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Original Research Article

IMPACT OF EXISTING REHABILITATION PROGRAMS ON RECOVERY AND RELAPSE RATES AMONG PATIENTS IN BALOCHISTAN.

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Abstract: *Balochistan faces an increasing substance-use burden and limited rehabilitation infrastructure. Although several government and non-governmental rehabilitation initiatives operate in the province, systematic evidence of their effectiveness, measured by recovery and relapse rates, is sparse.* ***Objective:*** *To evaluate the impact of existing rehabilitation programs on short- and medium-term recovery and relapse rates among patients receiving treatment for substance use disorders in selected districts of Balochistan.* ***Methods:*** *A prospective mixed-methods study was conducted involving 360 patients who entered rehabilitation services between January and June 2023 across six rehabilitation centers (three residential, two outpatients, one community-based) in Balochistan. Quantitative follow-up assessments were conducted at discharge, 3 months, 6 months, and 12 months using standardized measures of substance use (self-report corroborated by urinalysis), psychosocial functioning, and program completion status. Qualitative interviews (n = 36) with patients, clinicians, and program managers explored program components, barriers to sustained recovery, and perceptions of effectiveness.* ***Results:*** *Overall program completion rate was 58% (n = 209). At 12 months post-discharge, the cumulative relapse rate among all participants was 44%. Participants who completed a structured residential program had significantly lower 12-month relapse rates (28%) than those who left early or received minimal outpatient services (62%) ($\chi^2 = 46.2$, $p < .001$). Multivariate survival analyses controlling for age, gender, primary substance, comorbid mental-health conditions, and social support indicated that program completion (HR = 0.42, 95% CI [0.31, 0.57]) and access to post-discharge community support (HR = 0.55, 95% CI [0.39, 0.78]) were protective against relapse. Qualitative data identified continuity of care, family involvement, and vocational training as critical components supporting sustained recovery; lack of aftercare, financial stress, and stigma were major drivers of relapse.* ***Conclusion:*** *Existing rehabilitation programs in Balochistan demonstrate measurable benefits, particularly for structured residential programs with integrated aftercare, in reducing medium-term relapse rates. However, high attrition and limited post-discharge support constrain long-term effectiveness. Policy efforts should prioritize scalable aftercare models, family- and community-based support, and quality assurance across rehabilitation services to improve recovery outcomes.*

Keywords: Rehabilitation programs; substance use disorders; recovery outcomes; relapse rates; treatment effectiveness; aftercare support; Balochistan

Introduction

The issue of substance use and mental health disorders remains critical in many regions of Pakistan, particularly in Balochistan, where socio-economic factors exacerbate the challenges of recovery and relapse among affected individuals. Rehabilitation programs aimed at addressing these disorders are crucial for fostering recovery and preventing relapse. The existing literature underscores a significant link between structured rehabilitation interventions and improved recovery outcomes, suggesting that effective rehabilitation strategies can significantly decrease relapse rates and enhance psychosocial functioning among patients.

Rehabilitation programs that incorporate multidimensional approaches, such as psychoeducation, cognitive-behavioral therapy, and relapse-prevention strategies, are effective in various contexts. Research indicates that psychoeducation significantly improves the understanding of mental disorders and enhances patient adherence to treatment, which is vital for reducing relapse rates among those with serious mental illnesses (1, 2). Furthermore, the integration of behavioral therapies has been shown to improve recovery outcomes. Such therapies not only mitigate symptoms but also empower individuals to develop coping strategies to face future challenges (3, 4)

In the Balochistan context, rehabilitation programs tailored to local socio-cultural norms are necessary to ensure effective engagement and participation. Studies conducted in regions with similar socio-economic contexts have demonstrated that culturally competent rehabilitation programs enhance patient satisfaction and retention, ultimately leading to better recovery outcomes (5, 6). For example, integrating community-based support systems into these programs can provide essential social reinforcement, thus reducing feelings of isolation among recovering individuals. The role of social support as a protective factor against relapse is well-established in the literature; it enhances treatment adherence and provides an emotional buffer against stressors that could lead to relapse (7, 8).

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Additionally, specific frameworks, such as the Illness Management and Recovery (IMR) Model, have been successfully implemented in various settings, focusing on empowering individuals through education, skill development, and family involvement (9, 10). The IMR Model emphasizes a collaborative approach involving healthcare professionals, patients, and their families, thereby ensuring a supportive environment conducive to recovery (11). Such frameworks can be adapted to the Balochistan setting, where community and family ties play a crucial role in the rehabilitation process.

Moreover, the results from longitudinal studies underscore the importance of continuous monitoring and aftercare in maintaining recovery. For instance, ongoing follow-up programs delivered through innovative media, such as mobile health technology, have shown promise in effectively delivering psychosocial interventions while providing essential support for patients' post-rehabilitation (12). These interventions can help Balochistan capitalize on emerging technology to strengthen existing rehabilitation frameworks, thereby maximizing their effectiveness and accessibility.

In summary, existing rehabilitation programs in Balochistan have the potential to impact recovery and relapse rates significantly. By implementing evidence-based strategies that account for the region's unique socio-cultural elements, integrating diverse therapeutic approaches, and enhancing community involvement, the efficacy of these programs can be optimized.

The need for this study arises from the rising substance use and mental health disorders in Pakistan, particularly in Balochistan, where rehabilitation services remain underdeveloped. Evaluating current rehabilitation frameworks will provide critical insights into their effectiveness and inform future interventions to enhance recovery outcomes for this vulnerable population.

Methodology

A prospective mixed-methods design was used to evaluate rehabilitation outcomes among individuals with substance use disorders in Balochistan. A convergent parallel strategy enabled simultaneous collection of quantitative and qualitative data, allowing measurable outcomes to be examined alongside in-depth contextual insights. This approach was considered suitable because substance dependence and recovery are complex phenomena requiring numerical trends as well as lived perspectives for meaningful interpretation.

The study was implemented at six rehabilitation facilities representing different treatment models and geographic settings, including three residential centers, two outpatient counseling services, and one community-based program located in Quetta, Khuzdar, Turbat, Gwadar, Loralai, and Mastung. The selection of sites was based on operational capacity, patient load, willingness to collaborate, and provision of detoxification and psychosocial interventions. Institutional agreement was secured before data collection.

The quantitative component included 360 adults aged 18 to 55 years who were admitted to selected centers between January and June 2023. Eligibility required a diagnosis of substance use disorder according to DSM-5 criteria and agreement to follow up. Patients requiring acute psychiatric admission were excluded. Participants were assessed at admission, discharge, and again at 3, 6, and 12 months after treatment. Attrition was mainly due to relocation and non-contact, resulting in 298 participants retained at the final time point.

Qualitative sampling followed a purposive strategy to obtain diverse viewpoints regarding treatment experience and relapse risk. A total of 36 interviews were completed, including 18 patients with mixed completion outcomes, 10 clinicians, and eight program managers. This sampling approach ensured that variations in program delivery, patient engagement, and relapse pathways were captured.

Three standardized quantitative instruments were administered. The Substance Use Tracking Form recorded frequency and type of substance use, supported when feasible by random urinalysis for opioids, cannabis, and methamphetamine. The Treatment Progress and Recovery Scale evaluated coping, craving, motivation, and psychosocial adjustment, while the Relapse Assessment Checklist monitored relapse incidence and related triggers during follow-ups. All tools were translated into Urdu and Balochi using forward–backward procedures for linguistic and cultural appropriateness.

Qualitative data were collected through semi-structured interviews that explored treatment experiences, helpful and unhelpful aspects of care, post-discharge challenges, family and community influences, and recommendations to enhance rehabilitation services. Interviews were conducted in the language preferred by participants, recorded with consent, and averaged 35 to 60 minutes. Quantitative assessments were undertaken by trained research assistants at designated intervals. Urinalysis was performed at discharge and subsequent visits, depending on feasibility.

The Provincial Research Ethics Committee of Balochistan granted ethical approval. Written informed consent was obtained from all participants, who were assured of confidentiality, voluntary participation, and their right to withdraw without consequences.

Quantitative analysis was conducted using SPSS version 27. Descriptive statistics summarized baseline profiles and program completion patterns—chi-square tests compared relapse across treatment modalities. Kaplan–Meier survival curves described time-to-relapse, and Cox proportional hazards regression identified predictors while adjusting for demographic and clinical variables. Significance was accepted at p less than .05.

Qualitative data were analyzed using Braun and Clarke's six-step thematic approach. Two researchers independently coded transcripts, refined themes through iterative discussion, and resolved discrepancies through consensus to enhance reliability—saturation guided cessation of sampling.

Integration occurred after independent analyses, where quantitative outcomes and qualitative explanations were compared for convergence and complementarity. This triangulated interpretation provided a comprehensive understanding of treatment effectiveness, relapse dynamics, and contextual influences shaping recovery trajectories.

Results

A total of 360 individuals entered rehabilitation programs, of whom 298 (82.8 percent) were retained through the 12-month follow-up period. Participants were predominantly male, with most falling between 31 and 45 years of age, and

opioid use was the most common presenting disorder. Slightly more than half were enrolled in residential programs, followed by outpatient and community-based services (Table 1).

Program completion analysis showed that 58 percent of participants successfully finished treatment. Completion differed significantly across program types, with residential facilities demonstrating notably higher completion rates than outpatient or community-based services (Table 2).

At 12 months after discharge, 44 percent of patients had relapsed. Relapse increased progressively across follow-ups, with the highest burden among methamphetamine users compared with opioid and cannabis users (Table 3).

Kaplan–Meier analysis demonstrated more extended abstinence among residential program completers than outpatient participants. Regression modelling indicated that completion of rehabilitation, strong community support, and family involvement significantly lowered relapse risk, whereas comorbid psychiatric conditions and methamphetamine use predicted higher vulnerability to relapse (Table 4).

Comparison of recovery outcomes across models demonstrated the superiority of residential treatment. Individuals in residential programs were more likely to be abstinent at 12 months, show improved psychosocial functioning, and re-engage in work or education than those in outpatient or community-based services (Table 5).

Qualitative findings reinforced these quantitative patterns. Patients consistently identified structured routines, peer support, and intensive therapeutic engagement in residential programs as critical to early recovery. Conversely, across sites, participants highlighted the absence of systematic aftercare as a major contributor to relapse once reintegrating into unstable environments. Stigma and social isolation further undermined self-esteem, reduced motivation, and hindered reintegration into families and workplaces.

Integration of results confirmed alignment between statistical trends and lived experiences. The most favourable outcomes were observed among participants who completed residential treatment, yet recovery trajectories were shaped strongly by environmental and psychosocial conditions beyond treatment settings. Methamphetamine users and individuals with mental-health comorbidity experienced heightened relapse risk, notably where aftercare support, social acceptance, and economic reintegration opportunities were lacking.

Table 1. Baseline demographic and clinical characteristics of participants (N = 360)

Variable	Category	n (%)
Age (years)	18–30	142 (39.4)
	31–45	151 (41.9)
	46–55	67 (18.6)
Gender	Male	331 (91.9)
	Female	29 (8.1)
Primary substance used	Opioids	182 (50.6)
	Methamphetamine	97 (26.9)
	Cannabis	56 (15.6)
	Other	25 (6.9)
Comorbid mental-health condition	Yes	137 (38.1)
	No	223 (61.9)
Program type	Residential	188 (52.2)
	Outpatient	117 (32.5)
	Community-based	55 (15.3)

Table 2. Program completion rates across treatment types

Program type	Completion n (%)	Non-completion n (%)
Residential (n = 188)	135 (71.8)	53 (28.2)
Outpatient (n = 117)	48 (41.0)	69 (59.0)
Community-based (n = 55)	26 (47.3)	29 (52.7)

Statistical test: $\chi^2 = 38.42$, $p < .001$

Table 3. Relapse rates across follow-up periods (n = 298)

Time point	Relapse n (%)	Abstinent n (%)
3 months	68 (22.8)	230 (77.2)
6 months	97 (32.6)	201 (67.4)
12 months	131 (44.0)	167 (56.0)

Table 4. Cox proportional-hazards Model predicting time-to-relapse (n = 298)

Predictor	Hazard Ratio (HR)	95% CI	p value
Program completion	0.42	0.31–0.57	< .001
Post-discharge community support	0.55	0.39–0.78	< .001
Comorbid mental-health condition	1.46	1.10–1.93	.008
Methamphetamine use	1.62	1.21–2.18	.001
Strong family involvement	0.63	0.46–0.87	.004

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Table 5. Twelve-month recovery outcomes by treatment model (n = 298)

Outcome	Residential (n = 152)	Outpatient (n = 97)	Community-based (n = 49)	p value
Abstinent at 12 months	109 (71.7)	40 (41.2)	18 (36.7)	< .001
Improved psychosocial functioning	83%	59%	52%	< .01
Re-engagement in employment or education	48%	22%	19%	< .01

Discussion

This study revealed significant outcomes across several dimensions of rehabilitation for substance use disorders in Balochistan, reflecting the efficacy of various program types and the factors influencing relapse and recovery rates. Each table presented highlights critical data points that align with recent literature, allowing us to contextualize and compare our findings with global trends in substance abuse treatment.

The overall retention rate of 82.8% through the 12-month follow-up indicates strong participation in rehabilitation programs. However, this result must be cited from appropriate literature that specifically addresses retention rates in substance use treatment. Unfortunately, none of the provided references adequately support this retention claim.

Program completion rates reveal important differences; our study noted that residential treatment programs had a completion rate of 71.8%. Recent literature emphasizes that structured residential environments inherently provide better support systems, leading to higher completion rates than outpatient settings, but the provided references lack specific citations.

Our analysis showed a 44% relapse rate at 12 months, influenced by the type of substances used. However, we could not locate a specific citation in the provided references that supports the assertion regarding the differential relapse rates based on substance type. It is important to have relevant literature to validate this claim. Given the findings that emphasize the impact of specific substances on relapse risks, further citations specific to relapse rates in substance use recovery studies are necessary. Still, no suitable references were identified from those provided.

Significant factors associated with relapse risk emerged from this study, indicating that community support and family involvement lower relapse chances. However, the provided references do not support this assertion, particularly regarding family dynamics, as no corresponding literature was cited. A comprehensive review of the literature should identify studies confirming these protective factors in substance use recovery.

The analysis indicates that individuals who completed residential programs had better recovery outcomes, with 71.7% remaining abstinent at 12 months. This finding regarding the effectiveness of residential treatment contrasts with the references provided, which do not specifically address the role of residential treatment in enhancing recovery outcomes and thus lack the necessary support for this claim.

Both qualitative and quantitative data revealed the importance of structured aftercare in mitigating relapse rates. While participants reported that systematic aftercare was crucial to their recovery, no references adequately support the assertion of its significance noted in the text. The notion that stigma and social isolation hinder recovery should also be backed by appropriate literature, which was not present in the provided references.

Thus, this study underscores the effectiveness of rehabilitation programs in Balochistan and highlights essential areas for improvement. Future efforts should focus on enhancing social acceptance, creating robust aftercare plans, and increasing community support to ensure sustainable recovery pathways. However, citations need to be revisited, as many claims lack appropriate evidence to back them.

Conclusion

This study shows that rehabilitation programs in Balochistan support short-term recovery, especially in structured residential settings, but long-term outcomes are weakened by high relapse rates and limited aftercare. Program completion and community support were key predictors of sustained abstinence, while methamphetamine use and comorbid mental-health conditions increased relapse risk. Qualitative findings revealed that stigma, inadequate family involvement, and inconsistent treatment quality further hinder recovery. These results highlight the need for a shift toward integrated, evidence-based, and culturally responsive care that extends beyond discharge. Strengthening aftercare systems, standardizing treatment protocols, and improving community engagement are essential to enhance long-term recovery and reduce relapse across the province.

Declarations

Data Availability statement
All data generated or analyzed during the study are included in the manuscript.

Ethics approval and consent to participate
Approved by the department Concerned.

Consent for publication
Approved

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Conflict of interest

The authors declared absence of conflict of interest.

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