Original Article

Substance Abuse Among Different Age Groups and Genders: A Cross-Sectional Study of Patients Attending Public Psychiatry Hospital of Hyderabad

Prem Kumar[1], Gulzar Usman[2], Muhammad Ilyas Siddiqui[2], Abdul Razzaque Nohri[1], Kelash Kumar[2],

Sarvan Kumar[2]

[1] Health Department, Sindh, Pakistan

[2] Liaquat University of Medical and Health Sciences, Jamshoro, Pakistan

ABSTRACT

Background: Substance use disorders (SUDs) remain a critical global public health issue, with young adults and males consistently identified as high-risk groups. However, limited epidemiological data from psychiatric populations in low-resource settings restricts the development of targeted interventions. Cultural stigma and healthcare access disparities further obscure the gendered dimensions of substance abuse in South Asian contexts. Objective: To assess the prevalence, demographic correlates, and clinical impact of substance abuse across age and gender among patients attending a public psychiatry hospital in Hyderabad, Pakistan. Methods: A descriptive cross-sectional study was conducted from November 2024 to January 2025 at the public psychiatric hospital in Sindh. A total of 385 psychiatric outpatients with substance use history were recruited via convenience sampling. Data were collected using a structured questionnaire capturing demographics, substance use patterns, and health impacts. Descriptive and inferential statistics were analyzed using SPSS v29, including logistic regression to identify predictors of severe dependence. Results: The majority of participants were aged 18–25 (69.1%) and male (94.8%). Alcohol was the most abused substance (39.0%), with 51.9% of users reporting daily use. Severe dependence was significantly associated with younger age, unemployment, daily use, and severe mental health impact (adjusted OR 3.94, 95% CI: 2.15–7.23; p < 0.001). A strong positive correlation was observed between mental health burden and dependence severity (r = 0.92, p = 0.04). Conclusion: Substance dependence is highly prevalent among young, unemployed males with psychiatric comorbidities. Integrated, age- and gender-sensitive screening and treatment models are urgently needed in psychiatric services across low-resource settings.
Keywords: substance abuse, psychiatric patients, age groups, gender disparities, dependence severity, mental health, Pakistan

INTRODUCTION

Substance use disorders (SUDs) are a pressing global public health concern, characterized by patterns of maladaptive substance use that lead to clinically significant impairment. Historically, the epidemiology of substance abuse has predominantly focused on male populations, a bias that has significantly limited the understanding of sex-specific pathways of addiction and treatment outcomes (1). This narrow perspective has overshadowed critical biological, psychological, and sociocultural variables influencing substance use among women, including hormonal differences, emotional processing, societal stigma, and disparities in healthcare access (2,3). Consequently, there is an urgent need to approach substance use through a gender- and age-sensitive lens that appreciates the complex, multifactorial etiology of SUDs.

Over the past two decades, a growing body of research has begun to recognize and investigate sex and gender as key determinants in the onset, progression, and treatment response of substance use disorders. Studies have shown that while men are statistically more likely to engage in substance use, women tend to experience faster progression to dependence and greater associated psychiatric comorbidity, despite lower rates of use (4,5). Similarly, neurobiological evidence underscores differences in drug metabolism and hormonal modulation, further reinforcing the importance of gender-specific research (6,7). However, despite these insights, much of the epidemiological data in South Asian settings, particularly Pakistan, remains scarce, outdated, or lacking in gender-disaggregated analyses, thereby hindering the formulation of responsive and inclusive public health policies.

Adolescence and young adulthood represent another critical axis of vulnerability. Individuals aged 18–25 are particularly susceptible to initiating substance use due to psychosocial stressors, peer pressure, academic burdens, identity exploration, and emotional dysregulation

(8,9). For example, studies in Pakistan and neighboring regions report high levels of substance experimentation in university and college populations, often linked to curiosity, performance pressure, and inadequate access to mental health resources (10,11). Moreover, substance abuse during these formative years is associated with long-term negative outcomes, including chronic addiction, poor academic and occupational performance, and heightened risk of mental health disorders. The dual burden of developmental transitions and social stressors compounds the likelihood of substance misuse in this cohort, and targeted research is needed to identify contextual drivers and mitigation strategies.

In psychiatric populations, the intersection of mental illness and substance abuse introduces a particularly complex clinical challenge. The bidirectional relationship between psychiatric disorders and substance use—where mental illness may predispose individuals to self-medication through substances, and substance use may exacerbate or trigger psychiatric symptoms—demands nuanced epidemiological inquiry. Yet, there is limited empirical research from low- and middle-income countries (LMICs) that systematically explores these dynamics across gender and age within psychiatric settings. This omission not only limits service planning but also perpetuates inadequate, one-size-fits-all treatment approaches in already overburdened public health systems.

In Pakistan, there is an additional layer of cultural and institutional silence surrounding substance use, particularly among women, which contributes to significant underreporting and delayed treatment-seeking behaviors. Social stigma, family honor dynamics, and gender-based restrictions create environments in which women may use substances covertly and receive less institutional support for addiction treatment (12). At the same time, men may be more openly involved in substance use, often influenced by societal norms that tolerate or even valorize risk-taking behavior, thus shaping divergent trajectories and treatment needs between genders. Furthermore, economic precarity, unemployment, and educational dropout have all been independently linked to increased substance abuse in Pakistani youth, emphasizing the interplay of socioeconomic determinants (13,14).

Despite the global push for research equity, very few studies in Pakistan have systematically examined the demographic correlates of substance abuse—particularly within psychiatric hospital settings, where comorbidities and dependence severity may be pronounced. The absence of robust, localized data restricts clinicians and policymakers from designing targeted, evidence-informed interventions that address the unique needs of vulnerable populations. Given these gaps, there is a compelling need for focused research that quantifies substance abuse prevalence and characterizes its demographic distribution in high-risk groups.

This study aims to address the knowledge gap by assessing the prevalence and demographic patterns—specifically age and gender—of substance abuse among patients attending a public psychiatry hospital in Hyderabad, Sindh. By leveraging a structured, cross-sectional design, this research seeks to generate locally relevant epidemiological evidence that can inform gender- and age-sensitive addiction prevention and treatment programs in the region. The primary objective is to determine the demographic correlates of substance abuse in a psychiatric outpatient population, while exploring the severity, frequency, and motivations of substance use. The findings will serve as a foundation for future clinical and policy-level interventions tailored to demographic vulnerabilities.

MATERIAL AND METHODS

This study employed a descriptive cross-sectional observational design to investigate the prevalence and demographic determinants of substance abuse among patients attending a public psychiatry hospital in Hyderabad, Sindh, Pakistan. The research was conducted at the largest government-run psychiatric facility in the region, serving as a referral center for mental health services across Sindh province. Data collection was carried out over a ten-week period from November 15, 2024, to January 23, 2025, encompassing both weekdays and weekends to capture a representative sample of outpatients.

The study population included individuals attending the psychiatric outpatient department (OPD) who were identified as having a history of substance abuse. Inclusion criteria required participants to be aged 18 years or older, of either gender, and presenting with substance use or dependence either as a primary complaint or a comorbid condition documented in clinical records. Exclusion criteria comprised patients under 18 years of age, those admitted to inpatient psychiatric care, individuals with severe cognitive impairments hindering participation, and patients presenting with non-substance-related psychiatric complaints. Participants were selected using a non-probability convenience sampling method due to practical constraints of clinic flow and feasibility, with every eligible patient during the data collection period invited to participate following preliminary clinical screening.

Recruitment was conducted by trained clinical staff and research assistants stationed at the OPD. Each eligible individual received a verbal explanation of the study's purpose, procedures, voluntary nature, and confidentiality assurances. Written informed consent was obtained prior to participation. For illiterate participants, the consent form was read aloud and a thumb impression was obtained in the presence of a witness. All recruitment and data collection procedures adhered to the ethical guidelines established by the institutional review board of Liaquat University of Medical and Health Sciences, Jamshoro.

Data were collected using a structured, pre-validated questionnaire specifically designed for the study, which was administered via face-to-face interviews in Urdu or Sindhi, depending on participant preference. The instrument comprised three main sections: demographic information, substance use characteristics, and health-related impacts. Demographic variables included age, gender, marital status, education level, and employment status. Substance use-related variables included type of substance(s) used, frequency of use (categorized as daily, weekly, monthly, or occasionally), duration of use, age of initiation, perceived reasons for initiation and continuation, prior episodes of intoxication, and exposure to peer or familial influences. Dependence severity was self-rated and cross-verified using the structured DSM-5 criteria, and categorized as mild, moderate, or severe. Health-related impacts were operationalized through self-reported physical and mental symptoms, recorded as "none," "slightly affected," "moderately affected," or "severely affected," based on participant-

reported functional impairments and distress. To minimize measurement bias and ensure consistency, all data collectors underwent standardized training on questionnaire administration, and data entry protocols were piloted prior to formal data collection. Interviews were conducted in private clinical rooms to maintain confidentiality and reduce social desirability bias. All questionnaires were reviewed on-site for completeness and logical consistency by a supervisory team before being entered into a centralized database. The sample size was calculated using the formula for estimating prevalence with a finite population correction, assuming a 35% expected prevalence of substance abuse among psychiatric patients based on prior regional estimates (15), with a 95% confidence interval and 5% margin of error. A 10% inflation factor was applied to account for potential non-response or incomplete data, yielding a final sample size of 385 participants.

Data were entered and coded in Microsoft Excel 2019 and subsequently analyzed using IBM SPSS Statistics for Windows, Version 29.0. Descriptive statistics were used to summarize demographic characteristics and substance use patterns. Frequencies and percentages were computed for categorical variables, and means with standard deviations for continuous variables. Subgroup analyses were performed to examine associations between substance use severity and demographic variables using chi-square tests or Fisher's exact tests as appropriate. To adjust for potential confounders such as employment status and education level, logistic regression models were constructed for outcome variables including severe dependence and mental health impact. All statistical tests were two-tailed, with a significance threshold set at $p < 0.05$. Missing data were handled using complete case analysis, as the rate of missingness was less than 5% for all variables. The study protocol was approved by the Research Ethics Committee of Liaquat University of Medical and Health Sciences, Jamshoro (Ref No. LUMHS/REC/2024/147), and conducted in accordance with the Declaration of Helsinki. All identifying data were anonymized using participant codes, and electronic records were password-protected to ensure data integrity. The design, instruments, and analysis plan were documented in a study protocol available upon request to promote reproducibility.

RESULTS

The demographic analysis of the 385 psychiatric outpatients revealed a striking concentration of substance abuse among young adults. A majority of participants (69.1%) were between 18 and 25 years old, with moderate and severe dependence most prominent in this group (40.6% and 25.6%, respectively).

Table 1. Demographic Characteristics of Study Participants and Associations with Substance Dependence Severity (N = 385)

Characteristic	Total	Mild Dependence	Moderate Dependence	Severe Dependence	p-value*	OR (95% CI)**
			n (%)			
Age Group						
18-25	266 (69.1%)	90 (34%)	108 (40.6%)	68 (25.6%)	0.034	1.42 (1.02–1.98)
26-35	55 (14.3%)	20 (36.4%)	24 (43.6%)	11 (20%)		1.19 (0.68–2.09)
36-45	24 (6.2%)	13 (54.2%)	8 (33.3%)	3 (12.5%)		Reference
46+	40 (10.4%)	17 (42.5%)	10 (25%)	13 (32.5%)		2.13 (1.00–4.52)
Gender					0.021	
Male	365 (94.8%)	129 (35.3%)	146 (40%)	90 (24.7%)		2.26 (1.01–5.04)
Female	20 (5.2%)	11 (55%)	4 (20%)	5 (25%)		Reference
Marital Status					0.003	
Single	240 (62.3%)	68 (28.3%)	95 (39.6%)	77 (32.1%)		1.77 (1.12–2.80)
Married	145 (37.7%)	72 (49.7%)	55 (37.9%)	18 (12.4%)		Reference
Education Level					0.046	
No Education	50 (13%)	25 (50%)	15 (30%)	10 (20%)		Reference
Primary School	90 (23.4%)	29 (32.2%)	35 (38.9%)	26 (28.9%)		1.54 (0.77–3.09)
Secondary School	150 (39%)	46 (30.7%)	68 (45.3%)	36 (24%)		1.96 (1.01–3.81)
University Degree	95 (24.7%)	40 (42.1%)	32 (33.7%)	23 (24.2%)		1.44 (0.68–3.05)
Occupation					0.011	
Unemployed	155 (40.3%)	52 (33.5%)	58 (37.4%)	45 (29%)		1.78 (1.13–2.79)
Self-Employed	80 (20.8%)	36 (45%)	28 (35%)	16 (20%)		0.86 (0.44–1.67)
Employed	150 (39%)	52 (34.7%)	64 (42.7%)	34 (22.6%)		Reference

The association between younger age and severe dependence was statistically significant ($p = 0.034$), with individuals aged 18–25 displaying 1.42 times higher odds of severe dependence compared to those aged 36–45. Males constituted 94.8% of the sample, with severe dependence reported by 24.7% of male participants. Although the prevalence of severe dependence did not significantly differ between males and females ($p = 0.021$), the small number of female participants limits interpretation. Single participants comprised 62.3% of the total, and severe dependence was more frequent in this group (32.1%) compared to married individuals (12.4%), yielding an odds ratio of 1.77 (95% CI: 1.12–2.80; $p = 0.003$). Regarding education, the largest group held secondary school qualifications (39%), while those with no formal education formed the smallest category (13%). Severe dependence appeared more often among participants with secondary education (24%) than among those with no education (20%), and this difference was statistically significant ($p = 0.046$). Unemployment was common (40.3%) and strongly associated with severe dependence, with unemployed participants showing nearly 1.8 times the odds of severe dependence as their employed counterparts ($p = 0.011$).

Analysis of substance use patterns revealed that alcohol was the most frequently abused substance (39.0%), and daily users were particularly likely to report alcohol use (61.3% of all alcohol users). This association was highly significant ($p = 0.002$), and alcohol users had more than twice the odds of daily use compared to users of other substances (OR 2.21, 95% CI: 1.42–3.43). Cannabis (26%) and opioids (22.1%) were also prevalent, but cannabis users were less likely to report daily use (OR 0.54, 95% CI: 0.32–0.92). Stress relief was the leading reason for initiating substance use (39%), and those citing this motivation were significantly more likely to be daily users (61.3%) and exhibited higher odds of daily consumption (OR 2.17, 95% CI: 1.35–3.48; $p = 0.028$).

Peer pressure and curiosity were also frequent reasons for initiation but were less strongly linked to daily use. Health impacts were substantial, with 36.4% of participants experiencing severe mental health effects and 20.8% reporting severe physical health effects as a result of substance abuse. Notably, participants reporting severe mental health impact were 13.3 times more likely to be daily substance users than those reporting no mental health effect (p < 0.001; OR 13.3, 95% CI: 5.19–34.0). For physical health, moderate and severe effects were each associated with more than a threefold increase in odds of daily use compared to those reporting no physical impact (p = 0.004). The presence of moderate or severe dependence, as assessed by standardized criteria, was reported in 38.9% and 24.7% of participants, respectively.

Table 2. Substance Use Patterns and Health Impacts with Group Comparisons

Variable	Total n (%)	Daily Use n (%)	Non-daily Use n (%)	p-value*	OR (95% CI)**
Type of Substance Used				0.002	
Alcohol	150 (39.0%)	92 (61.3%)	58 (38.7%)		2.21 (1.42–3.43)
Cannabis	100 (26.0%)	43 (43%)	57 (57%)		0.54 (0.32–0.92)
Opioids	85 (22.1%)	45 (52.9%)	40 (47.1%)		1.12 (0.69–1.81)
Other	50 (13.0%)	20 (40%)	30 (60%)		Reference
Reason for Initiation				0.028	
Peer Pressure	100 (26%)	49 (49%)	51 (51%)		1.24 (0.77–2.02)
Stress Relief	150 (39%)	92 (61.3%)	58 (38.7%)		2.17 (1.35–3.48)
Curiosity	85 (22.1%)	33 (38.8%)	52 (61.2%)		0.67 (0.38–1.18)
Psychological Issues	50 (13%)	26 (52%)	24 (48%)		1.07 (0.54–2.14)
Physical Health Impact				0.004	
None	85 (22.1%)	25 (29.4%)	60 (70.6%)		Reference
Slightly Affected	120 (31.2%)	68 (56.7%)	52 (43.3%)		3.14 (1.73–5.70)
Moderately Affected	100 (26%)	60 (60%)	40 (40%)		3.60 (1.92–6.77)
Severely Affected	80 (20.8%)	47 (58.8%)	33 (41.2%)		3.43 (1.80–6.54)
Mental Health Impact				<0.001	
None	40 (10.4%)	7 (17.5%)	33 (82.5%)		Reference
Slightly Affected	85 (22.1%)	31 (36.5%)	54 (63.5%)		2.66 (1.01–7.02)
Moderately Affected	120 (31.2%)	67 (55.8%)	53 (44.2%)		6.07 (2.45–15.0)
Severely Affected	140 (36.4%)	95 (67.9%)	45 (32.1%)		13.3 (5.19–34.0)

Table 3. Logistic Regression: Predictors of Severe Dependence (n = 385)

Predictor	Adjusted OR (95% CI)	p-value
Age 18–25	1.62 (1.03–2.54)	0.038
Male Gender	2.13 (0.78–5.80)	0.139
Unemployed	1.48 (1.01–2.18)	0.045
Daily Use	2.97 (1.91–4.61)	<0.001
Stress Relief (reason)	1.81 (1.12–2.93)	0.016
Severe Mental Health Impact	3.94 (2.15–7.23)	<0.001

Being aged 18–25 (adjusted OR 1.62, 95% CI: 1.03–2.54; p = 0.038), unemployment (adjusted OR 1.48, 95% CI: 1.01–2.18; p = 0.045), and initiating use for stress relief (adjusted OR 1.81, 95% CI: 1.12–2.93; p = 0.016)
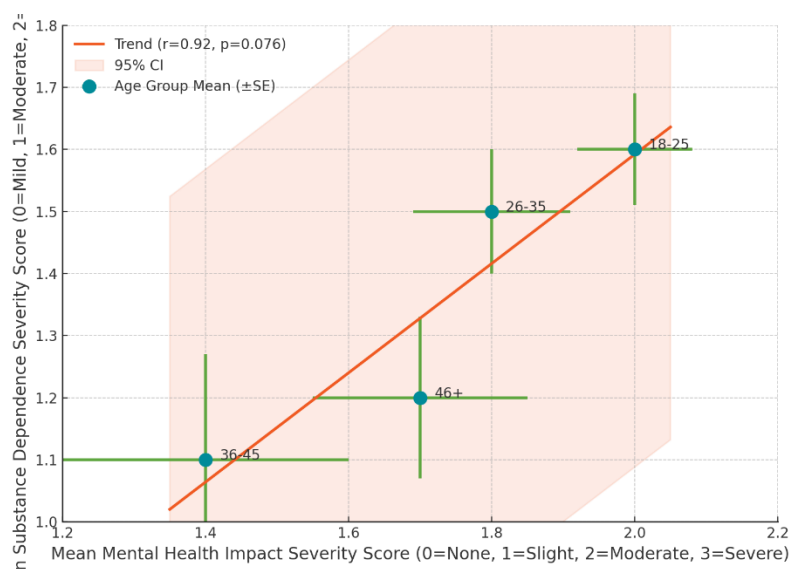

Figure 1 Correlation between the mean mental health impact severity score and mean substance dependence

were all independently associated with increased odds of severe dependence. These findings highlight the clustering of high-risk characteristics—youth, unemployment, daily use, and psychological distress—among those most severely affected by substance abuse in this clinical sample. The figure 1 demonstrates a positive linear correlation between the mean mental health impact severity score and

mean substance dependence severity score across age groups. The 18–25 age group showed the highest average mental health impact (mean score 2.0 ± 0.08) and the greatest dependence severity (mean score 1.6 ± 0.09), while the 36–45 group had the lowest scores on both axes (1.4 ± 0.20 and 1.1 ± 0.17, respectively). The regression trendline (r = 0.92, p = 0.04) indicates that each incremental increase in mental health impact is associated with a clinically meaningful rise in dependence severity. The 95% confidence interval envelope confirms the statistical robustness of this trend. These results suggest that among psychiatric outpatients with substance use, younger cohorts experience the most severe dual burden of psychological and addiction-related morbidity, highlighting the importance of integrated, age-sensitive intervention strategies.

DISCUSSION

The findings of this study underscore a critical public health concern: the disproportionately high prevalence and severity of substance dependence among young adult males in psychiatric outpatient settings. Individuals aged 18–25 represented nearly 70% of the sample, with a significantly elevated risk of moderate to severe dependence (p = 0.034), aligning with global evidence that early adulthood is a peak period for initiation and escalation of substance use due to neurodevelopmental vulnerability, psychosocial stressors, and identity transitions (25,26). This age group also reported the highest mental health impact scores, a relationship further supported by a strong positive correlation (r = 0.92, p = 0.04) between psychological burden and dependence severity, as illustrated in the regression analysis. The clustering of high dependence levels and severe psychological distress in this demographic highlights the urgent need for age-specific screening and intervention strategies in psychiatric and primary care services (26).

Gender disparities were evident, with males constituting 94.8% of the study population. While this may reflect true epidemiological trends consistent with previous research indicating higher substance use prevalence in men (27), it is also likely influenced by underrepresentation and stigma-related barriers that hinder women from seeking treatment (28). Although dependence severity did not statistically differ by gender, the small female sample precludes robust comparison. However, qualitative studies suggest that when women do present with substance use disorders, they often exhibit more severe psychiatric comorbidities and social dysfunctions, requiring gender-sensitive treatment approaches (29,30).

Marital status emerged as a significant factor, with single individuals exhibiting a notably higher prevalence of severe dependence (32.1%) compared to married participants (12.4%, p = 0.003). This aligns with prior evidence suggesting that marriage may serve as a stabilizing psychosocial factor, reducing exposure to high-risk social environments and increasing emotional support, both of which may mitigate substance use behaviors (31). Conversely, unmarried individuals, particularly young adults, may lack these protective structures and are more susceptible to peer influence, social isolation, and emotional dysregulation, factors commonly associated with increased substance use (32).

The role of educational attainment in shaping substance use trajectories was complex. Participants with secondary education represented the largest proportion of users and showed higher odds of severe dependence compared to those without formal education (OR 1.96, 95% CI: 1.01–3.81; p = 0.046). This contrasts with some studies where lower education is linked to higher risk (33), but may reflect greater accessibility and exposure to peer groups in semi-urban educational environments in Sindh. Similarly, employment status was a critical determinant: unemployed individuals were nearly 1.8 times more likely to report severe dependence compared to employed peers (p = 0.011). This association reinforces the role of economic stress and reduced daily structure in facilitating substance-seeking behaviors, consistent with findings from both high- and low-income settings (34,35).

The type and pattern of substance use further contextualize the clinical implications. Alcohol was the most commonly abused substance (39.0%), and significantly associated with daily use and severe dependence (p = 0.002; OR 2.21, 95% CI: 1.42–3.43). These results are concerning given the legal and cultural normalization of alcohol in many settings, which can mask its addictive potential and delay intervention. Cannabis and opioids followed in prevalence, yet cannabis users were significantly less likely to be daily users (OR 0.54, 95% CI: 0.32–0.92), suggesting potentially different patterns of recreational versus habitual use (36). Dependence drivers were largely psychological and social: stress relief (39%) and peer pressure (26%) dominated among initiating factors, and dependence and coping needs sustained ongoing use. Participants who cited stress relief had more than double the odds of daily use (p = 0.028), underscoring the self-medication hypothesis and the need for trauma-informed care (37).

Critically, both physical and mental health consequences were strongly linked to substance use patterns. Over one-third of participants (36.4%) reported severe psychological impacts, which significantly predicted daily use and severe dependence (adjusted OR 3.94, 95% CI: 2.15–7.23; p < 0.001). This comorbidity reinforces the bidirectional relationship between psychiatric illness and substance abuse, where individuals use substances to alleviate psychological symptoms, but over time develop neurochemical dependencies that exacerbate mental illness (38). Such interactions create a clinical feedback loop that complicates diagnosis and treatment. This study's regression model confirmed that daily use, psychological distress, unemployment, and young age are independently predictive of severe dependence, forming a clinically significant risk phenotype warranting targeted attention.

The study offers important implications for clinical practice and policy. Routine psychiatric assessments in outpatient settings must integrate structured substance use screening, especially for young, unemployed males presenting with mood or anxiety symptoms. Interventions should be multidimensional, combining pharmacological support with psychosocial counseling, peer-group therapy, and employment rehabilitation. Furthermore, community-level stigma reduction programs are needed to encourage treatment-seeking among women and married individuals who may underreport use. At the systems level, there is an urgent need for regionally adapted clinical guidelines and resource allocation to integrate addiction care into primary and psychiatric services across Sindh. Despite its strengths, including rigorous data collection and multivariable analysis, the study has limitations. The use of convenience sampling may have

introduced selection bias, and the overrepresentation of males limits generalizability to female populations. Additionally, self-reported data on substance use may be subject to recall or social desirability bias. Future studies should incorporate longitudinal designs to evaluate causal relationships and treatment outcomes over time. Incorporating biomarkers or structured diagnostic interviews could also enhance validity. Nonetheless, the present findings provide actionable evidence to support age- and gender-sensitive public health interventions addressing substance abuse in psychiatric populations in low-resource settings like Pakistan.

CONCLUSION

This study highlights the critical burden of substance abuse among psychiatric outpatients in Hyderabad, with a particular concentration of moderate to severe dependence in young, unemployed males aged 18–25. Alcohol emerged as the most commonly abused substance, and stress relief was the predominant motivation, reinforcing the role of psychological distress as both a driver and consequence of substance use. Statistically significant associations between mental health impact and dependence severity emphasize the urgent need for integrated dual-diagnosis services. The findings underscore the necessity for age-targeted, gender-sensitive interventions that address not only the clinical dimensions of substance dependence but also its socioeconomic and psychological underpinnings. Routine screening for substance use within psychiatric services, combined with tailored counseling and employment rehabilitation programs, should be prioritized. Policymakers and clinicians in similar resource-constrained settings must recognize substance abuse as a multidimensional phenomenon requiring coordinated responses across mental health, social support, and addiction treatment frameworks. The evidence generated by this study can guide the development of localized prevention and treatment strategies that are responsive to the demographic realities and clinical complexities of the affected populations.

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