

Is there a gender difference in associates of adolescents' lifetime illicit drug use in Tehran, Iran?

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Abstract

Introduction: Information regarding gender differences in drug use of adolescents is essential for designing gender-specific drug prevention policies. This study was conducted in high school students in Tehran, Iran, in 2007. Here, we report the gender differences in lifetime prevalence as well as psychosocial associates of drug use.

Material and methods: This was a gender analysis of the data collected in a drug use survey conducted in a random sample of high school adolescents (573 boys and 551 girls) in Tehran, Iran, 2007. Demographic characteristics, parental and peers' substance use, school performance, religious beliefs, attachment, self-esteem and emotional intelligence (EI) were entered in logistic regression analyses to predict the lifetime illicit drug use in boy and girls, separately.

Results: Boys were more likely to report lifetime illicit drug use than girls (10.1% vs. 6.4%, $p = 0.023$). Differences in the risk profile associated with lifetime illicit drug use by gender included history of substance use in the family, higher score of attachment, and having an employed mother as predictors of substance use in boys, but not girls.

Conclusions: Understanding this gender difference in predictors of lifetime use of illicit drugs in high school adolescents facilitates the design of gender-sensitive drug use preventive programmes. It seems that family variables may have more value in prevention of illicit drug use in male adolescents.

Key words: adolescents, substance use, predictors, gender.

Introduction

The negative impact of substance use on physical and mental health [1, 2] parallel with its widespread consequences in the period of adolescence [3] leads researchers to widely investigate substance use and its prevalence and predictors in this age group [4].

A review of the literature in evidence derived from developed countries mostly points to having a disrupted family, a history of substance use by their parents as well as peers [2-4], the mutual parent-child relationship and their attachments [2], and emotional intelligence (EI) as important predictors of substance use and dependency [5].

Gender has been shown to be associated with substance use in adolescents [2, 6, 7]. While some studies have shown a predictive effect of gender on substance use in adolescents [2, 8], some other studies have

shown that this difference is not always present in different cultures and societies [9]. Studies have shown that drug use has different risk factors in different genders [10, 11]. Nevertheless, further research is needed to demonstrate that different predictors of substance use in male and female adolescents separately are always present.

There are very few published studies on epidemiology of drug abuse in adolescents in Iran. According to one study conducted in both genders in Tehran in 2000, about 15% reported usage of illicit drugs ever in their lives: opium (3.5%), marijuana (3.8%), heroin (2%), LSD (0.5%), cocaine (1%), and morphine (0.8%). Substance use was significantly higher among males than females and seeking pleasure and release of tension were the most common reasons for substance use [12]. Another study in Tabriz, Iran, in male adolescents reported a lifetime prevalence of 2.0%. Studies have listed older age, having general risk-taking behaviour, higher smoking stage, having a history of self-injury and higher socioeconomic class as factors associated with student's ever use of illicit drugs [13, 14]. In Iranian male adolescents, the major predictive factor for drug use was the extent of the individual's exposure to drug use by someone else as a model. Such models are more likely to be adult family members than the adolescent's age peers, opposite to the situation which is usually found in Europe and America [15]. In both adolescents and adults, drugs are the most important agents of acute poisoning in this country (69%), especially sedative-hypnotics followed by opiates (12%). Drugs were at the top of the list of causes of poisoning-related death in this country [16]. Opiates and other illicit drugs are among the causes of poisonings in Iran, in both genders [17].

Herein, we report the gender differences in predictive factors of lifetime illicit drug use in high school adolescents in Tehran, Iran, 2007.

Material and methods

Subjects and methods

This is a secondary analysis of a lifetime drug use survey in school-attending adolescents selected from 20 public high schools in Tehran, the capital of Iran, from January to March 2007. Participants were defined as adolescents on the basis of their age: from 11 to 18 years old. The study was approved ethically by the ethics committee of the Research Centre for Substance Abuse and Dependence (Darius Institute) and the Ministry of Education of the Islamic Republic of Iran. Verbal consent was obtained from respondents and they were reassured that their answers would be confidential.

Samples and sampling

For this survey, sampling was done using a cluster random sampling strategy. As 19 city zones exist in Tehran, we sampled 3 schools from each city zone to have a total of 57 schools from all parts of the city. We used the list of all public high schools in the city which was obtained from Tehran Education Organization for this sampling. In the next step of sampling, using computer-generated random numbers, we invited 21 randomly selected participants from each school (600 males and 600 females were invited in total). In Iran, girls and boys go to separate schools; therefore, 28 schools for boys and 29 schools for girls were selected. Sample size was calculated using the following formula for determining proportions: $n = Nz2P(1 - P)/[(N - 1)d2 + z2P(1 - P)]$, considering $N = 457\ 056$ (obtained from Tehran Education Organization), $z = 1.96$, $p = 0.5$, and $d = 0.05$. The value $n = 384$ was multiplied by 3 (number of grades) and we came to the total sample of 1152 for both genders in all grades.

From this total, 1124 students participated in the study (97.60%). This number included 573 boys (51.0%) and 551 girls (49.0%).

Process

The interviews were done by trained interviewers in school, in the class and privately without the presence of school directors and teachers. Each interview was carried out by one of two (one male and one female) research assistants, who had a background in research and data collection in the field of drug use and had perused the study protocol and undergone a training session regarding the study questionnaires. Each interview took about 1 : 30-2 h for each subject. Participants were highly cooperative, although a large number of questions were asked via interview.

Measures

Predictors

An anonymous checklist was used to gather variables on demographic characteristics of adolescents such as work of mother and father, being a single child of the family (without any siblings), having an intact family (with both parents present in the family), as well as substance related variables such as family history of cigarette and substance use, peers' history of cigarette and substance use and seeing someone using substances (dichotomous answers: yes/no). Their school performance was scored via 3 questions on their total average grade during the previous year (less than 10 = 1, 11 to 12 = 2, 13 to 15 = 3, 16 to

18 = 4, and 19 to 20 = 5), their self-reported school performance (excellent = 4, good = 3, moderate = 2 and poor = 1) and what they believed about their school performance (to be excellent = 4, good = 3, moderate = 2 and poor = 1). For their religious beliefs, 5 questions on self-reported religious beliefs (strongly = 4, moderately = 3, a little = 2, and not at all = 1), how important this belief is in their life (a lot = 4, to some extent = 3, a little = 2, and never = 1), religious practice (a lot = 4, to some extent = 3, a little = 2, and never = 1) and how often their religious beliefs help them (a lot = 4, to some extent = 3, a little = 2, and never = 1) and if they encourage others to have religious beliefs (a lot = 4, to some extent = 3, a little = 2, and never = 1). Higher score for school performance and religious beliefs meant a better performance in school and being more religious.

The following questionnaires were used to assess attachment, self-esteem and emotional intelligence of the participants:

1. Modified version of Collins and Reed Inventory on attachment [18] for Iranian society with 75 items to calculate the total and scaled attachment score of adolescents. This inventory was in three parts (attachment to father, mother and peers), each of them consisting of 25 questions. Each question was measured on a 5-point Likert scale (almost always = 5, usually = 4, often = 3, rarely = 2, almost never = 1). The above-mentioned inventory was validated by Pakdaman *et al.* by performing a test-retest study with one-month interval and the correlation coefficient was reported to be 0.75 [19]. Cronbach's coefficient alpha for the above-mentioned attachment scale was 0.72 in this study.
2. Coopersmith Self-esteem Inventory for adolescents, with 58 items (with yes/no answer for each question) to calculate the total self-esteem score by defining their attitude towards themselves in social, academic, familial and social areas of life. A high score in this questionnaire means high self-esteem [20]. The Farsi version of this simple, easy to answer and understandable questionnaire, with an acceptable reliability and validity in the Iranian population, was used [21, 22]. Cronbach's coefficient α of this Farsi version of the mentioned questionnaire was 0.82 in this study.
3. Bar-On Emotional Quotient Inventory, a 133-item questionnaire to evaluate the total EI scores of the students by measuring intrapersonal, interpersonal, stress management, adaptability and general mood with a 5-point Likert scale (almost always = 5, usually = 4, often = 3, rarely = 2, almost never = 1) [23]. The Farsi version of this questionnaire was validated in the Iranian population by Dehshiri [24] and mean

reliability of it was reported to be 0.73. Cronbach's α for this questionnaire in the present study was 0.93.

Outcome variables

The dependent variable was the self-reported lifetime use of illicit drugs. The outcome was assessed using the following question: "Until now, have you ever tried drugs, such as marijuana, opium, heroin, amphetamines, ecstasy, or other illegal substances?" [25]. A similar item has been used in previous research on lifetime drug use of adolescents in Iran [12, 13].

The type of illicit substances and the frequency of use were not asked because of prohibiting regulations of the Ministry of Education in the Islamic Republic of Iran. As a result, substance use in the previous month/year or on a regular basis were not considered.

Statistical analysis

We first used the χ^2 test and *t*-test to analyse the relations between demographic characteristics such as having religious beliefs and school performance as well as variables reflecting parents or peer effect, self-esteem, attachment and EI scores and the dependent variable: lifetime self-reported substance use by adolescents. These analyses were done separately in boys and girls to determine the differences between genders. In the next step, the mentioned variables were entered into logistic regression analyses to predict the substance use separately in boy and girl adolescents. The missing data were relatively few. The data were analysed by using the SPSS statistical package and a *p* value less than 0.05 was considered significant.

Code of ethics

Before starting the study, all participants were given information about the purpose of the study. Verbal consent' names were not recorded to assure confidentiality. All participants were informed that they could withdraw consent at any time during the interview, by either choosing not to participate or by leaving it. We believe that we have conducted this study according to the 'Ethical Principles for Medical Research Involving Human Subjects' of the Helsinki Declaration [26].

Results

Total participants

The mean age of boys and girls was 16.1 \pm 1.0 and 15.9 \pm 1.0, respectively. The age distribution and their grades in high school are summarized for the two genders separately in Table I.

From the total of 573 boys, 58 students (10.1%) reported a history of illicit substance use. This proportion was 35 out of 548 (6.4%) for girls. The

difference between the genders regarding the self-reported history of illicit substance use was statistically significant (p -value = 0.023).

Table I. Age distribution and school grades of boys and girls

	Boys (N = 573) n (%)	Girls (N = 551) n (%)
Age		
14 years old or less	18 (3.1%)	39 (7.1%)
15 years old	155 (27.1%)	170 (30.9%)
16 years old	194 (33.9%)	199 (36.1%)
17 years old	156 (27.2%)	116 (21.1%)
18 years old	50 (8.7%)	27 (4.9%)
Grade in High School		
First grade	76 (13.3%)	350 (63.5%)
Second grade	217 (37.9%)	128 (23.2%)
Third grade	280 (48.9%)	73 (13.2%)
Family income level		
More than 400 US \$	275 (47.9%)	270 (49.0%)
400 US \$ or less	298 (52.1%)	281 (51.0%)
Religion		
Muslim	556 (97.0%)	543 (98.5%)
Others	17 (3.0%)	8 (1.5%)

Gender differences in predictors of lifetime illicit drug use

In the regression analyses conducted separately in boys and girls, some predictors of self-reported history of substance use remained in the model, for boys, but not girls. These included history of substance use in the family (RR = 11.0), attachment (RR = 1.023), and employment of mother (RR = 0.299). These variables did not remain in the regression model in girls (Table III).

Discussion

In a representative sample of high schools in Tehran, Iran, in 2007, gender affects not only the lifetime prevalence of drug use, but also its psychosocial predictors. Boys were more likely to report lifetime drug use than girls, and three family-related variables, namely having a history of substance use in the family, work of the mother and attachment were risk factors of lifetime drug use only in boys.

Gender difference regarding substance use during adolescence is a controversial subject in the literature. While some researchers provide evidence

Table II. Associating factors with self-reported history of substance use in boys and girls

	Boys (n = 573)			Girls (n = 551)		
	With history of substance use	Without history of substance use	Value of p	With history of substance use	Without history of substance use	Value of p
	Percent 95% CI	Percent 95% CI		Percent 95% CI	Percent 95% CI	
Having intact family	86.2 (77.3-95.1)	94.5 (92.5-96.5)	0.014	100 (92.4-96.4)	94.3 (92.4-96.4)	0.148
Employed mother	32.8 (20.7-44.8)	19.6 (16.1-23.0)	0.020	20.0 (6.8-33.3)	18.4 (15.0-21.8)	0.809
Employed father	94.6 (88.7-100.5)	97.8 (96.5-99.1)	0.151	97.1 (91.6-102.7)	97.8 (96.5-99.0)	0.809
Being single child of family	43.1 (30.4-55.8)	33.4 (29.3-37.5)	0.140	60.0 (43.8-76.2)	36.8 (32.7-41.0)	0.006
History of cigarette smoking in family	53.4 (40.6-66.3)	42.7 (38.5-47.0)	0.118	42.9 (26.5-59.3)	35.9 (31.7-41.0)	0.405
History of substance use in family	37.9 (25.4-50.4)	5.2 (3.3-7.2)	< 0.001	14.3 (2.7-25.9)	9.2 (6.7-11.7)	0.395
History of substance use in peers	86.2 (77.3-95.1)	57.3 (53.0-61.1)	< 0.001	66.7 (50.6-82.8)	31.1 (27.1-35.1)	< 0.001
Exposure to substance use by others	93.1 (96.6-99.6)	51.9 (47.5-56.2)	< 0.001	77.1 (63.2-91.0)	44.2 (39.9-48.5)	< 0.001

Table III. Associating factors with self-reported history of substance use in boys and girls

	Boys			Girls		
	With history of substance use	Without history of substance use	Value of <i>p</i>	With history of substance use	Without history of substance use	Value of <i>p</i>
	Mean (95% CI)	Mean (95% CI)		Mean (95% CI)	Mean (95% CI)	
School performance	7.2 (6.7-7.6)	8.9 (8.8-9.1)	< 0.001**	7.4 (6.9-7.9)	9.6 (9.5-9.8)	< 0.001**
Religious beliefs	15.0 (14.1-15.9)	16.9 (16.7-17.1)	< 0.001**	14.5 (13.7-15.3)	16.6 (16.3-16.8)	< 0.001**
Total score of self-esteem	28.8 (26.4-31.1)	36.9 (36.1-37.6)	< 0.001**	30.6 (27.2-34.0)	37.7 (36.9-38.5)	< 0.001**
Total score of attachment	229.0 (219.9-238.2)	264.5 (261.5-267.4)	< 0.001**	230.5 (217.3-243.5)	269.7 (266.5-272.9)	< 0.001**
Total score of emotional intelligence	403.0 (388.6-417.5)	466.9 (462.2-471.5)	< 0.001**	404.4 (380.5-428.3)	458.1 (453.7-462.7)	< 0.001**

p* value < 0.05 by χ^2 test, *p* value < 0.05 by t-test

of a difference between genders regarding time of initiation, type of substance and other characteristics of substance use [27, 28], some others believe that this difference is mostly influenced by culture and background [29].

Most of the studies focusing on gender differences in drug use have named gender as an important predictor of substance use [6, 7, 27, 30], and this effect may be explained by many psychological, cognitive and behavioural differences between males and females [8]. The predictive effect of gender for substance use is explained by

dissimilar reasons of boys and girls to initiate and continue substance use [7]. In total, substance use is sex-related (puberty), gender-specific (environmental tobacco smoking, alcohol consumption, drug abuse) and is affected by sex/gender (regular sexual intercourse) [31].

Drug control policy makers in most countries hope for a lower prevalence of drug use in females in their served society. However, they are aware of the global growing pattern of a substance use epidemic in females [28]. In a few countries, with no significant gender difference in lifetime illicit

Table IV. Gender-sensitive predictive factors for substance use in adolescents

	Boys			Girls		
	RR	CI (95%)	Value of <i>p</i>	RR	CI (95%)	Value of <i>p</i>
Exposure to substance use by others	3.461	1.091-10.979	0.035	4.354	1.360-13.942	0.013
History of substance use in peers	5.021	1.559-16.172	0.007	4.095	1.433-11.705	0.009
Poorer school performance	1.391	1.105-1.753	0.005	2.000	1.424-2.808	< 0.001
Lower score of emotional intelligence	1.014	1.007-1.021	< 0.001	1.023	1.012-1.034	< 0.001
Family history of substance use	11.000	3.605-33.566	< 0.001	–	–	–
Employed mother	1.299	1.115-1.776	0.013	–	–	–
Lower score of attachment	1.023	1.008-1.038	0.002	–	–	–

drug use [32], the lack of gender differences has warned of the rapidly increasing drug availability for women [33].

In both genders, better school performance was associated with substance use. Although most studies report a link between academic problems such as school dropout or absenteeism [34], we explain our findings with the effect of "study drugs" which enhance academic performance [35]. Some students use stimulants, such as Ritalin or amphetamines, to improve concentration, increase alertness, and obtain a high mood. A proportion of students used drugs "to study" [36].

We have found that the effect of family (positive family history of substance use and work of the mother and attachment) was a predictor of lifetime drug use in boys only and not girls. One study showed that the most influential familial interaction factor in this regard is the time spent with family [37].

An employed mother was also a risk factor of drug involvement in boys, not girls. According to one study, among parental factors, the employment status of the parents was shown to play a significant role in substance use of neither boys nor girls [38]. However, parental factors have a predictive effect of substance use in adolescents [27]. A close relationship with parents is believed to be a protective factor. Substance use may be more frequent among adolescents who are more disengaged from traditional social cultures (such as family) and look for links outside the family such as peer groups [27]. However, most studies show that this effect is present in both boys and girls in a similar pattern [4, 39]. There is strong evidence that an intact family is a crucial factor in substance use of adolescents.

Some studies show that an intact family is a predictor for substance use neither in girls nor boys [27]. On the other hand, some others show this effect in girls [40, 41]. The relationship between child and parents is an important component of the parental factor in substance use by adolescents. Closeness of parents to their children reduces the risk of substance use in adolescents [42, 43]. This fact is present even when the parents are divorced but each of them continues their close relationship and shows enough attention and love to their children [9].

Based on the results of the current study, a history of substance use in the family was only a risk factor for drug use in boys and not girls. According to the literature, illicit drug use in parents is highly associated with substance use in adolescents [2, 41]. But in contrast to our study, one study reported this link to be more important in girls [44].

Attachment to father, mother and friends is also an important predictor of substance use in

adolescents. A good attachment between child and parents leads them to have a good mutually affectionate, conflict-free relationship that can support adolescents to be well-adjusted individuals who do not use substances [2]. In this study, we considered the effects of parents and peers as their history of cigarette and substance use as well as work of each parent separately in boys and girls.

Also, attachment was a predictor of substance use among boys but not girls. These results show the prominent importance of the effect of family characteristics on the behaviour of boys, rather than that of girls. One study reports parental supervision to be more important in relation to males' than females' history of drug use [45].

The gender differences in predictors of drug use in adolescents show that gender is a key factor in approaching drug prevention in male and female adolescents. This will generate important new insights into how drug use is initiated in boys and girls. This information can be used to design selective preventive strategies [46], which are recommended for decreasing the high community burden of drug use [47], especially for countries with limited resources. Such substance abuse prevention programmes are regularly implemented in some countries worldwide, and they have shown promising results [48-50]. Such gender-specific interventions for drug use prevention have been suggested elsewhere as well [51]. Unfortunately, currently, strategies of drug prevention in Iran are not evidence based.

These gender differences in substance consumption should be taken into account in the development of preventive and treatment strategies for undergraduate university students [52]. Sex differences have been observed in the development of drug addiction and relapse to drug taking [53]. Compared to male subjects, female subjects were younger, were less educated, had higher rates of unemployment and had earlier onset of illicit drug use. Female subjects were 11-fold more likely than male subjects to exhibit suicidal behaviour. Among heroin abusers in the present study, female subjects were more widely exposed to unfavourable social factors and had a substantially higher incidence of suicidal behaviour than male subjects. Drug treatment centres should be aware of the gender differences and pay particular attention to different patterns of drug use and its outcomes among male and female drug abusers [54]. Some studies report poorer outcome for males [55] and some others for females [54]. Males and females may have different experience of relapse in substance use treatment [56] and behavioural changes due to drugs [57].

Analysis revealed that women are significantly more likely than men to use any prescribed drug, and that this gender difference is primarily driven

by women's increased risk for narcotic analgesic and minor tranquilizer non-medical use. Other factors, such as race, age, health status, and other substance use, are also significant predictors of non-medical use. Findings from this study will enable researchers as well as policy makers and providers to have a greater understanding of non-medical drug use patterns and support greater gender sensitivity in the prevention, education, and treatment of non-medical prescription drug use [58].

Similarly to other studies, the present study has some limitations, such as measurement bias [27] and relying on self-reported drug use (which is reported as valid among teenagers) [59]. The cross-sectional design of most of these studies does not allow aetiological inferences. However, we should keep in mind that it is better not to consider only adolescents in school, although some other studies did the same [31, 32]. With this method, we should be careful about the interpretation of the results of the present study. Positive points in our study may include high response rate, equal sample size in genders and considering a wide range of associating factors of substance use in adolescents at the same time. It should be mentioned that although there are large databases in western developed countries on substance use in adolescents, there is a lack of data in low and middle income countries. In contrast to developed countries with known predictors for adolescent substance use, much remains to understand about predictors in developing countries [2].

In conclusion, the prevalence of lifetime drug use is higher in male than female high school adolescents in Tehran, Iran. In addition, the gender difference in psychosocial associated factors necessitates gender-sensitive drug control policies to be designed for illicit drug use prevention. According to the current results, family data may be more important in prevention of drug use in boys than in girls.

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