

Psychological Impairment in Adolescents with Substance Use Disorder: A Cross-Sectional Study

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ABSTRACT

Background: Substance use disorder (SUD) among adolescents is an emerging public health concern that is frequently associated with adverse psychological outcomes, including depression, anxiety, and stress. Evidence regarding the psychological consequences of adolescent SUD in Bangladesh remains limited, highlighting the need for context-specific research. Aim of the study: To assess psychological impairment among adolescents with substance use disorder and determine its association with socio-demographic and substance use-related characteristics. **Methods & Materials:** This cross-sectional analytical study was conducted under the Department of Psychiatry, Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka, Bangladesh, between March 2020 and September 2021. Data were collected from the Central Drug Addiction Treatment Centre (CDC), Dhaka, and Ashokti Punorbashon Nibash (APON), Manikganj. A total of 44 adolescents aged 11–19 years with substance use disorder diagnosed according to DSM-5 criteria were enrolled using purposive sampling. Psychological impairment was assessed using the validated Bangla version of the Depression Anxiety Stress Scale-21 (DASS-21). Data were analyzed using SPSS version 27.0. Descriptive statistics were used to summarize the findings, while Chi-square test or Fisher's exact test was applied to assess associations. A p-value <0.05 was considered statistically significant. **Result:** The mean age of the participants was 16.48±2.32 years, with 79.55% aged 15–19 years and 88.64% being male. Most participants were from urban areas (70.45%), and 45.45% belonged to low socioeconomic status. The majority (52.27%) initiated substance use between 14 and 16 years of age, while 47.73% had a

duration of substance use of 1–3 years. Depression, anxiety, and stress were present in 72.73%, 81.82%, and 65.91% of participants, respectively. Moderate-to-severe psychological impairment was common across all three domains. Depression and anxiety were significantly associated with age ($p=0.041$ and $p=0.047$, respectively). Residence, socioeconomic status, age of first substance use, and duration of substance use showed significant associations with depression, anxiety, and stress (all $p<0.05$), whereas gender was not significantly associated with any psychological impairment ($p>0.05$). **Conclusion:** Psychological impairment was highly prevalent among adolescents with substance use disorder, with anxiety being the most common manifestation. Earlier initiation and longer duration of substance use, lower socioeconomic status, and rural residence were significantly associated with greater psychological impairment. These findings emphasize the importance of integrating routine psychological assessment and early mental health interventions into adolescent substance use treatment programs.

Keywords: Adolescents, Substance use disorder, Psychological impairment, Depression, Anxiety, Stress, DASS-21, Bangladesh.

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INTRODUCTION

Substance use disorder (SUD) among adolescents is characterized by the problematic and recurrent use of alcohol, tobacco, cannabis, inhalants, or other psychoactive substances, resulting in clinically significant impairment or distress [1]. Globally, adolescent substance use remains a major public health concern, and the prevalence rate is that approximately 13% of adolescents aged 15-19 years have used alcohol or other psychoactive substances. It varies across regions and socioeconomic contexts [2]. In Bangladesh, the prevalence of substance use among adolescents varies across studies; recent evidence has reported tobacco use rates between 6.9% and 9.6%, while the prevalence of alcohol or marijuana use among school-going adolescents has been estimated at approximately 2.3% [3]. The initiation of substance use at an early age is often influenced by a combination of individual, familial, peer, and environmental factors. Curiosity, peer pressure, family conflict, poor parental

monitoring, and exposure to substance-using social networks have been identified as important contributors to early experimentation [4,5]. Once initiated, psychoactive substances affect neurotransmitter systems involved in reward, motivation, and emotional regulation. Repeated exposure during adolescence may disrupt normal brain maturation processes, potentially increasing susceptibility to psychological and behavioral difficulties [6]. Substance use disorder is closely associated with psychological impairment. Adolescents with substance use disorder are more likely to experience symptoms of depression, anxiety, emotional dysregulation, low self-esteem, and behavioral problems compared with their peers without substance use disorder [7,8]. These impairments may adversely affect academic performance, interpersonal relationships, and overall quality of life. Furthermore, psychological difficulties and substance use often reinforce one another, creating a cycle that can persist into adulthood [9]. Research on

substance use disorder and psychological impairment offers several important advantages, including early identification of high-risk adolescents, stronger evidence for preventive interventions, and enhanced development of school- and community-based mental health programs. It can also support policymakers in designing evidence-based strategies to reduce substance use and promote adolescent psychological well-being [10]. Despite these advantages, the existing literature presents notable limitations. Most studies have focused primarily on prevalence estimates or isolated mental health outcomes, while the broader psychological consequences of adolescent substance use disorder remain insufficiently explored [11]. Furthermore, evidence from low- and middle-income countries is relatively scarce, limiting the generalizability of current findings across diverse sociocultural settings and highlighting the need for context-specific research [12,13]. Bangladesh is experiencing rapid social and cultural transitions that may influence adolescent behavior and mental

health. Despite growing concern regarding youth substance use, research exploring its psychological consequences remains insufficient^[14]. Therefore, there is a need for context-specific evidence to better understand the psychological impairment associated with substance use disorder among Bangladeshi adolescents. The objective of the study was to assess psychological impairment among adolescents with substance use disorder, thereby contributing evidence that may support prevention, early detection, and intervention efforts.

METHODS & MATERIALS

This cross-sectional analytical study was conducted under the Department of Psychiatry, Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka, Bangladesh. Data were collected from Central Drug Addiction Treatment Centre (CDC), Tejgaon, Dhaka, Bangladesh and Ashokti Punorbashon Nibash (APON), Singair, Manikganj, Bangladesh. The study was carried out between March 2020 and September 2021. The study population consisted of adolescents who had a history of substance use and were receiving treatment or counseling services during the study period. A total of 44 adolescents were enrolled in the study using a purposive sampling technique. Participants who fulfilled the inclusion criteria and provided informed consent/assent were included consecutively until the required sample size was achieved.

Inclusion Criteria:

- Adolescents aged 11–19 years.
- History of substance use for at least six months.
- Ability to understand and respond to the interview questions.

Exclusion Criteria:

- Adolescents with severe cognitive impairment or acute psychotic

symptoms that interfered with data collection.

- Adolescents in acute intoxication or withdrawal states.

Ethical Considerations

Ethical approval was obtained from the Institutional Review Board (IRB) of Bangabandhu Sheikh Mujib Medical University (BSMMU). Written informed consent was obtained from the parents or legal guardians of the participants, and assent was obtained from the adolescents. Confidentiality and anonymity were maintained throughout the study. Participation was voluntary, and participants were informed of their right to withdraw from the study at any stage without any consequences.

Data Collection

Substance Use Disorder was diagnosed by consultant psychiatrists according to the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5). After confirmation of diagnosis, data were collected through face-to-face interviews using a semi-structured questionnaire which included socio-demographic characteristics (age, sex, residence, and socioeconomic status) and substance use-related characteristics (age of first substance use and duration of substance use). Psychological impairment was assessed using the validated Bangla version of the Depression Anxiety Stress Scale-21 (DASS-21). Scores were calculated according to the standard DASS-21 scoring guidelines and classified into normal, mild, moderate, severe, and extremely severe categories based on the recommended cut-off values. For analysis, the presence of depression, anxiety, and stress was determined, and their severity levels were summarized for descriptive presentation. Participants were asked to report their symptoms experienced during the previous week. For participants who had difficulty

reading or understanding the questionnaire, the interviewer read the questions aloud and recorded their responses. Each interview was conducted in a private setting and lasted approximately 25–30 minutes. Completed questionnaires were checked immediately after data collection for completeness and accuracy before data entry.

Statistical Analysis

The collected data were cleaned, coded, and entered into the Statistical Package for Social Sciences (SPSS) version 27.0 for analysis. Descriptive statistics were used to summarize the study variables. Continuous variables were expressed as mean $\pm$ standard deviation (SD), categorical variables were presented as frequencies and percentages. Associations between socio-demographic and substance use-related characteristics (age, gender, residence, socioeconomic status, age of first substance use, and duration of substance use) and the presence of psychological impairment were assessed using the Chi-square test or Fisher's exact test where appropriate. A p-value of <0.05 was considered statistically significant. The findings were presented in tables, figures, and descriptive text.

RESULT

The majority of participants (79.55%) were aged 15–19 years, with a mean age of 16.48 ± 2.32 years. Most participants were male (88.64%) and resided in urban areas (70.45%). Regarding socioeconomic status, nearly half (45.45%) belonged to the low-income group, followed by the middle-income (38.64%) and upper-income (15.91%) groups. More than half of the participants (52.27%) initiated substance use between 14 and 16 years of age, while 22.73% started between 11 and 13 years. The duration of substance use was 1–3 years in 47.73% of participants, whereas 31.82% had been using substances for more than 3 years (Table 1).

Table 1

Sociodemographic and baseline characteristics of the study participants ($n=44$).

Variables	Frequency (n)	Percentage (%)
Age group (years)		
11–14	9	20.45
15–19	35	79.55
Mean ± SD	16.48 ± 2.32	
Gender		
Male	39	88.64
Female	5	11.36
Residence		
Urban	31	70.45
Rural	13	29.55
Socio-economic status		
Lower class	20	45.45
Middle class	17	38.64
Upper class	7	15.91
Age of First Substance Use (years)		
11-13	10	22.73
14–16	23	52.27

17–19	11	25.00
Duration of Use (years)		
<1	9	20.45
1–3	21	47.73
>3	14	31.82

Anxiety was the most common psychological impairment, affecting 81.82% of participants, followed by depression (72.73%) and stress (65.91%) (Table II).

Table II
Distribution of types of psychological impairment among participants (n=44).

Psychological Impairment	Frequency (n)	Percentage (%)
Depression	32	72.73
Anxiety	36	81.82
Stress	29	65.91

For depression, 27.27% had normal scores, while 25.00% had mild, 22.73% moderate, 18.18% severe, and 6.82% extremely severe symptoms. Regarding anxiety, 18.18% were normal, whereas 22.73%, 31.82%, 18.18%, and 9.09% experienced mild, moderate, severe, and extremely severe anxiety, respectively. For stress, 34.09% had normal scores, followed by mild (27.27%), moderate (20.45%), severe (13.64%), and extremely severe (4.55%) stress levels (Figure 1).

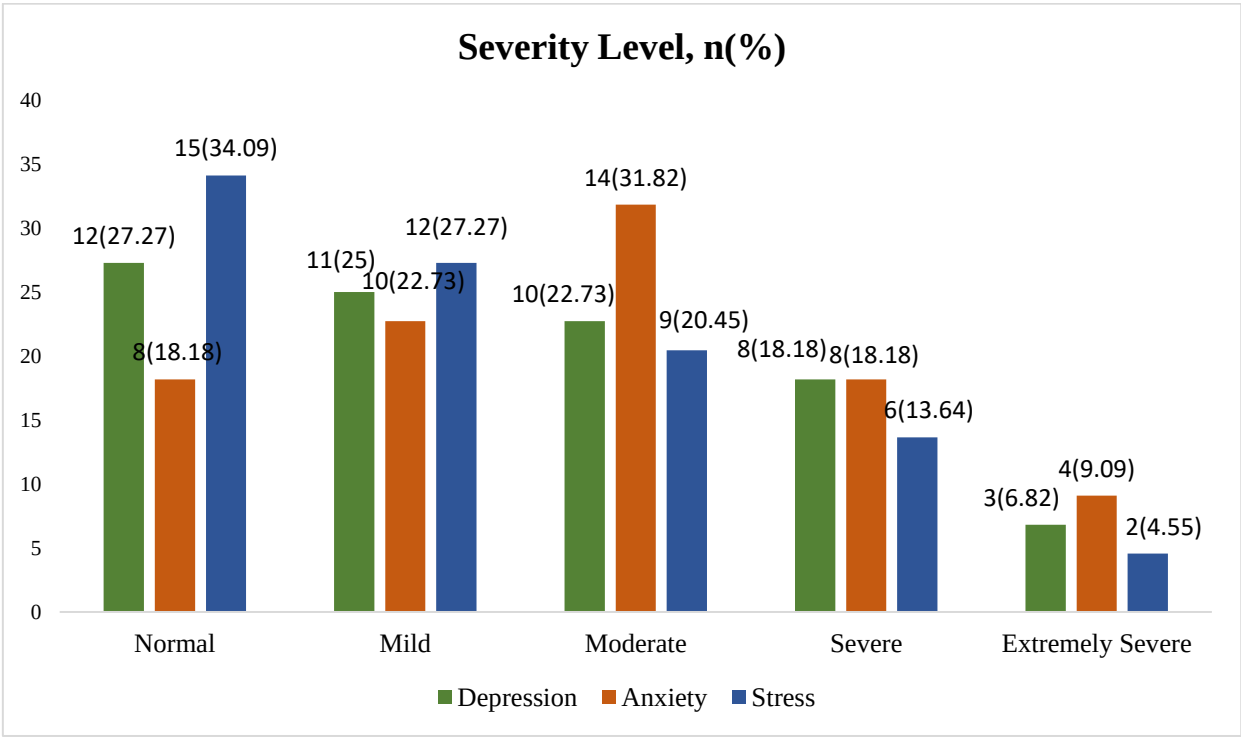


Figure 1 Distribution of severity level of psychological impairment among participants (n=44).

Depression and anxiety were significantly associated with age group ($p=0.041$ and $p=0.047$, respectively), while the association between age and stress was not statistically significant ($p=0.084$). No significant association was observed between gender and depression ($p=0.289$), anxiety ($p=0.376$), or stress ($p=0.458$). Residence showed significant associations with depression ($p=0.023$), anxiety ($p=0.032$), and stress ($p=0.041$), with higher proportions observed among rural participants. Socioeconomic status was also significantly associated with depression ($p=0.015$), anxiety ($p=0.011$), and stress ($p=0.037$), with the highest prevalence among participants from low-income families. Earlier age of first substance use was significantly associated with all three psychological impairments, including depression ($p=0.003$), anxiety ($p=0.011$), and stress ($p=0.018$), with participants initiating substance use between 11 and 13 years exhibiting the highest prevalence. Similarly, a longer duration of substance use was significantly associated with depression ($p=0.001$), anxiety ($p<0.001$), and stress ($p=0.002$), with participants reporting more than three years of substance use demonstrating the highest prevalence of psychological impairment (Table III).

Table III

Association between psychological impairment and socio-demographic variables among study participants.

Variables	Depression Present (n=32)		Anxiety Present (n=36)		Stress Present (n=29)	
	n	%	n	%	n	%
Age (years)						
11–14 (n=9)	7	77.78	6	66.67	5	55.56
15–19 (n=35)	25	71.43	30	85.71	24	68.57
p-value	0.041		0.047		0.084	
Gender						
Male (n=39)	29	74.36	33	84.62	26	66.67
Female (n=5)	3	60	3	60	3	60
p-value	0.289		0.376		0.458	
Residence						
Urban (n=31)	21	67.74	24	77.42	19	61.29
Rural (n=13)	11	84.62	12	92.31	10	76.92
p-value	0.023		0.032		0.041	
Socioeconomic status						
Low (n=20)	17	85	18	90	14	70
Middle (n=17)	12	70.59	13	76.47	11	64.71
High (n=7)	3	42.86	5	71.43	4	57.14
p-value	0.015		0.011		0.037	
Age of First Substance Use (years)						
11–13 (n=10)	10	100.00	10	100.00	9	90.00
14–16 (n=23)	17	73.91	19	82.61	15	65.22
17–19 (n=11)	5	45.45	7	63.64	5	45.45
p-value	0.003		0.011		0.018	
Duration of Use (years)						
<1 (n=8)	3	37.50	5	62.50	2	25.00
1–3 (n=20)	14	70.00	17	85.00	13	65.00
>3 (n=16)	15	93.75	14	87.50	14	87.50
p-value	0.001		<0.001		0.002	

DISCUSSION

Substance use disorder during adolescence is frequently accompanied by significant psychological impairment [15]. The present study assessed the prevalence and severity of depression, anxiety, and stress among adolescents with substance use disorder and explored their associations with socio-demographic and substance use-related characteristics. The mean age of the participants was 16.48±2.32 years, with the majority (79.55%) belonging to the 15–19-year age group. Most participants were male (88.64%), resided in urban areas (70.45%), and 45.45% belonged to the low socioeconomic class. More than half of the adolescents (52.27%) initiated substance use between 14 and 16 years of age, while 47.73% had been using substances for 1–3 years. These findings indicate that substance use disorder predominantly affects older male adolescents, particularly those from urban and socioeconomically disadvantaged backgrounds. This pattern is consistent with previous studies suggesting that substance use is more prevalent among older male adolescents due to increased peer influence, greater risk-taking behavior, and easier access to psychoactive substances. Similarly, Khan et al. reported a mean participant age of 16.5±2.3 years, which is highly comparable to the mean age observed in the present study [16]. The present study demonstrated a high prevalence of psychological impairment among adolescents with SUD. Depression was observed in 72.73%, anxiety in 81.82%, and stress in 65.91% of participants, with

anxiety being the most common psychological problem. Similar findings have been reported in previous studies showing that adolescents with substance use disorders frequently experience coexisting depression, anxiety, and psychological distress because substance use interferes with normal emotional regulation and brain development [17]. Regarding severity, 27.27% of participants had normal depression scores, whereas 25.00%, 22.73%, 18.18%, and 6.82% had mild, moderate, severe, and extremely severe depression, respectively. For anxiety, 18.18% were normal, while 22.73%, 31.82%, 18.18%, and 9.09% had mild, moderate, severe, and extremely severe anxiety, respectively. Similarly, 34.09% had normal stress levels, whereas 27.27%, 20.45%, 13.64%, and 4.55% experienced mild, moderate, severe, and extremely severe stress, respectively. These findings indicate that although many adolescents experienced mild-to-moderate symptoms, a considerable proportion suffered from severe psychological impairment requiring clinical attention [18]. Age was significantly associated with depression (p=0.041) and anxiety (p=0.047) but not with stress (p=0.084). Adolescents aged 15–19 years had higher rates of anxiety (85.71%) and stress (68.57%) than those aged 11–14 years. Increasing age has been recognized as an important determinant of psychological distress among adolescents because of greater academic, social, and developmental pressures together with longer exposure to substance use [19]. Gender was not

significantly associated with depression (p=0.289), anxiety (p=0.376), or stress (p=0.458), although males showed higher prevalence than females across all three domains. This may reflect the predominance of male participants in the study and suggests that psychological impairment among adolescents with SUD is influenced more by substance use characteristics than by gender alone [20]. Residence demonstrated significant associations with depression (p=0.023), anxiety (p=0.032), and stress (p=0.041). Rural adolescents showed higher prevalence of depression (84.62%), anxiety (92.31%), and stress (76.92%) than urban adolescents. Limited access to mental health services, lower awareness, and fewer addiction treatment resources in rural settings may explain these findings [21]. Socioeconomic status was significantly associated with depression (p=0.015), anxiety (p=0.011), and stress (p=0.037). Participants from low socioeconomic backgrounds experienced higher rates of depression (85.00%), anxiety (90.00%), and stress (70.00%) than those from higher socioeconomic groups. Financial hardship and adverse social environments may contribute to both substance use and psychological impairment [22]. Age at first substance use showed a strong association with psychological impairment. Participants who initiated substance use at 11–13 years exhibited the highest prevalence of depression (100%), anxiety (100%), and stress (90.00%), with significant associations for depression (p=0.003),

anxiety ($p=0.011$), and stress ($p=0.018$). Early initiation of substance use may interfere with normal brain maturation, increasing vulnerability to emotional and behavioral disorders [23]. Duration of substance use was also significantly associated with depression ($p=0.001$), anxiety ($p<0.001$), and stress ($p=0.002$). Adolescents with substance use exceeding three years had markedly higher rates of depression (93.75%), anxiety (87.50%), and stress (87.50%) compared with those with shorter durations. These findings support previous evidence that prolonged substance use contributes to cumulative neurobiological and psychosocial changes, leading to worsening mental health over time [24].

LIMITATIONS

This study had several limitations. The relatively small sample size and the use of purposive sampling limit the generalizability of the findings to the wider adolescent population. As a cross-sectional study, causal relationships between substance use disorder and psychological impairment could not be established. Additionally, psychological impairment was assessed using a self-reported questionnaire, which may be subject to recall and response bias. The study was also conducted in treatment centers; therefore, the findings may not be representative of adolescents with substance use disorder who are not receiving treatment.

CONCLUSION

RECOMMENDATIONS

Psychological impairment was highly prevalent among adolescents with substance use disorder, with anxiety, depression, and stress affecting a substantial proportion of participants. Early initiation and longer duration of substance use were significantly associated with greater psychological impairment. Routine psychological screening, early intervention, and integrated mental health services should be incorporated into adolescent substance use treatment programs. Further large-scale multicenter longitudinal studies are recommended to confirm these findings and guide evidence-based interventions.

FUNDING

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CONFLICT OF INTEREST

None declared

ETHICAL APPROVAL

The study was approved by the Institutional Ethics Committee of Bangabandhu Sheikh Mujib Medical University (Memo No: BSMMU/2021/126)

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