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Original Article

Effectiveness of Psychoeducation to Reduce Relapse Among Substance Users: An Interventional Study

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Abstract: Relapse rates among substance users are generally higher in the early stages following substance use cessation. Nevertheless, correctional facilities are seeking effective strategies to reduce the risk of relapse among incarcerated substance users. This study developed and assessed a psychoeducational program to reduce the risk of relapse among substance users using a quasi-experimental design. We recruited 102 incarcerated substance users from a correctional facility and divided them into two equal groups. The pretest, program implementation, and posttest were conducted from July 1, 2024, to March 2, 2025, using the Stimulant Relapse Risk Scale-35. Paired *t*-tests and a linear regression analysis were used to evaluate program effectiveness and identify the predictive factors for reducing the risks of relapse, respectively. The sample was predominantly male (82.2%). Approximately 51.2% and 56.4% participants in the control and experimental groups, respectively, were using methamphetamines. Participants in the experimental group showed a significant improvement following program implementation ($p < 0.001$). Significant predictors of greater improvement following the program's implementation were good financial status, being divorced, living with a spouse, living alone, and using opium. Conversely, significant predictors of lower improvement included having a bachelor's degree, having parents with substance use disorders, smoking fewer than 10 cigarettes per day, starting to smoke at an older age, and using alcohol. Our findings underscore the necessity of psychoeducational programs in correctional facilities to help substance users participate in programs, thereby reducing their risk of relapse.

1. Introduction

Substance use is a global issue that costs humans billions of disability-adjusted life years [1]. The global mortality rate of substance use disorders (SUDs) is estimated to have increased 7–12 times from 1990 to 2021. In addition, the global increase in fatalities from SUDs can be attributed to two key factors: population growth and changes in epidemiology. The number of SUD-related deaths is expected to continue to increase by 2040 [2]. Notwithstanding the increasing demand for illicit substances and a wider demographic of users, substance-related issues continue to pose a substantial threat to the safety of the community. These concerns adversely impact people's mental and physical well-being while exacerbating social problems and causing unstable relationships [3, 4].

"Relapse" refers to the process of returning back to using substances heavily after reducing use or being sober for a long period [5]. Guliyev *et al*. [6] reported relapse rates of 40.5% after 3 months and 74.6% after 12 months. In addition, 50%–60% of substance users (SUs) experience relapse after receiving treatment [7-9]. Despite sharing some features, opiate and stimulant relapses are differently influenced by situational factors [10]. Certain contextual factors, such as societal pressure and negative feelings, substantially affect both types of relapses. The prevalent factors contributing to relapse after abstaining

from substance use include peer or societal pressure, negative familial emotions such as despair and hostility, a lack of empathy from family members, and stress stemming from traumatic events or poor physical or mental health [11]. A systematic review by Barati *et al*. [12] identified the most common factors influencing drug relapse across all ecological model levels: negative feelings, interpersonal conflicts with friends and family, inadequate follow-up, social rejection, drug availability, and unhealthy environments.

Given the serious increase in SUDs and relapse rates, proactive and urgent strategies for SUDs must be implemented to decrease the associated mortality rates [2]. Consensus exists regarding the availability of various evidence-based psychosocial treatments and interventions for SUDs that aim to reduce the risk of relapse. Studies have indicated that group intervention is the most effective method for treating SUDs [13]. Psychoeducational group interventions provide crucial resources for individuals with mental disorders and adopt an extensive framework for understanding the etiology, treatment options, and potential outcomes of various mental health conditions. This strategy equips participants with knowledge that promotes awareness and hope. The collective experience of patients encountering similar challenges facilitates a supportive atmosphere where participants can learn from each other while investigating successful alternatives to conventional therapy [14]. Furthermore, participating in a psychoeducational program for relapse prevention contributes to favorable improvements in relapse rates [15].

In Iraq, the Kurdistan Regional Government published data in 2019 that indicated 1,794 arrests for illegal drug use and trafficking [16]. Additionally, 12% of individuals with mental illness exhibited signs indicative of SUDs (4% involved in alcohol use and 8% displaying predictors of other SUDs) [17]. In Erbil, high school students reported lifetime prevalence rates of 27.6% for cigarette smoking, 23.6% for water-pipe smoking, and 3.7% for alcohol consumption [18].

To date, no study has examined the effectiveness of psychoeducation in reducing relapse among SUs in the Kurdistan region of Iraq. Therefore, this study assessed the efficacy of psychoeducational interventions in preventing relapse among SUs. The reliable results provide a model for correctional facilities to adopt a structured rehabilitation program that aligns with the Kurdish culture.

2. Materials and Methods

2.1. Study Participants and Sample Size Calculation

This quantitative quasi-experimental study involved SUs from a correctional facility in Sulaimani. The correctional facility is divided into two distinct areas: one for males and the other for females and juveniles. The sample comprised 90 male and 12 female SUs. Participants were assigned to the control group (CG) or experimental group (EG), which remained separated according to their locations. The inclusion criteria were as follows: participants who were ≥ 18 years old; possessed the ability to read, write, and communicate effectively; had no significant mental health issues; had completed the withdrawal phase; and agreed to participate in the study. The exclusion criteria were as follows: participation in another group intervention or psychoeducational program within three months pretest or posttest, completion of a prison sentence before the posttest, and significant hospitalization within three months pretest or posttest. Data collection and implementation of the psychoeducational program were carried out from July 1, 2024, to March 2, 2025.

This study adhered to the standards established by the Institutional Ethics Board and the principles detailed in the Declaration of Helsinki. The ethical review committee of the Hawler Medical University, College of Nursing granted authorization for the study (ethical approval number: 2524, date: 19/3/2025). Informed verbal consent was obtained from all participants prior to data collection.

The sample size was determined based on prior studies [15, 19] using G*Power. The sample size was calculated for a two-group comparison (EG vs. CG) using a two-sided $\alpha = 0.05$ (indicating a 95% confidence interval) and 80% power. For these parameters, a simple and commonly used estimation for the required sample size per group is $n \approx 16/d^2$, where d represents Cohen's standardized effect size. Assuming a moderate effect size of $d \approx 0.56$, the required sample size per group was:

$$n \approx \frac{16}{(0.56)^2} \approx 51 \text{ participants per group.}$$

2.2. Study Questionnaire

The questionnaire was developed based on previous research that focused on relapse concerns among SUs [20] and comprised two main parts. The first part collected information on participants' sociodemographic characteristics, including age, sex, educational level, family history of drug misuse, and marital status. The questions focused on pre-incarceration issues, including place of residence, work status, parenting status, parental cohabitation, and income level. The second part gathered data regarding participants' lifestyles, including their smoking habits (e.g., whether they consumed more than 10 cigarettes daily and the age at which they commenced smoking), the period of their substance use, the individual who introduced them to the drug, the monthly dosage of drugs consumed in grams, and the types of substances used. Their patterns of drug use were also stated [20].

2.3. Validity of the Questionnaire

The questionnaire was standardized and already had face and content validity. Therefore, we only performed the cultural validation. For this purpose, we referred to the Task Force for Translation and Cultural Adaptation, supported by the International Society for Pharmacoeconomics and Outcomes Research [21]. Two bilingual experts translated the questionnaire from English to Kurdish. Two transcribed copies were analyzed and verified to generate an ideal version of the questionnaire. The Kurdish version was translated (retranslated) by two separate bilingual translators, who were instructed to prioritize meaning over exact translation while considering the original questionnaire. After examining the two translated copies, a modified version was derived. Following the preceding procedures, during the pilot study, we identified issues in the participants' expressions, vocabulary, terminology, and tenses and determined that some expressions could be enhanced, which we subsequently addressed. Additionally, none of the items were removed. The exact Kurdish version was acquired, and the original instrument was used in the final data collection (the English version is presented as a supplementary file).

2.4. Reliability of the Questionnaire

Before the initial data collection, we assessed internal consistency reliability. We recruited 12 participants from the Sulaimani Correctional Facility between September 9 and 11, 2024. The questionnaire was clear and took approximately 20 minutes to complete, as indicated by the pilot study. The internal consistency and reliability of the Stimulant Relapse Risk Scale-35 (SRRS-35) were assessed using Cronbach's alpha. The Cronbach's alpha coefficient for the SRRS-35 in this study was 0.792, indicating acceptable internal consistency.

2.5. Stimulant Relapse Risk Scale

The study's dependent variable was the score on the SRRS-35, which assesses relapse risk across five domains: anxiety and the desire to use drugs, emotional difficulties, compulsions to use drugs, positive expectancies, and a lack of negative expectancies regarding drug use. Each item was rated on a 3-point Likert scale ranging from 1 to 3. The mean score for each domain was used to calculate the overall SRRS-35 score, which was obtained by averaging the mean scores of the five domains. Individuals with low scores in "disorder perception" (for which a typical score is around 1 point) may overlook the acknowledgment of their issues [20].

2.6. Psychodeucational Program

The program was designed to help SUs comprehend the impact of substances on their lives and develop strategies for controlling their emotions, thoughts, and behaviors. Subsequently, they could identify the significance and indicators of weak assertiveness and its role in addiction therapy while comprehending the substances and their effects and complications. Additionally, SUs were informed of the treatment phases and relapse stages. Strategies for managing each phase of relapse and its duration were discussed. Additionally, participants received information on strategies for addressing the obstacles encountered by drug users at each stage as well as the methods to address them. Finally, several guidelines for rehabilitation were mentioned. Eight psychiatrists and one psychologist

evaluated the program's validity and provided feedback on its components. Additionally, experts were invited to share their perspectives and recommend improvements.

2.7. Program Design

2.7.1. Pretest Data Collection

We collected data from the participants, who were then divided into two groups. The six-session psychoeducational program was implemented for the EG only (Figure 1), while the CG received standard care.

2.7.2. Program Implementation

The psychoeducational program was conducted with 51 SUs in the EG. A program designed to ensure active participation allows opportunities for discussion, skills practice, and individualized feedback, emphasizing that excessively large groups can compromise cohesion, engagement, and treatment effectiveness [22]. The EG was further divided into five subgroups. The male subgroups comprised three groups of 11 participants each and one group of 12 participants. One subgroup of women included six participants.

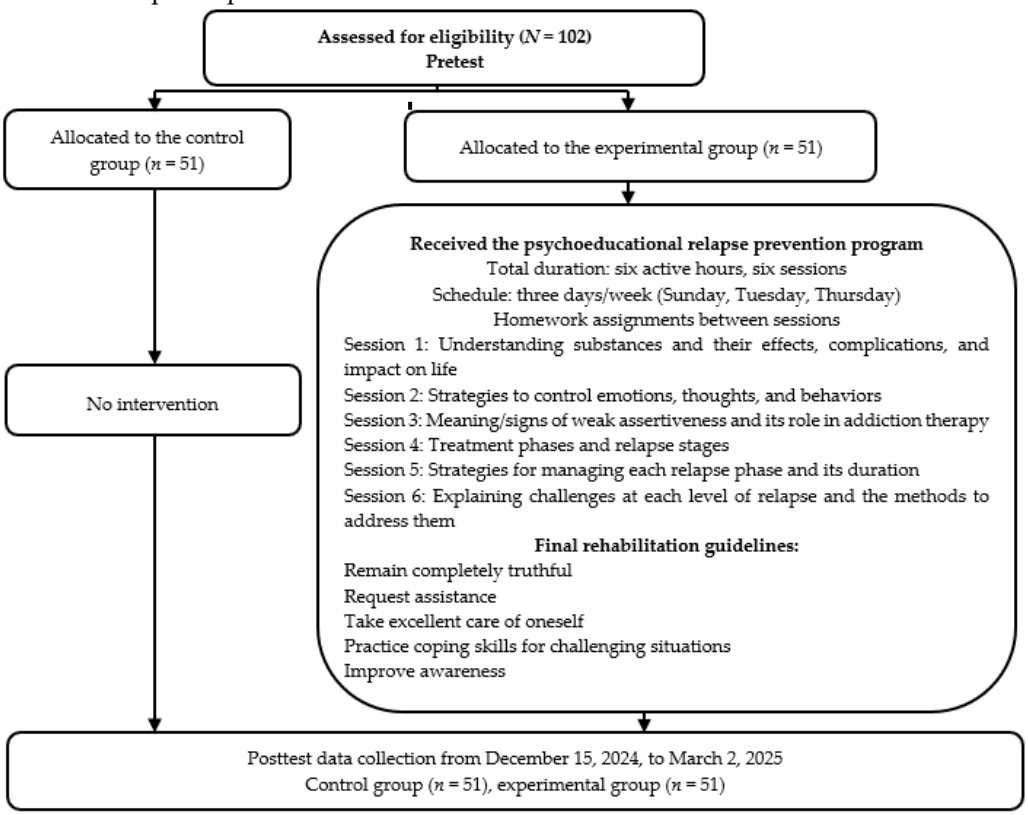


Figure 1: Program implementation (N = 102).

2.8. Statistical Analysis

Percentages and frequencies were used to analyze categorical data, whereas means and standard deviations were used for continuous variables. A normality test was performed using the Shapiro–Wilk test to determine whether the data were parametric or nonparametric. A chi-square test was used to compare the CG and EG to assess how similar or different the groups were before the intervention. A paired t-test was used to evaluate program efficacy. The SRRS-35 total score was calculated by summing all 35 items, with higher scores indicating greater relapse risk. Pretest and posttest scores were obtained for each participant. Subsequently, the difference in the SRRS-35 score (the change score of the dependent variable) was computed according to the following equation: SRRS-35 = pretest score – posttest score. A positive difference in the SRRS-35 score (> 0) represented a decrease in relapse risk, indicating program effectiveness; however, relapse risk (deterioration) increased when the difference was negative (< 0), and a difference of 0 indicated no change. Additionally, Pearson correlation

coefficients were computed to explore bivariate correlations between the SRRS-35 total score difference (pre–post) and candidates' sociodemographic and substance use variables. Dummy variables were created for the categorical predictors used in the regression models. All sociodemographic and substance use variables were entered into a multiple linear regression model. A backward elimination procedure was then applied to identify independent predictors of SRRS-35 difference scores, with the probability of F for removal set at 0.10. Clinically important covariates were retained regardless of statistical significance. We evaluated model assumptions using residual plots and the Durbin–Watson statistic and assessed multicollinearity using variance inflation factors (VIFs); predictors with VIF > 5 were removed, and the model was refitted until all remaining predictors had VIF ≤ 5. Confidence intervals were calculated at a 95% level, and the threshold for statistical significance was set at p-value < 0.05. All statistical analyses were conducted using SPSS (version 27, IBM, Boston, MA, USA).

3. Results

Table 1 presents the baseline sociodemographic characteristics of the CG and EG. Overall, the two groups were very similar; most participants were male (82.2%) and smoked more than 10 cigarettes per day (82.4% in the CG vs. 84.3% in the EG). Most participants lived in urban areas, were unemployed, and reported a moderate income. More than half of the participants in each group lived with their parents and had no family members with an SUD. None of the group comparisons based on these characteristics were statistically significant (all $p > 0.05$; chi-square test), indicating that the CG and EG were comparable at baseline.

Table 1: Distribution and comparison of participants' sociodemographic characteristics ($N = 102$).

Variables	Items	Control group ($n = 51$) No. (%)	Experimental group ($n = 51$) No. (%)	p-value
Sex	Male	45 (82.2)	45 (82.2)	0.620
	Female	6 (11.8)	6 (11.8)	
Educational level	Literate	7 (13.7)	9 (17.6)	0.766
	Primary school	21 (41.2)	16 (31.4)	
	High school	19 (37.3)	22 (43.1)	
	College	4 (7.8)	4 (7.9)	
Residential area	Rural	2 (3.9)	6 (11.8)	0.135
	Urban	49 (96.1)	45 (88.2)	
Working status	Employed	5 (9.8)	1 (2.0)	0.102
	Unemployed	46 (90.2)	50 (98.0)	
Are parents living together?	Yes	34 (66.7)	35 (68.6)	0.500
	No	17 (33.3)	16 (31.4)	
Income status	Poor	19 (37.3)	20 (39.2)	0.671
	Moderate	24 (47.0)	26 (51.0)	
	Good	8 (15.7)	5 (9.8)	
Marital status	Single	25 (49.0)	26 (51.0)	0.260
	Married	18 (35.3)	22 (43.1)	
	Divorced	8 (15.7)	3 (5.9)	
Live with	Parents	27 (52.9)	28 (54.9)	0.958
	Spouse	5 (9.8)	7 (13.7)	
	Spouse and children	12 (23.5)	10 (19.6)	
	Spouse, children, and parents	5 (9.8)	4 (7.9)	
	Alone	2 (3.8)	2 (3.9)	
Family member with SUDs	Parents	2 (3.9)	1 (2.0)	0.881
	Siblings	1 (2.0)	2 (3.9)	
	Partner	2 (3.9)	2 (3.9)	
	None	46 (90.2)	46 (90.2)	
Smoking more than 10 cigarettes a day	Yes	42 (82.4)	43 (84.3)	0.500
	No	9 (17.6)	8 (15.7)	
Who did you first get the drug from?	Close friend	42 (82.4)	39 (79.4)	0.463
	Others	9 (17.6)	12 (20.6)	

No.: number; %: percentage; p-value: probability value from chi-square test.

As shown in table 2, the predominant method of administration reported by the participants was smoking (61.4%), followed by oral ingestion (21.4%), with many participants concurrently using more than one route. In total, 84.3% of the participants reported smoking in combination with at least one other route of administration.

Table 2: Distribution of participants according to substance type and administration route ($N = 102$).

		Control group		Experimental group	
Variables	**Items**	**f**	**%**	**f**	**%**
Patterns of using substances	Smoking	43	61.4	41	65.1
	Oral ingestion	15	21.4	6	9.5
	Inhalation	10	14.3	14	22.2
	Injection	2	2.9	2	3.2
Total		70	100.0	63	100.0

f: frequency; %: percentage. The pattern of substance use was a multiple-response item. Participants could select more than one route of use; therefore, the sum of frequencies exceeds the number of participants in each group.

As shown in figure 2, most participants reported the concurrent use of two or more substances, indicating a predominance of polysubstance use over single-substance patterns. Methamphetamine was the most frequently reported substance (86.3%), followed by heroin in the EG (25.5%) and cannabis in the CG (23.5%).

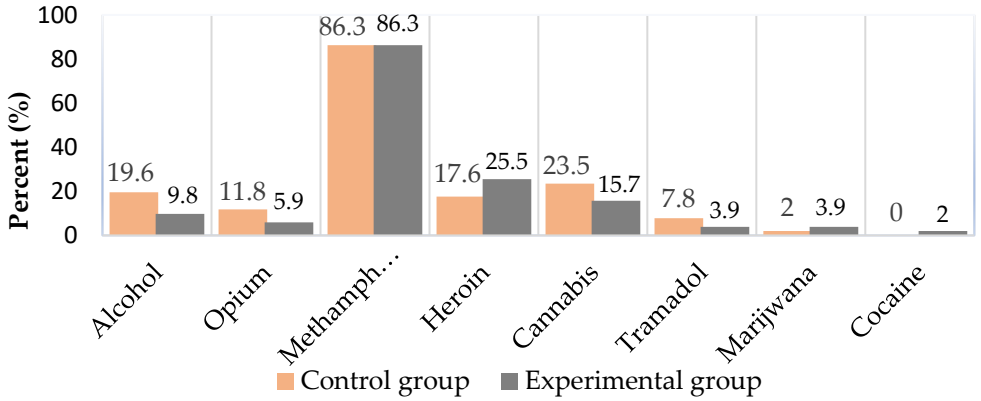


Figure 2: Distribution of participants according to substance type ($N = 102$).

As shown in table 3, there was a significant positive change in the relapse risk scores of the CG over three months (MD = 4.22, $p = 0.045$), indicating a slight increase in the risk of relapse. By contrast, the EG showed a marked decrease in relapse risk scores following the psychoeducational intervention (MD = −11.83, $p < 0.001$), reflecting a reduction in the risk of relapse. In addition, no significant difference existed between the pretest scores of the EG and CG (MD = 2.32, $p = 0.313$); however, at posttest, the EG's mean was significantly lower than that of the CG (MD = −11.73, $p < 0.001$), supporting the beneficial effect of the intervention on relapse risk.

Table 3: Risk of relapse before and after the psychoeducational program.

Variables	Group comparison	Mean	SD	MD	*p*-value
Risk of relapse posttest (CG)	CG posttest vs. CG pretest	65.35	11.23	4.22	0.080 ns
Risk of relapse pretest (CG)		61.13	9.69		
Risk of relapse pretest (EG)	EG pretest vs. CG pretest	63.45	13.08	2.32	0.313ns
Risk of relapse pretest (CG)		61.13	9.69		
Risk of relapse posttest (EG)	EG posttest vs. EG pretest	51.62	9.71	–11.83	< 0.001**
Risk of relapse pretest (EG)		63.45	13.08		
Risk of relapse posttest (EG)	EG posttest vs. CG posttest	51.62	9.71	–11.73	< 0.001**
Risk of relapse posttest (CG)		65.35	11.23		

SD: standard deviation; *p*-value: probability value; vs. versus; MD: mean difference. The *p*-values were obtained from the paired-samples *t*-tests for within-group comparisons and independent-samples *t*-tests for between-group comparisons. $^{ns}p > 0.05$; $^{*}p < 0.05$; $^{**}p < 0.01$.

Table 4 presents the multiple regression analysis outputs, which identified the predictive variables that decrease the risk of relapse following the psychoeducational program. Examining the normal P–P plot and the scatterplot of standardized residuals versus standardized predicted values showed that the residuals were approximately normally distributed and randomly scattered around zero. This indicates that the assumptions of linearity, homoscedasticity, and absence of influential outliers for the regression model with the SRRS-35 difference scores and selected predictors were reasonably met. Owing to the residuals' Durbin–Watson statistic of 1.812, we can conclude that they are independent. There were no bivariate outliers, and multicollinearity was assessed using VIFs. All predictors in the final model had VIF values < 5, indicating no evidence of problematic multicollinearity.

Table 4: Predictive factors decreasing the risk of relapse after the psychoeducational program (n = 52).

Independent variables	Unstandardized coefficients		Standardized coefficients	t	p-value	95% Confidence interval for B		Collinearity statistics	
	B	Std. error	Beta			Lower bound	Upper bound	Tolerance	VIF
(Constant)	32.110	5.298	---	6.060	< 0.001***	21.393	42.827	---	---
Bachelor's degree holder	–58.988	10.858	–1.046	–5.433	< 0.001***	–80.950	–37.025	0.257	3.890
Good financial status	12.975	4.973	0.276	2.609	0.013*	2.917	23.034	0.853	1.172
Marital status: Divorced	43.592	13.909	0.676	3.134	0.003**	15.458	71.726	0.205	4.890
Living with spouse	27.471	7.737	0.487	3.550	0.001**	11.821	43.121	0.506	1.975
Living alone	7.722	6.951	0.120	1.111	0.273^{ns}	–6.337	21.781	0.819	1.221
Having parents with SUDs	–61.866	20.544	–0.566	–3.011	0.005**	–103.421	–20.312	0.270	3.704
Smoking < 10 cigarettes/day	–14.201	4.633	–0.357	–3.065	0.004**	–23.573	–4.830	0.702	1.424
Age at which smoking commenced	–1.263	0.287	–0.481	–4.399	< 0.001***	–1.844	–0.682	0.796	1.257
Using alcohol	–13.371	7.726	–0.237	–1.731	0.091^{ns}	–28.999	2.257	0.508	1.970
Using opium	33.105	10.578	0.514	3.130	0.003**	11.708	54.502	0.354	2.828
Injection as a route of drug use	10.940	7.887	0.140	1.387	0.173^{ns}	–5.013	26.893	0.935	1.070

B: beta; Std.: standardized; t: t-value; p-value: probability value; VIF: variance inflation factor; ns: not significant ($p \geq 0.05$). *$p < 0.05$; **$p < 0.01$; ***$p < 0.001$. Dependent variable: SRRS-35 (difference between scores before and after the psychoeducational intervention); Total $R^2 = 0.628$, adjusted $R^2 = 0.524$, $F = 5.997$, $p =< 0.001$; standardized residual minimum = –2.032, standardized residual maximum = 1.812; Durbin–Watson test = 1.691.

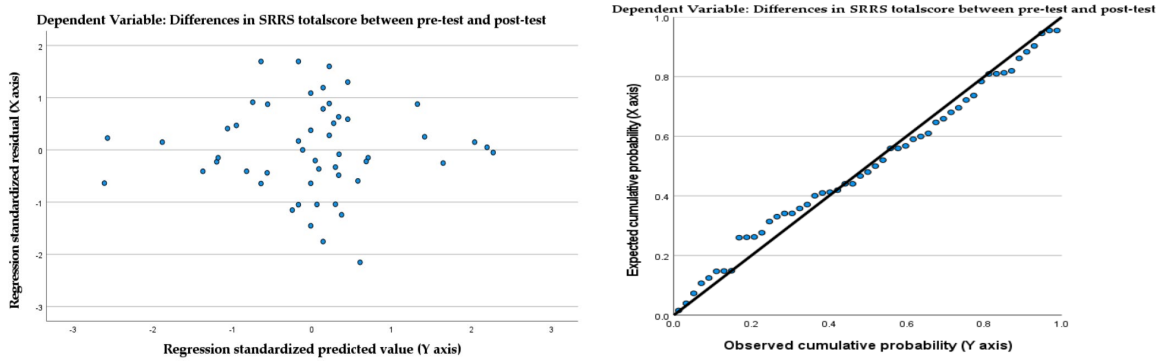
The correlations of the sociodemographic and substance use variables with the SRRS-35 score differences before and after the psychoeducational intervention are presented in table 5. A significant correlation existed between bachelor's degree holders, the age at which participants commenced smoking, and SRRS-35 total score differences ($p < 0.05$). The adjusted R^2 for this equation was 0.524, indicating that 52.4% of the variance in SRRS-35 scores before and after the intervention was predicted by the independent variables. Positive B values indicated that the predictor was associated with a higher SRRS-35 difference score (pretest > posttest), indicating improvement or a lower risk of relapse after the program. For instance, for each increase of one unit for participants with good financial status, who were divorced, living with a spouse, living alone, or using opium (which had positive B coefficients with $p < 0.05$), the SRRS-35 score difference before and after the intervention increased. Conversely, negative B values signified a decrease in the SRRS-35 difference score (pretest–posttest), implying deterioration or an increased risk of relapse following the program. For instance, for each increase of one unit for participants with bachelor's degrees, having parents with SUDs, smoking less than 10 cigarettes per day, and commencing smoking at an older age (which had negative B coefficients with $p < 0.05$), the difference in SRRS-35 scores before and after the intervention decreased.

Table 5: Correlation of the difference in SRRS-35 total scores (between pretest and posttest) of the experimental group with the independent variables.

Variables	1. SRRS-35 total score differences	2. Bachelor's degree holder	3. Good financial status	4. Marital status: Divorced	5. Living with spouse	6. Living alone	7. Parents with SUDs	8. Smoking < 10 cigarettes/day	9. Age at which smoking commenced	10. Using alcohol	11. Using opium	12. Injection as a route of drug use
1. SRRS-35 total score differences	---	r = –0.304 (p = 0.015)	r = 0.055 (p = 0.349)	r = –0.091 (p = 0.262)	r = 0.043 (p = 0.383)	r = 0.096 (p = 0.252)	r = –0.014 (p = 0.460)	r = –0.131 (p = 0.179)	r = –0.339 (p = 0.007)	r = 0.038 (p = 0.396)	r = 0.206 (p = 0.074)	r = 0.073 (p = 0.306)
2. Bachelor's degree holder		---	r = 0.120 (p = 0.201)	r = 0.547 (p =< 0.001)	r = 0.457 (p =< 0.001)	r = 0.237 (p = 0.047)	r = –0.041 (p = 0.387)	r = 0.056 (p = 0.347)	r = –0.229 (p = 0.053)	r = –0.085 (p = 0.276)	r = –0.073 (p = 0.306)	r = –0.059 (p = 0.341)
3. Good financial status			---	r = –0.091 (p = 0.262)	r = 0.120 (p = 0.201)	r = –0.091 (p = 0.262)	r = –0.052 (p = 0.359)	r = 0.150 (p = 0.146)	r = 0.050 (p = 0.363)	r = –0.107 (p = 0.228)	r = –0.091 (p = 0.262)	r = –0.074 (p = 0.303)
4. Marital status: Divorced				---	r = –0.073 (p = 0.306)	r = 0.292 (p = 0.019)	r = 0.566 (p =< 0.001)	r = 0.321 (p = 0.011)	r = –0.218 (p = 0.062)	r = –0.073 (p = 0.306)	r = 0.292 (p = 0.019)	r = –0.051 (p = 0.362)
5. Living with spouse					---	r = –0.073 (p = 0.306)	r = –0.041 (p = 0.387)	r = –0.135 (p = 0.172)	r = –0.027 (p = 0.425)	r = –0.085 (p = 0.276)	r = –0.073 (p = 0.306)	r = –0.059 (p = 0.341)
6. Living alone						---	r = –0.035 (p = 0.403)	r = 0.103 (p = 0.236)	r = –0.261 (p = 0.032)	r = –0.073 (p = 0.306)	r = –0.062 (p = 0.332)	r = –0.051 (p = 0.362)
7. Parents with SUDs							---	r = 0.306 (p = 0.015)	r = 0.048 (p = 0.369)	r = –0.041 (p = 0.387)	r = 0.566 (p =< 0.001)	r = –0.029 (p = 0.421)
8. Smoking < 10 cigarettes/day								---	r = –0.297 (p = 0.017)	r = –0.135 (p = 0.172)	r = 0.103 (p = 0.236)	r = 0.171 (p = 0.114)
9. Age at which smoking commenced									---	r = 0.061 (p = 0.335)	r = 0.042 (p = 0.386)	r = –0.036 (p = 0.400)
10. Using alcohol										---	r = 0.547 (p =< 0.001)	r = –0.059 (p = 0.341)
11. Using opium											---	r = –0.051 (p = 0.362)
12. Injection as a route of drug use												---

SRRS-35: Stimulant Relapse Risk Scale; r: Pearson coefficient correlation; p: probability value.

In figure 3(a), which resembles a rectangle, no point is outside –3 to +3 on the x- or y-axis. Moreover, figure 3(b) shows that the points typically follow the line.



(a) Scatterplot (b) Normal P–P plot of the regression standardized residual

Figure 3: Scatterplot (a) and normality plot (b) for the SRRS-35 total score differences (between pretest and posttest) of the experimental group (n = 51).

4. Discussion

A quasi-experimental study was conducted with 102 SUs in a correctional facility. The results revealed that the majority of the participants were incarcerated because of the use of methamphetamines. Such use has increased significantly in recent years, particularly among individuals from a lower socioeconomic status, involved in criminal activity, or having comorbidities [23], along with additional individual, social, and family factors [24]. In Iraq, the available data clearly indicate an increasing trend in the number of people affected by substance use despite strict legal action against drug users. Drug use is currently a significant social issue in Iraq and is increasing rapidly, indicating a lack of cognitive resilience in society [25]. The predominant indicators predicting methamphetamine use among the Iraqi population are being male, barely completing basic education, urbanization, and unemployment [26]. Consequently, correctional institutions and related organizations must focus on minimizing the increase in drug use and implementing programs that enhance cognitive resilience among the population. Staying inactively in correctional facilities and participation in interventional group treatment may increase the risk of relapse. The inaccessibility of services, health insurance, and welfare benefits and the difficulty of obtaining stable housing and assistance finding productive jobs are the challenges encountered by SUs, particularly upon release from prison. They also face personal difficulties in terms of "old habits," mental health concerns, and social networks, which may restrict social integration, as well as systemic obstacles. Therefore, when released from prison, (ex-)offenders deal with dangers and obstacles in unique ways. People who use drugs within and outside prison walls need better and more tailored medical and psychosocial treatment [27].

Implementing the psychoeducational program within a quasi-experimental framework yielded significant findings regarding the relapse risk among SUs in a correctional facility. SUs experience satisfaction with psychoeducational programs that offer comprehensive treatment, and improvements tend to be incremental [28]. Furthermore, psychoeducation effectively reduces adolescents' tendencies of drug use [29]. Participating in a psychoeducation program leads to significant improvements in self-efficacy and drug cognition after treatment [30]. Moreover, total self-efficacy has a substantial primary influence on addiction rehabilitation [31]. Elevated self-efficacy promotes motivation for significant improvements and enhances the quality of life, thereby reducing the likelihood of drug use relapse. Individuals with heightened self-efficacy exhibit more resistance to cravings, particularly during the initial months of recovery, indicating that self-efficacy is a crucial determinant of prolonged abstinence [32].

The present study revealed that the age at which a person started smoking was a predictive factor for relapse after the psychoeducational program. SUs are less successful in quitting and have a higher

risk of relapse if they smoke consistently or start smoking at a young age [33]. Nicotine—a component of cigarettes—is addictive and may predict substance consumption, increase cravings, and cause relapse [34]. In addition, the brain's neuronal plasticity may be altered by early nicotine exposure and smoking, which increases susceptibility to addiction and makes it more difficult to stop using other substances [35]. Nicotine plays a role in developing stimulant addiction, and people who simultaneously smoke and use drugs are more likely to be highly dependent on substances and resistant to treatment [36]. Several issues remain unresolved regarding interventions for illicit drug addiction and the effects of smoking on addiction progression. Our results demonstrated that the level of education was a predictive factor for decreasing the risk of relapse after program implementation. Patients with SUDs are encouraged to actively participate in psychoeducational programs to improve brain function and cognition [37]. Research has shown that psychoeducational interventions can lead to significant improvements in self-perception, self-efficacy, and treatment motivation. Additionally, relapse rates decrease with improvements in self-efficacy and treatment motivation [38]. Psychoeducation exerts positive effects on substance use and reduced relapse rates [39]. However, the correlation between psychoeducation and educational level is unclear and requires further investigation. The psychoeducational program is particularly effective for participants with stable financial resources [40], specific marital or living arrangements, and more severe drug profiles (e.g., opium use) [41]. Conversely, its effect is attenuated among those with higher education, intergenerational SUD exposure, lighter- or later-onset smoking, and concurrent alcohol use. These results align with some studies while contradicting others [42-45].

The inexperience of correctional institution personnel with the research design and the inmates' experiences presented significant limitations. The required duration to implement the program in 12 sessions, along with inmates' unwillingness to endure prolonged sessions and the need to bring them to the prison library where the sessions were held, further complicated matters for prison personnel. Finally, we used a standardized scale; however, depending on the verbal (subjective) responses from SUs, the reliability of the data diminishes. Therefore, we recommend conducting a longitudinal study in which researchers can follow participants over an extended period to validate the findings.

5. Conclusions

This study used a quasi-experimental design to assess the effectiveness of a psychoeducational program. Substance abuse relapse prevention is a cognitive–behavioral strategy to recognize and address the risk factors to prevent relapse. Programs that use relapse prevention approaches assist participants in recognizing risk factors, implementing established coping mechanisms, and enhancing self-efficacy. The duration of imprisonment offers a crucial window to break the cyclical pattern of substance abuse. Our results emphasize the significance of psychoeducation programs in correctional facilities for preventing inmates from relapsing. However, future versions of the program should be stratified or intensified for specific subgroups, particularly those with a family history of SUDs, alcohol co-use, and higher education, to optimize relapse prevention effects.

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