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SOCIAL AND PSYCHOLOGICAL PREDICTORS OF RESILIENCE IN DRUG REHABILITATION: A STUDY OF RECOVERING ADDICTS IN PAKISTAN

Original Article

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ABSTRACT

Background: Drug addiction is a critical public health issue affecting over 6.7 million individuals in Pakistan, with youth disproportionately impacted. Despite growing efforts in rehabilitation, long-term recovery remains a challenge, particularly in resource-constrained and socially conservative settings. Resilience—the psychological capacity to adapt and recover—is increasingly recognized as a crucial factor in sustainable recovery. This study explores how psychological and social variables, including family dynamics, self-perception, and social support, shape resilience among individuals undergoing rehabilitation for substance abuse in Islamabad, Pakistan.

Objective: To examine the influence of self-esteem, self-stigma, family functioning, family connectedness, and social support on resilience among substance abuse patients undergoing rehabilitation in Islamabad.

Methods: A cross-sectional, quantitative design was employed. Using a multistage random sampling approach, 200 participants were selected from five rehabilitation centers in Islamabad. Data were collected using structured questionnaires and analyzed via SPSS version 26.0. Statistical techniques included independent sample t-tests, one-way ANOVA, and multiple linear regression to identify group differences and predictors of resilience.

Results: Family functioning ($B = 0.127$, $p < 0.001$) and family connectedness ($B = 0.026$, $p < 0.001$) emerged as significant predictors of resilience, explaining 23.8% of variance (Adjusted $R^2 = 0.218$). Female participants reported significantly higher resilience ($M = 40.29$, $SD = 2.82$) and social support ($M = 42.24$, $SD = 3.47$) compared to males ($M = 38.65$, $SD = 4.51$; $M = 39.88$, $SD = 5.57$). Self-esteem and social support were not significant predictors. However, self-stigma, despite its small effect size ($B = 0.005$, $p < 0.001$), was statistically significant.

Conclusion: Resilience in substance abuse recovery is predominantly shaped by family-based factors and internalized stigma. Interventions should emphasize family engagement and culturally appropriate stigma-reduction strategies to enhance recovery outcomes.

Keywords: Family functioning, rehabilitation, resilience, self-esteem, self-stigma, social support, substance abuse.

INTRODUCTION

Drug addiction remains a critical global public health concern, with recent statistics highlighting an alarming increase in drug use worldwide. According to the World Drug Report 2022, approximately 284 million people used drugs in 2020, with cannabis remaining the most commonly used substance and amphetamine use steadily rising. Notably, an estimated 11.2 million individuals injected drugs during this period (1). In Pakistan, the issue is particularly severe, with around 6.7 million drug users—78% of whom are men—affected by the widespread availability and low cost of heroin and cannabis (2). The problem is especially pronounced in Khyber Pakhtunkhwa, a province bordering Afghanistan, where over 11% of the population reportedly struggles with narcotic use, primarily cannabis (3). The underlying causes of drug addiction are complex and multifaceted. Key psychosocial factors such as low self-esteem, peer pressure, dysfunctional family environments, and self-shame have all been associated with the initiation and persistence of substance use. Self-esteem plays a pivotal role in an individual's ability to overcome addiction, especially during the vulnerable post-rehabilitation period. It fosters resilience—the capacity to adapt positively despite adverse experiences—while self-stigma, the internalization of public disapproval and shame associated with addiction, often acts as a barrier to recovery (4,5). Drug users internalize negative societal perceptions, which can fuel cycles of relapse and hinder engagement in therapeutic interventions (6).

Family functioning and connectedness significantly impact the resilience of individuals recovering from addiction. Families provide the foundational structure for instilling values, beliefs, and behaviors that are socially acceptable (7). The manner in which families interact—whether supportive or neglectful—affects the psychological development and social adaptability of their members (8). Balanced family dynamics, devoid of parental substance abuse, are critical in preventing addiction and promoting post-treatment resilience (7,8). Strong familial connectedness, including emotional bonds with extended kin and community, cultivates a "sense of belonging," which serves as a protective buffer against drug relapse (9). Beyond the family unit, social support from peers, educators, and communities also plays a central role in the rehabilitation process. Feeling valued and cared for reinforces an individual's motivation to maintain sobriety (10). Social support networks serve not only as sources of encouragement but also as anchors for reintegration into society. Several studies have emphasized that the effectiveness of such support is contingent upon its relevance to the individual's needs and stressors (11,12). When social connections are strong and positively reinforcing, they greatly improve the odds of sustained recovery (13).

Self-esteem and stigma remain two interdependent psychological dimensions influencing substance abuse and recovery outcomes. High self-esteem has been associated with greater emotional intelligence, life satisfaction, and resilience (14). Individuals who perceive themselves as competent and worthy are more likely to resist relapse and manage social pressures effectively (15). On the other hand, stigma—particularly self-stigma—continues to undermine the willingness of individuals to seek help. Internalized shame, often rooted in negative public stereotypes, fuels withdrawal and deteriorates mental health, leading to increased isolation and vulnerability to relapse (16). The sociocultural framing of addiction as a moral failure rather than a chronic health condition further compounds this issue, reinforcing stigma and deterring help-seeking behavior (17). Resilience is the cornerstone of long-term recovery from substance abuse. It enables individuals to rebound from adversity and cope with the emotional, psychological, and social challenges associated with addiction. Evidence suggests that resilience is not an inherent trait but a dynamic, learnable process influenced by self-worth, emotional regulation, and environmental supports (17,18). In the context of rehabilitation, resilience-building interventions such as cognitive behavioral therapy and mindfulness practices have shown promise in reducing relapse rates and enhancing long-term abstinence. Strengthening resilience requires a multifaceted approach that integrates social support, family involvement, and the promotion of positive self-concept (19).

Despite the growing body of literature addressing drug addiction, there remains a need to further explore the interactive effects of psychosocial factors such as family functioning, social support, self-esteem, and stigma on the resilience of recovering individuals. While each of these components has been individually studied, limited research has holistically examined how they collectively contribute to long-term recovery outcomes, particularly in culturally complex settings like Pakistan. Therefore, this study aims to investigate the influence of family functioning, social support, self-esteem, and self-stigma on the resilience of individuals recovering from drug addiction, with the objective of identifying key determinants that can be targeted to enhance post-rehabilitation outcomes.

METHODS

The study adopted a quantitative, cross-sectional research design to investigate the influence of social and psychological factors on the resilience of individuals recovering from drug addiction. It was conducted in Islamabad, the capital city of Pakistan, where the researcher focused on rehabilitation centers actively engaged in the treatment and post-rehabilitation follow-up of substance-dependent individuals. The inclusion criteria comprised individuals aged 18 years or above who had completed their formal rehabilitation programs in selected centers and were in the reintegration phase. Those who were still undergoing treatment or had severe cognitive impairments that could interfere with informed participation were excluded from the study to ensure data reliability. A multistage random sampling strategy was employed to obtain a representative sample. In the first stage, purposive sampling was used to select five rehabilitation centers that met the study's inclusion parameters and had a sufficient number of post-treatment patients. In the second stage, the population at each center was stratified, and random sampling was applied within these strata to select participants, ensuring fair representation across the centers. This method enhanced the generalizability of findings while minimizing sampling bias.

The sample size was determined using Taro Yamane's formula: $n = N / (1 + N(e)^2)$, where n represents the sample size, N is the total population (400), and e is the level of tolerance (set at 0.05 for a 95% confidence level). This calculation yielded a sample size of 200 participants, distributed proportionally across the five centers based on their population size. Each center contributed between 25 to 60 participants depending on its respective population. Data collection was carried out using a structured questionnaire developed in alignment with the study variables—resilience, family functioning, social support, self-esteem, and stigma. The instrument was pre-tested for clarity and reliability before formal administration. Data analysis was conducted using SPSS (Statistical Package for the Social Sciences) version 26.0. The statistical techniques employed included the independent samples *t*-test for group comparisons, one-way ANOVA to examine differences among multiple groups, and multiple regression analysis to assess the predictive relationship between independent variables and resilience as the dependent variable. Ethical standards were rigorously upheld throughout the research process. Informed consent was obtained in writing from all participants after clearly explaining the study objectives, ensuring that participation was voluntary and that withdrawal was permitted at any stage without consequence. Confidentiality was strictly maintained; personal identifiers were removed, and data were stored securely to protect participant privacy. The study received ethical clearance from the Institutional Review Board of SZABIST University (IRB), confirming that all protocols complied with international research ethics guidelines.

RESULTS

The demographic analysis revealed that the majority of respondents were under the age of 30, accounting for 81.5%, followed by 16.4% aged between 31–40 years, and only 2.1% aged above 40. Males made up a significant majority of the sample at 91.0%, while females constituted just 9.0%. Most respondents were unmarried (78.8%), whereas 18.5% were married and 2.6% divorced. Residence-wise, the sample was almost equally divided, with 50.3% from rural areas and 49.7% from urban areas. Regarding the duration of rehabilitation, 44.4% had undergone treatment for 6 months, 39.7% for 8 months, and 15.9% for one year. Peer influence was notable, with 76.7% of participants reporting that their friends also used substances. Only 18.0% of respondents had a family history of substance use. A gender-based comparison using independent sample t-tests indicated that female participants had significantly higher resilience ($M = 40.294$, $SD = 2.823$) than males ($M = 38.657$, $SD = 4.512$) with a t-value of -2.136 ($p < 0.05$). Similarly, social support scores were significantly higher among females ($M = 42.235$, $SD = 3.474$) compared to males ($M = 39.888$, $SD = 5.573$), with a t-value of -2.462 ($p < 0.05$). No statistically significant gender differences were observed for family functioning, family connectedness, self-stigma, or self-esteem.

Comparative analysis based on residence showed that urban respondents had slightly higher resilience ($M = 38.919$, $SD = 3.955$) than rural ones ($M = 38.697$, $SD = 4.831$), though the difference was not significant ($t = -0.343$, $p > 0.05$). Family functioning and connectedness scores were also similar between rural and urban groups, with negligible differences. However, rural participants reported significantly higher self-stigma ($M = 84.323$, $SD = 10.526$) compared to urban respondents ($M = 82.046$, $SD = 11.830$) with a t-value of 1.402 ($p < 0.05$). Social support was also higher among rural participants ($M = 40.544$, $SD = 5.293$) compared to their urban counterparts ($M = 39.642$, $SD = 5.602$), with a t-value of 1.081 ($p < 0.05$). In relation to family history of substance use, individuals with such a history had slightly higher resilience ($M = 39.117$, $SD = 4.551$) than those without ($M = 38.735$, $SD = 4.387$), but the difference was not statistically significant ($t = 0.446$, $p > 0.05$). Family functioning was significantly lower among individuals with a family history ($M = 70.882$, $SD = 9.024$) than those without ($M = 73.948$, $SD = 9.596$), with a t-value of -1.773 ($p < 0.05$). Interestingly, self-esteem was significantly higher in those with a family history of substance use ($M = 39.588$, $SD = 8.499$) than in those without (M

= 35.419, SD = 8.888), with a t-value of 2.568 ($p < 0.05$). No significant differences were found for family connectedness, self-stigma, or social support based on family history.

Regression analysis showed that the model significantly predicted resilience ($R^2 = 0.238$, Adjusted $R^2 = 0.218$, $F = 11.456$, $p < 0.05$). Among the predictors, family functioning ($B = 0.127$, $t = 3.794$, $p < 0.001$), family connectedness ($B = 0.026$, $t = 4.022$, $p < 0.001$), and self-stigma ($B = 0.005$, $t = 0.179$, $p < 0.05$) were significant contributors to resilience. Self-esteem ($p = 0.179$) and social support ($p = 0.607$) were not found to be statistically significant predictors. A multivariate analysis of variance (two-way ANOVA) was conducted to assess the combined effects of marital status and duration of rehabilitation on resilience among drug rehabilitation patients. The results indicated statistically significant main effects for both marital status ($F = 1.13\times10^{28}$, $p < 0.001$) and duration in the rehabilitation center ($F = 3.73\times10^{27}$, $p < 0.001$), suggesting that both variables independently influenced resilience scores. Additionally, a significant interaction effect was observed between marital status and rehabilitation duration ($F = 1.49\times10^{27}$, $p < 0.001$), indicating that the impact of rehabilitation length on resilience varied depending on the respondent's marital status. These findings highlight the importance of considering combined demographic factors when designing personalized rehabilitation interventions, as both social stability and treatment duration can significantly affect psychological recovery outcomes.

Table 1: Frequencies and Percentages of Demographic Variables

Variable	Frequency (f)	Percentage (%)
Age		
less than 30	154	81.5
31-40 years	31	16.4
40 above	4	2.1
Gender		
Male	172	91.0
Female	17	9.0
Marital Status		
Unmarried	149	78.8
Married	35	18.5
Divorced	5	2.6
Residence of the Respondents		
Rural	95	50.3
Urban	94	49.7
Duration in Rehabilitation Center		
6 Months	84	44.4
8 Months	75	39.7
1 Year	30	15.9
Having Substance Using Friends		
Yes	145	76.7
No	44	23.3
Family History of Substance use		
Yes	34	18
No	155	82.0

Table 2: Gender-Based Comparison of Psychological and Social Factors

Variables	Gender	N	Mean	SD	SEM	t-value	C. I. 95%	
							L	U
Resilience	Male	172	38.657	4.512	.344	-2.136*	-3.215	-.058
	Female	17	40.294	2.823	.684			
FF	Male	172	73.616	9.859	.751	1.682	-.524	5.403
	Female	17	71.176	5.114	1.240			

Variables	Gender	N	Mean	SD	SEM	t-value	C. I. 95%	
FC	Male	172	433.447	51.415	3.920	-0.677	-41.538	21.257
	Female	17	443.588	59.569	14.447			
S-Stigma	Male	172	82.784	11.057	.843	-1.445	-11.050	2.031
	Female	17	87.294	12.388	3.004			
SE	Male	172	36.168	8.670	.661	-.003	-6.121	6.105
	Female	17	36.176	11.673	2.831			
SS	Male	171	39.888	5.573	.426	-2.462*	-4.265	-.37965
	Female	17	42.235	3.473	.842			

Note: p<0.05*, FF= Family Functioning, FC= Family Connectedness, S-Stigma=Self-Stigma, SE=Self Esteem, SS= Social Support

Table 3: Comparison of Psychological and Social Factors Based on Residence

Variables	Residence	N	Mean	SD	SEM	t-value	C. I. 95%	
							L	U
Resilience	Rural	95	38.697	4.831	.495	-.343*	-1.486	1.046
	Urban	94	38.919	3.955	.408			
FF	Rural	95	73.297	11.649	1.195	-.148*	-2.949	2.538
	Urban	94	73.500	6.857	.707			
FC	Rural	95	434.34	59.551	6.109	.002	14.960	14.956
	Urban	94	434.31	43.633	4.500			
S-Stigma	Rural	95	84.323	10.526	1.079	1.402*	-.931	5.498
	Urban	94	82.046	11.830	1.220			
SE	Rural	95	36.379	8.870	.910	.323	-2.151	2.994
	Urban	94	35.954	9.057	.934			
SS	Rural	95	40.544	5.293	.543	1.081*	-.706	2.418
	Urban	93	39.642	5.602	.580			

Note: p<0.05*, FF= Family Functioning, FC= Family Connectedness, S-Stigma=Self-Stigma, SE=Self Esteem, SS= Social Support

Table 4: Comparison of Psychological and Social Factors Based on Family History

Variables	Family History	N	Mean	SD	SEM	t-value	C. I. 95%	
							L	U
Resilience	Yes	34	39.117	4.551	.780	.446	-.314	2.529
	No	155	38.735	4.387	.352			
FF	Yes	34	70.882	9.024	1.547	-1.773*	2.91	9.024
	No	155	73.948	9.596	.770			
FC	Yes	34	425.882	42.207	7.238	-1.225	10.000	40.705
	No	155	436.219	53.975	4.335			
S-Stigma	Yes	34	436.219	7.451	1.277	-1.225	-.717	8.205
	No	155	11.881	11.881	.954			
SE	Yes	34	39.588	8.499	1.457	2.568*	-.554	5.084
	Yes	155	35.419	8.888	.713			
SS	Yes	34	40.529	4.863	.834	.525	-1.616	1.993
	No	155	40.032	5.575	.447			

Note: p<0.05*, FF= Family Functioning, FC= Family Connectedness, S-Stigma=Self-Stigma, SE=Self Esteem, SS= Social Support

Table 5: Regression Analysis of Psychological and Social Factors Predicting the Resilience

Note p <0.05*, FF= Family functioning, FC =Family connectedness, SS=Self stigma, SE=Self-esteem, SS=Social support

Model	Unstructured Coefficient			
	B	SE	t-value	p-value
Constant	20.549	3.493	5.833	.000
FF	.127	.033	3.794	.000
FC	.026	.007	4.022	.000
S-Stigma	.005	.026	.179	.000
SE	-.004	.033	-1.348	.179
SS	0.30	.059	.515	.607
R^2 (.238)				
Adj R^2 (.218)				
F (11.456)				

Table 6: Multivariate ANOVA Results

	Sum sq	df	F	PR(>F)
C (Marital Status)	10.162	2	1.13E+28	0
C(Duration)	3.366	2	3.73E+27	0
C (Marital Status):C (Duration)	2.699	4	1.49E+27	0
Residual	0	183		

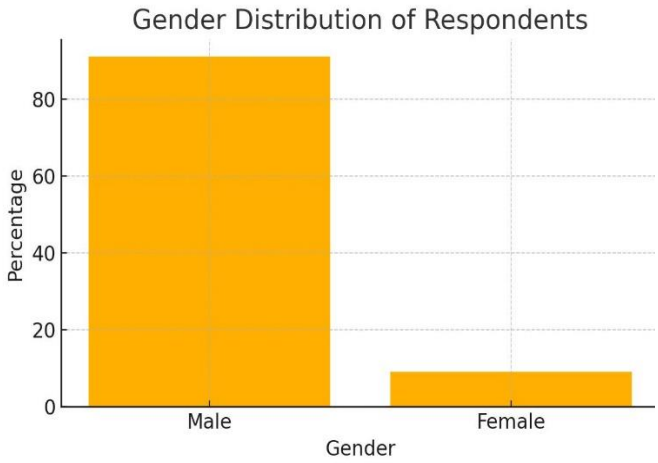

Figure 1 Gender Distribution of Respondents

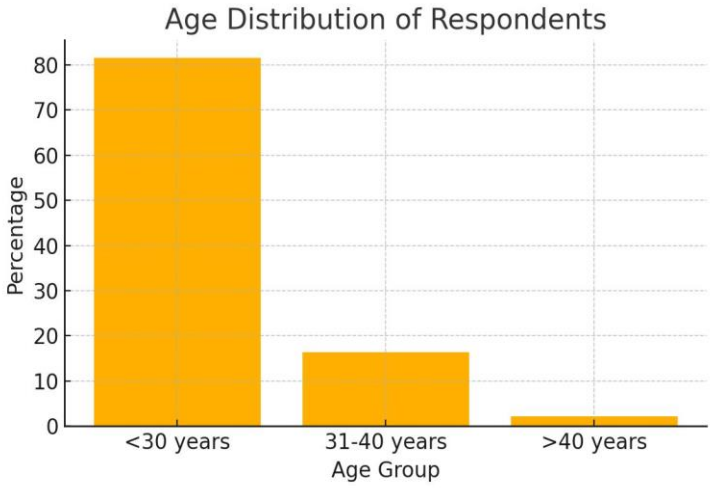

Figure 2 Age Distribution of Respondents

DISCUSSION

The current study explored how key psychological and social factors—namely self-esteem, self-stigma, family functioning, family connectedness, and social support—shape resilience among individuals recovering from drug addiction in rehabilitation centers within Islamabad, Pakistan. The findings provide valuable insight into the multidimensional nature of resilience in a post-treatment context and offer evidence-based implications for enhancing recovery outcomes. One of the most salient findings was the significantly higher resilience and perceived social support among female participants compared to their male counterparts. This aligns with broader

literature indicating that women are more likely to engage in emotionally supportive relationships and maintain stronger social bonds, which serve as critical buffers in times of psychological distress (17,18). These social networks may provide essential coping resources that aid in maintaining sobriety and psychological adjustment following rehabilitation. Interestingly, no significant gender differences emerged in family functioning, self-esteem, or self-stigma, suggesting that core psychosocial constructs relevant to recovery may operate similarly across sexes in this context. This reinforces the importance of gender-sensitive yet universally applicable treatment frameworks within rehabilitation settings (19).

The family history of substance use was associated with weaker family functioning but unexpectedly correlated with higher self-esteem. This paradox may be explained through the concept of adaptive learning, where individuals from affected families develop internal coping strategies or resilience through shared experiences and mutual understanding. The weakened family environment, however, likely reflects the long-term destabilizing influence of generational substance use on emotional support systems and role modeling within the family unit (20,21). Regression analysis underscored the predictive value of family functioning and family connectedness on resilience. These findings support a large body of psychosocial research that underscores the foundational role of family in identity development, emotional regulation, and behavioral norms (22,23). Families that provide emotional support, open communication, and structural stability appear to enhance an individual's capacity to recover from addiction. The protective effect of a supportive familial network reinforces the utility of involving families in post-rehabilitation programs and calls for integrative care models that address both individual and familial wellbeing (24).

Despite strong theoretical and empirical links in previous studies, self-esteem and social support did not emerge as significant predictors of resilience in the current sample. This discrepancy may reflect cultural dynamics specific to Pakistan, where communal identity and familial obligations often supersede individual self-concept in determining psychological outcomes. In collectivist cultures, personal attributes such as self-esteem may be less influential than relational dynamics in shaping behavioral resilience. Similarly, perceived social support from non-familial sources may hold limited impact if trust and dependency lie predominantly within the familial sphere. Self-stigma, while exhibiting a minimal coefficient, was statistically significant in predicting resilience. This finding suggests that even subtle levels of internalized shame can influence the recovery process. Stigma remains a persistent barrier to open communication, self-efficacy, and reintegration, particularly in conservative societies where addiction is often seen as a moral failing rather than a treatable condition. Addressing self-stigma through cognitive-behavioral approaches or psychoeducation could yield meaningful benefits, even if its statistical weight appears limited (25).

The study contributes meaningfully to the literature by focusing on a culturally nuanced population and employing a comprehensive framework of psychosocial variables. Its strengths lie in its structured sampling strategy, robust analytical approach, and focus on both psychological and social dimensions of recovery. However, several limitations warrant acknowledgment. The cross-sectional design precludes causal inference, and reliance on self-reported data introduces the potential for social desirability and recall biases. The sample was geographically confined to Islamabad, which may limit the generalizability of findings to other regions of Pakistan. Additionally, certain variables such as religiosity, economic stressors, and therapeutic alliance—known to influence recovery—were not included in the current model. Future research would benefit from a longitudinal design to trace the evolution of resilience over time and explore causal pathways. Expanding the scope to include rural and underserved regions may offer a more comprehensive national perspective. Moreover, qualitative inquiry into lived experiences could enrich understanding of how social and psychological factors interplay within different cultural and familial contexts. Tailored intervention programs that leverage familial support and address internalized stigma may hold the potential to optimize recovery outcomes in drug rehabilitation settings.

CONCLUSION

This study concluded that resilience in individuals recovering from substance abuse within rehabilitation settings in Islamabad is deeply influenced by psychosocial dynamics, particularly family functioning and connectedness. These familial elements serve as critical foundations for emotional stability, social learning, and relapse prevention. While self-esteem and general social support are widely recognized as protective factors in global contexts, their limited predictive relevance here underscores the role of cultural values and social structures in shaping recovery outcomes. Importantly, the influence of even minimal self-stigma on resilience highlights the urgent need for therapeutic and community-based strategies that reduce internalized shame and promote acceptance. These findings affirm that recovery from addiction is not solely an individual endeavor but a socially embedded process, emphasizing the importance of integrating family-oriented and stigma-reducing interventions into rehabilitation frameworks to foster long-term resilience and reintegration.

AUTHOR CONTRIBUTION

Author	Contribution
Salman Khan Mahsud	Substantial Contribution to study design, analysis, acquisition of Data Manuscript Writing Has given Final Approval of the version to be published
Muhammad Abo Ul Hassan Rashid*	Substantial Contribution to study design, acquisition and interpretation of Data Critical Review and Manuscript Writing Has given Final Approval of the version to be published

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