

# Smoking and drug use among students of a medical university in Iran; prevalence and associated factors

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## Research Article

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# Abstract

**Background:** Drug abuse is a critical health problem of human society. This study aimed to evaluate the prevalence and determinants of drug abuse among students in one of the medical universities of Iran.

**Methods:** This cross-sectional study was performed in 2016 among a convenient sample of 800 undergraduate students from a medical university in the capital of Iran. Data were gathered by means of a self-administered questionnaire inquiring students' age, gender, marital status, home city, living status, and drug used including history, frequency and types. Statistical evaluation included the Chi-square test and logistic regression models.

**Results:** respondents' mean age was 23.5; 67% were men, and 70% were single. Totally, 15% of the students reported to smoke cigarette and  $\leq 6\%$  use other drugs; more men than women ( $p < 0.01$ ). Alcohol use reported by 7% of the students more women than men ( $p = 0.02$ ). Older students, those spending their free time alone, and those without a job more frequently ( $p \leq 0.001$ ) reported using all types of the drugs.

**Conclusion:** The majority of the studied students did not report drug abuse. Considering the critical responsibilities of health care students, the prevalence is, however, needs to be reduced even further with purposeful preventive programs.

## Introduction

Smoking and drug use constitute two undesirable individual and social behaviors that involve groups of people from various social classes in different countries. These risky behaviors usually begin with occasional minor use or in response to curiosity but finally result in an ethical and mental decline in dependent individuals (Degenhardt et al., 2013; Shadel, Shiffman, Niaura, Nichter, & Abrams, 2000). Smoking and drug use threaten global health as one-fifth of the >15-year-old world population is estimated to be current smokers (World Health Organization, 2017a) and a quarter of one billion 15-64-year-old people is estimated to use at least one drug (United Nations Office on Drug and Crime, 2016).

University students comprise a major risk group for smoking and drug use. Characteristics of this life period such as efforts for being independent, separation from family, and pressures from academic responsibilities make them vulnerable for smoking and drug use (Locke, Shilkret, Everett, Petry, 2015). This may ruin the students' overall academic performance (Arria et al., 2013) and reduce their efficiency for future life responsibilities. Smoking and drug use among university students have received a lot of consideration as a global health issue in recent years (Charitonidi et al., 2016; Chekib et al., 2017; van Wel, Rosiers, & Van Hal, 2016).

Prevalence of smoking and drug use has been widely studied by questionnaire in university students in different countries. The prevalence of smoking, for example, reported to be 1.4% among 773 students of nine medical technology schools in Thailand (Namjuntra and Suriyaprom, 2015), 7% among 11,954 students from 50 universities offering medical/ health professional programs in China (Yang et al., 2015),

19% among 1,217 of third year medical students of 12 medical schools in Turkey (Inandi et al., 2013), 26% among 163 enrolled medical students at all seven medical schools in Lebanon (Chidiac, Tamim, Kanso, & Tfayli, 2016), and drug use is up to 26% among 855 medical students representing 49 medical colleges throughout the United States (Ayala, Roseman, Winseman, Mason, 2017), 5-25% among 3706 students from seven universities in England, Wales, and Northern Ireland (El Ansari, Vallentin-Holbech, & Stock, 2014), 20% among 230 undergraduate and postgraduate medical students in a private medical college in north India (Arora et al., 2016), 14% among 1,587 male students from private and public universities in Kuwait (Bajwa et al., 2013), 2-16% among 7,923 students from Cambodia, Indonesia, Laos, Malaysia, Myanmar, the Philippines, Singapore, Thailand and Vietnam (Yi, Peltzer, Pengpid, Susilowati, 2017) and 13-19% in different universities in Iran (Babaei Heydarabadi et al., 2015; Khosravi et al., 2015; Reza Hosseini, Roohbakhsh, Tavakolian, & Assar, 2014).

Health-related university students have the ethical responsibility to work for the promotion of population health. They, therefore, are expected firstly to avoid health damages of smoking and drug abuse for their own health and secondly to help people in this regard. In Iran with about 200,000 students studying in 60 medical universities, continuous monitoring of the rates and risks of smoking and drug use during medical education at a national level and also in each university is an increasingly important task. The present study aimed to evaluate the prevalence of smoking and drug use and factors affecting these unhealthy behaviors among the students of a medical university in Tehran, capital of Iran.

## Methods And Materials

The present cross-sectional study was conducted among undergraduate students at one of the medical universities in Tehran, Iran. The target population for this study comprised a convenience sample of undergraduate students in all eleven faculties of the university. During April 2016, one of the authors (MA) visited each of the faculties and asked the present students to answer the questionnaire. Inclusion criteria were being an undergraduate student in each faculty as expressed by the respondents.

The process of data collection was designed to reach 800 completed questionnaires. The sample size was based on the following calculation: If 20% is considered for the proportion of students who use a drug, in order to estimate it in the whole population of the university students within 3 percentage points of the true value and 95% confidence, a sample of 682 is needed. To compensate for approximately 0.15 probable loss of samples or non-complete questionnaires, an additional 120 has been added which concluded to 800 subjects for the final study sample.

The questionnaire included the following parts: demographic questions including age, gender, marital status, home city (capital or other cities), questions about students' living status (in dormitory, with parents, alone, or with friends), and questions regarding the students' reported frequency of cigarette smoking, alcohol drinking and drug use (including: hashish, opium, marijuana, bhang (a form of cannabis), cocaine, opium dross (opium residue), Ritalin, and sedatives, anti-anxiety drugs, or narcotic drugs) using. For the use of cigarettes, alcohol or drugs, the question was as follows: "Do you use

cigarettes/alcohol/drug?" with the following alternatives: 1. Not at all, 2. Not currently, 3. Occasionally, when it is available, 4. Once a week, 5. Once a day, 6. More than once a day. For further analysis, a dichotomous variable was developed that reflects students' belonging to the category of user (alternatives 3-6) or non-user (alternatives 1-2).

The questionnaire was developed originally using related questions from similar studies. The Validity of the questionnaire has been assured by revisions based on the advice of a group of professors in the department of community oral health of Shahid Beheshti School of Dentistry. To assess the reliability of the questionnaire, a test-retest process on 20 students with a two week time period resulted in a Kappa statistic of >0.9.

The Ethics committee of the Shahid Beheshti School of Dentistry approved this study (ethic code: IR.SBMU.RIDS.REC.1395.206). All respondents were assured about the confidentiality of their reported information and their acceptance to fill the questionnaire was regarded as informed consent to enter the research.

Descriptive statistics included frequency and percent of the students belonging to each category. The Chi-square test served as a statistical evaluation to assess differences in frequencies. To evaluate the factors related to the students' reported drug use, separately for cigarette, alcohol, and other drugs, three similar multivariate logistic regression models were fitted to the data while the students' gender, age, living with or without parents, home city, marital status, and spending free time served as covariates. The corresponding odds ratios (OR) and their 95% confidence intervals (95% CI) were calculated. The goodness of fit of the models was assessed by the Hosmer-Lemeshow test.

## Results

In total, 800 students completed the questionnaires; the mean age was 23.5 ( $\pm 1.9$ ); 67% were men, and 70% were single. As may be seen in Table 1, about two-thirds of the students came from cities other than the capital, one-third lived in dormitories, one-third reported to spend their free time alone, and more than 80% reported to have no job.

Table 2 shows the distribution of the students' self-reported drug use. Of the whole respondents, 15% reported to smoke cigarette occasionally or always; 21% of male and 6% of female students ( $p < 0.001$ ). With alcohol, 7% of the respondents reported to use at least occasionally; significantly more likely for women (10%) than men (5%) ( $p < 0.05$ ). Further analysis showed that about half of women who reported to drink alcohol were divorced.

Using marijuana and hashish was reported by 5-6% of the respondents with no gender difference. From 2% to 5% of the male students reported to use occasionally opium, bhang, cocaine, opium dross, Ritalin, sedative, anti-anxiety and narcotic drugs.

The association between some background factors and the students' reported drug use is shown in table 3. Except for alcohol, men were significantly more likely than women to report drug use ( $p \leq 0.05$ ). Cigarette smoking and alcohol use were more prevalent among students who did not live with their parents ( $p \leq 0.03$ ). With all types of studied drugs, the prevalence of use was higher among older students, those spending their free time alone, and those without a job ( $p \leq 0.001$ ).

Table 4 shows the results of three logistic regression models explaining factors related to the students' reported use of cigarette, alcohol, or other drugs. The likelihood of being in the category of cigarette smoker was higher for male (OR=3.3, 95%CI=0.2-0.5) and students reported to live alone (OR=2.0, 95%CI=1.3-3.3). The likelihood of being in the category of alcohol drinker was higher for female (OR=8.7, 95%CI=3.0-25.0), older (OR=3.7, 95%CI=2.5-5.5) and single students (OR=10, 95%CI=0.0-0.5). The likelihood of being in the category of using other drugs was higher for older (OR=1.4, 95%CI=1.1-1.6), students from the capital (OR=5.0, 95%CI=0.0-0.6) and students reported to live alone (OR=10.7, 95%CI=4.7-24.0).

## Discussion

The present findings reveal that the majority of the students did not report drug use of any kind. The cigarette was the most prevalent drug reported to be used by 15% of the students and other drugs just by less than 10% of the students. The following factors: gender, age, the home city of the students and living with or without parents were associated with students' reported drug use.

Prevalence of cigarette smoking of the students in this study (15%) is comparable to findings from two other medical universities of Iran; about 19% (Jalilian et al., 2015; Taheri, Ghorbani, Salehi, & Sadeghnia, 2015), overall rate of smoking among university students in Iran; 6.7-15.7% (Haghdoust and Moosazadeh, 2013), and overall prevalence of cigarette smoking among adult population of the country; 12.5% (Meysamie et al., 2010). This figure is lower than 26% among medical students in Lebanon (Chidiac et al., 2016), and 19% in 12 medical universities of Turkey (Inandi et al., 2013), but higher than 7% in 50 universities in China (Yang et al., 2015), and 1.4% in 9 medical universities in Thailand (Namjuntra and Suriyaprom, 2015). The difference in the prevalence of cigarette smoking in the above studies may partly be due to cultural variations among the countries. In the case of the study in Thailand (Namjuntra and Suriyaprom, 2015), very low rates of cigarette smoking among medical students, was claimed to be a result of recent national smoke control programs like tobacco control policies, interventions of health professional alliances and the enforcement of the smoke ban policies.

Rates of the students' reported alcohol drinking in this study (7%) is a bit higher than whole population estimates (5.7%) (Amin-Esmaili et al., 2017), commensurate with a survey on medical students in Tehran (7%) (Abbasi-Ghahramanloo, Fotouhi, Zeraati, & Rahimi-Movaghar, 2015) but lower than similar studies from other cities of Iran; 10% of male medical students from Isfahan and Kermanshah (Jalilian et al., 2015), and 16% of medical students of Tabriz (Jodati, Shakurie, Nazari, & Raufie, 2007). These figures are lower than the prevalence of alcohol drinking among medical students of western countries: 97% of

students from a French medical school (Gignon et al., 2015), 91% of students from 49 medical universities of United States (Ayala et al., 2017), 84% of university students in Ireland and United Kingdom (Davoren, Demant, Shiely, & Perry, 2016). In a study from India, about 17% of students from 8 medical colleges (Goel, Khandelwal, Pandya, & Kotwal, 2015) reported to drink alcohol and this figure for a population of students from 3 universities in Iraq (Al-Ameri, Al-Badri, & Lafta, 2016) was about 10%. Variation in the prevalence of alcohol drinking in the above studies originates mainly from structural and cultural differences of the countries. In Iran and other Islamic countries, alcohol drinking is contrary to Islamic law. This may partly explain the low rate of alcohol drinking among the students in this study and the study in Iraq (Al-Ameri et al., 2016).

The overall prevalence of using other drugs in the present study was 1-6% with marijuana being in the first rank reported by 6% of the students. Findings from several Iranian universities show a similar range of 1-10% (Babaei Heydarabadi et al., 2015; Jalilian et al., 2015; Jodati et al., 2007; Reza Hosseini et al., 2014). The prevalence of drug use in the Iranian population aged 15–64 was estimated to be <2.5% (World Health Organization, 2017b). On the other hand, some of the studies from western countries show higher rates for drug use among university students; 26% of the university student population in the USA (Ayala et al., 2017), up to 25% of university students in the UK (El Ansari et al., 2014), 3-77% from a French medical school (Gignon et al., 2015), and 5-51% of a sample of university students in Germany (Schilling et al., 2017). Various figures for drug use among university students in the above studies might be partly due to different types of drugs investigated, duration of drug use, target groups of students, and settings in which the study performed (all university premises, particular campuses, dormitories, etc.). However, higher rates for drug use among university students of some American and European countries compared to Eastern countries is reported in a previous review (Roncero et al., 2015).

Generally, the figures for the prevalence of smoking, alcohol drinking, and drug use as reported by the medical students in this study were close to those of similar national studies and far below the figures from the universities of western countries especially in case of alcohol drinking and drug use. However, continuous monitoring surveys and developing intensified preventive programs to reduce the prevalence of these unhealthy behaviors even further among the present medical students is called for.

Gender clearly correlates with drug use among university students in which men more frequently than women reported to use drugs (Arora et al., 2016; Babaei Heydarabadi et al., 2015; El Ansari et al., 2014; Haghdoost and Moosazadeh, 2013; Khosravi et al., 2015; Reza Hosseini et al., 2014). This reflects further access to or higher demand for these drugs among male than female students. In addition, higher adherence to social and cultural norms among women and social stigma for female drug users may partly explain this difference (Becker, McClellan, & Reed, 2016). Moreover, small figures for the prevalence of some of the drugs among women as reported in the present study may help to tailor preventive programs by gender. Higher rates for alcohol drinking among women than men in this study may partly be explained by the point that approximately half of the women who reported drinking alcohol were divorced. Unfavorable psychological outcomes of divorce may lead them to adopt unhealthy behaviors like alcohol drinking. The finding is in accordance with the result of one study in a French medical school

(Gignon et al., 2015). This necessitates more emphasis on preventive programs as pieces of evidence show an increase in the prevalence of drug use among women (Keyes, Grant, & Hasin, 2008; McHugh, Wigderson, & Greenfield, 2014).

In this study, the results of the bivariate analysis show that older students, students living without their parents, those living alone, and those without a job represent a higher prevalence of drug use. Several studies in the UK (El Ansari et al., 2014), France (Gignon et al., 2015), and Iran (Mohammadpoorasl, Ghahramanloo, Allahverdipour, & Augner, 2014), found that drug use was less common among students living with their parents. Parental supervision seems to protect students from being involved in drug use. Parents, even, may play a significant role in controlling this risky behavior (LaBrie et al., 2016). In the present study, lower prevalence of drug use among students who had a job may reflect their further perceived responsibilities and limited time due to working condition. Correlation between students' drug abuse and having a job is, however, controversial. In a study on students from six universities in France, Verger et al. found a higher prevalence of drug use among students who had a paid job (Verger, Guagliardo, Gilbert, Rouillon, & Kovess-Masfety, 2010). Another study from France showed no significant correlation between students' binge drinking behavior and having a job (Tavolacci et al., 2016).

The target population for this study was students in one of the main medical universities of Iran. Studying the prevalence and determinants of drug use among these students is, therefore, important due to their responsibilities as future care providers. The generalizability of the results to the whole student population, however, should be made with caution because of the convenience nature of sampling. Limitations may also arise from cross-sectional nature of the data, and characteristics of a questionnaire survey in which the respondents may conceal or under-report their real behavior especially about drug use which is a socially sensitive issue and that all probable confounding factors are hard to be considered in a single study.

## Conclusion

A relatively low prevalence of drug use among the students in this study is promising. The social responsibility of medical students as health care providers, however, necessitates specially designed preventive programs for these students to reduce the prevalence of drug abuse even further. In such programs, the effects of underlying factors on the students' drug use need to be reflected.

## Declarations

- Ethics approval and consent to participate: The Ethics committee of the Shahid Beheshti School of Dentistry approved this study (ethic code: IR.SBMU.RIDS.REC.1395.206). All respondents were assured about the confidentiality of their reported information and their acceptance to fill the questionnaire was regarded as informed consent to enter the research.
- Consent for publication: Not applicable

- Availability of data and materials: The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.
- Competing interests: The authors declare that they have no competing interests.
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- Authors' contributions: HG contributed to the conception of the study, data cleaning and analyzing and writing drafts of the manuscript. MJ contributed to the conception of the study and commenting on, analysis and manuscript writing. MA basically involved in data collection and helped in manuscript drafting.
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## Tables

Table 1. Distribution (%) of students (n=800), based on background factors.					
		All (%)	Men (%)	Women (%)	P-value*
Marital status	Single	563 (70)	369 (76)	194 (61)	<0.001
	Married	237 (30)	114 (24)	123 (39)	
Age (years)	≤ 22	221 (27)	111 (35)	110 (23)	<0.001
	23-25	507 (63)	190 (60)	317 (66)	
	≥ 26	72 (10)	16 (5)	56 (12)	
Home city	Capital	218 (27)	127 (26)	91 (29)	0.46
	Other cities	582 (73)	356 (74)	226 (71)	
Living status	In dormitory	258 (32)	201 (41)	57 (18)	<0.001
	With parents	303 (38)	163 (34)	140 (44)	
	Home single	186 (23)	94 (20)	92 (29)	
	Home with friends	53 (7)	25 (5)	28 (9)	
Spending free time with	Friends	175 (22)	116 (24)	59 (19)	<0.001
	Family	225 (28)	102 (21)	123 (39)	
	Fiancé	129 (16)	46 (10)	83 (26)	
	Alone	271 (34)	219 (45)	52 (16)	
Having job	Yes	124 (16)	108 (22)	16 (5)	<0.001
	No	676 (84)	375 (78)	301(95)	
* Statistical evaluation by the Chi-square test.					



Table 2. Distribution (%) of students (n=800), according to their self-reported drug use.					
		All (%)	Men (%)	Women (%)	P-value*
Cigarettes	yes	123 (15)	103 (21)	20 (6)	<0.001
	no	677 (85)	380 (79)	297 (94)	
Alcohol	yes	56 (7)	26 (5)	30 (9)	0.02
	no	744 (93)	457(95)	287 (91)	
Hashish	yes	41 (5)	25 (5)	16 (5)	1.00
	no	759 (95)	458 (95)	301 (95)	
Opium	yes	24 (3)	24 (5)	0 (0)	<0.001
	no	776 (97)	459 (95)	317 (100)	
Marijuana	yes	50 (6)	34 (7)	16 (5)	0.29
	no	750 (94)	449 (93)	301(95)	
Bhang	yes	24 (3)	24 (5)	0 (0)	<0.001
	no	776 (97)	459 (95)	317 (100)	
Cocaine	yes	9 (1)	9 (1)	0 (0)	0.01
	no	791 (99)	474 (99)	317 (100)	
Burned opium	yes	15 (2)	15 (3)	0 (0)	0.001
	no	785 (98)	468 (97)	317 (100)	
Ritalin	yes	15 (2)	15 (3)	0 (0)	0.001
	no	785 (98)	468 (97)	317 (100)	

Sedative or anti-anxiety drugs	yes	15 (2)	15 (3)	0 (0)	<0.001
	no	785 (98)	468 (97)	317 (100)	
Narcotic dugs	yes	15 (2)	15 (3)	0 (0)	0.001
	no	785 (98)	468 (97)	317 (100)	
* Statistical evaluation by the Chi-square test.					

Table 3. Distribution (%) of students (n=800) who reported to use different kinds of drugs based on background factors.

		All (%)	Cigarette (%)	Alcohol (%)	Other drugs* (%)
Gender	Male	483 (60)	103 (21)	26 (5)	43 (9)
	Female	317 (40)	20 (6)	30 (10)	16 (5)
	P-value		<0.001	0.03	0.05
Marital status	Single	563 (70)	89 (16)	30 (7)	42 (8)
	Married	237 (30)	34 (14)	17 (7)	17 (7)
	P-value		0.66	1.00	1.00
Age (years)	≤ 22	221 (27)	45 (20)	1 (0.5)	16 (7)
	23-25	507 (63)	54 (11)	32 (6)	20 (4)
	≥ 26	72 (10)	24 (33)	23 (32)	23 (32)
	P-value		<0.001	<0.001	<0.001
Home city	Capital	218 (27)	27 (12)	24 (11)	21 (10)
	Other cities	582 (73)	96 (17)	32 (6)	38 (7)
	P-value		0.15	0.008	0.17
Living status	With parents	303 (38)	36 (12)	9 (3)	21 (7)
	Without parents	497 (62)	87 (18)	47 (10)	38 (8)
	P-value		0.03	<0.001	0.78
Spending free time	Alone	271 (34)	67 (25)	41 (15)	47 (17)
	Not alone	529 (66)	56 (11)	15 (3)	12 (2)
	P-value		<0.001	<0.001	<0.001
Having job	Yes	124 (16)	0 (0)	0 (0)	0 (0)
	No	676 (84)	123 (18)	56(8)	59 (9)

P-value	<0.001	0.001	0.001
*Using at least one of hashish, opium, marijuana, bang, cocaine, burned opium, sedative or narcotic drugs, Ritalin			
Statistical evaluation by the Chi-square test.			

Table 4. Determinants for drug use among the students (n=800), as assessed by means of three similar logistic regression models.

	E.S.	s.e.	OR	95% CI	p-value
<b>Using cigarettes (0=no, 1=yes)</b>					
Gender (0=male, 1=female)	-1.23	0.26	<b>0.3</b>	<b>0.2-0.5</b>	<b>&lt;0.001</b>
Age (years)	0.00	0.06	1.0	0.8-1.1	0.89
Living (0=with parents, 1= without parents)	0.22	0.30	1.2	0.7-2.2	0.45
Home city (0=capital, 1=non-capital)	0.02	0.30	1.0	0.5-1.8	0.94
Marital status (0=single, 1=married)	0.37	0.26	1.4	0.8-2.4	0.15
Spending free time (0=not alone, 1=alone)	0.73	0.23	<b>2.0</b>	<b>1.3-3.3</b>	<b>0.002</b>
Constant and goodness of fit <sup>1</sup> (P)	-2.13	1.40			<i>P</i> <0.001
<b>Drinking alcohol (0=no, 1=yes)</b>					
Gender (0=male, 1=female)	2.17	0.53	<b>8.7</b>	<b>3.0-25.0</b>	<b>&lt;0.001</b>
Age (years)	1.31	0.20	<b>3.7</b>	<b>2.5-5.5</b>	<b>&lt;0.001</b>
Living (0=with parents, 1= without parents)	22.8	1158	>100	0.0-0.0	0.98
Home city (0=capital, 1=non-capital)	-0.23	1158	0.0	0.0-0.0	0.98
Marital status (0=single, 1=married)	-1.77	0.60	<b>0.1</b>	<b>0.0-0.5</b>	<b>0.003</b>
Spending free time (0=not alone, 1=alone)	20.6	1158	>100	0.0-0.0	0.98
Constant and goodness of fit <sup>1</sup> (P)	-55.2	1158			<i>P</i> =0.38
<b>Using other drugs<sup>2</sup> (0=no, 1=yes)</b>					
Gender (0=male, 1=female)	0.32	0.17	1.4	0.6-2.7	0.36
Age (years)	0.30	0.08	<b>1.4</b>	<b>1.1-1.6</b>	<b>&lt;0.001</b>
Living (0=with parents, 1= without parents)	0.13	0.51	1.1	0.4-3.1	0.79
Home city (0=capital, 1=non-capital)	-1.55	0.53	<b>0.2</b>	<b>0.0-0.6</b>	<b>0.004</b>
Marital status (0=single, 1=married)	-0.39	0.40	0.7	0.3-1.4	0.32
Spending free time (0=not alone, 1=alone)	2.37	0.42	<b>10.7</b>	<b>4.7-24</b>	<b>&lt;0.001</b>
Constant and goodness of fit <sup>1</sup> (P)	-10.2	1.98			<i>P</i> <0.001

<sup>1</sup> Hosmer-Lemeshow test

<sup>2</sup> Using at least one of hashish, opium, marijuana, bhang, cocaine, burned opium, sedative or narcotic drugs, Ritalin