years of schooling compared with individuals with college or university degree. A study by Kassani et al²¹ on male citizens in Tehran also showed the highest smoking prevalence in individuals with middle school level of education. Fernandez et al²² showed that male individuals with higher education levels have lower probability of becoming smokers at a certain age compared with those with lower education levels, as a study by Charafeddine et al²³ concluded that education level does not have a significant effect on the association between mortality and smoking. Smoking, as a risk factor, affects mortality equally at different education levels.²⁴

Table 2. Details of smoking profile in Tabari cohort study (TCS)

Variables		Total	Urban	Mountainous	P value
Have you smoked at least 100 cigarettes during your life?, No. (%)	Yes	1737 (16.9)	1262 (18.0)	475 (14.6)	<0.001
	No	8518 (83.1)	5750 (82.0)	2768 (85.4)	
Current smoking, No. (%)	Yes (daily)	926 (9.1)	640 (9.1)	289 (8.9)	<0.001
	Yes (sometime)	146 (1.4)	143 (2.0)	3 (0.01)	
Exposed to tobacco smoke at home currently or previously, No. (%)	No	9180 (89.5)	6229 (88.8)	2951 (91.0)	<0.001
	Yes	3126 (30.5)	2483 (35.4)	643 (19.8)	
Exposed to tobacco smoke at work place currently or previously, No. (%)	No	7129 (69.5)	4529 (64.6)	2600 (80.2)	<0.001
	Yes	795 (7.8)	670 (9.6)	125 (3.9)	
	I don't work	5797 (56.5)	4025 (57.4)	1772 (54.6)	
Smoking in family during your childhood, No. (%)	Almost never	3663 (35.7)	2317 (33.0)	1346 (41.5)	<0.001
	Yes	3201 (31.2)	2700 (38.5)	501 (15.4)	
Age at the first smoking initiation (y), No. (%)	No	7054 (68.8)	4312 (61.5)	2742 (84.6)	<0.001
	<15	220 (12.7)	147 (11.6)	73 (15.4)	
	15-19	672 (38.7)	450 (35.7)	222 (46.7)	
	20-24	480 (27.6)	367 (29.1)	113 (23.8)	
	25-29	182 (10.5)	150 (11.9)	32 (6.7)	
The age of the first regular cigarette smoking initiation (y), No. (%)	≥30	183 (10.5)	148 (11.7)	35 (7.4)	<0.001
	<15	79 (4.6)	56 (4.5)	23 (4.8)	
	15-19	493 (28.5)	329 (26.2)	164 (34.5)	
	20-24	606 (35.0)	421 (33.6)	185 (38.9)	
	25-29	245 (14.2)	200 (15.9)	45 (9.5)	
Frequency of smoking in day and night currently or previously, No. (%)	≥30	306 (17.7)	248 (19.8)	58 (12.2)	<0.001
	<5	524 (30.3)	447 (35.7)	77 (16.2)	
	5-9	238 (13.8)	187 (14.9)	51 (10.7)	
	10-19	346 (20.0)	249 (19.9)	97 (20.4)	
Duration of exposure to tobacco smoke at home by hours, No. (%)	≥20	620 (35.9)	370 (29.5)	250 (52.6)	<0.001
	<1	1038 (33.2)	752 (30.3)	286 (44.5)	
	1-2	1769 (56.6)	1427 (57.5)	342 (53.2)	
Duration of exposure to tobacco smoke at work place by hours, No. (%)	>2	319 (10.2)	304 (12.2)	15 (2.3)	<0.001
	<1	278 (35.0)	263 (39.3)	15 (12.0)	
	1-2	432 (54.3)	329 (49.1)	103 (82.4)	
Age at the first smoking initiation (Mean±SD)			20.94±7.59	19.34±7.56	<0.001
The age of the regular cigarette smoking initiation (Mean±SD)			23.59±8.11	22.14±7.68	<0.001
Frequency of smoking in day and night currently or previously (Mean±SD)			10.9±9.8	15.09±9.3	<0.001
Duration of exposure to tobacco smoke at home by hours per day (Mean±SD)			1.41±1.31	0.95±0.63	<0.001
Duration of exposure to tobacco smoke at work place by hours per day (Mean±SD)			1.29±1.23	1.43±0.8	0.106

Prevalence of smoking and drug abuse was significantly higher among married individuals than single, divorced or widowed ones in Tabari cohort population, which is the same as the results reported by Kassani et al.²¹ Conversely, studies have suggested that marriage is associated with smoking cessation²⁵ and have protective effect against smoking,²⁶ which might be due to social support on behalf of the partner.^{27,28} Conversely, divorce significantly increases the risk of smoking.²⁹ According to Razzaghi et al study, more than 50% of individuals

with drug abuse were married.²⁰ Conversely, a study by Edwards et al³⁰ in Sweden showed that getting divorced is a potential risk factor for drug abuse onset. Social differences between families in different societies can be the possible explanation for these results, therefore, further studies are needed to investigate factors involving an association between marriage and smoking and drug abuse.

Socioeconomic level is an important factor in smoking onset and quitting as individuals with lower

Table 3. Prevalence of drug abuse by residence area and other variables

Variables		Total		Urban		Mountainous	
		No. (%)	P value	No. (%)	P value	No. (%)	P value
Gender	Male	584 (14.1)	<0.001	341 (11.6)	<0.001	243 (20.2)	<0.001
	Female	40 (0.7)		17 (0.4)		23 (1.1)	
Age group (y)	35-44	178 (5.3)	0.003	106 (4.2)	0.001	72 (8.7)	0.772
	45-54	192 (5.7)		118 (4.7)		74 (8.3)	
	55-70	254 (7.2)		134 (6.6)		120 (7.9)	
Education level	No education	72 (4.7)	<0.001	13 (3.9)	<0.001	59 (4.9)	<0.001
	1-5 years in school	122 (5.2)		38 (3.1)		84 (7.6)	
	6-8 years in school	107 (9.5)		58 (7.0)		49 (17.0)	
	9-12 years in school	213 (7.4)		152 (6.3)		61 (12.6)	
	University/college	110 (4.6)		97 (4.4)		13 (7.9)	
Marital status	Single-widow-divorced	23 (2.8)	<0.001	13 (2.6)	0.007	10 (3.0)	<0.001
	Married	601 (6.4)		345 (5.3)		256 (8.8)	
Scio- economic level	1 (The lowest)	148 (7.2)	0.002	27 (6.6)	0.680	121 (7.4)	0.068
	2	150 (7.3)		57 (5.0)		93 (10.3)	
	3	109 (5.3)		83 (5.0)		26 (6.9)	
	4	110 (5.4)		88 (4.9)		22 (9.0)	
	5 (The highest)	107 (5.2)		103 (5.2)		4 (5.3)	
BMI	<25	270 (10.9)	<0.001	122 (8.9)	<0.001	148 (13.5)	<0.001
	25-29	240 (5.5)		155 (5.0)		85 (6.8)	
	≥30	114 (3.3)		81 (3.2)		33 (3.7)	

Abbreviation: BMI, body mass index.

socioeconomic status have less successful quitting and higher uptake, which can be due to lack of self-efficacy and motivation for quitting, stronger tobacco addiction, and low support for quitting.³¹ Smoking prevalence differs between different socioeconomic groups as factors including age and wealth are some of determinants of smoking by countries' income group.³² The prevalence of smoking is higher among individuals with lower socioeconomic status in most developed countries, however, overall lower socioeconomic status is generally associated with smoking in all countries.³¹ Masjedi et al²⁹ in their study showed that odds of smoking was significantly and positively associated with all economic levels, which can suggest ease of access for all economic levels. In the present study, there were no significant differences between smoking prevalence among individuals with different socioeconomic status, which can be also suggesting the same conclusion as previous studies, so further control programs are essential to reduce the risk of smoking especially in groups with lower socioeconomic status.

Exposure to smoking in family during childhood was significantly higher in urban population than mountainous population in the present study. Studies have shown that parental smoking can affect future smoking in children as less parental smoking and more strict rules and controlling acts on smoking significantly

decrease the risk of smoking in children.³³ A study by Gilman et al³⁴ showed that parental smoking was significantly associated with higher risk of smoking in adolescents, which was increased by duration of smoking and number of smoking parents. Parental monitoring and involvement was negatively associated with smoking initiation³⁵ even smoking cessation could be effective in the prevention of adolescent smoking in future.³⁶ Tilson et al³⁷ in their study suggested that high levels of parent-child relationship could prevent future youth smoking, when parents are not smokers themselves. Future control programs can focus on prevention and cessation of smoking in parents especially in urban areas in order to prevent smoking initiation in their young offspring.

Early smoking onset could increase the risk of morbidities including cardiovascular diseases, pulmonary diseases, and cancer, and increases hazard ratio of mortality to 1.18 for current smokers.³⁸ Mean age of smoking onset was 20.21 ± 0.6 years in Mazandaran until 2009,¹⁷ which is lower than the age of regular smoking onset reported in the present study (23.59 ± 8.1 years). A study by Amiri et al³⁹ showed the hazard ratio of the initial smoking experience in the same age for adolescents was significantly higher in high-risk families than low-risk ones. Smoking prevention and cessation programs need to pay attention to young individuals at risk of smoking initiation in order to prevent harmful effects, which could

be caused by smoking at young ages.

One of the possible limitations of the present study is underreporting cigarette smoking in women. The possible reasons for low-estimated prevalence of smoking among females could be pointed as underreporting due to stigma of women smoking in the society.

Conclusion

This study showed high burden of smoking and drug use in men. Also, in general, exposure to tobacco (passive or active smoker) was estimated high in Tabari cohort population. Therefore, if preventive interventions are not on the agenda, it is likely that a significant part of the consequences that will occur in this population in the future, will be attributed to these risk factors. Policy makers should also focus on reducing harms and risk of smoking and drug abuse for individuals who are more susceptible in the society like adolescents living in families with smoking and drug abuse and individuals with low socioeconomic status.

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Author Contributions

MM, IG, and AH collected data, performed the statistical analyses, interpreted data, and drafted and revised the manuscript for important intellectual content and approved the final version. SAN and SHH interpreted data, reviewed the analyses, and approved the final version.

Availability of Data and Materials

The datasets used and/or analyzed during the present study are available from the corresponding author on reasonable request.

Conflict of Interests

The authors declare that they have no competing interests.

Ethical Approval

TCS was confirmed by the Ethics Committee of Mazandaran University of Medical Sciences (Ethical code: IR.MAZUMS.REC.1395.2524). Also, written informed consent was obtained from all participants.

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