

Drug Addiction and Psychological Distress: The Role of Neuroticism as a Mediator

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Abstract

Purpose: This study examines the relationship between drug addiction and psychological distress among university students in Pakistan, focusing on the mediating role of neuroticism.

Methodology: A quantitative cross-sectional correlational design was employed using purposive sampling to recruit 154 university students (men and women) from public and private universities in Pakistan, aged 18 to 30 years ($M = 22.65$, $SD = 3.24$). Standardized instruments were used, including the Drug Abuse Screening Test (DAST-10), the Depression Anxiety Stress Scale (DASS-21), and the neuroticism subscale of the Big Five Inventory (BFI-10). Pearson correlation analysis and mediation analysis were conducted to test the hypothesized relationships.

Findings: Results revealed that drug addiction, neuroticism, and psychological distress were all significantly and positively correlated. Mediation analysis indicated that neuroticism significantly mediated the relationship between drug addiction and psychological distress. Drug addiction significantly predicted both neuroticism and psychological distress, while neuroticism also significantly predicted psychological distress. The indirect effect was significant, confirming partial mediation.

Unique Contribution to Theory, Policy, and Practice: This study extends the Vulnerability-Stress Model by identifying neuroticism as a key mechanism linking drug addiction to psychological distress among university students in Pakistan. The findings highlight the need for personality-informed mental health interventions. Universities and policymakers should integrate substance use screening with psychological support programs targeting emotional instability and stress management.

Keywords: *Drug Addiction, Psychological Distress, Neuroticism, Mediation, University Students, Pakistan*

Introduction

Drug addiction among university students has become an increasingly serious public health and psychosocial concern, particularly in low- and middle-income countries. The university period represents a critical developmental stage characterized by identity exploration, academic pressure, peer influence, and increased independence, all of which may contribute to risky behaviors including substance use. Global evidence suggests that substance use among young adults is rising, with significant mental health consequences (Wei et al., 2025; Zhao et al., 2026). In parallel, psychological distress encompassing symptoms of depression, anxiety, and chronic stress—has also shown high prevalence among university students, often co-occurring with addictive behaviors (Abdullah et al., 2025; Chang et al., 2022).

In Pakistan, the situation is further complicated by sociocultural pressures, academic competition, and limited access to mental health services, which collectively increase students' vulnerability to both substance use and emotional difficulties (Shahid et al., 2025). Drug addiction in university settings is often underreported due to stigma and fear of social consequences, resulting in a hidden but growing burden of psychological and behavioral problems. Consequently, many students' experiencing substance-related issues do not receive timely psychological support, which may exacerbate long-term mental health outcomes.

Moreover, psychological distress among university students is not merely a direct consequence of substance use but is also influenced by underlying psychological and personality-related factors. Students may differ in their emotional regulation abilities and coping styles, which shape how they respond to stressors and substance-related experiences. Among these individual differences, personality traits such as neuroticism may play a crucial role in determining vulnerability to emotional instability and maladaptive coping behaviors, thereby potentially strengthening the link between drug addiction and psychological distress. According to previous and recent western studies neuroticism is highly associated with distress, however, once accompanied with drug addiction the symptoms of distress elevate substantially (Cuartero & Tur, 2021; Miech et al., 2025). However, such studies are limited in the cultural context of Pakistan.

Problem Statement

Despite increasing awareness of drug addiction and mental health issues among university students in Pakistan, there is limited empirical understanding of the psychological mechanisms underlying this association. Most existing studies focus on prevalence and demographic risk factors, while neglecting the role of personality traits in explaining why some students develop psychological distress in the context of substance use, whereas others do not. This gap is particularly evident in Pakistani university settings, where cultural stigma, limited mental health infrastructure, and academic stressors intensify vulnerability but remain underexplored in research.

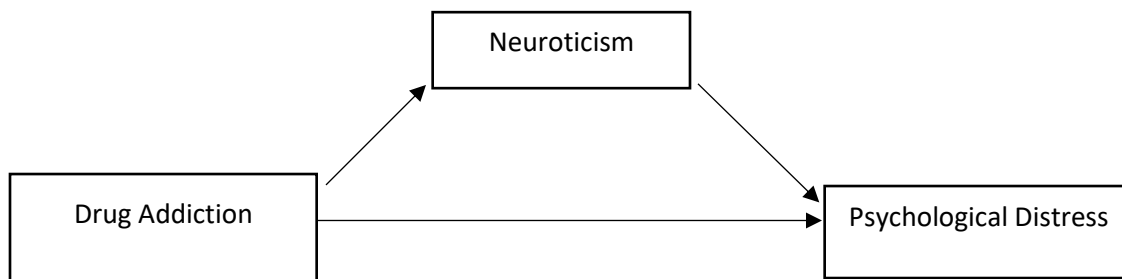
Research Gap

Although international literature has established associations between substance use, personality traits, and mental health outcomes, there is a lack of context-specific evidence from Pakistan examining the mediating role of personality factors. In particular, neuroticism—a stable personality trait characterized by emotional instability and negative affectivity—has not been adequately examined as a mechanism linking drug addiction and psychological distress among university students. Prior studies tend to treat personality as a correlational variable rather than exploring its mediating psychological function in substance-related distress. This highlights a clear need for mediation-based empirical models in South Asian university populations.

Theoretical Framework

This study is grounded in the Vulnerability-Stress Model, which suggests that psychological disorders and maladaptive behaviors emerge from the interaction between individual vulnerabilities and environmental stressors. Within this framework, neuroticism serves as a key vulnerability factor that increases sensitivity to stress and negative emotional experiences. Individuals high in neuroticism are more likely to engage in maladaptive coping strategies, including substance use, to regulate emotional instability (Zuckerman et al., 2022). Over time, such coping mechanisms can intensify psychological distress rather than alleviate it.

Figure 1: Theoretical Framework



The study examines Pakistani university students using a mediation model where drug addiction is the independent variable and psychological distress is the dependent variable. Neuroticism acts as a mediator, explaining how drug addiction influences psychological distress. It is proposed that higher drug addiction increases neuroticism, which in turn raises psychological distress levels. Thus, neuroticism partially or fully mediates the relationship between drug addiction and psychological distress in university students.

Rationale of the Study

The rationale of this study is to understand the psychological pathway through which drug addiction contributes to psychological distress among university students in Pakistan. By identifying neuroticism as a mediating factor, the study aims to move beyond simple association-

based research and provide a mechanism-based explanation. This understanding is essential for designing targeted interventions that address not only substance use but also underlying personality vulnerabilities. The findings may also assist university counseling centers and mental health professionals in developing personality-informed prevention strategies.

Hypothesis

H1: Neuroticism significantly mediates the relationship between drug addiction and psychological distress among university students in Pakistan.

Methodology

The present study employed a quantitative, cross-sectional research design to examine the mediating role of neuroticism in the relationship between drug addiction and psychological distress among university students in Pakistan. The study was conducted in selected public and private universities, targeting students aged 18 to 30 years. A purposive sampling technique was used to recruit participants who met the inclusion criteria, specifically enrolled undergraduate and postgraduate students with self-reported substance use behavior.

A total of 210 university students were approached, out of which 154 participants successfully completed the study, yielding a response rate of 73.3%. The mean age of participants was 22.65 years ($SD = 3.24$). Regarding educational level, 95 participants (61.7%) were enrolled in bachelor's degree programs, while 59 (38.3%) were enrolled in master's degree programs. In terms of socioeconomic status, 82 participants (53.2%) belonged to the lower class, 53 (34.4%) to the middle class, and 19 (12.3%) to the upper class. The sample included 102 males (66.2%) and 52 females (33.8%).

Measures

Drug Addiction

Drug addiction was assessed using the Drug Abuse Screening Test (DAST-10) developed by Skinner (1982). It is a 10-item self-report instrument designed to measure drug-related problems and dependency behaviors. Responses are dichotomous (Yes = 1, No = 0), with higher scores indicating greater drug addiction severity. The DAST-10 has demonstrated good psychometric properties with reliability ranging from $\alpha = .81$ to $.84$ (Skinner, 1982; Johnson et al., 2025). In the present study, the reliability coefficient was $\alpha = .84$.

Psychological Distress

Psychological distress was measured using the Depression Anxiety Stress Scale (DASS-21) developed by Lovibond and Lovibond (1995). It is a 21-item self-report scale designed to assess overall psychological distress. Items are rated on a 4-point Likert scale ranging from 0 ("Did not apply to me at all") to 3 ("Applied to me very much or most of the time"). Higher scores

indicate greater levels of psychological distress. The scale has demonstrated strong internal consistency with $\alpha = .88$ in previous research (Lovibond & Lovibond, 1995).

Neuroticism

Neuroticism was measured using the Neuroticism subscale of the Big Five Inventory (BFI-10) developed by Rammstedt and John (2007). This brief subscale consists of two items (Item 4 and Item 9) measuring emotional instability, worry, and negative affect. Item 4 is reverse-coded as per the original scoring instructions. Responses are recorded on a 5-point Likert scale ranging from 1 (“Strongly disagree”) to 5 (“Strongly agree”). Despite its brevity, the BFI-10 has shown acceptable reliability across diverse populations ($\alpha \approx .81$) (Rammstedt & John, 2007).

Ethical Considerations

Ethical approval was obtained from the institutional ethical review committee prior to data collection. The study strictly followed APA 7 ethical guidelines. Informed consent was obtained from all participants after explaining the purpose, procedures, risks, and benefits of the study. Participation was voluntary, and respondents were informed that they could withdraw at any time without any penalty. Confidentiality and anonymity were strictly maintained, and no identifying information was collected. Participants were assured that the data would be used solely for academic purposes. Care was taken to minimize psychological discomfort, and participants were provided with information about available counseling services if needed.

Result

Table 1

Correlational Analysis (154)

	1	2	3
1. Drug Addiction	-	.26***	.35***
2. Neuroticism		-	.27***
3. Psychological Distress			-

Note. *** $p < .001$

The correlational analysis revealed that drug addiction was positively and significantly associated with neuroticism ($r = .26, p < .001$) and psychological distress ($r = .35, p < .001$). Furthermore, neuroticism was positively and significantly related to psychological distress ($r = .27, p < .001$).

Table 2

Mediation Analysis (N = 154)

Antecedents	Consequences					
	Neuroticism (M)			Psychological Distress (Y)		
	B	SE	P	B	SE	P
Drug Addiction (X)	A .26***	.07	<.001	c' 1.48***	.37	<.001
Neuroticism (M)	-			b .96**	.38	.01
Constant	I 3.53	.66	<.001	I 2.25	3.42	.51
	$R^2 = .06, F = 11.27$			$R^2 = .15, F = 14.28$		
	*** $p < .001$			*** $p < .001$		

Note. ** $p < .01$ *** $p < .001$

Table 2 shows that drug addiction significantly predicted neuroticism, $a = 0.26, SE = 0.07, p < .001$, indicating that higher levels of drug addiction were associated with higher neuroticism. Furthermore, neuroticism significantly predicted psychological distress, $b = 0.96, SE = 0.38, p = .01$. Drug addiction also remained a significant direct predictor of psychological distress after controlling for neuroticism, $c' = 1.48, SE = 0.37, p < .001$. The first model explained 6% of the variance in neuroticism, $R^2 = .06, F(1, 152) = 11.27, p < .001$, whereas the second model explained 15% of the variance in psychological distress, $R^2 = .15, F(2, 151) = 14.28, p < .001$. These findings suggest that neuroticism partially mediates the relationship between drug addiction and psychological distress, such that higher drug addiction is associated with greater neuroticism, which in turn contributes to increased psychological distress.

Table 3.1

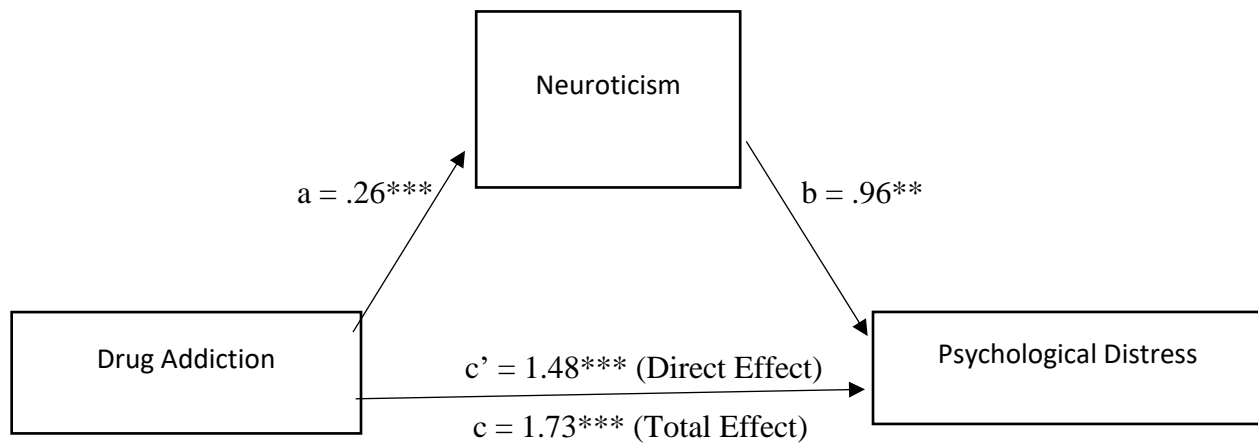
Indirect Effect

Pathways	B	B	BootSE	95% CI (BootLLCI – BootULCI)
DA → Neuroticism → PD	.24	.05	.02	(.002 - .101)

Note. N = 154, DA = Drug Addiction, PD = Psychological Distress

The indirect effect of drug addiction on psychological distress through neuroticism was statistically significant (B = 0.24, $\beta = 0.05, BootSE = 0.02, 95\% CI [0.002, 0.101]$), as the confidence interval does not include zero, indicating a significant mediation effect.

Figure 2: Statistical Model



Note. N = 154, ** $p < .01$ *** $p < .001$

Figure 2 illustrates the mediation model in which drug addiction significantly predicts neuroticism ($a = 0.26$, $p < .001$), and neuroticism, in turn, significantly predicts psychological distress ($b = 0.96$, $p < .01$). The total effect of drug addiction on psychological distress is significant ($c = 1.73$, $p < .001$), and the direct effect remains significant after including the mediator ($c' = 1.48$, $p < .001$). This pattern indicates that neuroticism partially mediates the relationship between drug addiction and psychological distress. In other words, drug addiction increases psychological distress both directly and indirectly through elevated levels of neuroticism.

Discussion

The present study aimed to examine the relationship between drug addiction and psychological distress among university students in Pakistan, with a specific focus on the mediating role of neuroticism. The findings confirmed that drug addiction significantly predicts psychological distress, both directly and indirectly through neuroticism. This highlights that substance use is not only a behavioral issue but also a psychologically driven process influenced by personality traits. Understanding this mechanism is important because university students represent a vulnerable population facing academic pressure, identity formation challenges, and increasing exposure to substance use behaviors.

The study was guided by the Vulnerability–Stress Model (Zuckerman et al., 2022), which explains that psychological outcomes emerge from the interaction between environmental stressors and individual vulnerabilities. In this context, drug addiction acts as a maladaptive coping response to stress, while neuroticism represents a stable personality vulnerability that intensifies emotional reactivity. Individuals high in neuroticism are more likely to experience negative affect and use substances as an escape mechanism, which ultimately increases psychological distress rather than reducing it. Consistent with this framework, previous research has shown that neuroticism is strongly associated with higher levels of anxiety, depression, and stress (Cuartero

& Tur, 2021; Huang et al., 2025). Similarly, studies have found that substance use exacerbates emotional instability and contributes to long-term psychological maladjustment among young adults (Wei et al., 2025; Zhao et al., 2026).

The results also indicate partial mediation, meaning that neuroticism explains part, but not all, of the relationship between drug addiction and psychological distress. This suggests that drug addiction has both direct psychological effects and indirect effects through personality-based emotional vulnerability. The presence of partial mediation may be explained by the complexity of substance use behavior, which is influenced not only by personality traits but also by environmental, social, and cultural factors. In Pakistan, academic stress, peer pressure, socioeconomic instability, and strong cultural stigma surrounding mental health and substance use may independently contribute to psychological distress. These contextual factors may weaken the possibility of full mediation, as drug addiction likely affects psychological distress through multiple unmeasured pathways beyond neuroticism.

From a cultural perspective, Pakistani university students often face limited access to mental health services and low help-seeking behavior due to stigma and societal expectations. Substance use is frequently hidden and underreported, which increases emotional burden and reduces opportunities for early intervention. In such a collectivistic culture, failure to meet academic and familial expectations can intensify feelings of guilt, shame, and distress, further strengthening the psychological consequences of drug addiction. These cultural pressures may amplify the observed relationships in the current study and highlight the need for culturally sensitive mental health interventions.

Conclusion

The present study concludes that drug addiction is a significant predictor of psychological distress among university students in Pakistan, and this relationship is partially mediated by neuroticism. This indicates that students who engage in substance use are more likely to experience higher emotional instability, which further contributes to psychological distress. However, drug addiction also has a direct effect on psychological distress beyond personality influences, suggesting a multifaceted relationship.

Implications

The findings highlight the need for university-based mental health programs that focus not only on substance use prevention but also on personality assessment and emotional regulation training. Counseling services should be strengthened to identify students with high neurotic tendencies and provide early psychological support. Psychoeducational workshops on stress management and adaptive coping strategies may also help reduce reliance on substances.

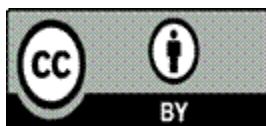
Limitations and Recommendations

This study is limited by its cross-sectional design, which restricts causal interpretations. The use of self-report measures may also introduce response bias. Additionally, the sample was limited to university students, which restricts generalizability to other populations. Future research should employ longitudinal designs to better understand causal relationships. It is also recommended to explore additional mediators such as coping strategies, resilience, and social support. Expanding research to diverse populations and cultural settings will further strengthen the generalizability of findings.

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