



Age of Substance Use Onset in Kermanshah Province: Results from a Large Cross-Sectional Study

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Abstract

Objectives: The aim of this study is to determine the epidemiology of substance use in terms of age of initiation, duration of use and age of patients when they seek the treatment.

Methods: This cross-sectional study was performed on drug-dependent individuals (4176 subjects), who had referred to methadone maintenance treatment (MMT) centers of Kermanshah province, western Iran, during year 2015. The information was gathered by psychologists working in substance use wards, who interviewed clients seeking treatment.

Results: Mean age of substance use initiation was 24.1 ± 8.2 year. On average, males and females became dependent on illegal drugs only after 3.6 and 2.5 year since substance use initiation, respectively. The chance of treatment failure for persons over 55 years was 2.5 (95%CI: 1.6 - 3.8) times higher than that for patients aged less than 24 years old. Generally, chance of treatment failure increased by 1.2 (1.1 to 1.3) for every one-year increase since substance use initiation.

Conclusions: Given that the age of substance use initiation is very low in Kermanshah and it has a declining trend in Iran, and has a declining trend, increase/decrease in prevalence/age of using illegal drugs is expected unless efforts are made to change status and implement preventive programs.

Keywords: Substance Use Initiation, Abuse, Substance-Related Disorders, Addiction

1. Background

Phenomenon of substance use is presently one of the major health problems worldwide (1). This phenomenon can directly or indirectly overshadow the quality of life of people in short and long term (2). Drug dependence inflicts severely deep physical and psychological damages, and also causes social harm, such as increased rates of divorce, crime, and unemployment (3). World Health Organization (WHO) identifies illegal drugs as a critical issue threatening and challenging human life seriously (1, 4).

The pattern of substance use varies widely across developed and developing countries and also varies across different regions of the country. Developing countries face considerable drug-related social problems because of a high proportion of youth population (5). Iran is a country with the highest proportion of drug abusers in the world, where substance use is the third biggest problem following inflation and unemployment (6, 7). As estimated by UN Office on Drugs and Crime (UNODC), 180 million people (of whom 4.2 million are above 15) use illegal drugs around the world (8). Although no precise data on the number of

substance users is available in Iran, one to two million has been estimated, according to official reports and field studies. This figure grew by 8% per year during the past 30 years, and age of substance use onset decreased more and more, which can be attributed to factors such as easy accessibility of illegal drugs, abundance of distribution centers, and lack of knowledge of drug detriments among young people (7).

Diagnostic and statistical manual of mental disorders-fifth edition (DSM-V) criteria for substance dependence includes several specifiers. Dependence was diagnosed when three or more dependence criteria were met. The remission category can also be used for patients receiving agonist therapy (such as methadone maintenance) or for those living in a controlled, drug-free environment (9).

Results of previous researches showed that drug abuse has no single cause and there are different individual, social, and economic factors that contribute to the tendency towards this behavior (10). Age is the most influential on individuals' dependence on illegal drugs (11). Considering the effects of age on addiction epidemiology and etiology, and given the lack of examination of patterns and

effects of age on drug dependence in Iran, this study was performed with the aim of determining the epidemiology of age of substance use initiation, duration of substance use, and age of seeking treatment as well as studying the effects of these factors on the success of drug quitting in methadone maintenance treatment (MMT) centers of western Iran. Hopefully, results from the present study will help initiation of useful steps towards framing and providing appropriate plans to prevent this predicament in the society.

2. Methods

2.1. Study Design

This cross-sectional study was performed on drug-dependent clients, whose records were available during year 2015 and who underwent treatment after they had referred to Kermanshah province MMT centers. Kermanshah is a western province of Iran, and is bordered by Iraq to the west. It has a population of more than 1700000 people.

2.2. Data Collection and Definition of Variables

After obtaining the required permits from the provincial MMT center, a list of all centers was made. There are 95 active MMT centers in the province. Forty-two centers were randomly selected. Then, all of the patients' records from 42 centers were reviewed.

Data were collected by addiction ward psychologists using interviews with all clients referring to selected centers. Information was obtained on subject's demographic, reasons why clients tend to quit using illegal drugs, treatment history, and type of illegal drug used. In the present study, age of onset of substance use was the age at which an individual began to use drugs such as alcohol, tobacco, and marijuana for the first time.

Drug dependence was assessed based on DSM-V. The most important feature of drug dependence set forth in DSM is a set of cognitive, behavioral, and psychological indications signifying that despite considerable problems caused by using illegal drugs, a person may continue using them. There exists a pattern of repeated use of drugs, which usually results in appearance of tolerance, and quit and forced substance use-related behaviors. In addition, the age at which a person begins seeking treatment to quit substance use, whether by medications or by non-medication methods, is considered as age of quitting. At MMT centers, clients need to provide urine samples monthly as prescribed by their physician and/or at requests of psychologists, whenever they are in doubt that the client is using illegal drugs. If the test is positive, this will be regarded as a failed treatment. Given that a person may be under treatment or hospitalized at several centers,

various methods such as employing four digits of clients' ID cards, in order to identify them, is used. The main inclusion criterion was treatment with methadone with at least one year and the exclusion criterion was not providing a urine test to check failed treatment.

Based on illegal drug classification, there are seven different categories, as follows:

1. Depressants: Those drugs, which slow down brain reactions such as heroin, opium, and morphine;
2. Stimulants: Those drugs, which make the nervous system work faster. Cocaine, amphetamine, methylene dioxamphetamine, methamphetamine (Ice), Ritalin, and crack (smoking form of cocaine) are examples of this category. Although crack falls in the group of stimulants, the crack available on the Iranian market is considered an opioid stimulant drug because of having synthetic opioid compositions;
3. Hallucinogens: Drugs which create states like delirium/delusion. PCP-LSD is an example;
4. Inhalants: Those drugs, which are used by inhaling, such as marijuana and glue;
5. Somnolent and Tranquillizers: These drugs are typically used to mitigate anxiety and to treat insomnia, such as benzodiazepines, including diazepam, chlordiazepoxide, lorazepam, flurazepam, etc. The second group of these sedative hypnotic drugs include barbiturates, such as phenobarbital, sec barbital, and amobarbital;
6. Opioids: This group is divided to two subgroups; (a) natural drugs like opium, opium extraction, and paregoric; and (b) synthetic drugs like morphine and similar opioids (Methadone, Laam, Propoxyphene, Daroon); and
7. Alcohol

2.3. Data Analysis

Description of data was done by using frequency, mean, and standard deviation. T-test and Chi-square tests were used to compare means and ratios, respectively. Moreover, logistic regression test was used to examine reasons why treatments failed. Variables with $P < 0.3$ at univariate model were entered into the multiple logistic regression model. Nearly 1% of data was missing, which was excluded from analyses. Significance level was set at $P < 0.05$.

3. Results

The study population consisted of 4176 subjects, of whom 4038 (96.7%) were males. Mean age was 40 ± 11.3 years for females and 40 ± 12.6 years for males, with no significant difference ($P = 0.69$). Mean age of substance use initiation was 24.1 ± 8.2 and 29.7 ± 10.5 year in males and females, respectively. Drug dependence in males and females occurred on average 3.6 and 2.5 year after drug onset,

respectively. In summary, mean age of drug dependence was 27.7 ± 8.7 and 32.2 ± 10.7 for males and females, respectively. The proportion of treatment failure was 76.9% in males and 75.4% in females. The mean age of subjects seeking treatment was 36.1 (9.1) and seeking treatment was about 9.1 (1.3) years after drug onset (Figure 1).

As shown in Table 1, there is no significant difference with respect to the types of substance used, age of substance use initiation, and age of seeking treatment.

Among 4176 clients referred to MMT centers, who were under MMT, relapse rate was 23.19%. The univariate model showed that the chance of treatment failure in males was 1.5 (1.4 - 1.7) times higher than in females. However, after adjusting the age of substance use initiation and duration of substance use, no significant difference was observed between males and females in terms of the chance of treatment failure, 1.1 (0.8 to 1.2) (Table 2).

Univariate analysis showed a significant relationship between older age of substance use initiation and higher chance of treatment failure. However, an inverse relationship was found between the age of drug dependence and treatment failure after adjusting for the duration of substance use so that the chance of treatment failure for individuals who began to use drugs at age of > 45 was 0.3 (0.2 - 0.6) times lower than that of those, who did so at age < 15 (Table 2).

The findings indicated that older individuals seeking treatment had a higher chance of treatment failure that is the chance of treatment failure in subjects above 55 years was 2.5 times more than age group of < 24 years. In summary, with increasing one year of seeking treatment the chance of treatment failure increased by 1.2 (1.1 to 1.3).

4. Discussion

Addiction is an important public health challenge threatening modern society, which, as a social problem, has always motivated individuals, organizations, and associations. The growing number of individuals addicted to illegal drugs has turned this problem to a national crisis in Iran. Something remarkable and shocking in this regard is the age of substance use initiation and of drug dependence. This study found that the age of substance use initiation has a positive skew distribution that is more than 65% of people begin to use drugs before 25 years of age. Therefore, the peak of substance use initiation with frequency of 15% is between 19 and 20 years old while less than 10% of people begin to use drugs after the age of 35. Thus, it can be said that if a person has no tendency towards using drugs until age of 35 years old, he/she has the least likelihood to drug onset. For this reason, prevalence of substance use can be reduced by implementing preventive programs for this age group, especially for individuals younger than 20

years old. Unfortunately, age of substance use initiation has been decreasing recently so that, according to results of a research evaluating drug abuse in Iran, mean age of substance use initiation decreased by three years during 2004 to 2005 (7, 12). Rostami et al. (13), in a study that compared drug-related mortality rates in different geographical regions of Iran, reported an increasing trend of the rate among the 10- to 19-year-old age group in the southwest, west, north, and northeast regions of Iran from 2006 to 2011. This declining trend of age of substance use initiation is not limited to Iran and according to the UN Office on Drugs and Crime report, mean age of substance users was 22.7 years old globally in 2001, decreasing to 18.5 in 2011. In other words, age of substance use initiation was globally decreased by four years during the recent ten years (14, 15).

There are different factors contributing to the reduction of age of substance use initiation, including lack of proper support for teens and young people in families, schools and society, no responses to meet teenager's needs, lack of meaning in lives of society members, availability of illegal drugs, educational pressures, unemployment and not considering information and subject matters in curricula that commensurate with teenager's needs. Therefore, solving any one of the mentioned problems can be an effective step in dealing with the declining age of substance use initiation (16, 17).

In the present study, less than 5% of substance abusers were females. Although the number of females using illegal drugs has increased recently in Iran and other countries, substance abuse and dependence is still considered as a gender-dependent illness in Iran (18). Previous evidence reported gender differences in smoking and alcohol consumption worldwide (19).

Age of substance use initiation among females is five years older than that of males, which is in agreement with the results of studies carried out in this field (20, 21). For various reasons, such as physiological, psychological, and physical characteristics, females become dependent on illegal drugs more quickly, which is in agreement with results of similar studies (22, 23). Although more than 95% of users in Iran are males, it is possible that gender-based differences in the prevalence and age of substance use initiation will reduce in the near future, given the intense decrease in age of substance use initiation and increase in prevalence of substance use among females. Therefore, it is necessary to develop plans to prevent females from using drugs as well as to treat those already using them because this group is more dependent on drugs with greater likelihood of having more prevalent risk factors, such as HIV/AIDS, using shared syringes, and sexual and physical abuse.

The older age of substance use initiation was associated with the higher chance of treatment failure. Subjects'

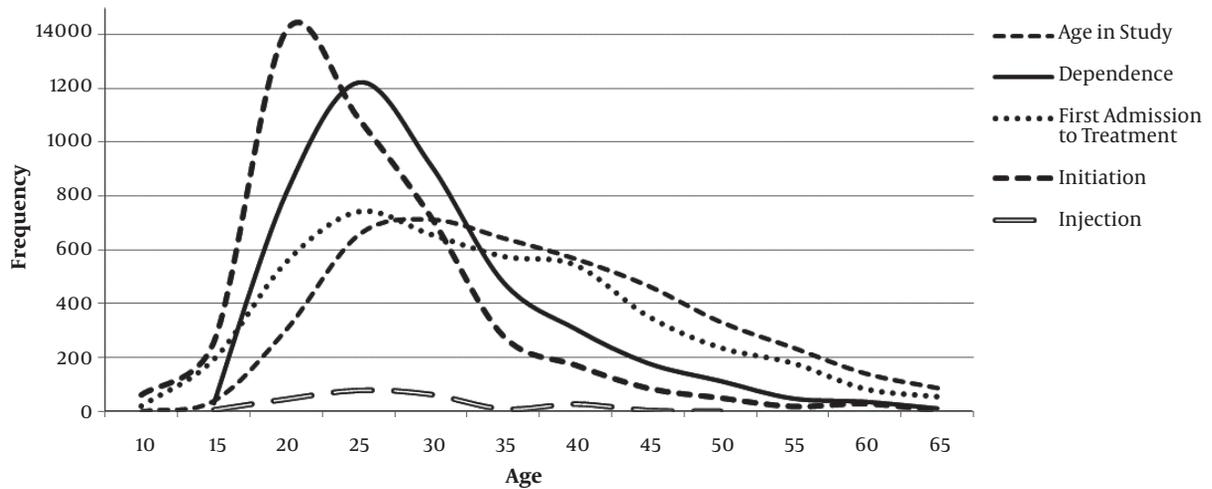


Figure 1. Age of substance use initiation, drug dependence, injection, and seeking treatment in western Iran

Table 1. Age of Substance Use Initiation, Dependence on Drugs, and Seeking Treatment Based on the Types of Substance Used in Kermanshah Province^a

Determinant	Depressant	Stimulant	Hallucinogen	Inhalant	Sleeper	Opioid	Alcohol	P-value
Age of study subjects	39.7 ± 11.6	40.1 ± 11.4	39.2 ± 12.2	39.6 ± 11.8	38.3 ± 11.1	40.3 ± 11.6	39.5 ± 13.1	0.5
Age of substance use initiation	23.4 ± 7.9	24.1 ± 8.3	23.8 ± 8.3	25.4 ± 9.4	23.0 ± 8.8	24.4 ± 8.5	23.6 ± 8.7	0.2
Age of addict	27.4 ± 8.3	27.6 ± 8.5	27.1 ± 9.4	28.1 ± 10.2	27.9 ± 8.8	28.8 ± 8.9	27.5 ± 9.8	0.3
Age of seeking treatment	36.2 ± 11.5	36.7 ± 11.3	36.9 ± 12.4	35.0 ± 11	36.7 ± 11	36.7 ± 11	36.0 ± 12	0.7

^aValues are expressed as mean ± SD.

age had effects on treatment failure even when age of substance use initiation and duration of substance use were adjusted. Similar studies had different results so that the chance of treatment failure was more than 10 years with older persons in a cohort study and with young persons in a 12-month follow-up (24). However, the results from most studies indicate that chance of treatment failure increased as individuals grew older. There are many reasons why treatment failure chance increases with an increase in individuals' age, the most important of which includes decreased motivation, acceptance of addicts by their families and society, and difficulties in behavioral withdrawal of a habit (25, 26).

On average, substance users embark on seeking treatment nine years after starting to use drugs which indicates that duration of substance use had greater effect on treatment failure compared to the age of seeking treatment, which is in agreement with similar studies. Beginning treatment sooner increases the chance of treatment success, and improves addicts' social functions while greatly reduces physical, criminal, occupational, psychological consequences, such as depression, and social and familial disorganizations. In the present study, opium accounted

for more than 50% of drugs used, being different from those used in other countries, especially in Western countries (27). In the US, the most commonly used illegal drugs are marijuana, cocaine, and heroin, respectively (28).

4.1. Study Limitations and Strengths

Limitations of the present research include not recording information, documents un-readability, and missing data in the subject's records. To solve this problem, the researchers attempted to collect data and information from staff and psychologists of MMT centers in addition to using statistical methods.

As with other studies on addiction, the most important limitation of the present research was the changing patterns of drug abuse from the onset of substance use till the time when addicts try to seek treatment. Initially, drug abuse begins with using drugs, such as opium and hashish, eventually, ending up with using several types of drugs simultaneously. Most of these patients suffer from multi-substance abuse. Therefore, the age of substance use initiation can be related with each type of these substances. Also, drugs are used initially by simple modes, such as smoking

Table 2. Univariate and Multiple Analyses of Factors Contributing to Treatment Failure with Clients of MMT Centers in Kermanshah Province

Variable	No. (%)	Crude [OR (95% CI)]	Adjusted [OR (95% CI)]	P Value
Sex				
Female	138 (3.3)	1	-	
Male	4038 (96.7)	1.5 (1.4 - 1.7)	-	
Duration of substance use, y				
< 3	843 (20.2)	1	1	
3 - 5	1228 (29.4)	1.2 (0.9 - 1.6)	1.2 (0.9 - 1.6)	0.5
6 - 8	918 (22.0)	1.6 (1.2 - 2.2)	1.7 (1.2 - 2.4)	0.01
9 - 10	967 (23.1)	1.7 (1.3 - 2.5)	2.1 (1.4 - 3.0)	< 0.001
≥ 11	216 (5.3)	2.4 (1.5 - 3.9)	3.6 (2.0 - 6.4)	0.001
Age of initiation, y				
≤ 15	263 (6.3)	1	1	
16 - 19	1425 (34.1)	1.1 (0.9 - 1.3)	0.8 (0.6 - 1.0)	0.8
20 - 24	1100 (26.5)	1.1 (0.9 - 1.4)	0.6 (0.5 - 0.8)	< 0.001
25 - 29	735 (17.6)	1.1 (0.8 - 1.4)	0.5 (0.4 - 0.7)	< 0.001
30 - 39	463 (11.1)	0.9 (0.7 - 1.1)	0.3 (0.2 - 0.4)	< 0.001
≥ 40	186 (4.4)	1.3 (0.9 - 2.0)	0.3 (0.2 - 0.6)	< 0.001
Age of seeking treatment, y				
≤ 24	208 (5.0)	1	1	
25 - 29	552 (13.3)	1.5 (1.1 - 2.1)	1.4 (1.0 - 2.1)	0.04
30 - 34	740 (17.7)	1.4 (1.0 - 1.9)	1.3 (1.0 - 1.9)	0.04
35 - 39	656 (15.7)	1.5 (1.1 - 2.1)	1.5 (1.1 - 2.2)	0.02
40 - 44	574 (13.8)	2.0 (1.4 - 2.8)	2.3 (1.6 - 3.4)	< 0.001
45 - 54	894 (21.4)	2.0 (1.4 - 2.8)	2.4 (1.6 - 3.5)	< 0.001
≥ 55	548 (13.1)	2.1 (1.5 - 3.1)	2.5 (1.6 - 3.8)	< 0.001
Substance used				
Depressant	806 (19.3)	1	-	
Stimulant	340 (8.1)	2.3 (1.1 - 2.1)	-	
Hallucinogen	421 (10.0)	1.6 (1.1 - 2.1)	-	
Inhalant	79 (1.8)	1.1 (1.4 - 2.8)	-	
Opioid	2409 (57.7)	2.0 (1.4 - 2.8)	-	
More than one substance used	117 (2.8)	2.1 (1.5 - 3.1)	-	

and oral mode, ending up with modes of injection, as duration of substance use increases. For this reason, types and modes of substance use cannot be identified correctly. In order to reduce the study bias, the researchers considered the type of drug mostly used by an individual as the substance used. Another important limitation was self-reported data, the results of which should be warily interpreted.

This research had several strengths, including use of a large sample, selection of several MMT centers, and collec-

tion of information with help of people specialized in the field of drug abuse prevention.

4.2. Conclusions

In Iran, issue of substance use is of more importance because this country has a high percentage of young population and shared borders with the largest narcotic drugs producing countries. On one hand, age of substance use initiation is very low and has a declining trend and, on the other hand, with decreased age of substance use initia-

tion, drug dependence probably increases. Therefore, authorities and experts should expect an increase/decrease in prevalence/age of substance use initiation in case they make no changes in status quo and perform no preventive plans.

Footnote

Ethical Considerations: This study was approved by the Ethics Committee of the Deputy of Research of the Kerman-shah University of Medical Sciences.

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