

Epidemiology of Tobacco and Substance Abuse Among University Students in Mashhad, Northeast of Iran, in 2008

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Background: Risky behaviors such as tobacco and substance abuse, which often begin in adolescence, have been considered as the most important cause of morbidity and mortality in the world.

Objectives: This study was designed to assess the frequency of tobacco smoking, substance abuse and alcohol consumption among students of a university in Mashhad, Iran.

Patients and Methods: In this cross-sectional study, 944 university students in Mashhad were randomly selected from 11 faculties with 12183 students in 2008 and filled out a self-administer questionnaire. Kaplan-Meier survival analysis and log rank statistics were used to evaluate the mean initiation age of the behaviors. Logistic regression analysis was performed for the prediction of the behaviors using SPSS software.

Results: The overall frequency of smoking, alcohol drinking and substance abuse among students were 18.9%, 9.6% and 4.7%, respectively. Among students with a history of smoking, 69% had started smoking before 20 years of age. Moreover, 69.9% of individuals with a history of alcohol consumption and 56.5% of those with a history of substance abuse had reported their first use before 20 years of age. Older and human sciences students had a higher possibility to smoke tobacco (OR = 2.31 and OR = 1.27, respectively) and drink alcohol (OR = 2.20 and OR = 1.40, respectively).

Conclusions: Present study demonstrated that the frequency of tobacco and substance abuse is considerable among Iranian university students who thought to be more knowledgeable and concerned about their health. Thus, efficient educational programs are needed to reduce the high-risk behaviors before students enter to university.

Keywords: Risk-Taking; Smoking; Substance Abuse; Iran

1. Background

Health threatening behaviors have been considered as the most important cause of morbidity and mortality in the world. Risky behaviors including tobacco smoking, substance abuse and alcohol drinking often begin in adolescence and will continue into adulthood. Young people are usually getting involved in high-risk behaviors and do not think to the consequences seriously. They may simultaneously experience multiple risk behaviors; however, most of them are preventable (1). Some clinical researches proposed that give up the habit of smoking reduces the risk of related diseases and as a consequence, may increase the life expectancy (2).

Tobacco use including cigarette, hookah pipe or pipe and smokeless tobacco products is the most important cause of death in the developed countries (3). Furthermore, smoking has been known as a predicting factor for illegal drug consumption (4). Smoking is very common among university students in various countries (5, 6). In a study conducted in Nepal, the prevalence of cigarette smoking

among college students has shown to be as high as 73.7% (7). A study by Zivari-Rahman et al. (8) in 2011, reported that more than 20% of Iranian university students had a history of smoking. During this stage, youth may smoke or have substance abuse under influence of peers (2).

Substance abuse among the youth is increasing worldwide (9, 10). Alcohol is the most commonly used addictive substance among students (11, 12). The prevalence of alcohol consumption among university students in Kerman, Southeast of Iran was reported to be 20% in 2011 (8). Alcohol consumption and illicit drugs have great effects on physical, mental and social health of youth and are involved in almost half of all deaths caused by car accidents (13). Furthermore, they may lead to educational and occupational problems as well as risky sexual behaviors. Near one third of university students in USA, reported that they had consumed alcohol before sexual contact (14).

In Iran, opium is the most widely consumed substance after alcohol and cannabis (15). Iran has been located in

the drug transit routes from Afghanistan (the largest producer of opium in the world), and the rate of drug addiction is growing increasingly in this country (16). It has been estimated that more than 2.5 percent of youth studying in Iranian universities are dependent to at least one narcotic drug and more than 5% of them are at risk of drug dependency in 2002 (15). In other countries such as Kenya and Ethiopia, the prevalence of substance abuse among university students was reported to be 60% - 70% (17, 18). Many researches were conducted on the prevalence of risky behaviors among university students in various cities of Iran (4, 8). On the other hand, there have been few researches on risky behaviors in Mashhad, the center of Khorasan Razavi province, in the Northeast of Iran. This province has long boundaries with Afghanistan, the biggest narcotics producer in the world (19). Also, a lot of foreign immigrants especially afghans who have been resided in Iran, live in Mashhad, the second largest city of the country after Tehran (20). Therefore, the third old university in the country with more than 20000 students was selected for studying the frequency of tobacco and substance abuse and alcohol consumption among young students in Mashhad.

2. Objectives

This study was a cross-sectional research of tobacco and substance abuse and alcohol consumption among university students of Mashhad in 2008.

3. Patients and Methods

3.1. Study Design

The biggest university in the Northeastern Iran including fifteen faculties with 12645 students in non-medical fields was selected for the survey. This cross-sectional study was conducted on students studying for Bachelor of Arts (BA) or Bachelor of Science (BS) during May and June 2008. Four faculties were excluded from the sampling because of locating out of the city and/or lacking students for BA or BS degrees. The remained 11 faculties with 12183 students were classified into four groups including human sciences, agriculture and natural resources, engineering, and basic sciences. In each group, one of the two available faculties that had more students was chosen, in the first group, two from five faculties were selected. In each of the five chosen faculty with totally 8627 students in 31 study fields, one field was randomly selected from each of the four different admissions so that twenty field-admissions with 944 students were chosen. Finally, one class in the first shift and one in the second shift were selected by chance from each study field-admission.

Data were gathered using a self-administer questionnaire designed by researchers after review of similar studies from Iran and other countries especially a national survey performed in 1995 among colleges of USA (21). The main variables were included: smoking all kind

of tobacco such as cigarette, hookah, pipe, etc., substance abuse such as opium, opium derivatives, hallucinogens (cannabis, ecstasy), and alcohol consumption. Using any amount of tobacco, substance and alcohol was considered as the behavior occurrence.

3.2. Data Analysis

The data were described and analyzed using SPSS ver. 16.0. The behavior occurrence was evaluated in two ways: lifetime occurrence, a history of the behavior any time during the life, and current occurrence, a history of the behavior in the month preceding study. The mean initiation age of each behavior was calculated by Kaplan-Meier survival analysis. Log rank statistics were used to evaluate the significant differences between males and females. Logistic regression analysis using effect coding method was performed for the prediction of the behaviors occurrence. A P value < 0.05 was considered statistically significant.

3.3. Ethical Consideration

Research and technology deputy of Iranian academic center for education, culture and research (ACECR) approved the study with grant number of 1551 - 10. This study followed the tenets of the Declaration of Helsinki and participation in the study was voluntarily. Students were asked not to write their names, faculties, and study fields on the questionnaires and they had a choice not to answer if they did not feel comfortable about a question. They put the questionnaires in a box brought by the study team for this purpose.

4. Results

Six-hundred five students answered the questionnaires completely. Fifteen cases over 25 years old were excluded from the following analyses. The average age of participants was 20.8 ± 1.5 years (18-25). 71.4% were female and 85.3% were single. 67.2% of students were studying in the first shift. Distribution of the students in study fields was as follows: 41% human sciences, 22.6% engineering, 18.4% agriculture and natural resources and 18% basic sciences.

4.1. High-Risk Behavior Occurrence

One-hundred nine students (18.9%) had a history of smoking at some point in the past, 48.6% of which smoked cigarette, 56.9% hookah, 10.1% pipe, and 15 students did not mention their smoking habits. In addition, 52 (9.6%), and 25 (4.7%) students had a history of alcohol drinking and substance abuse, respectively. From 25 students with a history of substance abuse, 14 individuals used opium/opium derivatives, seven students used hallucinogens such as cannabis and four students reported that they used both substances.

On the other hand, 8.8% of students had smoking in the past month with an average of 10.9 days. Similarly, current alcohol consumption and substance abuse were 2.4%

and 1.7% with an average of 3.5 and 2.3 days, respectively, in the past month. Moreover, 69% and 10% of students had started smoking before 20 and 10 years of age, respectively. In terms of alcohol consumption, 69.9% of students before 20 and 4.3% before 10 years of age had begun drinking. Finally, 56.5% and 8.7% of students had reported their first substance abuse before 20 and 15 years of age, respectively. Kaplan-Meier survival analysis showed that the mean onset age of smoking, alcohol drinking and substance abuse was 23.3, 24.3 and 24.6 years, respectively.

4.2. Gender and High-Risk Behaviors

Table 1 shows that the current and lifetime smoking and alcohol use were significantly different between male and female students ($P < 0.001$ for all). As shown in Table 2, male students presented tobacco smoking and alcohol use 2.2 and 1.3 years earlier than females, respectively ($P < 0.0001$ for both). However, in the case of onset age for substance abuse, there was no significant difference between males and females.

4.3. Relation Between High-Risk Behaviors

From 528 students, 25.4% at least had a history of one behavior. Seventy-nine (15%) showed one, 36 (6.8%) reported two and 19 (3.6%) indicated three high-risk behaviors. To survey the relation between three behaviors, a combined

index was proposed for each behavior. The indices were designed based on a history of the behavior (0, 1), initiation age of the behavior (0 - 5 according to classified age, higher scores were assigned for lower categories) and number of days in the past month that a behavior had reported (0 - 4 according to the classified numbers). Significant positive correlations were observed between tobacco smoking index with alcohol consumption ($r = 0.50$, $P < 0.01$) and substance abuse indices ($r = 0.40$, $P < 0.01$). Furthermore, a positive correlation was found between drinking and substance abuse indices ($r = 0.34$, $P < 0.01$).

4.4. Elements Related to High-Risk Behaviors

Bivariate analysis showed that smokers were slightly older compared to other students (21.4 ± 1.7 and 20.7 ± 1.5 years, respectively, $P < 0.001$). In addition, students with a history of alcohol and substance abuse had older age (21.8 ± 1.8 and 20.8 ± 1.5 years for both variables, $P < 0.001$ and $P = 0.002$, respectively). The relation between other demographic features and risk behaviors are shown in Table 3. Frequency of tobacco smoking in males was three times more than in females ($P < 0.001$). Besides, the highest frequency of smoking was observed among individuals studying human sciences ($P = 0.003$). Alcohol use was four times more prevalent among males ($P < 0.001$) and engineering students had the highest frequency of alcohol consumption ($P = 0.025$).

Table 1. Lifetime and Current Occurrence of High-Risk Behaviors According to Gender

High-Risk Behavior	Total Number		Occurrence ^a		P Value
	Male	Female	Male	Female	
Tobacco Smoking					
Lifetime	168	410	59 (35.1)	50 (12.2)	< 0.001
Past 30 days	165	400	36 (21.8)	50 (3.5)	< 0.001
Alcohol Consumption					
Lifetime	157	387	33 (21)	19 (4.9)	< 0.001
Past 30 days	156	384	10 (6.4)	3 (0.8)	< 0.001
Substance Abuse					
Lifetime	157	380	10 (6.4)	15 (3.9)	0.23
Past 30 days	157	378	3 (1.9)	6 (1.6)	0.79

^a Data are presented as No (%).

Table 2. Kaplan-Meier Survival Statistics for Initiation Age of a High-Risk Behavior^a

Behavior	Number of All Cases	Number of Censored Cases	Mean Initiation Age		P Value ^b
			Value	95% CI ^a	
Tobacco Smoking					
Male	158	102	21.8	21 - 22.5	< 0.0001
Female	388	346	24	23.7 - 24.3	
Alcohol Consumption					
Male	148	117	23.4	22.9 - 23.9	< 0.0001
Female	368	355	24.7	24.5 - 24.9	
Substance Abuse					
Male	148	140	24.6	24.3 - 24.9	0.78
Female	316	352	24.7	24.5 - 24.8	

^a Abbreviation: CI: confidence interval.

^b log rank statistics.

Table 3. Frequency Distribution of High-Risk Behaviors According to Demographic Features

Variable	Tobacco Smoking (n = 578)			Alcohol Consumption (n = 544)			Substance Abuse (n = 537)		
	Total Number	No. (%)	P Value	Total Number	No. (%)	P Value	Total Number	No. (%)	P Value
Gender			< 0.001			< 0.001			0.23
Male	168	59 (35.1)		157	33 (21)		157	10 (6.4)	
Female	410	50 (12.2)		387	19 (4.9)		380	15 (3.9)	
Marital status			0.41			0.61			0.92
Single	492	90 (18.3)		463	43 (9.3)		455	21 (4.6)	
Married	86	19 (22.1)		81	9 (11.1)		82	4 (4.9)	
Study field			0.003			0.025			0.39
Human science	216	53 (24.5)		204	21 (10.3)		204	12 (5.9)	
Agriculture	98	18 (18.4)		94	9 (9.6)		97	5 (5.3)	
Engineering	120	24 (20)		111	17 (15.3)		107	5 (4.7)	
Basic science	93	6 (6.5)		87	2 (2.3)		84	1 (1.2)	
Study shift									
First shift	378	65 (17.2)	0.18	360	34 (9.4)	0.98	355	19 (5.4)	0.23
Second shift	183	40 (21.9)		168	16 (9.5)		167	5 (3)	

According to logistic regression analysis, predicting factors for smoking and drinking were sex, age, and study field (Table 4). Males and older students had a higher possibility to smoke tobacco (OR = 2.31 and OR = 1.27, respectively) and drink alcohol (OR = 2.20 and OR = 1.40, respectively). In addition, human sciences students were 2.51 times more likely to smoke and 2.34 times to drink alcohol. The only predicting factor for substance abuse was age and older students were more likely to have the behavior (OR = 1.49).

5. Discussion

This study was conducted to survey the frequency of tobacco, alcohol, and substance abuse among university students in Mashhad, Iran. Nineteen percent of our students reported a history of smoking at some point in the past and 9% had smoking in the past month. High prevalence of smoking has been previously reported among Iranian university students. In a study conducted in 2010, frequency of current smoking among Tehran University students was 27% with a mean duration of 4.2 ± 3.1 years (22). Moreover, a study conducted in 2007 stated the prevalence of current smoking among students of Kerman university of medical sciences as 16% (23). Similarly, 14% and 29% of male students in Semnan university of medical sciences in 2006 were currently and former smoker, respectively (24). However, in a study conducted on students of Mashhad university of medical sciences, the overall prevalence of cigarette smoking was 9.8% (25). The frequency of smoking in our study was lower than other countries. A study in Armenia revealed that about 77% of students had a history of using tobacco (6). In addition, prevalence of tobacco use among American students has been reported

40% to 80% in different studies (5, 26, 27). A comparative study showed that 80.5% of male and 76% of female students in the U.S. had a history of tobacco smoking. In contrast, the frequency of smoking in Chinese males and females were 71.1% and 14.5%, respectively (5).

Table 4. Logistic Regression Test Results for High-Risk Behaviors

Variable	P Value	Odd Ratio	
		Value	95% CI ^a
Tobacco Smoking			
Male gender	0.0001	2.31	1.75 - 3.05
Age, y	0.002	1.27	1.09 - 1.49
Human science	0.0001	2.51	1.66 - 3.81
Agriculture	0.12	0.88	0.53 - 1.46
Engineering	0.10	0.81	0.5 - 1.3
Alcohol Consumption			
Male gender	0.0001	2.20	1.52 - 3.18
Age, y	0.001	1.40	1.14 - 1.72
Human science	0.015	2.34	1.18 - 4.65
Agriculture	0.08	1.10	0.5 - 2.41
Engineering	0.06	1.59	0.78 - 3.21
Substance Abuse			
Age, y	0.002	1.49	1.15 - 1.93

^a CI: confidence interval.

Age, gender, socio-economic status, study field as well as family and peer influences have been suggested as related risk factors of youth smoking in some studies (2, 28). The usual age of initiating smoking was estimated to be between 13 - 20 years in Iran. Our findings indicated that most of the smokers started smoking before age of 20 years, which is in agreement with the previous reports (2, 29). In consistent with other studies, tobacco use among our male students was three times that of females (22, 23). Furthermore, tobacco use among university students in the US has been reported to be 62.2% in males and 33% in females (30). Also, studying in human sciences field was one of the important factors for smoking among our students. This suggests that students of certain fields of study are at higher risk for smoking. Berg et al. reported a higher rate of smoking among students studding in communications, languages, or cultural studies (28).

In the present study, the frequency of alcohol use was 10%, which was comparable to the result of a study in students of Kerman universities (7%) (8). Similarly, in a study took place in 2011, the prevalence of alcohol use in the past month was 7.7% among students from nine universities in Tabriz, Northwest of Iran (4). On the other hand, the frequency of alcohol use among our students was significantly lower than other countries with a higher initiation age of consumption (6, 31, 32). A study in Armenia found that 79% of higher education students had a history of alcohol consumption (6). This discrepancy could be due to the different cultural and religious conditions; alcohol drinking is known as a banned and unconventional practice in Iran.

In agreement with the other studies, we found that alcohol drinking was more frequent in males compared to females. In a study conducted on students in universities of Tabriz, higher prevalence of alcohol drinking was reported among male students compared to females (4). In addition, Griffiths et al. (32) stated that 72% of male students had a history of alcohol drinking compared to 53% of females in Hong Kong.

In this study, the frequency of substance abuse was 4.7%. In a study among students of Kerman universities, 13% had declared a history of substance abuse including opium/opium derivatives, cannabis and other hallucinogens (8). The frequency of substance abuse among Iranian students was comparable to Armenian and Japanese students (6, 33). However, in a study on students from Thailand 22% of males and 4% of females had a history of using marijuana (31).

In this study, 56% of students started substance abuse before age of 20 years. This finding was consistent with the reports from studies in Iran and other countries. In a study on 2531 students from 21 Iranian public universities, the mean initiation age of substance abuse was 18 years old and one-third of students have experienced the first use before they entered to the university (34). In addition, in a nationwide survey among civilian, non-institutionalized population aged 12 years old and

older in U.S., 55% of the drug users started substance abuse before age of 18 (35).

In contrast to the previous surveys, we could not find a significant difference between both sexes regarding substance abuse. In a study in Tabriz, being male was a risk factor for use of illicit drugs (4). Additionally, the rate of current illicit drug use among American males aged 12 or older (12%) was higher than in females (7%) (35). In a study on students from Thailand, males had indicated a history of using marijuana five-times more than females (31).

In conclusion, this study clearly shows that the frequency of tobacco and substance abuse is considerable among Iranian university students who thought to be more knowledgeable and concerned about their health. Moreover, tobacco use was more prevalent maybe due to the easy availability and affordability. Thus, effective measures are needed to reduce the high-risk behaviors among the students and to encourage them to engage in more sensible and healthier behaviors. The intended interventions for the youth should be implemented earlier before entrance to the university.

5.1. Limitations

It is likely that some students did not attend in the class at the time of study, which could result in underestimating of the behaviors occurrence. Besides, this study was based on self-reported responses, which increases the possibility of underreporting risky behaviors due to social desirability bias.

It could be suggested to perform similar studies on risky behaviors among students from other public and private universities in this region. Determination of risky behaviors frequency and the related factors could be useful in planning for health promotion and prevention of main morbidities in young people.

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Authors' Contributions

Study concept and design, Analysis and interpretation of data, drafting of the manuscript: Mohammad Reza Hedayati-Moghaddam; data collection and drafting of the manuscript: Farhad Fathimoghaddam, Iman Eftekharzadeh-Mashhadi, and Seyed Javad Pourafzali.

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