A tendency to drug addiction and associated risk factors: A case-control study

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Abstract

Introduction: Drug addiction is a chronic medical illness characterized by a person's inability to control the impulse to use drugs even when there are negative consequences on the health and everyday life of the addicted person, their family, and society in general. A growing body of evidence shows substance abuse phenomenon and tendency to drug addiction interacts with each other, leading to the onset and continued use of illegal drugs. This study aimed to assess the association between sociodemographic factors and the tendency to drug addiction.

Methods: A matched case-control study was conducted in 240 adults (120 cases and 120 controls) aged 15-72. The cases were sampled using a simple random sampling method based on the list of registered drug addicts' files in the DUTCs clinics. The eligible criteria for case subjects (person who was addicted to drugs) were defined as a patient requiring interventional actions due to substance abuse, consuming at least one narcotic drug, and any psychoactive substance without prescribing by a physician. Cases were identified through the DUTCs registry system, while controls were selected with a one-to-one ratio for the case group. A 17-item questionnaire was generated by reviewing the literature to collect the data. The four areas for this questionnaire included (a)socio-demographic information, (b) pre-addiction behavior, (c) post-addiction behavior, and (d) future vision of addict person. After applying the univariate logistic regression model, variables with a significant level of ≥ 0.1 were selected for the multivariable logistic regression. Adjusted odds ratios (aORs) and corresponding 95% confidence intervals (95%CI) were reported and significant level was set at α=0.05.

Results: In the adjusted regression model, tobacco smoking history (aOR=17.16:7.34-40.13), being single (aOR=8.24:1.29-52.77), a residency of an urban area (aOR=7.76(2.38-25.28)), history of running away from home (aOR=7.85:1.10-55.84), being unemployed (aOR=3.73:1.02-13.67) and having less than a high school education (aOR=2.43:1.04-5.68) were significantly associated increased likelihood of tendency to drug addiction among participants. Factors such as low monthly income and the number of children (≥1) were also significantly associated with tendency to drug addiction (P-value< 0.05).

Conclusion: This study suggests that tobacco smoking history, running away from home, living in an urban area, education, income class, number of children, and marital status were associated with a higher chance of tendency to drug addiction. Therefore, public health policymakers must take immediate actions to tackle individual and social factors in order to prevent people, particularly young people from tendency to drug addiction. Additionally, evidence-based individuals and family-centered preventive interventions (e.g., educational campaigns) appeared to be the urgent priorities in curbing the tendency to drug addiction in Iran.

Keywords: Tendency, Drug addiction, Socio-demographic factors, Iran

Introduction

Drug addiction is a chronic medical illness characterized by a person's inability to control the impulse to use drugs even when there are negative consequences on the health and everyday life of the addicted person, their family, and society in general. According to the World Drug Report, about 5.5% of the world population (estimated 270 million people) had used drugs in 2017; 35 million of whom are affected by the harmful patterns of drug addiction in the same year. A growing body of evidence shows substance abuse phenomenon and tendency to drug addiction interacts with each other, leading to the onset and continued use of illegal drugs [1,2]. Understanding the factors associated with a tendency to drug addiction is the critical process to curb this social phenomenon. According to the literature, these factors can divide into three general categories of individual, family, and environmental factors. The higher the number of factors in a person, the greater the chance of a tendency to drug addiction. Individual factors include a lack of confidence, child abuse, positive attitudes toward the effects of drugs, particularly psychotropic and chemical, curiosity, depression and mental disorders [3-15]. The factors associated with family and environment include family structure and function disorders, generation gap, social and ecological disorder in a criminalized neighborhood, low social status, poverty and class divide, the crisis of identity, isolation and seclusion, the pleasure of Hedonism, unemployment and lack of social activity, modeling of family members and influence of friends and peer groups [16-26].

The distinctive points for the necessity of conducting this study can be found in (a) the high incidence and prevalence of drug use in Iran and globally; (b) the social disorder associated with substance abuse in many parts of the world; (c) the focus on preventable factors or target interventions of behavioral and social characteristics of drug users and (d) the growing trend of fail or resistance to quitting drug [27-31]. Therefore, this study aims to determine the factors associated with the onset and continuation of addiction among the patients who referred to Drug Use Treatment Clinics (DUTCs) in Kohgiluyeh and Boyer Ahmad in Iran.

Methods

Study Design, Population, and Sampling

A matched case-control study was conducted in 240 adults (120 cases and 120 controls) aged 15-72. The cases were sampled using a simple random sampling method based on the list of registered drug addicts' files in the DUTCs clinics. The eligible criteria for case subjects (person who was addicted to drugs) were defined as a patient requiring interventional actions due to substance abuse, consuming at least one narcotic drug, and any psychoactive substance without prescribing by a physician. Cases were identified through the DUTCs registry system, while controls were selected with a one-to-one ratio for the case group. The umbrella matching approach was chosen from the general population, preferably from the closest households and neighborhoods to the place where cases were living [32]. This matching approach mitigated the effects of confounders such as age, gender, socioeconomic status, and most importantly,

neighborhood effects on the tendency to drug addiction. The inclusion criteria for controls were not consuming any drugs including narcotics and psychoactive substances, stimulants, and hallucinations in the past five years preceding the study..

Data collection tools

A 17-item questionnaire was generated by reviewing the literature to collect the data. The four areas for this questionnaire included (a) socio-demographic information, (b) pre-addiction behavior, (c) post-addiction behavior, and (d) future vision of addict person. The predictors (levels used as reference categories in regression models are underlined) of tendency to drug addiction included sex (male/female, marital status(single/married), education (≤high school/>high school), employment (unemployed/employed), monthly income (≤1000000 Rial [~$80 at the time of study], 1000000-2500000[$80-190], 2500000-5000000Rial [$190-380], 5000000 [$380]), residency status (urban/rural), insurance support(yes/no),private house(yes/no), number of children (no child/≤3/>3), family member addiction history(yes/no), incarceration history(yes/no), smoked tobacco/nicotine prior to the onset of addiction(yes/no), high-risk sexual behavior before the onset of addiction(yes/no), and a history of running away from home before the onset of addiction(yes/no). The main outcomes of the study, which was either non-addicted or addicted to illegal drugs, were defined by codes 0 and 1, respectively.

To reduce the unjustified defect in data, the research team called the participants to verify their answers to overcome data ambiguity. If the participants were not available or incompletion of answers exceeded 25% among received responses, the questionnaire was withdrawn from the study. All participants were aware of the objectives, steps, and expected outcomes of the research. Informed consent was obtained from all individuals included in the study.

Data Analysis

Distribution of factors related to tendency to drug addiction was summarized using frequencies and percentages. After applying the univariate logistic regression model, variables with a significant level of ≥ 0.1 were selected for the multivariable logistic regression. This step can identify predictors that, by themselves, are not significantly associated with the outcome of interest but make an important contribution in the presence of other variables [33]. Finally, the number of variables entered into the multiple logistic regression, taking into account the criteria for entering the study, as well as considering the number of 10 samples per predictor, included 17 important variables. The magnitude of the association between a predictor and a tendency to drug addiction was reported as "significant level of 0.05" and "estimated confidence limits for odds ratio". To determine the model fit and which of the used models predicts the classes best, the "likelihood ratio" and "under Receiver Operating Characteristic (ROC) curve" levels were applied, respectively. The cutoff point in the logistic regression analysis was considered as 0.5 [34]. The analytical tool in this study was SPSS version 20.

Results

The demographic characteristics of the study population are presented in Table 1. The average age of participants in the case and control groups were 37.63 (95%CI: 35.6-39.67) and 34.85 (95%CI: 33.26-36.44), respectively. The mean age of attendance at the rehabilitation centers for the case group was 3.26 years (95%CI: 2.82-3.70). Overall, 86.7% of the case group and 73.3% of the control group were men (Table 2).

Table 3 is showing adjusted OR and corresponding 95% CI. Tobacco smoking history (aOR=17.16:7.34-40.13), being single (aOR=8.24:1.29-52.77), a residency of an urban area (aOR=7.76(2.38-25.28)), history of running away from home (aOR=7.85:1.10-55.84), being unemployed (aOR=3.73:1.02-13.67) and having less than a high school education (aOR=2.43:1.04-5.68) were significantly associated increased likelihood of tendency to drug addiction among participants. Factors such as income status and the number of children presented significant association (P-value< 0.05). In Figure 1, gray circles represent related and predictive variables of tendency to drug addiction, while the white circles refer to variables that have no significant association with tendency to drug addiction.

Table 1: Socio – demographic data: case vs. control group.

Variable	Level	Groups, N (%)		Total	Variable	Level	Groups, N (%)		Total
		Case	Control				Case	Control	
Sex	Male	104(86.7)	88(73.3)	192(80.0)	**Location**	Urban	78(65)	108(90)	54(22.5)
	Female	16(13.3)	32(26.7)	48(20.0)		Rural	42(35)	12(10)	186(77.5)
	Total	**120(100)**	**120(100)**	**240(100)**		**Total**	**120(100)**	**120(100)**	**240(100)**
Income per month	≤1000000 (80$)	13(10.8)	23(19.2)	36(15)	**Smoke initiation age**	No	21(17.5)	66(55)	87(36.2)
	1000000-2500000)80-190$(	10(8.3)	20(16.7)	30(12.5)		U15	65(54.2)	2(1.7)	67(27.9)
	2500000-5000000)190-380$(	22(18.3)	21(17.5)	43(17.9)		16-20	26(21.7)	36(30.0)	62(25.8)
	5000000 (Rial)=380$	75(62.5)	56(46.7)	131(54.6)		21-35	8(6.7)	16(13.3)	24(10.0)
	Total	**120(100)**	**120(100)**	**240(100)**		**Total**	**120(100)**	**120(100)**	**240(100)**
Employment	Unemployed	29(24.2)	32(26.7)	61(25.4)	**Education**	≤high school	86(71.7)	52(43.3)	138(57.5)
	Employed	91(75.8)	88(73.3)	179(74.6)		>high school	34(28.3)	68(56.7)	102(42.5)
	Total	**120(100)**	**120(100)**	**240(100)**		**Total**	**120(100)**	**120(100)**	**240(100)**
Marriage	Married	93(77.5)	82(68.3)	175(72.5)	**Insurance**	Yes	41(34.2)	29(24.2)	70(29.2)
	Single	27(22.5)	38(31.7)	65(27.1)		No	79(65.8)	91(75.8)	170(70.8)
	Total	**120(100)**	**120(100)**	**240(100)**		**Total**	**120(100)**	**120(100)**	**240(100)**
Child	≤3	46(38.3)	60(50)	106(44.2)	**Number of incarcerations**	No	103(86.7)	116(98.3)	222(92.5)
	>3	29(24.2)	19(15.8)	48(20.00)		One time	8(5.8)	4(1.7)	9(3.8)
	NO	45(37.5)	41(34.2)	86(35.8)		More than 2	9(7.5)	0(0.00)	9(3.8)
	Total	**120(100)**	**120(100)**	**240(100)**		**Total**	**120(100)**	**120(100)**	**240(100)**
House	Private	65(54.2)	73(60.8)	138(57.5)	**Incarceration history**	Yes	17(14.2)	4(3.3)	21(8.8)
	Not private	55(45.8)	47(39.2)	102(42.5)		No	103(85.8)	116(96.7)	219(91.2)
	Total	**120(100)**	**120(100)**	**240(100)**		**Total**	**120(100)**	**120(100)**	**240(100)**
Heterosexual history	Yes	17(14.2)	9(7.5)	26(10.8)	**Homosexual history**	Yes	7(5.8)	1(0.8)	8(3.3)
	No	103(85.8)	111(92.5)	214(89.2)		No	113(93.3)	119(99.2)	231(96.2)
	Total	**120(100)**	**120(100)**	**240(100)**		**Total**	**120(100)**	**120(100)**	**240(100)**
Running away from home	**Yes**	**11(9.2)**	**2(1.7)**	**13(5.4)**	**Age groups**	15-19	2(1.7)	4(3.3)	6(2.5)
	No	**109(90.8)**	**118(98.3)**	**227(94.6)**		20-29	33(27.5)	33(27.5)	66(27.5)
	Total	**120(100)**	**120(100)**	**240(100)**		30-39	38(31.7)	53(44.2)	91(37.9)
Number of running from home	**No**	**109(90.8)**	**118(98.3)**	**227(94.6)**		40-49	27(22.5)	23(19.2)	50(20.8)
	One	**5(4.2)**	**2(1.7)**	**7(2.9)**		50-59	16(13.3)	6(5)	22(9.2)
	Two	**3(2.5)**	**0(0.00)**	**3(1.2)**		60-70	4(3.3)	1(0.8)	5(2.1)
	>2	**3(2.5)**	**0(0.00)**	**3(1.2)**		**Total**	**120(100)**	**120(100)**	**240(100)**
	Total	**120(1000)**	**120(100)**	**240(100)**					

Table 2: Crude association between tendency to drug addiction and related risk factors.

Risk factors	OR	95% CI for OR		P-value
		Upper	lower	
Sex; male (reference level: female)	2.36	1.21	4.5	0.010
Unemployed (reference level: Employed)	0.87	0.48	1.56	0.650
Education; No high school graduation (reference level: Academic)	3.30	1.93	5.65	<0.001
Income (reference level: > 5000000 (Rial))	---	---	---	---
-≤ 1000000	2.96	1.10	5.082	0.027
-1000000-2500000	2.68	1.16	6.16	0.021
-2500000-5000000	1.28	0.64	2.55	0.480
Marriage status; single (reference level: married)	1.59	0.89	2.84	0.110
Resident in Urban (reference level: Rural)	4.84	2.39	9.80	<0.001
The number of child (reference: no child)	---	---	---	---
≤3	1.43	0.80	2.53	0.220
>3	0.72	0.35	1.47	0.370
House private; yes (reference level: no)	0.76	0.45	1.27	0.290
Insurance support; yes (reference level: no)	1.63	0.93	2.86	0.090
Family addiction history; yes (reference level: no)	12.42	3.66	42.09	<0.001
Incarceration history; yes (reference level: no)	4.78	1.56	14.68	0.006
number of Incarceration (continuous)	3.97	0.80	19.55	0.090
Running away from home; yes (reference level: no)	5.95	1.29	27.46	0.022
The number of running away from home	2.70	0.51	14.24	0.240
Homosexual; yes (reference level: no)	2.03	0.86	4.77	0.100
Smoking (yes)	21	10.85	40.63	<0.001
Smoking initiation age (continuous)	0.93	0.93	0.99	0.019

Note: since cases and controls were matched based on age therefore the variable age is not included in the table.

Table 3: Adjusted association between tendency to drug addiction and related risk factors.

Risk factors	OR	95% CI for OR		P-value
		Upper	lower	
Sex; male (reference level: female)	1.20	0.41	3.52	0.74
Education; No high school graduation (reference level: Academic)	2.43	1.04	5.68	0.040
Unemployed (reference level: Employed)	3.73	1.02	13.67	0.047
Marriage status; single (reference level: married)	8.24	1.29	52.77	0.026
Resident in Urban (reference level: Rural)	7.76	2.38	25.28	0.001
Income (reference level: upper 5000000 (Rial))	---	---	---	---
≤1000000	9.53	1.95	46.53	0.005
1000000-2500000	9.22	2.30	36.87	0.002
2500000-5000000	3.77	1.157	12.28	0.028
House private; yes (reference level: no)	1.39	0.48	4.002	0.530
Number of child (reference: no child)	---	---	---	---
≤3	6.65	1.12	39.55	0.037
>3	9.62	1.27	72.42	0.028
Insurance support; yes (reference level: no)	1.51	0.57	4.000	0.400
Family addiction history; yes(reference level: no)	4.55	0.86	23.86	0.074
Incarceration history; yes (reference level: no)	4.23	0.85	21.02	0.078
Running away from home; yes (reference level: no)	7.85	1.10	55.84	0.039
Homosexual; yes (reference level: no)	1.37	0.35	5.30	0.640
Smoke history; yes (reference level: no)	17.16	7.34	40.13	<0.001

Figure 1 Behavioral and social factors leading to tendency to drug addiction among participants.

Discussion

The findings of this study indicate a significant association between two behavioral variables (history of smoking, history of running away from home) and six social variables (income level, living in an urban area, being single, number of children, being unemployed, and having less than high school education) and tendency to drug addiction.

Smoking was the most important factor that presented a significant association in the logistic regression model. We found that having a history of smoking has a 17-fold increase in the likelihood of tendency to addiction. A substantial body of evidence also showed that smoking, particularly cigarette, as a threat to the initiation, tendency, and the continuation of drug addiction [35-39]. For example, in a case-control study, Molavi and et al, reported that the smoking was 84% among the cases compared to 16% among the controls, resulting in a significant relationship between smoking and first-line drug use and tendency to drug addiction. In the study by Asayesh and et al, aimed of linking individuals and family characteristics with the tendency of people to drug addiction, tobacco smoking significantly increased the likelihood of drug use [40]. Similarly, Sussman et al, reported a positive correlation between cigarette smoking in the month preceding the survey and the tendency to drug addiction among teenagers in the United States and Russia. Smoking is not only considered an individual behavioral feature; this behavior is influenced by many social determinants. Lifetime tobacco use generally starts when young adults graduate from high school(USDHHS 2012). Smoking prevention or cessation strategies, especially from a younger age, and incorporating these preventive efforts into substance abuse treatment may help to prevent tendency to drug addiction.

In our study, an important behavioral feature that showed a significant relationship with tendency to drug addiction was running away from home prior to the onset of drug addiction. We found that those who experienced running away from home were 8 times more likely to have tendency to drug addiction compared to those who did not report this experience. The association between substance use and running away from home behavior as well as the relationship between the harmful conditions of the family and high chance of running from home/or being sent away from home were highlighted in previous studies [41-45]. Overall, these findings underscore the role of "determinants of social features" in the onset and continuation of the phenomenon of tendency to drug addiction.

There is no coherent evidence that reveals causal direction between income level and tendency to drug addiction, but studies have shown that drug addiction is more common among people of lower economic status. For example, some studies have shown that the association between the tendency to drug addiction and income does not have a definite class pattern and tendency to drug addiction can be observed in all income levels [46, 47]. On the other hand, our finding, in line with previous studies, indicated an indirect association between the income level and the tendency towards to drug addiction [48-50]. In general, people in lower-income classes often display more tendency to addiction [16,51]. Lower-income is directly connected to employment status and they have an interplay role in drug addiction. For example, Asayesh et al, found that permanent employment (with a decent income) reduces the temporal tendency towards drugs and unemployment tends to be effective in drug use. Rumi et al, also showed that 71% of unemployed addicts were unemployed and only 25% were employed, which can explain the role of the employment status of people in the tendency to addiction. Taken

together, preventive and treatment programs that can provide public assistance to unemployed and low-income addicts are critical to curb this epidemic in Iran, particularly amid economic sanctions that are negatively and consistently affecting this country's welfare.

We found a greater likelihood of tendency to addiction in people who resided in urban compared to the rural areas. Although this reflects the tense conditions overriding the urban atmosphere, it can implicitly represent a more complicated reality. First, changes in migration patterns and the desire to urbanization in Iran is a pervasive phenomenon [52]. Around 74 % of the population lives in cities and is likely to continue with the trend of urban-rural migration in the future. Low-income rural areas enter the divisions of the urban areas of the country, while the regions still have texture and rural conditions. Second, marginalization in cities following the migration of people from rural to cities are common phenomena that should not be superfluous in interpreting these differences. Therefore, interpreting the impact of urbanization as an independent variable on the tendency to drug addiction should be discussed more cautiously and require further in-depth studies in this area.

We found that a greater chance of addiction among singles than married individuals. However, Khazaei et al, reported that the prevalence of substance abuse among married students was 3.7, single students 2.76, and in students who divorced was 31.82% [53]. A study by Scott et al found an association between marriage and a lower risk of the onset of psychiatric disorders in both genders, with more reduction risk among women, which was consistent with the finding of our study. Similarly, the results of this study showed that the previous marriage was associated with an increased risk of psychiatric disorders in comparison with the "current stable" marriage, which increased the risk of the onset of psychiatric disorders for women [54]. This could be due to the rise of marriage age in Iran and prolonged encounters with modeling factors (such as the Internet and virtual media spaces), the intrinsic tendency of single young people to such matters is one that should not be easily discounted in the analysis of the role of being single in the tendency to drug addiction [55].

The individuals with no high school graduation reported a higher chance of becoming addicted than those with academic education. Asayeshet al, showed that the having college education decrease the chance of tendency to drug addiction. On the other hand, Khazaie et al, showed that the highest prevalence of drug abuse (6.34%) was for doctoral students and lowest (0%) for master's students. Similarly, the prevalence of drug use was 1.32% among those with associate degrees and 1.72% among those with Bachelor degrees. A nationwide study is required to reach a solid conclusion regarding the association between education and tendency to drug addiction in Iran.

Our study has elucidated, to some extent, the contributing factors to tendency to drug addiction prediction in Iran. However, some limitations should be noted. First, we reported OR with a wide 95% CI, which possibly indicates that the sample size for the purpose of this study was small. Nevertheless, random selection and using a multistage selection approach could increase the validity of the study. Second, the case-control nature of our study does not allow us to deduce causality or determine the direction of the observed associations. The confounding variables could also mask the association. However, to tackle this limitation we used the matching process by selecting the control groups from the same neighborhood as cases. We use the term smoking, which is mainly referred to as cigarette smoking. Future studies should consider the different tobacco/nicotine products such as hookah and electronic cigarettes. Despite these limitations, our study has considerable strength such as manifesting the important individuals and social features associated with tendency to drug addiction.

Conclusion

This study suggests that tobacco smoking history, running away from home, living in an urban area, education, income class, number of children, and marital status were associated with a higher chance of tendency to drug addiction. Therefore, public health policymakers must take immediate actions to tackle individual and social factors in order to prevent people, particularly young people from tendency to drug addiction.

Three main points that we can get from our results:

1. Understanding the factors associated with a tendency to drug addiction is the critical approach to curb this social phenomenon

2. We found that smoking tobacco, being less educated, single and unemployed, residing in an urban area, a record of running away from are the important factors that increase the likelihood of a tendency to drug addiction in Iran.

3. Targeted interventions that focus on individual and social factors are needed in order to prevent people, particularly the young generation from the tendency to drug addiction.

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