

Social Capital as a Predictor of Substance Misuse Relapse: Findings from a Case-Control Study

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Abstract

Background: Relapse during substance misuse treatment is common and poses a significant public health challenge. A variety of personal, social, and psychological factors influence it. This study explored the relationship between patients' social capital, individual traits, and the risk of relapse.

Methods: In this case-control study, 218 relapsed patients (case group, n=109) were compared with 109 abstentious patients (control group, n=109) in the four voluntary outpatient addiction treatment centers and one maintenance addiction treatment center using random cluster sampling in Dezful City, Iran, 2020. The data were obtained from structured interviews to determine personal traits, including age, marital status, family size, education level, job status, type of substance, smoking, and addiction history in the family. A standard social capital questionnaire was used to assess the participants' personality. Chi-square test, t-test, and logistic regression were used for data analysis.

Results: All patients were male, aged between 16 and 68 years, with a mean age of 36.84 ± 6.76 years. The three dimensions of social capital —individual trust (OR=0.33, CI=0.11-0.51), cohesion/social support (OR=0.27, CI=0.07-0.48), and social trust/associative relations (OR=0.65, CI=0.32-0.92) —are significantly associated with substance misuse relapse. In addition, age (OR=0.85, CI=0.65-0.91), educational level of illiterate/ academic (OR=2.87, CI=1.05-4.18), job status, unemployed/employed (OR=1.39, CI=1.11-1.80), and type of drugs (OR=2.71, CI=1.70-3.73) had a direct association with substance misuse relapse.

Conclusion: The association between social elements and the recurrence of substance misuse in patients receiving Methadone Maintenance Treatment (MMT) is of importance. This study showed that reduced levels of social capital were associated with a higher chance of relapse. To address this issue, it is suggested to introduce inclusive social assistance initiatives that focus on nurturing the community and promoting inclusion among MMT patients.

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Introduction

Addiction is a chronic, relapsing disorder characterized by compulsive drug seeking, continued use despite adverse consequences, and long-lasting changes in the brain, even though it is treatable. It is regarded as both a complex brain disorder and a mental illness. Addiction is the most severe form of a full spectrum of substance use disorders and is a medical condition caused by repeated substance abuse.^{1,2} Liu and Li (2018) define addiction as a psychological and behavioral episode that can lead to social, mental, and physiological problems.²

Substance misuse relapse continues to be a significant health problem worldwide. According to the current World Drug Report from the United Nations Office on Drugs and Crime, over 35 million people worldwide are projected to suffer from drug use disorders and require treatment services. In comparison, only one in seven people receives treatment (UNODC). In 2018, around 269 million people used drugs worldwide, a 30% increase from 2009. In addition, the number of opioid users is estimated to be 53 million, up by 56% from prior estimates. Opioids are responsible for two-thirds of the 585,000 drug-related deaths in 2017.^{3,4} In Iran, an estimated 2 million people are addicted to opium or its derivatives, and this trend is expected to increase.^{5,6}

Addiction to opioids adversely affects the communities, with massive economic, social, cultural, legal, and health implications.^{7,8} Socio-economically disadvantaged individuals are at a higher risk of developing drug use disorders.⁹ A large number of people with an addiction relapse within a short time after beginning treatment. Methadone is the most often utilized treatment in Iran for substance abuse and relapse prevention, and Methadone Maintenance Treatment (MMT) clinics are commonly employed for this reason.^{10,11}

Previous research has found that the highest proportion of substance misuser and relapse is associated with male gender, unemployed or underemployed status, prior attention-deficit/hyperactivity disorder (ADHD), low-level education, family history of substance issues, comorbid mood disorders, low SES, low levels of social capital and limited social support.^{12,13} Other factors such as depression, anxiety, social problems, unfavorable life, and traumatic events, and decreased levels of social capital have been identified as relapse causes in similar studies.^{13,14} Individual reactions to substance misuse treatment also differ.¹² All these determinants are rooted in a wide range of environmental, social, demographic, intrapersonal, and physical factors.¹⁵ Substance misuse relapse is common among treated substance users and is seen as part of the rehabilitation program during the treatment process.¹⁶

Since the mid-1980s, there has been a greater emphasis on the social element of addiction in substance misuse studies. Several recent studies have attempted to demonstrate a potential association between social situational factors, such as social capital, and relapse, which can impact treatment outcomes.^{16,17} Relapse prevention can be improved by increasing social capital support. There is strong evidence to suggest that the patient's social support condition is critical in preventing drug relapse.¹⁸ Several studies have found that participation in peer social support groups helps reduce relapse.¹⁷

The social network approach has revealed important insights into the social factors that influence drug user behavior. Social capital is one component of the social network that focuses on the social environment, the composition of the social network, the structure of relationships, and the provision of social support.¹⁷ Previous research has found that social capital is strongly linked to substance abuse and relapse.^{16,19}

Social capital refers to the collective abilities acquired through social networks, which are about an individual's positive relationships with others. The three main elements of social capital are a) individual and social trust, b) social support, and c) social cohesion. Individuals with more substantial social capital have more social networks and are less likely to relapse into drug dependence.^{20,21}

Nonetheless, research on the impact of social capital in preventing substance misuse relapse across different geographical locations of the Iranian context is narrow and uneven.^{16,17} Improved social capital can boost social bonds such as family and friend ties. Because of lower levels of antisocial behavior, strong family and friend relationships may improve overall social behavior among drug addicts.^{12,17}

Moreover, social capital theory's potential influence on treatment procedures to prevent substance misuse relapse is relatively under-researched.¹⁹ Therefore, it is essential to develop effective relapse prevention programs and interventions and to pinpoint various factors, such as social features, that have a significant effect on substance misuse relapse.^{19,22}

This study aimed to investigate the association between social capital and substance misuse relapse among patients undergoing MMT, addressing a significant gap in existing literature. This research is novel in its focus on specific dimensions of social capital, such as individual trust, social support, and social cohesion, within a culturally distinct population, providing new insights into how these social factors influence recovery. By highlighting the critical role of social elements in relapse prevention, the study not only enhances our understanding of the

interplay between social networks and substance use outcomes but also informs the development of targeted interventions that promote community engagement and support for patients, ultimately aiming to improve treatment effectiveness in addiction recovery.

Methods

This case-control study was conducted in four voluntary outpatient addiction treatment centers and one maintenance addiction treatment center in Dezful City, Iran. In total, 218 male patients were recruited for the study, including 109 subjects with substance misuse relapse in the case group and 109 subjects (relapse-free, abstinent) in the control group. Subjects in the case group had a history of quitting in one of the addiction treatment centers at least once but had relapsed into drug use at the time of the study and had taken methadone treatment for at least one month.

This study used a multi-stage random sampling approach to select patients from addiction treatment centers. Initially, among the eight voluntary outpatient addiction treatment centers and two maintenance addiction treatment centers in the city, four voluntary outpatient addiction treatment centers and one maintenance addiction treatment center were selected through a cluster sampling approach. Subsequently, 109 patients with substance misuse relapse were included in the study using a simple random sampling method. Following the selection of the case group, an additional 109 relapse-free drug addicts were selected as the control group, also through simple random sampling.

The sample size was estimated using a power analysis to achieve 80% statistical power and a significance level of 0.05. The expected effect size was derived from a previous study, which found an odds ratio (OR) of 1.15 with a standard error (SE) of 0.52. The sample size of 218 participants (109 per group) was determined.²³

The inclusion criteria were being between the ages of 15 and 69, having used methadone for at least one month at the time of the study, being able to communicate and understand research questions, complying with treatment, and providing informed consent. The dependent variable was whether the subjects had used drugs in the past six months, coded as 1 for those with drug abuse and 0 for those without it.

To enhance the measurement of social capital and other relevant variables, we conducted structured interviews with all patients. These interviews were designed to collect detailed demographic information and assess the independent variables, including age, marital status, family size, education level, job status, type of substance used, smoking habits, family history of addiction, and levels of social capital.

The Social Capital Questionnaire comprises nine subscales with 69 items that assess participants' relationships with family, relatives, friends, neighbors, colleagues, individuals of the same ethnicity and religion, and the broader community. Responses are scored using a 5-point Likert scale. The first four subscales focus on voluntary participation, collective action, trust, and social cohesion. The fifth subscale addresses honesty, integrity, fairness, and the courage to speak the truth. Additionally, the remaining four subscales evaluate social support, involvement in community activities (including collaborations among parents and teachers, religious organizations, sports teams, charities, professional associations, political groups, ethnic communities, and academic circles), social status (reflecting an individual or group's standing within a social framework based on cultural, social, and economic factors), and social networks (which examine connections with family, relatives, friends, neighbors, and colleagues).²⁰

Data were analyzed using SPSS software, version 22 (SPSS Inc., Chicago, IL, USA). Descriptive statistics were calculated, including mean, standard deviation, and frequency tables. Bivariate analyses, including Chi-square tests, odds ratios (OR), and t-tests, were performed to compare the relapse groups and independent variables. A multivariate logistic regression model was used to estimate the predictors of relapse, with the dependent variable coded as 0 for being drug-free and 1 for experiencing relapse. Before conducting these analyses, the assumptions of each statistical method, including normality and multicollinearity of independent variables, were tested to ensure their validity. The level of significance was set at 0.05.

Ethics Statement

Ethics approval was obtained from the Ethics Committee at Dezful University of Medical Sciences (IR.DUMS.REC.1397.040). A participant information statement was provided to all potential subjects, and informed consent was obtained from those who agreed to participate in the study. The study maintained the privacy and confidentiality of all subjects and their data throughout the research process.

Results

All subjects were males between 16 and 68 years old, with a mean age of 36.84 ± 6.76 . A total of 119 subjects (54.58%) had only primary school education or even less. The mean for the number of years addicted and family size were 4.63 ± 2.39 years and 3.32 ± 1.33 , respectively. The mean scores for social capital dimensions, i.e., individual trust, cohesion/social support, and social trust/associative relationships, were 2.93 ± 0.72 , 3.28 ± 0.56 , and 2.49 ± 0.39 , respectively. Additionally, 21.10% ($n=46$), 25.23% ($n=55$),

and 29.36% (n=64) of the subjects reported poor levels of individual trust, cohesion/social support, and social trust/associative relations, respectively. Table 1 shows the patients' other characteristics and the association between these variables and substance misuse relapse using univariate analysis.

The findings of univariate analysis showed that education level, marital status, type of drug used, and job status had a statistically significant association with substance misuse relapse in both case and control groups (Table 1). However, there was no significant association between addiction history in the family and smoking with drug abuse relapse.

Table 2 indicates the characteristics of the quantitative factors, the dimensions of social capital, and their associations with substance misuse relapse in the case and control groups.

According to Table 2, the case group's mean age (35.55 years) was lower than the control group's (38.13 years). There was also no association between the family size and substance misuse relapse. Furthermore, the dimensions of social capital were associated with substance misuse relapse in such a way that their means were greater in the control group than in the case group. The significant variables identified in the univariate analysis ($P=0.03$) were included in the multivariate logistic regression, and the results are presented in Table 3.

The multivariate logistic regression analysis in Table 3 revealed that the dimensions of social capital were related to substance misuse relapse. Age, educational level, employment situation, and drug type all had a direct association with relapsed substance misuse. However, no significant association between marital status or smoking and substance misuse relapse was found.

Discussion

The present study assessed the role of social capital and some individual characteristics in relapse in 218 patients following treatment for substance misuse. The primary objective was to evaluate the differences in social capital between individuals who had relapsed and those who reported being abstinent. Although many past studies have investigated substance misuse and health problems using social capital frameworks, in addition, little attention has been paid to the role of social capital in the post-treatment process in addicts.^{10,24} Our findings revealed an association between social capital and substance misuse relapse in people with an addiction under investigation. All three aspects of social capital exhibited a statistically significant association with drug abuse relapse. Individual trust, cohesion/social support, and social trust/associative relationship were lower in the case group than in the control group. The prediction of increased substance misuse relapse due to lower social

Table 1: Characteristics of the addicts with substance misuse relapse in the case and control groups

Characteristics	Category	Case N (%)	Control N (%)	P value	OR crude	CI 95%
Education level	Illiterate	16(14.68)	11(10.09)	0.03	3.27	1.36-6.31
	Primary and middle school	51(46.79)	41(37.61)	0.02	2.79	1.43-4.92
	High school	34(31.19)	39(35.78)	0.16	1.96	0.75-3.02
	Academic	8(7.34)	18(16.51)	-	-	-
Marital status	Married	37(34.58)	49(46.23)	0.02	0.68	0.11- 0.89
	Widow / divorced	18(16.82)	10(9.43)	0.26	1.63	0.68-3.87
	Single	52(48.60)	47(44.34)	-	-	-
Job-status	Unemployed	56(53.33)	45(43.27)	0.04	1.57	1.03-3.45
	Employed	15(14.29)	19(18.27)	-	-	-
	Other	34(32.38)	40(38.46)	0.31	0.93	0.41-2.10
Type of drug	Opium	55(50.46)	37(34.26)	0.03	1.89	1.04-3.43
	Cannabis	17(15.60)	24(22.22)	0.78	0.90	0.43-1.91
	Other	37(33.94)	47(43.52)	-	-	-
Addiction history in the family	Yes	44(42.72)	40(37.74)	0.54	1.23	0.71-2.14
	No	59(57.28)	66(62.26)	-	-	-
Smoking (Currently)	Yes	69(63.89)	62(57.41)	0.33	1.31	0.76-2.26
	No	39(36.11)	46(42.59)	-	-	-

OR: Odds Ratio; CI: Confidence Interval

Table 2: Characterization of some demographic factors and dimensions of social capital in case and control groups

Variables	Case		Control		t	P value
	Mean	SE	Mean	SE		
Age	35.55	0.63	38.13	0.65	-2.87	0.01
Family size	3.28	0.12	3.35	0.13	-0.41	0.68
Individual trust	2.85	0.18	3.32	0.24	-3.18	0.01
Cohesion/social support	2.93	0.19	3.26	0.22	-2.84	0.01
Social trust/associative relations	2.44	0.26	2.78	0.26	-1.92	0.03

Table 3: Association of demographic variables and dimensions of social capital with substance misuse relapse using logistic regression

Variables	Category*	Unstandardized coefficient (B)	Standard Error	OR adjusted	CI % 95**	P value
Constant	-	1.51	0.09	1.21	-	0.001
Age	-	-0.73	0.13	0.85	0.65-0.91	0.024
Education level	Illiterate	1.04	0.50	2.87	1.05- 4.18	0.012
	Primary and middle school	0.68	0.09	1.96	1.67-2.30	0.026
	High school	-1.83	2.11	0.33	0.12-1.45	0.321
	Academic	-	-	-	-	-
Marital status	Married	-0.56	0.11	0.55	0.44	0.731
	Widow and divorced	-0.06	0.09	0.95	0.76-1.18	0.652
	Single	-	-	-	-	-
Job-status	Employed	-	-	-	-	-
	Unemployed	0.32	0.09	1.39	1.11-1.80	0.008
	Other	-0.13	0.08	0.87	0.71-1.15	0.812
Type of drug	Opium	1.01	0.22	2.71	1.70-3.73	0.001
	Cannabis	0.41	0.23	1.50	0.93-2.09	0.083
	Other	-	-	-	-	-
Smoking	Yes	3.18	0.07	1.23	0.96-1.49	0.255
	No	-	-	-	-	-
Individual trust	-	-1.14	0.10	0.33	0.11-0.51	0.003
Cohesion/social support	-	-2.12	0.13	0.27	0.07-0.48	0.001
Social trust/associative relations	-	-0.38	0.05	0.65	0.32-0.92	0.009

OR Odds Ratio; CI Confidence Interval. *The second category was defined as the reference group for each variable. **Significant level is 0.05

capital is consistent with the findings of previous research that studied the effect of social capital components on deviant behaviors.^{17, 25} The components of social capital can primarily establish a high level of self-esteem and self-identity, thereby initiating a sequence of positive events. Furthermore, a low level of social capital and a lack of social ties can be decisive in the experience of drug use.^{16, 19} Previous research in psychology. Behavior suggests that a low level of social support/capital can significantly affect individual psychological and behavioral states, which can have a direct and indirect impact on drug use/abuse.^{13, 16} In a study in China, Xiong and Jia reported the role of external social support and perceived social capital in predicting addiction relapse. According to the findings of this study, a positive association was observed between internal and external social support, perceived social capital, and the likelihood of relapse.¹⁷ Likewise, Garmendia et al. found that social capital and social support protected drug users from relapse for at least six months after treatment.²⁵ Arabshahi's study conducted in 2023 demonstrated that adequate social support can lead to a threefold decrease in addiction relapse, a finding that aligns with the outcomes of the current study.²⁶

A high level of social capital can effectively lower the likelihood of substance misuse relapse by increasing individual and social trust, social solidarity, reciprocity, social cohesion, and social support. Individuals with a higher level of social capital typically have a more substantial social involvement and social network, which can help prevent drug relapse by enhancing mental health and preventing the emergence of risk factors associated with relapses in people with an addiction.²⁷

In addition, our study revealed an association between substance misuse relapse and some of the characteristics related to it. In the logistic regression model, the variables of age, educational levels, employment status, and type of drugs were significantly correlated with drug abuse relapse. However, the study found no statistically significant association between marital status or smoking and drug abuse relapse. Numerous research has found that younger age is associated with relapse to drug abuse, which is consistent with the findings of this study.^{5, 27} In a cross-sectional study in Shiraz, Iran, Taghva et al. (2018) found a strong association between average abstinence time and age, gender, work, marital status, and social, psychological, and medical characteristics of people with an addiction, which is consistent with the findings of the current study.²⁸

This study has several limitations affecting its findings. Reporting bias may arise from self-reported data, leading participants to underreport drug use or exaggerate social capital. Sampling bias is evident, as the exclusive focus on male participants from specific treatment centers limits the generalizability of the results. The case-control design captures data at a single point in time, hindering the establishment of a causal association. The limited cultural diversity may overlook varying influences on social capital and relapse. Finally, unmeasured confounding variables, such as mental health status and access to healthcare, could further impact the relapse rates. Conducting similar studies in various cities and provinces with distinct cultural characteristics can improve the overall relevance of the findings.

Conclusion

In patients who underwent MMT after undergoing a drug detoxification regimen, social factors such as the level of social capital were associated with the prevention of relapse. Also, factors such as age, educational level, job status, and type of drugs were significantly associated with substance misuse relapse. It is recommended that developing social support programs, strengthening self-efficacy, counseling support programs, and following therapeutic approaches should be integrated to reduce the likelihood of substance misuse relapse. The research emphasizes the importance of incorporating social capital into addiction treatment programs, underscoring the significance of having robust support systems to diminish relapse rates. Therapists should design interventions that consider individual traits such as age and level of education while also involving familial and community resources. Educating patients about the importance of social connections can empower them to pursue supportive relationships actively. Subsequent research should investigate specific interventions that enhance social capital and assess their effectiveness across diverse populations. Furthermore, it should examine the enduring effects of social support on recovery outcomes to inform optimal approaches in addiction treatment.

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Authors' Contribution

A.S. contributed to the study design, statistical analysis, and initial manuscript drafting. A.B. assisted with methodology development, data validation, and critical revisions of the manuscript. MA. B. participated in data acquisition, project coordination, and resource provision. A. K. supervised the entire research process, provided expert guidance on analysis and interpretation, secured funding, and finalized the manuscript for submission. All authors reviewed and approved the final version of the manuscript.

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Conflict of Interest

None declared.

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