

Gender differences in substance use patterns and disorders among an Iranian patient sample receiving methadone maintenance treatmentAmir Ghaderi¹, Maryam Motmaen², Iraj Abdi³, Morad Rasouli-Azad^{4,5}

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Type of article: Original**Abstract**

Background: The current prevalence rate of substance abuse and dependence, represents an increasing trend of substance abuse and dependence among women, and the results of epidemiology studies indicate that substance use patterns are different between men and women. This study aimed to determine gender differences in substance use patterns and disorders among the patients undergoing methadone maintenance treatment.

Methods: This cross-sectional study was conducted throughout a specified time bracket ranging from September 2012 through March 2013 in Methadone Maintenance Treatment (MMT) clinics of Mashhad, Iran. In this study, 140 men and 120 women were selected from among the patients referring to MMT clinics in Mashhad through purposeful sampling method. The sample units were assessed using a demographic information questionnaire and Structured Clinical Interview for Diagnostic and Statistical Manual of Mental Disorders (SCID). The data were then analyzed by Chi Square test, Mann-Whitney U test, and Independent-samples t-test. SPSS software 16 was used to conduct statistical analyses with P values less than 0.05 regarded as significant.

Results: The results showed that men and women are significantly different from each other in terms of marital status ($p=0.001$), education ($p=0.001$), income ($p=0.001$), history of injection ($p=0.002$), imprisonment ($p=0.001$), and substance use abstinence ($p=0.023$). It was also revealed that methamphetamine dependence ($p=0.017$) and simultaneous use of multiple substances ($p=0.001$) in the past 12 months were diagnosed, to a larger extent, in male participants than those in female participants. In addition, the diagnoses of nicotine dependence ($p=0.001$), cannabis abuse ($p=0.001$), heroin dependence ($p=0.001$), and substance abuse and alcohol dependence ($p=0.001$) during a lifetime were more frequently existing in males than those in females.

Conclusion: There are gender differences in substance use patterns and disorders that appear to be caused by the degree of access to substances and the impacts of cultural and social aspects on men and women in Iran.

Keywords: Iran, Gender, Opioid substitution treatment, Substance-related disorder, Methadone

1. Introduction

There is a high prevalence of narcotic drugs in Iran because eastern Iran is situated in the same region as Afghanistan (the largest opium-producing country) and is one of the main routes for drug trafficking into Europe. In

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this regard, the report released by the World Health Organization (WHO) suggests that the mean prevalence of opioid use in the general population was 0.6 to 0.8% throughout the world in 2013, while that was nearly three times larger in Iran in 2010, i.e. 2.275% (1). The prevalence of opioid use is rising in Iran and the following statistics have been reported for Iran according to the latest survey in 2011: 3.02% for at least one time use of opioids, 1.56% for opioid dependence in the past 12 months, and prevalence of using any type of illicit drugs and opioids more than 5 times in a lifetime for males respectively were 6.4 and 2.8%, which for females, was 0.54 and 0.29% that is approximately 10 to 12 times more in males (2). In Iran, opium is the most prevalent opioid (82%), followed by opium ashes (28%), methadone for non-medical usages (16.6%), heroin and heroin /cracked (16%), morphine (2.6%). Apart from opioids, the common substances that are illegally used in Iran include alcohol with a prevalence of 2% within the past 12 months in 2012 (3), cannabis with a prevalence of 1%, and methamphetamine with a prevalence of 0.5% in 2011 (2). However, the main focus has been placed upon the treatment of opioid dependence in Iran, and there exist around 5,000 Outpatient Buprenorphine or MMT clinics, that put a population of about 500,000 people under treatment (4, 5). On the other hand, substance use and dependence are also increasing among women and, accordingly, specific clinics are being established in Iran for the treatment of opioid use among women (6). Normally, the number of women referring to MMT clinics is on the rise while women constitute about 10% of the patients referring to the MMT clinics now (7). Moreover, addiction studies have shown that the routes to entering drug addiction are significantly different between men and women (8). Van Etten (9) showed that the rate of substance abuse in women is lower than that in men; however, the number of women who take legal or illegal drugs is increasing and men become dependent on opioids substance 2 to 3 times higher than women. Other studies have shown that women tend to increase the rate of heroin use faster than men in such a way that they become addicted in a shorter period of time and seek treatment process faster than men do (10). Studies have also shown that women become dependent on opioid use after the first use in a shorter time than men (11). According to the review study done by Merikangas et al. (12), it seems that gender differences are being reduced in the consumption of various substances in the West; however, the prevalence of consumption of alcohol and illicit substances in men is twice as much as that in women (13) and the severity of addiction and substance-related problems in men is higher than that in women (14, 15). Studies in Iran have examined gender differences in drug use patterns to a lesser extent. Ziaaddini and Ziaaddini (16) reported that there is a significant difference between women and men in the consumption of hashish, opium, heroin, and sedatives. The conduct of studies on substance use disorders and patterns in the women referring to MMT clinics is experiencing an increasing trend (6, 17-19); however, no such studies have been done on the difference in the prevalence of substance-related patterns and disorders between men and women in Iran. Hence, the aim of this study is to examine the gender and prevalence differences in Substance Use Patterns and Disorders among the patients referring to MMT clinics for the treatment of opioid dependence in the largest and nearest eastern city of Iran to Afghanistan.

2. Material and Methods

This cross-sectional study was done between September 2012 and March 2013. The only inclusion criteria were diagnosis of opioids dependence disorder (opium, opium ashes, heroin and cracked heroin), and being satisfied to participate in the study. Two hundred and sixty patients (140 males and 120 females) who referred to legal MMT clinics of Mashhad were selected as participants. The exclusion criteria were; having psychotic and mania episode, imprisonment and the presence of one of the borderline personality trait disorders or antisocial personality disorders in Axis II that is diagnosed by the psychiatrist of the clinics. Samples were collected in 22 clinics (2 governmental and 20 private clinics) by multistage cluster sampling. The sample group was assessed by trained clinical psychologists by means of a structured demographic questionnaire and Structured Clinical Interview for DSM-IV (SCID-I, SCID-II). This interview has two sections for all substances, current diagnosis and life time diagnosis. The psychometric characteristics of this instrument were reported appropriate in the Iranian community (20). Diagnostic agreements between test and retest SCID administration were good for most diagnostic categories. For current diagnoses, weighted κ was 0.52 and for lifetime diagnoses was 0.55. Weighted κ for current opioid dependence and any substance-related disorders respectively was 0.84 and 0.71. Specificity values for opioid dependence and abuse and any substance-related disorders were 0.95, and sensitivity values for diagnosis of opioid abuse and dependence and any substance-related disorders respectively were 0.64 and 0.54. Long-life substance abuse and dependence within the last 12 months were assessed by SCID-I. The structured demographic questionnaire was used to obtain demographic data and patterns of substance use. This questionnaire includes information on age, occupation, marital status, education, income, job status, age of the first illicit drug use and onset of the dependence, daily cost of substance use, the first use of an illicit substance, history of injection, substance use abstinence and incarceration, route of latest substance use, and illicit substance use by family member. This research was carried out in accordance with the Declaration of Helsinki and all participants in the study were enrolled on a voluntary basis, and

informed consent was obtained for all interviews. Chi Square test, Mann-Whitney U test, and Independent-samples t-test were used to compare the two groups. SPSS software 16 was used to conduct statistical analyses with P values less than 0.05 regarded as significant.

3. Results

The sample group of this study included 260 patients, wherein the male participants, 22 were laborers, 6 were employed, 17 were drivers, 40 were self-employed, 3 had other jobs, and 9 were unemployed. There was no significant difference between the two groups in terms of age ($p=0.41$). The comparison of men and women showed that there are statistically significant differences between them in terms of marital status ($p=0.001$), education level ($p=0.001$), and monthly income rates ($p=0.001$) (Table 1). As per Table 1, the majority of male patients were single (25%) and the women were mostly married (85%). Women were more illiterate (17.5%) and had mostly elementary education (38.3%) whereas the majority of the male patients were educated (41.4%). Monthly income of the men was higher than that of the women and 90% of women had no income ($p=0.001$), while the income rate among men equaled 40%. In terms of the age of the first consumption, males and females are different in age of onset for dependence ($p=0.001$) or age of regular consumption ($p=0.001$); males begin substance use more rapidly than females and they become dependent on substance use and regular consumers over a period of approximately 3 years. However, females experience substance use dependence in less than one year after their first use of substance. On average, females begin illegal substance use at the final part of the third decade of their life, whereas this age for males starts earlier than the third decade, that is, at 21 years. Males' daily consumption cost is higher than females ($p=0.001$); and males generally start the use of marijuana and alcohol ($p=0.001$). As for females, they begin the use of opioids (opium, opium residues, and heroine). According to Table 2, males have a richer history of injection (by 3 times), history of imprisonment (by 5 times), and substance abstinence in comparison to females. Family member use in females is higher than that in males and nearly 41% of female users have addicted spouses. In the past year of males' diagnosis, they received a higher number of poly substance dependence diagnoses, whereas females received more dependence diagnosis of opium and opium ashes (Table 2). Twelve males (8.5%) were involved in methamphetamine while only 3 females (2.5%) experienced it in the last 12 months. Males experienced a longer diagnostic life of heroin use, alcohol consumption, cannabis use, and poly substance abuse or dependency, and recent nicotine dependency compared to females. There was no difference in routes of opium administration ($p=0.15$) between males (injection: $n=42$, 30%; smoking: $n=32$, 22.8% mixed route: $n=66$, 47.2%) and females (injection: $n=40$, 33.3%; smoking: $n=48$, 40%; mixed route: $n=32$, 26.7%). On the other hand, males used more opium residues ($p=0.02$) by both injection and smoking (injection: $n=43$, 30.7%; smoking: $n=13$, 9.3%; mixed route: $n=72$, 60%), whereas females used opium residues by smoking (injection: $n=34$, 28.3%; smoking: $n=40$, 33.3%; mixed route: $n=46$, 38.4%). In terms of heroin use, males injected heroin (injection: $n=18$, 12.9%; smoking: $n=112$, 80%; mixed route: $n=10$, 7.1%) more than females (injection: $n=2$, 1.7%; smoking: $n=116$, 96.6%; mixed route: $n=2$, 1.7%); however, females smoked heroin more than males ($p=0.02$). The age of onset for dependence on nicotine, opium, and opium residues in males was lower than that in females. In addition, no difference was found between males and females in long life diagnosis of dependence on opium, opium residues, and benzodiazepine (Table 3).

Table 1. Comparing demographic characteristics in males and females

Demographic characteristics		Males (n=140) n (%)	Females (n=120) n (%)	Test value	p-value
Marital status	Married	95 (67.9)	102 (85)	21.73 ¹	0.001
	Single	35 (25)	5 (4.2)		
	Other	10 (7.1)	13 (10.8)		
Education (Years)	Illiterate	9 (6.4)	21 (17.5)	21.59 ¹	0.001
	Elementary	33 (23.6)	46 (38.3)		
	Secondary	58 (41.4)	23 (19.2)		
	High school	40 (28.6)	30 (25)		
Income (I.R. Rials per month)	without income	56 (40)	107 (89.2)	54.81 ¹	0.001
	<8.000.000	24 (17.1)	8 (6.7)		
	8.000.000-12.000.000	39 (27.9)	3 (2.5)		
	>12.000.000	21 (15)	2 (1.7)		
Age (Mean±SD)		35.6±10	36.6±9.8	0.81 ²	0.41

1: Chi-Square, 2: t-test

Table 2. Comparing variables related to substance use in males and females

Variables		Males (n=140); (Mean±SD) / n (%)	Females (n=120); (Mean±SD) / n (%)	Test value	p- value
Age of first illicit substance use #		21.7±6.9	28.6±8.7	7.12 ¹	0.001
Onset of dependence		24.7±7.8	29.4±8.8	4.56 ¹	0.001
Daily cost of substance use (I.R. Rials)		157800±66920	95250±58400	7.96 ¹	0.001
The first used substance	Marijuana	22 (15.7)	1 (0.8)	32.26 ²	0.001
	Opium	91 (65)	87 (72.5)		
	Opium ashes	10 (7.1)	18 (15)		
	Heroin or Cracked heroin	4 (2.9)	12 (10)		
	Alcohol	13 (9.3)	2 (1.7)		
History of Injection	Yes	22 (15.7)	5 (4.2)	9.25 ²	0.002
History of incarceration	Yes	35 (25)	6 (5)	19.45 ²	0.001
History of Withdrawal	Yes	91 (65)	61 (50.8)	5.44 ²	0.023
Family member consumption	No	106 (75.7)	55 (45.8)	16.65 ²	0.001
	Parents	8 (5.7)	13 (10.8)		
	Siblings	20 (14.3)	3 (2.5)		
	Spouse	6 (4.3)	49 (40.9)		

1: t-test; 2: Chi-Square; #: Alcohol is an illicit drug in Iran

Table 3. Comparing long-life diagnosis of substance use disorders in males and females

Diagnosis		Males (n=140); n (%) / Mean (±SD)	Females (n=120)	Test value	p- value	
Past year Diagnosis	Opium and opium ashes dependency	38 (27.1%)	51 (42.5%)	13.07 ¹	0.001	
	Heroin or Cracked Heroin dependency	62 (44.3%)	48 (40%)			
	Poly Substance dependency	40 (28.6%)	21 (17.5%)			
	Methamphetamine dependency #	12 (8.5%)	3 (2.5%)			
Lifelong Diagnosis	Nicotine dependency	Frequency	108 (77.1%)	47 (39.2%)	38.7 ¹	0.001
		Regular consumption age	20.1 (±6.4)	24.1 (±7.9)	3.32 ²	0.003
	Cannabis abuse and dependency	Frequency	36 (25.7%)	6 (5%)	20.46 ¹	0.001
		Onset age	18.2 (±4.1)	25.2 (±4.8)	3.78 ²	0.001
	Alcohol abuse and dependency	Frequency	32 (22.9%)	4 (3.3%)	20.64 ¹	0.001
		Onset age	18.3 (±4.5)	30.7 (±1.5)	5.41 ²	0.001
	Opioid abuse and dependency	Frequency	129 (92.1%)	109 (90.8%)	0.14 ¹	0.70
		Onset age	25 (±7.8)	29.9 (±8.9)	4.52 ²	0.001
	Heroin or Cracked heroin abuse and dependency	Frequency	100 (71.4%)	63 (52.5%)	9.89 ¹	0.001
		Onset age	30.6 (±9.2)	32.5 (±9.8)	1.25 ²	0.21
	Benzodiazepines abuse and dependency	Frequency	6 (4.2%)	11 (9.1%)	2.51 ¹	0.21
		Onset age	32.2 (±6.8)	30.4 (±9.2)	0.41 ²	0.68
	Poly substance dependency	Frequency	45 (32.1%)	22 (18.3%)	6.44 ¹	0.015
		Onset age	31.5 (±9.5)	34.9 (±8.1)	1.44 ²	0.15

1: Chi-Square, 2: t-test; #: they receive polysubstance dependence diagnosis

4. Discussion

The findings of this study showed that the two groups were significantly different from each other in demographic variables, such as sample marital status, education, and income. Most of the male patients are single but the women are mostly married; the men have higher education than the women and 90% of the women have no income and home. The results of this study are consistent with the findings reported by Dolan et al. (18), Hojjat et al. (19), Zolala et al. (21) regarding the women undergoing MMT in the capital of Iran, North Khorasan, and Kerman in the east of Iran. Low education and unemployment are considered as important factors in the prevalence of substance use, particularly in Iranian women (2, 12, 21-26). Almost 41% of the female participants had addicted husbands; and there is no significant difference between men and women regarding the history of substance use among the original family members. The economic dependence of women on their husbands (90% without income) and the patriarchal structure of Iranian families create a situation wherein substance dependent husbands are more likely to orient their wives to substance dependence; this finding is in line with those of the study conducted by Eitle & Eitle (27). About 90% of the women begin drug abuse after marriage (19). Compared to addicted men, addicted women are more likely to have sexual partners that depend on substance use and tend to become familiar with opioid substance by an older man with whom they have a close intimate relationship (28). Women may take refuge in stereotypical responses, such as the use of drugs and substance to escape from stress (29). In this study, the drug dependence of wives and original family members did not have a considerable effect on men's substance dependency. In terms of the age of the first substance use, women experience using an illegal substance approximately 7 years later than men and they succumb to regular use and receive dependence diagnosis after less than a year. This is so, while men begin taking illegal substances earlier in life than women and they develop substance use dependence after about three years of their first experience of substance use. Consistent with the findings of this study, men begin substance use earlier in adolescence and raise the dosage while women become dependent more rapidly after the beginning of the first use and quickly enter the treatment process (10, 30, 31). However, the age of the first experience of illicit substances in Europe and the United States was at teenage years and lower than that of Iran (26, 32-35) in such a way that Iranian men experience the use of illicit substance in the early third decade of their life and women experience it in the late third decade of their life (2, 18, 19, 23). In this study, opium, hashish, and alcohol were the first substances used by the male participants while opium ashes, opium, and heroin were the first substances tested by women. According to the gateway drug theory, the progress of addiction occurs in four stages. The first stage includes the use of legal drugs, such as alcohol and cigarettes. The second stage is marijuana use. The third stage is the use of illicit drugs other than marijuana. The last one is the use of prescribed medical drugs. Illegal drug use hinges upon the history of alcohol consumption in men and upon cigarette smoking or alcohol consumption regarding marijuana use in women (36). This difference in the consumption pattern of the present study with western societies may be due to the illegality of alcohol consumption in Iran (due to compliance with Islamic rules) and cultural differences in men's higher access to illicit substances than women's access to them. Moreover, the history of injection, imprisonment, and drug use abstinence were higher in men than in women. In this study, the 4% prevalence of injection history is absolutely in line with the results obtained by Hojjat et al. (19), in the neighboring province. This is so while the recent injection method among MMT individuals in Tehran has been reported to be such that about 5% turn to heroin and methamphetamine injection most frequently (23). However, in the present study, men inject methamphetamine more than women, which can be because of the higher prevalence of heroin and methamphetamine among men. Nikfarjam et al. (37) have reported the injection rate in men is approximately 15 times larger than that in women. According to a review article conducted by Rahimi-Movaghar et al. (38), the prevalence of injection is increasing in substance users in Iran and it has reached about 18%, which is close to the prevalence of injection in the male participants in the present study. The global prevalence of injection in drug users is about 40%, which is two times larger than that in Iran (1). Numerous studies have supported a higher frequency of history of imprisonment and substance use abstinence in men than those in women (32, 39-41). In connection with diagnosis in the past 12 months, women were diagnosed as opioid users (opium and opium ashes) more than men whereas men had the criteria for simultaneous dependence on polysubstances and methamphetamine. It seems that significant differences have been created regarding the diagnosis and demographic information between the last 12 months and research findings in 2000 in Iran; and the trend in substance use disorders has been changed from dependence on opium, opium ashes, and heroin to methamphetamine dependence and simultaneous dependence on polysubstances in both genders (2, 23, 37, 42). In the present study, the prevalence of nicotine dependence in men was two times as large as that in women. Research findings in various studies in Europe and the USA have been inconsistent. These studies suggest the equal prevalence of smoking in both genders (43, 44), or a higher prevalence in women (32) or in men (14, 45, 46). However, prevalence of nicotine is generally about 2 to 7 times larger in the Middle East student population (47-49) and this about twenty times larger in the general population of Iran (50). In connection with lifetime diagnoses, men held the criteria for cannabis, alcohol, and heroin abuse and dependence

more than women. However, there was no significant difference between men and women regarding the criteria for dependence on opium, opium ashes, and benzodiazepines. Lifetime cannabis dependence and abuse in men was about 5 times larger than that in women and alcohol dependence and abuse was 7 times larger in men than that in women. The prevalence of cannabis in the present study was consistent with that of the research findings obtained by Mahalik et al. (51) and Khan et al. (52). Being male, accessibility, and norms among friends and schoolmates are the most powerful predictors of marijuana smoking among American adolescents (51). Lifetime prevalence of alcohol use disorders and illegal substance use disorders are equal between adolescent American boys and girls. On the other hand, the last year prevalence of alcohol abuse and dependence and illicit substance abuse in men is twice larger than that this year (12, 14). In this research, men consumed opium ashes by multiple routes, such as eating and smoking, paid more money on a daily basis on their drug use dependence, and turned to injection for heroin use. These findings indicate the higher severity of dependence on opioids in men than women. The prevalence of lifetime use of alcohol consumption among women in this study is consistent with that of the study done by Hojjat et al. (19), even though the epidemiology of alcohol and nicotine use disorders in Iran requires more investigation. The prevalence of opiate and heroin dependency in the past year and in lifetime in MMT clinics are nearly equal to each other, which is consistent with the studies conducted by Dolan et al. (18), Hojjat et al. (19) in Iran, and Back et al. (53) in the United States. The increase of methamphetamine use among patients under methadone treatment in Iran also arises from these factors. Methamphetamine use in the general population of Iran is growing. This substance is abused, especially during the course of MMT to eliminate the side effects of methadone, to increase energy, to improve sexual performance, and advance cognitive functions (54, 55). The higher efficiency of methadone, negative result of morphine test, increased mood, and more tolerance to stressful conditions are considered the incentives to use methamphetamine in these clinics. Women consider methamphetamine use as a solution to cope with psychological problems and family conflicts. The prevalence of methamphetamine use in the present study is consistent with that in the study undertaken by Hojjat et al. (19) and stimulants are widely used by around a third of women in Tehran (18). Men's access to substances significantly increases the prevalence of using alcohol, cannabis, opiates, hallucinogens, and cocaine compared to women (56, 57). It seems that the availability of substances is a determining variable in substance use among women; and having addicted family members and women's employment, increases accessibility to substance among Iranian women and are considered risk factors for women's substance dependence. The prevalence and patterns of substance use in the United States, European countries, and even in regions of Iran are different. Southeastern, southwestern, and northeastern Iran have experienced the highest rate of consumption of opioids and illicit substances, whereas western and northwestern Iran have the lowest rate of opiate use. Unlike the prevalence of opiate use, alcohol prevalence in western and central regions of Iran takes up the highest ranking. With increased levels of substance availability in society, the consumption rate of illicit substances was increased. The entry of different substances from eastern and western borders can determine the prevalence and consumption patterns of different substances in Iran. The entrance of opiates (opium, heroin, and morphine) by smuggling from the east and alcohol from west of Iran are important factors in the availability of these substances in these areas and determine the prevalence and patterns of drug use in different regions of Iran. Regarding the limitations of the study, we should say that sample size was small in our study. Bigger sample sizes are recommended for future studies.

5. Conclusions

Women begin substance use at a later stage than men and become addicted to it more quickly, whereas men try using substance for the first time sooner than women and become dependent on it at a more later stage. In the same way, gender differences existed in gateway drugs in this study, in that women began substance use directly with opioid and the rate of cigarette smoking was less than half (40%) among them unlike men who experienced the use of cigarettes, alcohol, and marijuana for the first time for the progress of drug dependence. There are gender differences in substance use patterns and disorders and it appears that these differences are caused by the degree of access to substances and the impacts of cultural and social aspects on men and women in Iran. It is suggested that more comprehensive studies be conducted on the interactive impact of environmental, social, and cultural factors on patterns and disorders of substance use among men and women in different parts of Iran. According current study findings, substance prevention programs may differ in males and females. In females, substance dependence treatment centers are places to prevent substance onset in patient's wives and daughters. But in males, schools and low-class areas may be targeted to prevent substance use. Also, more studies need to investigate treatment response in males and females.

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Conflict of Interest:

There is no conflict of interest to be declared.

Authors' contributions:

All authors contributed to this project and article equally. All authors read and approved the final manuscript.

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