Explaining socioeconomic inequalities in illicit drug use disorders in Iran

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Abstract

Background: Drug use disorders are one of the major health problems in societies, which cause physical, psychological, and social damages to individuals. Socioeconomic status is often inversely associated with drug use disorders. The present study aimed at determining the effect of socioeconomic inequality on the prevalence of drug use disorders and identifying its determinants in Iran.

Methods: Data of 7886 individuals aged 15 to 64 years were collected from Iran Mental Health Survey (IranMHS). Initially, the socioeconomic status of the participants was determined by principal component analysis. Later, socioeconomic inequality was measured using the concentration index, and the factors influencing the gap between the high and low socioeconomic groups were identified using the Oaxaca-Blinder Decomposition.

Results: The concentration index for drug use disorders in Iran was -0.29 (standard error= 0.06). The results of decomposition technique revealed that 1.14% and 2.7% of the participants with high and low socioeconomic status were affected by drug use disorders, respectively. In addition, the gap between these 2 groups was found to be 1.65%. Among the studied variables, occupation, marital status, and gender accounted for the highest contribution to inequality, respectively.

Conclusion: There is inequality in the prevalence of drug use disorders in Iran; these disorders are more common in lower socioeconomic group. Based on the findings, it is suggested that improvement in the socioeconomic status of the households, especially for males, the divorced or widowed individuals, and the unemployed may lead to a reduction in inequality in drug use disorders.

Keywords: Drug use disorders, Socioeconomic inequality, Oaxaca-Blinder Decomposition

Introduction

Drug abuse or dependence is followed by extensive outcomes in public health (1). Drug abusers experience higher rates of suicide attempts (2-3) and disability (4) than others in the general population. The simultaneous incidence of drug use disorders and mental disorders is very common (5), as such these people suffer from poor health, unemployment, and housing instability (6-10), and they usually do not receive appropriate care and treatment services (11). Another consequence of drug abuse is the

heavy costs imposed on societies. For example, the annual cost related to drug use in the US is estimated to be 181 billion dollars (12, 13).

There is a growing interest in the study of the relationship between socioeconomic status and drug use. However, there are conflicting pieces of evidence on this relationship, as some studies have reported a positive relationship and others a negative relationship between them. For instance, some indicators of high socioeconomic status

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↑What is "already known" in this topic:

When inequalities in the health sector are measured, a natural approach is to search to explain them. The core idea is to explain the distribution of the outcome variable by a set of factors. The Oaxaca decomposition outlined in this study is one of the methods capable of explaining inequalities.

→What this article adds:

When faced with a gap in outcome variable between the 2 groups, researchers frequently try to determine how much of the gap can be explained by differences in observable characteristics. In addition to this part, the Oaxaca decomposition can specify the difference in the coefficients. This trait is exclusive to the Oaxaca method.

such as higher educational attainment of parents or higher family income have been shown to be associated with drug use (14, 15), while higher educational attainment of individuals has been reported to be related to reduced drug use (16). Antony (1971) found that academic achievement has a positive and negative relationship with cannabis and cocaine use, respectively (17).

Inequality in health is a kind of difference in the health status of individuals based on which vulnerable social groups or those who permanently experience adverse conditions and discrimination are exposed to more risk factors than other social groups (18). To the best of our knowledge, no studies have been conducted on determining the effect of socioeconomic inequality on the prevalence of drug use disorders using the decomposition techniques. Most studies have merely dealt with the relationship between socioeconomic status and drug use disorder without evaluating the contribution of the variables to this relationship (19-21). A study was conducted in Iran in 2011 entitled "Iran Mental Health Survey (IranMHS)", and one of its objectives was to determine the prevalence of any drug use disorder (drug abuse and dependence) in the past 12 months (22, 23). Therefore, based on the data obtained from IranMHS, the present study aimed at determining the rate of socioeconomic inequality in the prevalence of drug use disorders and identifying the factors causing the gap between groups with low and high socioeconomic status in Iran. The results could be helpful in the identification of subgroups of the population, who are more susceptible to drug use.

Methods

The data of Iran Mental Health Survey (IranMHS) were used in the present study. In this study, 7886 individuals aged 15 to 64 years were selected using a three-stage random sampling method. The required data were collected through a demographics questionnaire, socioeconomic status, and Composite International Diagnosis Interview Version 2.1 (CIDI 2.1). CIDI 2.1 was used to diagnose mental disorders in the past 12 months. The drug use part of this scale consists of items about screening, the frequency of use, and symptoms of disorders (drug use and dependence). The drugs studied in this questionnaire include cannabis, stimulants, opiates, cocaine, hallucinogens, and inhalants (22).

Principal component analysis (PCA) was done based on the data of household assets including personal home, villa or garden, independent kitchen, bathroom, toilet, color TV or LCD, refrigerator, freezer, mobile phone, washing machine, dishwasher, microwave, vacuum cleaner, computer, internet connection, and motorbike and car for personal use. The first component of the analysis, which explained more of the variance, was set as the indicator of socioeconomic status (24).

The rate of inequality in drug use disorders was measured using the concentration index, which is calculated based on the concentration curve and is equal to twice the area between the concentration curve and line of equality (25). The horizontal and vertical axes of this curve represent the socioeconomic status as the cumulative percent-

age from the poorest to the richest and health as the cumulative percentage. If health has more accumulation among the poor, the concentration curve lies above the line of equality and the concentration index would be negative. By contrast, if health has more accumulation among the rich, the concentration curve lies below the line of equality and the concentration index would be positive. If the line of equality and concentration curve is the same, the concentration index would be 0, indicating equality. This index ranges between -1 and +1. Using Equation 1, concentration index can be easily calculated based on the covariance between the health status and fractional rank in the distribution of socioeconomic status $C = \frac{2}{\mu}(h_i r_i)$; where

h_i is the health status of individual i, μ is its mean, r_i is the fractional rank of individual i in the distribution of the SES variable, and cov denotes the covariance (26, 27).

The impact of independent variables (age group, gender, marital status, education, and occupation, place of residence, income, and socioeconomic status) on the outcome variable (any drug use disorder) was measured using simple and multiple logistic regression.

Based on the median of socioeconomic status, the participants were assigned into 2 groups of high (n= 3872) and low socioeconomic status (n= 3801). Then, the rate of inequality in the prevalence of drug use disorders and the contribution of effective factors to the gap between the 2 groups were determined using the Oaxaca-Blinder Decomposition (OBD). Generally, OBD method decomposes the mean difference of the outcome variable into 2 parts: one part is due to group differences in the determinants of the outcome variable (sometimes called the explained component or endowments) and another part is due to group differences in the effects of these determinants or differences in the coefficients, sometimes called the unexplained component or coefficients (25). ADePT Version 6 was used in to measure the concentration index and draw the concentration curve. Other statistical analyses were performed in STATA Version 13 at a significance level of 0.05.

Results

Table 1 demonstrates the demographic characteristics of the participants and the prevalence of any drug use disorder, based on the study variables. Frequencies were weighted and estimated using a complex sample analysis. According to the results of IranMHS, the prevalence of any drug use disorder during the last 12 months was equal to 2.1%.

Concentration index for drug use disorders in Iran was -0.29 (standard error = 0.06). The negative sign of concentration index and its curve, which lies above the line of equality (Fig. 1), indicate the higher concentration of these disorders in participants with low socioeconomic status. Table 2 demonstrates the relationship between demographic characteristics of the sample and the 12-month prevalence of drug use disorders. Based on the results of simple logistic regression, gender, the 30-39 age group, education, marital status, occupation, income, and socioeconomic status had a significant relationship with drug

Table 1. Sociodemographic characteristics and 12-month prevalence of any drug use disorder in the IranMHS (N= 7886), Iran, 2011

Characteristics	N (Weighted %)	Any drug use disorder	
		N	% (95% CI)
Age groups (years)			
15-19	999 (18.1)	9	1.2 (0.5, 1.9)
20-29	2550 (33.8)	41	1.9 (1.4, 2.4)
30-39	2199 (21.8)	62	3.0 (2.3, 3.8)
40-49	1189 (15.3)	30	2.7 (1.7, 3.6)
50-59	702 (8.7)	7	1.4 (0.5, 2.3)
60-64	247 (2.5)	2	1.4 (-0.1, 2.9)
Gender			
Female	4499 (49.5)	15	0.3 (0.2, 0.5))
Male	3387 (50.5)	136	3.8 (3.1, 4.4)
Marital Status			
Never married or Married	7552 (96.4)	139	2.0 (1.7, 2.3)
Previously married [a]	332 (3.6)	12	4.3 (2.1, 6.5)
Education			
University	1208 (18.5)	10	0.9 (0.4, 1.5)
Diploma or less	6666 (81.5)	141	2.3 (1.9, 2.7)
Occupation			
Non-unemployed	7147 (90.5)	110	1.7 (1.4, 2.0)
Unemployed	737 (9.5)	41	5.5 (3.9, 7.2)
Residence			
Rural	3506 (29.1)	76	2.3 (1.8, 2.8)
Urban	4380 (70.9)	75	1.9 (1.6, 2.4)
Income (per month)			
More than 2,000,000 Rials (189 USD)	5462 (75.5)	81	1.7 (1.3, 2.0)
Less than 2,000,000 Rials (189 USD)	2355 (24.5)	67	3.1 (2.4, 3.8)
Socioeconomic status			
High	3872 (58.3)	44	1.2 (0.8, 1.6)
Low	3801 (41.7)	106	3.4 (2.8, 3.9)

IranMHS = Iranian Mental Health Survey; N = Number; CI= Confidence Interval; [a] Previously married = widowed, divorced or separated persons

Table 2. Sociodemographic correlates of 12-month prevalence of any drug use disorder in the IranMHS (N= 7886), Iran, 2011

Characteristics	Any drug use disorder			
	Unadjusted OR [b] (95% CI)	p	Adjusted OR [c] (95% CI)	p
Age groups (years)				
15-19	1	-	1	-
20-29	1.6 (0.7, 3.6)	0.247	1.5 (0.7, 3.6)	0.263
30-39	2.6 (1.2-5.8)	0.019	2.4 (1.1-5.4)	0.034
40-49	2.3 (0.9-5.3)	0.058	2.1 (0.9-4.8)	0.101
50-59	1.2 (0.4-3.6)	0.757	1.1 (0.4-3.5)	0.836
60-64	1.2 (0.2-6.1)	0.806	1.0 (0.2-5.3)	0.994
Gender				
Female	1	-	1	-
Male	11.4 (5.9-21.8)	<0.001	12.5 (6.4-24.5)	<0.001
Marital Status				
Never married or Married	1	-	1	-
Previously married [a]	2.2 (1.1-4.5)	0.028	4.2 (1.9-8.9)	<0.001
Education				
University	1	-	1	-
Diploma or less	2.5 (1.2-5.2)	0.018	2.0 (0.9-4.2)	0.092
Occupation				
Non-unemployed	1	-	1	-
Unemployed	3.3 (2.1-5.1)	<0.001	1.7 (1.1-2.8)	0.026
Residence				
Rural	1	-	1	-
Urban	0.8 (0.6-1.2)	0.396	1.2 (0.9-2.0)	0.177
Income (per month)				
More than 2,000,000 Rials (189 USD)	1	-	1	-
Less than 2,000,000 Rials (189 USD)	1.8 (1.3-2.8)	0.002	1.2 (0.7-1.9)	0.483
Socioeconomic status				
High	1	-	1	-
Low	2.8 (1.8-4.2)	0.002	2.4 (1.4-3.9)	<0.001

IranMHS = Iranian Mental Health Survey; CI = confidence interval; [a] Previously married = widowed, divorced or separated persons; OR = odds ratio; [b] Simple logistic regression; [c] Multiple logistic regression

use disorders ($p<0.05$). In addition, the results of multiple logistic regression revealed that the risk of drug use disorders during the past 12 months was significantly higher in males than in females ($p<0.01$) in the 30-39 age group than in other age groups ($p= 0.034$), in divorced or widowed individuals than in single or married ones ($p<0.001$), in unemployed individuals than in employed ones ($p=0.026$), and in people with low socioeconomic status than in those with high socioeconomic status ($p<0.001$). Because there were no significant differences in education, place of residence, and income, these variables were excluded from the final multiple model and others were
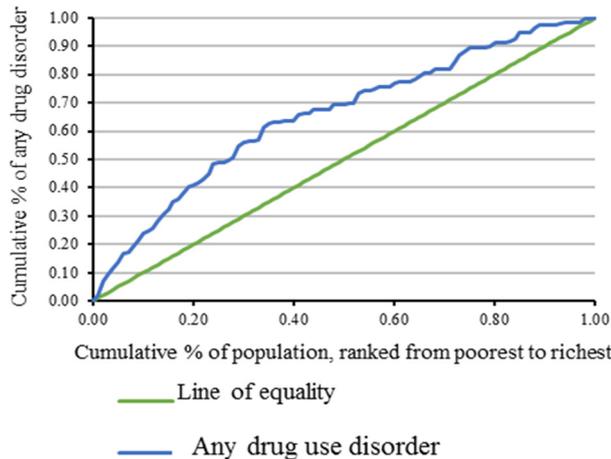
Fig. 1. Concentration curve of any drug use disorder in Iran

Table 3. Differences in the prevalence of any drug use disorder between low and high socioeconomic groups, Iran, 2011

Any drug use disorder	% (95% CI)	p
Prevalence in high socioeconomic group	1.14 (0.80, 1.47)	< 0.001
Prevalence in low socioeconomic group	2.79 (2.26, 3.31)	< 0.001
Differences	-1.65 (-2.27, -1.03)	< 0.001
Amount attributable to endowments (explained)		
Gender	0.11 (0.02, 0.19)	0.011
Age group (years)	-0.01 (-0.03, 0.02)	0.562
Marital Status	-0.07 (-0.13, -0.02)	0.012
Occupation	-0.18 (-0.27, -0.07)	< 0.001
Total	-0.15 (-0.29, -0.01)	0.045
Amount attributable to coefficients (unexplained)		
Gender	-1.25 (-1.85, -0.65)	< 0.001
Age group (years)	-0.49 (-0.92, -0.06)	0.025
Marital Status	-0.15 (-0.29, -0.01)	0.030
Occupation	-0.08 (-0.35, 0.19)	0.561
Constant	0.47 (-0.14, 1.10)	0.134
Total	-1.50 (-2.10, -0.91)	< 0.001

CI= confidence interval

entered into the OBD model.

Table 3 demonstrates the results obtained from the OBD method. The rate of the gap between the 2 groups in the prevalence of drug use disorders was 1.65%, which was in favor of participants with high socioeconomic status. The contributions of explained and unexplained components were 0.15 and 1.5, respectively. In unexplained component, it was observed that gender, marital status, and the 30-39 age group accounted for a significant proportion of the difference between the 2 groups (p<0.05). In this part,
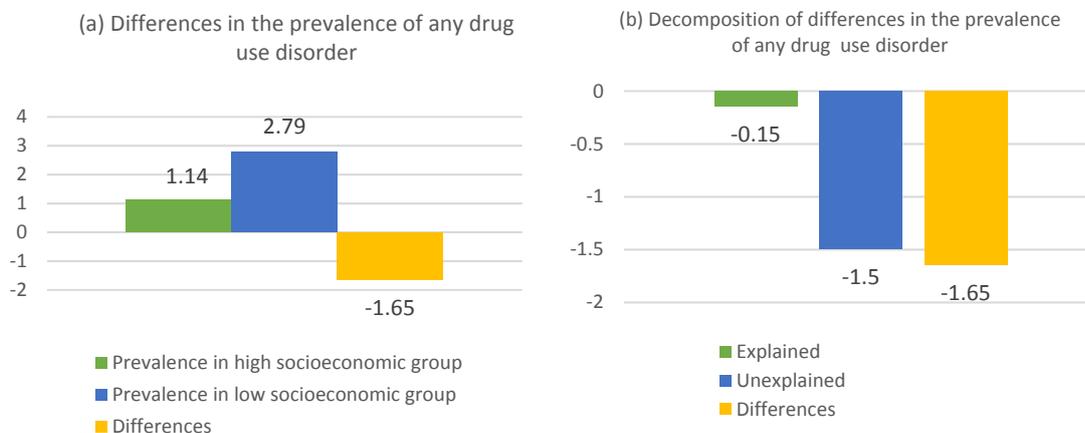

Fig. 2. Oaxaca-Blinder Decomposition

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Med J Islam Repub Iran. 2017 (18 Dec); 31:108.

intercept was positive, which was in favor of the participants with low socioeconomic status although it was not statistically significant (p= 0.134). A schematic view of the difference between the 2 groups in the prevalence of drug use disorders (2a) and decomposition of this difference into explained and unexplained components using OBD method (2b) are depicted in Fig. 2.

Discussion

In the present study, the prevalence of drug use disorders in the group with low socioeconomic status was 2.44 times more than that of the group with high socioeconomic status, suggesting the considerable role of socioeconomic factors in these disorders. The results obtained from measuring inequality using the concentration index and decomposition by OBD method revealed that inequality distribution in drug use disorders is in favor of high socioeconomic group in Iran. If these 2 groups are considered equal in the study variables, only 9.1% (0.15 out of 1.65) of the difference between them can be eliminated, and the remaining 90.9% (1.50 out of 1.66) can be attributed to the unexplained component. Because a significant proportion of the gap between the 2 groups is related to the unexplained component, there may be other factors affecting this inequality that are still unknown.

The most important factors affecting the inequality between the 2 groups in explained component, in order of priority, include occupation (-0.18), marital status (-0.07), and gender (0.11). However, the 30-39 age group is not statistically significant as an effective factor in the gap (p=0.562).

To the best of our knowledge, no studies have been conducted on determining the effect of socioeconomic inequality on the prevalence of drug use disorders using the decomposition techniques. However, inequality has been studied in some psychiatric disorders (28-31).

Although it is generally accepted that socioeconomic status is associated with drug use disorders, there is no consensus yet on the quality of this relationship (32-33). Similar to a study conducted in the US in 2004, the results of logistic regression in the present study revealed that the prevalence of drug use and dependence disorders in males is higher than in females (19). In another study in the US, it was found that unemployment is associated with increased prevalence of drug abuse or dependence (20-21). In the present study, drug use disorders during the past 12 months were higher among the unemployed than the employed. The results of linear and logistic regression models in a study conducted by Charitonidi et al. (2016) indicated that increased income level and educational attainment of households increases the risk of alcohol abuse, while low family income and educational attainment increases the risk of smoking (34). The results of a longitudinal study revealed that accessibility to educational facilities is associated with reduced risk of drug use disorders (35). According to the present study and another study by Karriker-Jaffe (2013), the risk of cigarette and marijuana use is higher among people living in deprived areas with low socioeconomic status (36).

The use of IranMHS data was one of the strengths of this study because this national survey had features such as large sample size, precise design of the sampling method to avoid selection bias, high rate of response, quality control protocol, monitoring of fieldwork, and the use of CIDI 2.1 as a diagnostic instrument, which made it possible to compare the results of this study with other studies in the field of world mental health survey. One of the limitations of the present study was the participants' socioeconomic status being measured based on household asset data because in developing countries such as Iran, there is no standard of living to be used for people to classify the society into different groups of socioeconomic status. Another limitation of this study was its cross-sectional nature and the relationships observed between variables, which were not necessarily causal.

Conclusion

Generally, the unequal distribution of drug use disorders in Iran is in favor of the high socioeconomic group. In this study, unemployment was the most important factor affecting the prevalence of drug use disorders, and other parameters such as widowhood and gender (male) were also found to be influential in this inequality. To minimize inequalities in the prevalence of drug use disorders in Iran, policymakers in the health sector should deal with the identified factors through making an accurate evaluation and developing appropriate strategies. In addition, the unexplained component, which plays a significant role, should be taken into account in future studies to identify the unknown factors affecting drug use disorders.

Conflict of Interests

The authors declare that they have no competing interests.

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