

Follow-Up of a Sample of Patients with Substance Use Disorder After Completing a Rehabilitation Program in a Continuous Care Unit in Eastern Province of Saudi Arabia, from 2012 to 2022: A Retrospective Study

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Purpose: There has been limited research on Saudi patients with substance use disorders (SUDs) that has examined and assessed the psychotherapy modalities utilized in rehabilitation. Therefore, there is a need to evaluate rehabilitation programs in the continuous care unit of the Erada Complex for Mental Health, Eastern Province, Saudi Arabia.

Patients and Methods: The purpose of this study was to compare patients who finished the program with those who did not in order to determine the rate of re-admission and recurrence. Male patients (1160) aged >20 who had been diagnosed with SUDs were included in this retrospective cohort study. After ruling out mood, anxiety, psychosis, and other psychiatric disorders, they commenced a one-year rehabilitation program. Six months after leaving the facility, all participants who completed the program or not were re-admitted had relapses and underwent urine toxicological tests.

Results: Data analysis showed that 34.97% of patients completed the program, while 65.03% of patients did not complete the program. Within 6 months of follow-up after discharge, re-admission occurred in only 13.1% of patients that completed the program, but patients who did not complete the program had a readmission rate that reached 26.9% with statistical significance. In comparison between the two groups regarding relapse without needing admission, there was a significant difference between patients who completed the program (reached 14%) and those who did not complete the program (reached 28.9%). With a logistic regression model, the only significant predictor was completion of the program (the odds ratio was 0.42).

Conclusion: The present results in this study revealed that patients with substance use disorder who had finished the specific rehabilitation program in the continuous care unit had lower risk of relapse and re-admission. Further studies are needed to elucidate the importance of the rehabilitation programs in the management of substance use disorder.

Keywords: psychotherapy, rehabilitation, re-admission, recurrence

Introduction

As substance use disorder is a growing challenging problem worldwide as well as in our community especially the novel one from the diagnosis, creating follow-up programs, cultural and logistic issues, also as few long-term programs, are present in our community, and few studies have addressed those program efficacy as well as effectiveness. The same persistent or recurrent diseases that cause other continuous medical problems, such as diabetes and hypertension, affect more individuals now and necessitate ongoing treatment, including substance use disorders (SUD). These individuals

usually have significant functional limitations and a substantial prevalence of associated cultural, cognitive, and physical issues that require attention.¹

Statistics indicate that 40–60% of those receiving treatment for alcohol or other drug addictions revert to their previous patterns of usage within a year after finishing treatment.^{2,3} Historically, acute bouts of care have dominated short-term treatments for addiction. A restricted course of outpatient treatment is usually provided to patients following primary medically guided drug withdrawal and/or stabilization at a higher level of therapy. A national survey of outpatient SUDs treatment programs found that the planned duration of outpatient care was most often 90 days, while the actual duration was less than 30 days. Treatment has largely taken place in specialty addiction programs that employ a single treatment modality, often without access to medication.^{4–6}

Many MRI studies showed that SUDs have been associated with lower grey-matter volumes (GMVs) regionally, mainly in the prefrontal cortex (PFC). Increased GMV in these areas has been associated with treatment responses.⁷ Unfortunately, whether changing GMVs in people with SUDs may lead to better outcomes is still unclear. Recent studies showed that synaptic density has been reported to be reduced in PFC regions in individuals with stimulant use disorders such as cocaine and amphetamine.⁸ Regarding subcortical regions such as the striatum, amygdala, or hippocampus, there are insufficient studies to draw strong conclusions regarding treatment–GMV relationships, with some studies suggesting different directions of associations when linking GMVs to treatment outcomes.⁷ Additionally, in contrast to the PFC findings in cocaine use disorder, reduced synaptic density has been observed in the hippocampus in cannabis use disorder, indicating the importance of considering targeted interventions differentially across SUDs.⁹

The strategy for treating SUDs is changing from episodic to ongoing treatment, which relies on the chronic care model, as a result of growing awareness of the significant patient population suffering from chronic SUDs (addiction). Regular evaluations and treatment plans tailored to each patient's requirements and preferences are part of continuing therapy for addiction. Over time, as the addiction waxes and wanes, the intensity of therapy was modified. Patients are taught self-management techniques and connected to further resources for expert and social assistance.^{7,10,11}

Most of the recent studies showed that substance use disorder is a behavioral disorder where rehabilitation programs are considered a cornerstone in its management. The ideal rate and length of ongoing treatment are not supported by studies. The patient who maintains their abstinence throughout treatment moves through progressively less intense grades of care, which is the target audience for these early maintenance programs. Depending on how the patient responded to the previous phases of ongoing care, the frequency and length of subsequent phases would be modified.^{12–14} Since its establishment fifteen years ago, the Eradah Complex has had an ongoing treatment unit program where patients' clinical state and relapse risk are carefully and continuously evaluated. It is considered the only facility in the Eastern Province of Saudi Arabia that delivers inpatient addiction services as well as outpatient Addiction services. The Continued Care Unit program (CCU) program offers a variety of intervention approaches, including counselling for families, occupational medicine, cognitive behavioral therapy (CBT), motivational interviewing, and twelve step techniques, to improve the clinical status of the patients and lower the chance of recurrence. It has been altered multiple times. Re-admission rate between individuals with substance use disorders is significantly lower when the continuous care unit program is completed. The Continuous Care Unit in Erada Complex programs was modified not only to provide service for Saudi Arabian patients but also to be a role model for newly designed programs in different rehabilitation centers in the Middle East.

This investigation was done to evaluate the Continuous Care Unit in Erada Complex program's efficacy in continuing managing SUD patients, measure the quantity of patients with substance use disorders who are readmitted to the Eradah, to determine how many patients with substance use problems were readmitted to the Eradah Complex following their completion of the program for the continuous care unit, to evaluate the duration of recovery upon completion of the program in the ongoing rehabilitation unit, and to contrast the readmission rate and functional status of patients with substance use disorders who are enrolled in the Continuous Care Unit in Erada Complex program with those who are not. Furthermore, this work was done to strength the importance of the long term follows up for patients with substance use disorders and how this follow-up affect their rate of relapse and re-admission and tried to show its advantages in decreasing the rate of addiction relapse which decrease the burden in our medical services from the readmission and increase the rate of productivity for those patients in the community.

Materials and Methods

Study Design & Participants

This investigation was a retrospective study and included all patient who joined the Continuous Care Unit in Erada Complex from January 2012 to December 2022 for the first time, including 1525 patients. This study excluded all patients who had a history of major psychiatric illness other than substance use disorder and had a history of previous admission to the Continuous Care Unit in Erada Complex. Patient who completed the program was 577 (37.83%), and patients who did not complete the program were 948 (62.17%). After revising medical records for patients for 6 months, follow-up appointments in OPD, there was a drop-off (which is defined as failure to have at least two 2 successive or more follow-up appointments from both groups). One hundred and seventy-one patients from the group had completed the program and did not follow-up in OPD for two or more appointments (29.6%), while patients who did not complete the Continuous Care Unit in Erada Complex program and who did not follow-up in OPD for at least two successive or more appointments were 194 (20.4%). There was no statistical significance between the two groups regarding drop-off. There were 1160 patients after excluding the drop-off. They joined the rehabilitation program in the Continuous Care Unit at the Erada Complex for Mental Health, Eastern Province, Saudi Arabia, after being hospitalized in the addiction department for at least 1 month. Participants joined the program were with or without prescribed medications.

Every participant was at least 18 years old and male. Based on the Diagnostic and Statistical Manual of Mental Disorders: Fifth edition (DSM-5) criteria,¹⁵ they have been diagnosed with substance use disorder. The research study excluded patients with a history of mood, anxiety, psychosis, or other psychiatric illnesses.

The one-year rehabilitation program included a variety of rehabilitation modalities, including CBT, relapse prevention (individual and group sessions), facilitating the twelfth step, family and couple therapy, outreach programs, and occupational therapy. The Program had three phases (early, medium, and advanced), and each phase lasted for four months. The program had to be finished in twelve months, and those who did not continue for the twelve months were deemed to have not completed the program.

Examining each participant's medical records for six months following their release from the continuous care unit is necessary in order to compare the outcomes of patients who finished the program with those who did not in terms of re-admission, relapse, and routine urine toxicological tests.

Following-up the patient after release for the Continuous Care Unit by monthly appointment and urine toxicological screening. Patients who did not present in two or more appointments after release from CCU considered drop-offs.

Selection bias originated from the way the participants of the study were selected or followed and can affect our sample of males due to their cultural background. Information biases that originated in the observed individuals while collecting the data. Besides, gender and cultural differences were considered limitations in our data collection.

Prior to administration, the study received approval from the Institutional Ethical Review Board at the Erada complex for mental health in Dammam, Saudi Arabia. The Declaration of Helsinki¹⁵ was followed when evaluating any ethical concerns pertaining to this scientific study. Additionally, the Research Ethics Committee of the Institutional Ethical Review Board at the Erada complex for mental health in Dammam, Saudi Arabia, issued an official authorized letter outlining the goal of the present investigation in January 2024 (Identification: MED 009). Besides, the patient consent to review their medical records was not required by the Institutional Ethical Review Board at the Erada Complex for Mental Health, and the data for the patients were secured in their secured electronic medical records with high confidential term signs by healthcare workers who have access to this files and compliant with declaration of Helsinki.

Analysis of Statistics

Data are presented as numbers and percentages. The fixed threshold of significance was a *P* value at the 5% level. Student-*t*-test was applied to examine the statistical difference between means of the two study groups; the chi-square test was used to test the relation among two qualitative variables; non-random associations among two categorical variables. The Fisher exact test has been performed. *P* values greater than 0.05 were used to signify non-significant results. Statistical *P* was set to 0.05, denoted statistical significance.¹⁴

Results

In the current work, 65.03% of patients did not finish the program, compared to 34.97% of patients who did. Table 1 the examined parameters were tabulated and explained in the following tables: Table 1 tests the impact of completing the program on the tested ages and those who did not complete the program (data are represented as means where $p < 0.05$ considered a significant using *t*-test). The mean age of the group who completed the program was 34.7 ± 9.7 ; the mean age of the group who did not complete the program was 37.4 ± 10.3 . There is a dramatic difference ($p < 0.001$) among the patients who completed the programs versus those who did not complete the program in the patients with the tested age range, as shown in Table 2.

In this work, 120 patients reported using amphetamine and did not complete the program, while 92 patients reported using amphetamine and completed the program. Besides, 86 patients reported using methamphetamine, and did not complete the program, while 12 patients reported using methamphetamine and completed the program. Furthermore, 64 patients reported using cannabis and did not complete the program, while 36 patients reported using cannabis and completed the program. Additionally, 87 patients reported using opioids and did not complete the program, while 40 patients reported using opioid and completed the program. Moreover, 37 patients reported using alcohol and did not complete the program, while 19 patients reported using alcohol and completed the program. While 132 patients reported using polysubstance with methamphetamine and did not complete the program, while 39 patients reported using polysubstance with methamphetamine and completed the program. Besides, 204 patients reported using polysubstance with amphetamines and did not complete the program, while 150 patients reported using

Table 1 Testing the Impact of Completing of Program on the Tested Ages and Non-Completion of the Program (Data are Represented as Means Where $P < 0.05$ Considered a Significant Using *t*-Test)

	Did not Complete Program		Complete Program		t-test		
	Mean	SD	Mean	SD*	t	p-value	Sig.**
Age	34.7	9.7	37.4	10.3	-4.3	<0.001	S

Abbreviations: *SD, Standard deviation; **Sig., Significance.

Table 2 Testing the Impact of Diagnosis of Using Various Drugs Upon Completion of the Program in Cases of Those Who Do and Do Not Complete the Program (Data are Represented as Means Where $P < 0.05$ Considered a Significant Using Chi-Square Test)

		Did not Complete Program		Complete Program		Chi Square Test		
		N*	%	N	%	χ^2	p-value	Sig.**
Diagnosis	Amphetamine	120	15.9	92	22.7	51.2	<0.001	***S
	Methamphetamine	86	11.4	12	3			
	Cannabis	64	8.5	36	8.9			
	Opioid	87	11.5	40	9.9			
	Alcohol	37	4.9	19	4.7			
	Polysubstance with methamphetamine	132	17.5	39	9.6			
	Polysubstance with amphetamine	204	27	150	36.9			
	Polysubstance	20	2.6	14	3.4			
	Benzodiazepines	4	0.5	4	1			

Abbreviations: *N, Number of patients; **Sig, Significance; S, Significant difference, ***S, highly significant.

polysubstance with amphetamines and completed the program. Twenty patients reported using polysubstance and did not complete the program, while 14 patients reported using polysubstance and completed the program. Lastly, 4 patients reported using benzodiazepines and did not complete the program, while 14 patients reported using benzodiazepines and completed the program. There is a dramatic difference ($p < 0.001$) among the patients who used the programs versus those who did not use the program among the patients with the various detected drugs. In this work, 120 patients who reported to use amphetamine and did not complete the program, while 92 patients who reported to use amphetamine and completed the program. Besides, 86 patients who reported to use methamphetamine and did not complete the program, while 12 patients who reported to use methamphetamine and completed the program. Furthermore, 64 patients who reported to use cannabis and did not complete the program, while 36 patients who reported to use cannabis and completed the program. Additionally, 87 patients who reported to use opioid and did not complete the program, while 40 patients who reported to use opioid and completed the program. Moreover, 37 patients who reported to use alcohol and did not complete the program, while 19 patients who reported to use alcohol and completed the program. Meanwhile, 132 patients who reported to use polysubstance with methamphetamine and did not complete the program, while 39 patients who reported to use polysubstance with methamphetamine and completed the program. Besides, 204 patients who reported to use polysubstance with amphetamine and did not complete the program, while 150 patients who reported to use polysubstance with amphetamine and completed the program. Besides 20 patients who reported to use polysubstance and did not complete the program, while 14 patients who reported to use polysubstance and completed the program. Lastly, 4 patients who reported to use benzodiazepines and did not complete the program, while 14 patients who reported to use benzodiazepines and completed the program. There is a dramatic difference ($p < 0.001$) among the patients who used the programs versus those who did not use the program in the patients with the various detected drugs as shown in Table 3.

The results of a chi-square test compared the outcomes of patients who completed the program versus those who did not. The program was associated with significantly lower rates of medication use, relapse, admission, and urine toxicity. The odds ratios indicate that the program reduced the odds of these outcomes by more than half. This suggests that the program was effective in improving the patients' recovery and well-being, as shown in Table 3.

Table 4 shows the results of the logistic regression model used to detect relapse based on age, medications, and program. The only significant predictor of relapse was the program, with an odds ratio of 0.42, indicating that participants in the program had a lower risk of relapse than those who did not. Age and medications were not significant predictors of relapse, as their confidence intervals included 1 and their p values were above 0.05.

Table 3 Testing the Impact of Completion and Non-Completion of the Program on Medication Use, Relapse, Admission, and Urine Toxicity Parameters (Data are Represented as Means Where $P < 0.05$ Considered a Significant Using Chi-Square Test)

		Did not Complete Program		Complete Program		Chi Square Test			OR (95% CI)
		N	%	N	%	χ^2	p-value	sig.	
Medications	No	510	67.5	329	81	23.95	<0.001	S	0.49 (0.36–0.65)
	Yes	245	32.5	77	19				
Relapse	No	537	71.1	349	86	29.39	<0.001	S	0.41 (0.29–0.57)
	Yes	218	28.9	57	14				
Admission	No	552	73.1	353	86.9	32.14	<0.001	S	0.4 (0.29–0.55)
	Yes	203	26.9	53	13.1				
Urine toxicity	No	552	73.1	353	86.9	29.39	<0.001	S	0.41 (0.29–0.57)
	Yes	203	26.9	53	13.1				

Abbreviations: N, number; OR, Odd ration.

Table 4 A Logistic Regression Model to Detect Relapse Based on Age, Medications, and Program

	OR	OR (95% C.I.)	p-value
Age	1.010	1.01 (0.99–1.02)	0.164
Medications	1.088	1.09 (0.8–1.48)	0.592
Program	0.417	0.42 (0.3–0.58)	<0.001

Abbreviation: OR, odds ratio.

Table 5 Testing the Impact of Completion and Non-Completion of the Program Upon Using Various Drugs (Data are Represented as Means Where P <0.05 Considered a Significant, Using Fisher Exact Test)

	Did not Complete Program		Complete Program		Test of sig.		
	N	%	N	%	Test value (Fisher Exact Test)	p-value	sig.
Amphetamine	120	15.9	92	22.7	$\chi^2 = 8.098$	0.004	S
Methamphetamine	86	11.4	12	3	$\chi^2 = 24.307$	<0.001	S
Cannabis	64	8.5	36	8.9	$\chi^2 = 0.051$	0.821	NS
Opioid	87	11.5	40	9.9	$\chi^2 = 0.757$	0.384	NS
Alcohol	37	4.9	19	4.7	$\chi^2 = 0.028$	0.867	NS
Polysubstance with methamphetamine	132	17.5	39	9.6	$\chi^2 = 13.045$	<0.001	S
Polysubstance with amphetamine	204	27	150	36.9	$\chi^2 = 12.274$	<0.001	S
Polysubstance	20	2.6	14	3.4	$\chi^2 = 0.593$	0.441	NS
Benzodiazepines	4	0.5	4	1	$\chi^2 = 1.1021$	0.461	NS

Abbreviations: N, number; S, significant; NS, Non-significant.

Table 5 There is a significant difference ($p < 0.05$) between patients who used (amphetamine, methamphetamine, polysubstance with amphetamine, and polysubstance with methamphetamine) and completed the program and those who did not complete the program. There was a non-significant difference between patients who used (cannabis, opioids, alcohol, polysubstance and benzodiazepines) and completed the program and those who did not complete the program.

Discussion

In latest update for United Nations office on drug and crime emphasis on creating general guide lines for rehabilitation programs for traditional and novel synthetic psychoactive substances based on Developing a strategic framework for treatment, Assessing treatment needs, Effective treatment and rehabilitation services, Developing and implementing treatment services either pharmacological or non-pharmacological, Effective integration of treatment services from primary care setting to specialized addiction facilities to long-term follow-up addiction facilitates and Monitoring treatment activity and outcome, yet technical, logistic, financial challenges facing implementation of those guidelines worldwide.¹⁶ Managing drug usage and addiction and developing treatment procedures both heavily depend on determining the most prevalent SU.^{17–20} Practical studies and proof are regarded as essential components in the creation of treatment strategies.²¹ Regretfully, little information is known about the incidence of SU in Saudi Arabia from studies. This study looked into the incidence of the most prevalent SU among Saudi patients receiving mental health treatment at an Erada facility in Dammam, Saudi Arabia. All programs in different phases of treatment in addiction department from

detoxification department to rehabilitation department to the advanced continuous care unit are approved by patients in therapeutic contracts including details about the therapeutic programs which are provided for them under complete medical supervision, those programs are matched with the international guide lines for the standard addiction guide lines and tailored to respect different ethnic and cultural background for each patient who agreed to join the program under strict terms of confidentiality and under umbrella of regulating rules from ministry of health as well as interior.¹⁵

The results of the study indicated that the age of patients was an essential parameter associated with the type of SU and there is a significant difference between those who completed the program and those who did not complete the program. In accordance with Alodhayani et al,²² who showed that the age of the patient at the time of starting drug use was found to be a significant factor in the single and multiple substance use of patients.

The findings of this investigation revealed a diagnosis of substance use disorder for different drugs, including amphetamine, methamphetamine, cannabis, opioids, alcohol, polysubstance with methamphetamine, polysubstance with amphetamine, polysubstance and benzodiazepines, and there is a significant difference between patients who completed the program and those who did not. There are differences in the findings related to the type of drugs consumption and completion of the program. Several issues about the consequences of additional mental disorders on SUD treatment results remain to be addressed and explained.^{23–27}

Many studies have illustrated the essential roles of urine toxicology, admission and the possibility of relapse among SUD patients.^{28,29} The present study revealed a dramatic difference between patients with SUD who completed the program and those who did not complete the program in terms of medications, relapse, admission and urine toxicity.

The available data substantiates the effectiveness of t CBT for relapse prevention, which provides in-person psychosocial therapies for Saudi patients suffering from substance use disorders. This aligns with the program's goals and previous research conducted over the past ten years.^{30–32}

The ever-growing list of substances as well as the novel groups makes it extremely urgent to develop an advanced, thorough knowledge and understanding as to the chemical complexities of such substances through constantly updating and updating the rehabilitation programs suitable for them.^{33–35}

Conclusion

The present study, which compared patients with substance use disorders who completed a particular rehabilitation program in a continuous care unit to those who did not, is thought to be the most significant of its kind in the Erada Complex for Mental Health, Eastern Province, Saudi Arabia. It was also found that the first group had a lower risk of a rebound and returning to the hospital, which was recommended to be applied on larger scales in Saudi Arabia.

Abbreviations

CBT, cognitive behavioral therapy; SUD, substance use disorder; CCU, continued care unit program; DSM-5, Diagnostic and Statistical Manual of Mental Disorders: Fifth edition; SD, standard deviation; OD, odds ratio; sig., level of significance; s, significant; NS, non-significant.

Disclosure

The authors report no conflicts of interest in this work.

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