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RESEARCH ARTICLE

Experience Assessment of Tobacco Smoking, Alcohol Drinking, and Substance Use Among Shahroud University Students by Crosswise Model Estimation –The Alarm to Families

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Abstract:

Background

In this study, we considered to determine the estimation of experience of substance use, cigarette smoking, and alcohol drinking among Iranian students, using the crosswise model estimation.

Methods

The Cross-sectional study was done in November 2012 to February 2013. A total of 1500 students were selected from Shahroud Universities, using multistage sampling. Three pairs of questions were designed, based on the crosswise model, and the questionnaire was presented to the students after written consent forms were obtained. Data were analyzed using χ^2 , t-test and crosswise test.

Results

The Mean \pm SD age of girls was 20.26 ± 1.49 vs boys 20.32 ± 1.575 . Based on the findings, the prevalence of cigarette smoking, alcohol drinking, and substance abuse among students was 20%, 33%, and 7%, respectively.

Conclusion

Considering the high prevalence of drug use among Iranian students and the unbiased design of this study, it is suggested that the necessary skills be incorporated and introduced in the school curriculum for students at primary schools.

Keywords: Adolescent, Alcohol, Epidemiology, Smoking, Public health, Addiction.

Article History

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1. INTRODUCTION

Illegal drug use is now considered as one of the most important social, political, and health challenges in different countries around the world including Iran. Due to its geographical location and young population, Iran is majorly exposed to this global problem [1]. According to statistics, the rate of drug use in Iran imposed a heavy burden on the health care system [2].

According to various studies, people start to smoke cigarettes and use drugs at the age of 15 or 17 years. Teenagers normally start with the use of legal substances such as tobacco and then turn to illegal substances such as alcohol and drug [3 - 5]. Several studies have reported reduced age of the onset of substance use [4, 6]. Based on a report in 2014, 27million people, aged 12 years or older, had used some type of illegal substance over the past 30 days. In addition, 66.9 million people were current users of tobacco and alcohol, and 139.70 million cases had used these substances over the past month. Based on a previous study on Karaj University students, the prevalence of tobacco smoking, alcohol drinking, and use of recreational drugs, were estimated at 9%, 9.5%, 7%, and 4.87%,

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respectively [4]. On the other hand, in Isfahan, the prevalence of ecstasy use was reported to be 2.2%, while the prevalence of tobacco smoking was 8.1% [6]. All the discussed studies have evaluated the prevalence of substance use, Alcohol consumption and tobacco smoking, using direct questions [1, 2, 4]. All the discussed studies have evaluated the prevalence of drug use, smoking, and alcohol using direct questions. When encountering sensitive questions in direct, people may avoid giving an honest answer for reasons such as fear, mistrust, and guilt. Consequently, the reliability of the findings is compromised due to regular deviation from the actual state. In this method, two questions, *i.e.*, one sensitive and one insensitive question (independent of the sensitive question), are presented to the respondent. This method is easier for the respondent to comprehend, and is more convenient to implement; also, the negative response bias seems to be less frequent [7]. With this background in mind, in this study, we aimed to investigate the prevalence of experience of tobacco smoking, alcohol drinking, and substance use among Iranian students by the crosswise model analysis.

2. METHODS

This was a cross sectional study conducted in November 2012 to February 2013. After acceptance of the ethical committee (code 890/08) of Shahroud University of Medical Sciences, a total of 1500 samples were selected through multi-stage sampling. The sample size was considered as 50% of the rate of prevalence and given that the use of cluster sampling was on the agenda, the design effect = 2 with a response rate = 80% and considering an error type I of 0.05, 1000 persons were enrolled. But as it considered sensitive questions including drug abuse and alcohol to be used by a crosswise method, 50% was added to the sample size and finally, 1500 students were enrolled in the study. Students were selected from all Shahroud Universities (6 universities). Because the number of university students varied from 400 to 9,000; consequently, more clusters were selected from universities with more students. Each classroom corresponded to one cluster. All of the 6 universities were included in the sampling.

After obtaining written permission from the universities and informing the authorities, classes held on the day of the researcher's visit were randomly selected through drawing lots. After selecting the classes, the aim of the study was explained to the university instructor and the coordination requirements were met.

The last 15 min of the class was devoted to completing the questionnaires. After entering the classroom, the researcher introduced herself to the students. After describing the study objectives and its significance, the students were asked to voluntarily participate in the study. The students were also assured about the confidentiality of the data. For estimation of high-risk behaviors, we considered the crosswise model. This method does not require a random device, is easier for the respondent to comprehend, and is more convenient to implement. In the present study, the crosswise model consisted of pairs question for every sensitive question, including one sensitive and one insensitive. Also, every pairs question had 2 choices "A" and "B". The respondent was asked to select the

option 'A' if the answer to both questions was 'Yes' or 'No'; otherwise, he/she was asked to select option 'B'. This method does not require a random device, is easier for the respondent to comprehend, and is more convenient to implement. In the present study, the crosswise model consisted of question pairs, including one sensitive and one insensitive question (independent of one another). The pair question is given in Table 1. These questions were also used by Shamcipoor *et al.* [8] and Vakilian *et al.* [9, 10]. The prevalence of the insensitive questions was estimated at 24% in population in other studies [8 - 10]. Also, in this study, the prevalence of the second non-sensitive question (names of girls as Fatemeh, Zehra, Maryam) was estimated to be 24% according to the list of people in the Civil Status Registration. For the organization with the name Ali or Mohammad or a combination of both, the estimation of the prevalence of tobacco smoking, alcohol drinking, and substance use was obtained by Eq (1):

λ = the proportion of those who chose A

π = the proportion of those who had sexual abuse.

p = the probability of positive response to insensitive item $p = 0.24$.

$$\lambda = p\pi + (1-p)(1-\pi) \quad (1)$$

An orthogonal estimate is obtained through Eq. (2)

$$\pi = \frac{\lambda + p - 1}{2p - 1} \quad (2)$$

The variance of π is calculated as follows in Eq. (3). It should be noted that the second part of the equation is due to the insensitive item.

$$Var(\pi) = \left[\frac{\pi(1-\pi)}{n} \right] + \left[\frac{p(1-p)}{n(2p-1)^2} \right] \quad (3)$$

The collected data were analyzed with descriptive (Mean, Percent) and inferential tests, (independent t-test, χ^2 , and Crosswise test) using SPSS 18 and STATA softwares.

3. RESULTS

Mean \pm SD age of girls was 20.26 ± 1.49 vs boys 20.32 ± 1.575 , with 919(62.1%) being females and 539(36.1%) males. The other demographic characteristics of the participants are presented in Table 2. Crosswise test showed that 20% college youth had experienced tobacco smoking. Also, 33% and 7% had experienced alcohol and substance use respectively. Difference between females and males is given in Table 3.

4. DISCUSSION

The prevalence of alcohol consumption has been reported to be higher than tobacco smoking. According to the results of the present study, 27% of girls and 39% of boys had a previous experience of alcohol use during their lives. Today, the prevalence of tobacco smoking and alcohol drinking is on the rise in Iran. Although the use of alcohol is illegal in our country due to Islamic restrictions [4, 6], its consumption has increased among young Iranians [6]. In previous research, the

Table 1. Items in the crosswise model questionnaire.

Items	Question Pairs	Answers
1	- Please recall the cell phone number of one of your friends or acquaintances. Is the last digit, 1, 2 or 3 ? - Have you ever used drugs?	A- if the answer to two sensitive and insensitive questions was “yes” or “No” B- “yes” to one of them and “no” to another one
2	- Please think about one of your female friends or acquaintances. Is her name Fateme, Zahra, or Maryam (either singularly or in combination with other names)? - Have you ever drunk alcohol?”	A- if the answer to two sensitive and insensitive questions was “yes” or “No” B- “yes” to one of them and “no” to another one
3	- Please recall the number of your father’s (or one of your acquaintances’) house. Is the right digit 2, 4, or 6? - Have you ever smoked cigarettes?	A- if the answer to two sensitive and insensitive questions was “yes” or “No” B- “yes” to one of them and “no” to another one

Table 2. Demographic characteristics of the students at Shahroud universities divided

Group Variables		Female N (%)	Male N (%)	*P-value
Marital status	Married	138(15.2)	29(5.5)	0.001
	Single	771(84.8)	498(94.5)	
Father’s occupation	Employed	835(93.7)	481(92.5)	0.380
	Unemployed	84(6.3)	58(7.5)	
Mother’s occupation	Housewife	760(83.1)	443(83.4)	0.884
Household status	With partner	60(6.7)	9(1.8)	0.001
	With family	336(37.3)	330(64.6)	
Birth order in the family	First	273(29.8)	195(37)	0.015
	Middle	312(34.3)	161(30.2)	
	Last	329(35.9)	178(33.8)	
Place of residence	City	816(91.7)	462(91.3)	0.842
	Village	74(8.3)	44(8.7)	
Life skill training	Yes	326(35.5)	199(37.2)	0.007
Participation in religious ceremonies over the past 12 months	Never	62(6.8)	37(7.0)	0.001
	Hardly ever	257(28.2)	122(22.9)	
	Sometimes	407(44.7)	212(39.8)	
	Often	185(20.3)	161(30.3)	

Table 3. The prevalence of experience of high-risk behaviors among female and male students in Shahroud universities (×100).

Variable Group	Tobacco Smoking		Alcohol Drinking		Drug Use	
	(n)	Confidence Interval	(n)	Confidence Interval	(n)	Confidence Interval
Female	14	6-22	37	31-43	2	(-5, 10)
Male	32	21-43	39	31-48	19	(7,31)
Total	20	14-27	33	33-43	7	(0.7,13)
*P-value	0.04		0.03		0.04	

prevalence of alcohol use was estimated at 7% [11], while in the present study, the prevalence was reported to be 33% (without bias); therefore, the increased rate of alcohol consumption was confirmed in our study.

In addition, in another study, the highest frequency of alcohol abuse was reported among school students, as well as those aged 20-22 years [12]. Several studies have shown that alcohol consumption is more prevalent in large cities than in

small towns. Previous reports have presented prevalence rates of 15.5%, 11 %, Tehran, Kerman, respectively. Also, in these studies, the prevalence was lower among women than men [6, 13].

Alcohol consumption has negative consequences for girls, such as increased testosterone level, which leads to menstrual disturbances and infertility [14]. In men, an average rate of consumption increases the testosterone level, although it does

not change sperm quality. Nevertheless, based on a previous study, using 20 units of alcohol per week could affect sperm quality [15]. In fact, one of the reasons for increased infertility in Iran might be alcohol abuse during adolescence, which calls for further research in this area.

In the present study, 14% of female and 22% of male students had a prior history of tobacco smoking. In studies conducted in 43 countries, the prevalence of tobacco smoking varied from 1% to 39.6%. According to the literature, the prevalence of smoking varies in different communities, depending on the cultural, social, and economic factors [16]. Also, the consumption rate seems to vary in different cities of Iran, with rates ranging from 2.3% in Zahedan to 39.6% in Tehran [17].

Investigations show that drug addiction starts with smoking cigarettes [18]. Smoking can threaten the reproductive health of girls and increase the risk of cervical and ovarian cancer in middle age [19]. Therefore, considering the high prevalence of smoking in Iranian girls, if proper planning is not established to prevent smoking among girls, chronic diseases and reduced fertility can be expected in the future.

In this study, the prevalence of drug use was reported to be 19% in boys and 2% in girls. Nahvizadeh *et al.* conducted a review study in which they showed that a study conducted in Kerman, Iran in 2006, the prevalence of drug abuse was reported to be 26.5% and 11.5% among boys and girls, respectively. Also, in Zanjan, Iran 2010, the prevalence rate was reported to be 11.2% among high school students. In this study, opium and cannabis were the most frequently used illegal substances [20]. In all the of the mentioned studies in Iran, lower rates of drug abuse were reported among young girls in comparison with boys [6, 17]; the same finding was reported in the present study. However, despite the lower rates of drug abuse among girls, the risks can be major for their health [18]. Previous studies show that alcohol and drugs can increase high-risk sexual behaviors among the youth [19] and lead to an increased prevalence of HIV infection in countries [21].

CONCLUSION

Considering the high prevalence of substance use, alcohol consumption and tobacco smoking among Iranian students and the unbiased design of this study, necessary skills should be incorporated in the school curriculum for adolescents at primary schools.

Limitations and suggestions: Using the indirect method for data gathering (crosswise model) was a strong point. Also, this method is a limitation too. Because we could not evaluate the relationship between demographic characteristics of students to using substance, alcohol use and smoking. Researchers recommend using crosswise model for sensitive subjects such as violence and sexual abuse.

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

The study was approved by the Ethical committee (cod 890/08) of Shahroud University of Medical Sciences.

HUMAN AND ANIMAL RIGHTS

No animals were used in this research. All human research procedures followed were in accordance with the ethical standards of the committee responsible for human experimentation (institutional and national), and with the Helsinki Declaration of 1975, as revised in 2013.

CONSENT FOR PUBLICATION

Written informed consent was obtained from all the participants.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest, financial or otherwise.

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