

ORIGINAL ARTICLE

Quality of life among adolescents with substance use disorders

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ABSTRACT

Background: Adolescents are vulnerable to substance use, which profoundly affects their function, feelings and quality of life (QoL). This study aimed to assess the physical health, psychological, social relationships, and environmental domains of QoL among adolescents with substance use disorders (SUDs).

Methods: A cross-sectional study was done from October 2020 to September 2021 among 44 adolescents selected purposively from Central Drug Addiction Treatment Center (CDC), Dhaka and Ashokti Punorbashon Nibash (APON), Manikganj. Clinical diagnosis was assigned using The Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) by psychiatrists. Then, they were interviewed with a questionnaire and a Bengali Version of the World Health Organization quality of life scale brief version (WHOQOL-BREF).

Results: Among the 44 adolescents with SUD, 18 (40.9%) rated their QoL as poor, 14 (31.8%) as very poor, 8 (18.2%) as neither poor nor good, and only 4 (9.1%) as good. Nearly half of them (47.7%) reported that they were dissatisfied, one third (29.5%) were very dissatisfied with their health. Among the four domains, the psychological domain (9.8±2.3) had the lowest mean score, followed by physical health (10.5±2.7), social relationships (10.6±2.6), and environmental domain (11.5±2.2) of the WHOQOL-BREF. Multiple drug users had poorer scores of their QoL than single drug user.

Conclusion: Our study demonstrated that all domains of QoL (physical, psychological, social, and environmental) are impaired in adolescents with SUDs.

Keywords: quality of life, substance use disorders, adolescents

INTRODUCTION

Substance use disorders (SUDs) are one of the alarming mental health issues in adolescents throughout the world, which lead to impairment and distress. There are substantial geographical variations in the prevalence of SUD among adolescents. A study done in the United States using data from the National Household Survey on Drug Use and Health (NSDUH) shows that 7-9% of adolescents in the US between the ages of 12-17 years met the criteria for an alcohol or illicit drug disorders.¹ In a community-based cross-sectional study carried out among 3564 children of Bangladesh aged 5 to 17 years in 2009, substance-related disorders was found in 0.8% of respondents. In the case of adolescents aged 12 years and above, substance abuse was 2.1%.² A nationwide household-based cross-sectional study conducted by the

National Institute of Mental Health, Dhaka during the periods of 2017 to 2018 showed a 2.9% prevalence of substance use among seven years and above children and adolescents.³

In several studies, it was found that quality of life (QoL) is poorer among substance-dependent individuals and substance use disorders treatment seekers than among cohorts without substance use disorders.^{4,5} SUDs are associated with a wide range of serious health, social, and economic complications. The health status of alcohol and drug abusers is generally affected by their abuse. Consequently, their life expectancy is often much lower than the general population.⁶⁻⁹ Housing, relational, and judicial problems are also well-documented among substance abusers. Drug and alcohol abuse further causes high costs due to frequent

HIGHLIGHTS

1. Quality of life is lower among adolescents with substance use disorders.
2. Among the four domains of the WHOQOL-BREF scale, the psychological domain is affected most by adolescent substance usage.
3. Multiple substance use affect QoL more adversely than single substance use.

and multiple hospitalizations and treatment episodes.¹⁰

A study revealed that adolescents who met the criteria for SUDs had reduced scores across all domains of QoL, with the most observable effects on academic achievement and school adjustment.¹¹ Stevanovic et al. found that adolescents who reported using substances had significantly lower scores in total, physical, emotional, social, and school functioning domains of the Pediatric Quality of Life Inventory (PedsQL) than those who did not report using any substance.¹² On the other hand, a moderate reduction in the frequency of substance use among adolescents was associated with improvements in QoL.¹³

The primary objective of our study was to assess the quality of life in relation to sociodemographic factors among adolescents with SUDs. Our secondary objective was to compare the quality of life among adolescents using single and multiple substances.

METHODS

Study design and participants

This cross-sectional study was done from October 2020 to September 2021 in the Central Drug Addiction Treatment Centre (CDC), Tejgaon, Dhaka, and Ashokti Punorbashon Nibash (APON), Singair, Manikganj. A total of 44 adolescents within the range of 11 to 19 years of either sex with SUD who attended the inpatient and outpatient department of the CDC and APON were purposively included in the study. However, adolescents in an intoxication or withdrawal state who were mute and those with non-communicable were excluded from the study. We obtained ethical approval from the Institutional Review Board of Bangabandhu Sheikh Mujib Medical University.

Research instruments

a. Questionnaire for socio-demographic and related variables for the study of QoL

A semi-structured questionnaire in Bangla was designed by the researcher to collect information regarding socio-demographic variables such as age, sex, residence, religion, level of education, family type, family history of substance use, age of onset of taking the drug, the reason for initiation of substance use, name of substance currently using, route of administration, monthly expenditure, history of receiving treatment and admission in hospital for substance use, etc.

b. DSM-5 criteria for SUD

The DSM-5 criteria for substance use disorders were used to diagnose SUDs in adolescents. The DSM-5 recognizes SUDs resulting from the use of ten separate classes of drugs: alcohol, caffeine, cannabis, hallucinogens, inhalants, opioids, sedatives-hypnotic-or-anxiolytics, stimulants, tobacco, and other unknown substances.¹⁴

c. World Health Organization quality of life scale, brief version (WHOQOL-BREF)

This study used WHOQOL-BREF to assess the quality of life of adolescents with SUD. The scale had 26 items, among which the first two items are used to measure an individual's overall perception of QoL and overall perception of their health. The remaining 24 items measured the following four domains: physical health, psychological, social relationships, and environment.¹⁵ The WHOQOL-BREF has been translated into Bangla and validated for Bangladeshi adolescents.¹⁶

Data collection

Prior permission was taken from the authority of two institutions: CDC and APON. Participants and their parents were informed about the study's purpose, method, and outcome. Informed written assent/consent was taken from the patients and one of their parents before data collection, as appropriate, by face-to-face interviews. Qualified psychiatrists made clinical diagnoses by applying DSM-5 criteria of SUD. Then, socio-demographic information was documented using the semi-structured questionnaire. The Bangla version

of the WHOQOL-BREF was applied to evaluate the QoL. One of the investigators (RK) read out the questions and recorded the answers given by the participants.

Data analysis

Descriptive statistics such as frequency (percent) or mean (standard deviation) were used as appropriate. Student's *t* test was used to compare the mean score of four domains (physical health, psychological health, social relationship, and environment) of the WHOQOL-BREF categories. The analysis of variance was used to compare more than two categories (e.g., education). $P < 0.05$ was considered statistically significant.

RESULTS

Forty-four adolescents with SUDs were included in this study, among which 24 were from APON and 20 from CDC. The mean age of the study participants was 16.5 (2.3), 88.6% being male. The majority (79.6%) of the respondents were from urban areas. About half (43.2) of the parents were divorced, widows, widowers, or separated. About 80% were from nuclear families (TABLE 1).

About 47.7% of the respondents had a family history of substance use. The mean age of onset of substance use was 12.2 years. The mean monthly expenditure due to substance use was BDT 11,579.

A little less than half (40.9%) of them rated their QoL as poor, and 31.8% as very poor. About 48.0% of the respondents were dissatisfied with their health, but 9.1% were satisfied (FIGURE 1). The most commonly used substance was tobacco (75.0%), followed by cannabis (65.9%), stimulant (45.5%), alcohol (38.6%), inhalant (18.2%), sedative (15.9%), and opioid (9.1%) (FIGURE 2).

The mean standard deviation scores of physical health, psychological, social relationships, and environmental domains were 10.5 (2.7), 9.8 (2.3), 10.6 (2.6), and 11.5 (2.2), respectively. According to the WHOQOL-BREF scale, a higher score indicates a better quality of life. Therefore, the psychological domain was most impaired among the four domains, followed by the physical health, social relationships, and environmental domain (TABLE 2).

TABLE 1 Socio-demographic characteristics and substance use among the study participants with substance use disorder (n=44)

Variables	Findings	
	Mean	SD
Age, years	16.5	2.3
Age of onset of substance use, years	12.2	3.5
Monthly expenditure due to substance use (BDT)	11,579	11,117
	Number	Percent
Sex		
Male	39	88.6
Female	5	11.4
Residence		
Urban	35	79.5
Rural	9	20.5
Education		
Primary or below	16	36.4
Secondary school	13	29.5
Higher secondary or above	15	34.1
Type of family		
Nuclear	35	79.5
Joint	9	20.5
Marital status of parents		
Married	25	56.8
Separated/ divorced/ widow/ widower	19	43.2
Family history of substance use		
Yes	21	47.7
No	23	52.3
Reason for initiation of substance use*		
Peer pressure	18	40.9
Curiosity	19	43.2
Broken family	9	20.5
Family negligence	11	25.0
Failure in study	2	4.5
Failure in a love affair	6	13.6
Number of substances currently used		
Single	10	22.7
Multiple	34	77.3
Route of administration*		
Smoking	40	90.9
Swallowing	25	56.8
Inhalation	17	38.6
Injection	1	2.3
History of treatment for substance use		
Yes	24	54.5
No	20	45.5
History of hospital admission for substance use		
Yes	17	38.6
No	27	61.4

SD indicates standard deviation

*Multiple responses

DISCUSSION

SUDs are complex condition characterized by uncontrolled use of a particular substance despite harmful consequences. Adolescents are at greater risk of substance use. During adolescence, development occurs in multiple domains like-emotional, social, cognitive, and biological, and conditions like SUDs may affect adolescents' behavior, lifestyle, and future life. Nowadays, SUD has increased significantly among adolescents and

young adults.¹⁷ SUD impairs individuals' physical and psychological health and also jeopardizes general safety and social performance and, thereby, overall quality of life. Thus, the present study aimed to evaluate the quality of life among adolescents with SUD.



FIGURE 1 Perception of quality of life and satisfaction about health among the participants of substance use disorder (n=44).

Our study's mean scores for four domains were from 9.8 to 11.5. According to the WHOQOL-BREF scale, the higher the mean scores, the better the quality of life. We found that the mean scores of physical health, psychological, social relationships, and environmental domains of WHOQOL-BREF were higher in the healthy male adolescent population of both slum and residential areas of Dhaka city than the mean scores of these four domains of our respondents who were substance users.¹⁸ This indicates that all four domains of the QoL of adolescents with SUD were low compared to the healthy adolescent male population.

A study done in Etawah, India, on 145 street children 13-18 years of age abusing substances revealed that mean scores of physical health, psychological, social

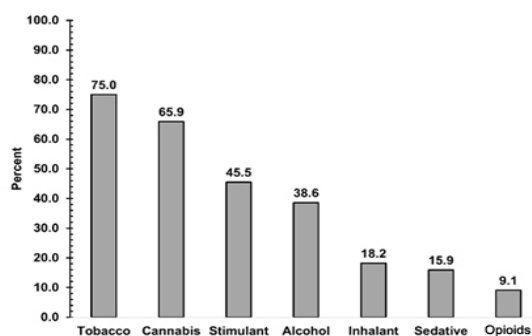


FIGURE 2 Proportion of type of substance use among the respondents with substance use disorders (n=44).

TABLE 2 Relationship of WHOQOL-BREF scores and socio-demographic variables of the respondents (n=44)

Variables	Mean (standard deviation) scores of Quality of Life			
	Physical Health	Psycho-logical	Social Relation-ships	Environ-mental
Overall	10.5 (2.7)	9.8 (2.3)	10.6 (2.6)	11.5 (2.2)
Gender				
Male	10.5 (2.7)	9.8 (2.3)	10.6 (2.6)	11.4 (2.2)
Female	10.6 (2.9)	9.6 (2.3)	10.2 (2.3)	11.4 (2.0)
P*	0.97	0.85	0.74	0.91
Residence				
Urban	10.7 (2.5)	9.8 (2.3)	11.0 (2.4)	11.8 (2.3)
Rural	10.6 (2.9)	10.1 (2.3)	11.0 (3.1)	11.6 (2.0)
P*	0.74	0.57	0.61	0.32
Education				
Primary or below	9.6 (2.5)	9.2 (2.3)	11.0 (2.6)	12.3 (2.8)
Secondary school	11.1 (2.4)	10.0 (2.1)	11.5 (1.8)	11.5 (2.4)
Higher secondary or above	11.1 (2.6)	10.3 (2.5)	11.1 (2.8)	12.5 (2.5)
P*	0.18	0.41	0.88	0.64
Type of family				
Nuclear	10.5 (2.5)	9.9 (2.4)	10.9 (2.6)	11.6 (2.2)
Joint	10.6 (3.5)	9.2 (1.8)	9.1 (1.1)	10.5 (1.5)
P*	0.90	0.35	0.03	0.09
Marital Status of Parents				
Married	10.9 (3.0)	10.2 (2.7)	10.2 (2.2)	12.0 (2.3)
Separated/divorced/widow/widower	9.3 (2.7)	9.2 (1.7)	9.8 (2.1)	11.4 (2.8)
P*	0.27	0.03	0.37	0.98
History of receiving treatment				
Yes	9.4 (2.3)	8.8 (2.3)	10.5 (2.1)	11.2 (2.1)
No	12.0 (2.5)	10.1 (2.2)	10.7 (3.1)	11.5 (2.3)
P*	0.001	0.002	0.90	0.90
History of admission to the hospital				
Yes	9.4 (2.3)	9.1 (2.2)	10.7 (2.1)	11.4 (2.3)
No	11.3 (2.7)	10.3 (2.4)	10.6 (2.9)	11.5 (2.1)
P*	0.02	0.10	0.81	0.81
Number of substances				
Single	13.0 (1.9)	11.8 (2.2)	12.1 (2.3)	12.5 (2.2)
Multiple	9.8 (2.5)	9.2 (2.1)	10.1 (2.5)	11.1 (2.1)
P*	0.001	0.005	0.03	0.11

*Student t-test or ANOVA

relationships, and environmental domains were low.¹⁹ An international study involving 2393 adolescents from seven countries using the Pediatric Quality of Life Inventory (PedQL) showed adolescents using substances have a significantly lower score in PedsQL physical, emotional, social, and school functioning domains.¹²

Most adolescents rated their QoL as poor or very poor. Most of the substance-dependent adolescents were dissatisfied with their health, and only a few were satisfied. Though the QoL among adolescents with SUD is a major public health concern, QOL assessment using the WHOQOL-BREF among adolescents was minimal. Therefore, comparing this study's results concerning the perception of quality of life and satisfaction with health with other studies was impossible.

Among the four domains, the psychological domain was mostly affected in adolescents with SUD. Psychological distress is a common experience for patients with SUD, partly due to substance use and its consequences and partly due to psychiatric disorders that often coexist with SUDs, resulting in a double burden of symptoms and problems.²⁰ Approximately 70-80 percent of youths presenting to treatment for SUD are duly diagnosed.²¹ A study in Bangladesh revealed that among the patients with first-episode psychosis, lifetime SUD was double that of control.²² The temporal relationship between substance use and psychological symptoms, such as depression, anxiety, or psychosis, should be considered. Substance use may be a perpetuating factor for deteriorating mental health. On the other hand, impaired mental health may also have preexisted before the substance use, precipitated the substance use, and may have deteriorated further.²³ Therefore, assessment of the psychological domain and providing appropriate interventions toward treating both SUD and psychiatric disorders simultaneously is mandatory for a better QoL.

The impairment in physical health may be due to increased risk for injury and violence associated with substance use, respiratory problems due to smoking, or inhalation of substances. Co-occurring psychiatric disorders may have contributed to lower scores in the psychological domain. In an aspect of social relationships, adolescents with multiple substance use may be more neglected by the family or society due to social stigma. Those who go to hospital might have severe problems of SUD as indicated by our data.

Clear male dominance was (88.6%) observed. Throughout the world, the prevalence of substance use is higher in males than in females.²⁴ Due to social restrictions and the society's attitude, male dominance is also observed in our country. The majority (79.6%) of the patients hailed from urban areas. As the sample was collected from two centres near Dhaka city, most attendants belonged to the metropolitan area. It may also refer that adolescents from urban areas have better access to services.

Education might have some link to adolescents' addiction behaviour. However, our participant's

educational background is almost identical to the national data. Moreover, it is similar to other studies.²⁵ Broken family and history of substance use in the family increase the risk of adolescent substance use.²⁶

In the present study, the average age of onset of substance use was 12 years, and the reasons for initiation were peer pressure, curiosity, broken family, family negligence, academic failure, and relationship failure. Sawhney and Kaur also reported similar age of onset, and the reasons were enjoyment, showing manhood and fun, frustration, curiosity, peer pressure, and imitating their father and siblings.²⁵

The finding of this research suggests that adolescents with SUD have reduced QoL across all domains. Therefore, a biopsychosocial approach through a multidisciplinary team should be implemented while managing such patients. Management should include treatment of co-morbid physical and psychiatric illness, psychological intervention, and social rehabilitation to improve and maintain QoL. Proper psychological assessment by a psychiatrist and a more integrated approach are needed for a better QoL. Awareness programs for society about the disease, treatment, and outcome of SUD should be implemented. Psychiatrists, governmental organizations, and non-governmental working on drug use should deal with this condition holistically. The QoL assessment, therefore, should be considered in health care. QoL measures are needed to be routinely included in the evaluation of treatments.

This study has several limitations too. First, SUDs were diagnosed by psychiatrists using DSM-5 criteria, where a structured interview could give a more accurate diagnosis. Second, small number of participants from selected drug addiction treatment centres, lack the representativeness, and therefore, findings cannot be generalized. Third, a cross-sectional study design cannot provide a causal relationship.

Conclusion

The quality of life is impaired in adolescents with SUD. The psychological domain is the most impaired among the four domains of the WHOQOL-BREF scale. In addition, physical health, psychological, and social

relationships domains are significantly impaired in multiple substance users. The physical health domain is significantly lower among those who seek services. A comprehensive management plan is necessary to improve the health of adolescents with SUDs. Longitudinal studies using a more representative sample are warranted.

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Author Contributions

Conception and design: RK, MSA. Acquisition, analysis and interpretation of data: RK, MSA, MTRS, BKD, MCN. Manuscript drafting and revising it critically: RK, MSA. Approval of the final version of the manuscript: RK, MSA, MTRS, BKD, MCN. Guarantor accuracy and integrity of the work: RK, MSA.

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Conflict of Interest

Authors declare no conflict of interest.

Ethical Approval

The study was approved by the Institutional Review Board of Bangabandhu Sheikh Mujib Medical University (Memo No: BSMMU/2021/126 issued on 13 February 2021).

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REFERENCES

- Mericle AA, Arria AM, Meyers K, Cacciola J, Winters KC, Kirby K. National Trends in Adolescent Substance Use Disorders and Treatment Availability: 2003-2010. *J Child Adolesc Subst Abuse*. 2015;24(5):255-263. DOI: <https://doi.org/10.1080/1067828X.2013.829008>.
- Rabbani, M.G., Alam M.F., Ahmed HU, Sarker M, Chowdhury WA, Zaman MM, Chowdhury S, Chowdhury MWA, Das SK, Hamid MA, Islam MT, Mohir MA, Jahan NA, Rahman AHM, Choudhury S, Chowdhury KP, Wahab MA, Rahman F, Mandal MC, Hossain MD, Bhowmik AD, Bashar MK, Khan NM, Uddin MJ, Khan MJR. Prevalence of mental disorders, mental retardation, epilepsy, and substance abuse in children. *Bangladesh Journal of Psychiatry*. 2009; 23:12-54. https://www.researchgate.net/profile/M-Zaman/publication/274066488_Prevalence_of_mental_disorders_mental_retardation_epilepsy_and_substance_abuse_in_children/links/5513b5fa0cf23203199cc0ee/Prevalence-of-mental-disorders-mental-retardation-epilepsy-and-substance-abuse-in-children.pdf (Access Date 18 Nov 23).
- Alam MF, Sarker M, Alam MT, Ahmed HU, Bhowmik AD, Roy S. Prevalence of substance use in Bangladesh. *Bangladesh Journal of Psychiatry*. 2018;32(1):1-8. <https://bapbd.org/docs/journal/46.pdf>.
- Donovan D, Mattson ME, Cisler RA, Longabaugh R, Zweben A. Quality of life as an outcome measure in alcoholism treatment research. *Journal of Studies on Alcohol, Supplement*. 2005 Jul(15):119-39. DOI: <https://doi.org/10.15288/jsas.2005.s15.119>.
- Smith KW, Larson MJ. Quality of life assessments by adult substance abusers receiving publicly funded treatment in Massachusetts. *Am J Drug Alcohol Abuse*. 2003 May;29(2):323-35. DOI: <https://doi.org/10.1081/ada-120020517>.
- De Alba I, Samet JH, Saitz R. Burden of medical illness in drug- and alcohol-dependent persons without primary care. *Am J Addict*. 2004 Jan-Feb;13(1):33-45. DOI: <https://doi.org/10.1080/10550490490265307>.
- Price RK, Risk NK, Murray KS, Virgo KS, Spitznagel EL. Twenty-five year mortality of US servicemen deployed in Vietnam: predictive utility of early drug use. *Drug Alcohol Depend*. 2001 Nov 1;64(3):309-318. DOI: [https://doi.org/10.1016/S0376-8716\(01\)00134-X](https://doi.org/10.1016/S0376-8716(01)00134-X).
- Sørensen HJ, Jepsen PW, Haastrup S, Juel K. Drug-use pattern, comorbid psychosis and mortality in people with a history of opioid addiction. *Acta Psychiatr Scand*. 2005 Mar;111(3):244-249. DOI: <https://doi.org/10.1111/j.1600-0447.2004.00445.x>.
- Wahren CA, Brandt L, Allebeck P. Has mortality in drug addicts increased? A comparison between two hospitalized cohorts in Stockholm. *Int J Epidemiol*. 1997 Dec;26(6):1219-1226. DOI: <https://doi.org/10.1093/ije/26.6.1219>.
- Xie X, Rehm J, Single E, Robson L, Paul J. The economic costs of alcohol abuse in Ontario. *Pharmacol Res*. 1998 Mar;37(3):241-249. DOI: <https://doi.org/10.1006/phrs.1998.0293>.
- Clark DB, Kirisci L. Posttraumatic stress disorder, depression, alcohol use disorders and quality of life in adolescents. *Anxiety*. 1996;2(5):226-233. DOI: [https://doi.org/10.1002/\(SICI\)1522-7154\(1996\)2:5%3C226::AID-ANXI4%3E3.0.CO;2-K](https://doi.org/10.1002/(SICI)1522-7154(1996)2:5%3C226::AID-ANXI4%3E3.0.CO;2-K).
- Stevanovic D, Atilola O, Balhara YP, Avicenna M, Kandemir H, Vostanis P, Knez R, Petrov P. The relationships between alcohol/drug use and quality of life among adolescents: An international, cross-sectional study. *Journal of child & adolescent substance abuse*. 2015 Jul 4;24(4):177-85. DOI: <https://doi.org/10.1080/1067828X.2013.773864>.
- Becker SJ, Curry JF, Yang C. Longitudinal association between frequency of substance use and quality of life among adolescents receiving a brief outpatient intervention. *Psychol Addict Behav*. 2009 Sep;23(3):482-490. DOI: <https://psycnet.apa.org/doi/10.1037/a0016579>.
- American Psychiatric Association. *Substance-related and Addictive Disorders*. Desk Reference to the Diagnostic Criteria from DSM-5. American Psychiatric Association; 2013:227-284.
- Whoqol Group. Development of the World Health Organization WHOQOL-BREF quality of life assessment. The WHOQOL Group. *Psychol Med*. 1998 May;28(3):551-558. DOI: <https://doi.org/10.1017/S0033291798006667>.
- Izutsu T, Tsutsumi A, Islam A, Matsuo Y, Yamada HS, Kurita H, Wakai S. Validity and reliability of the Bangla version of WHOQOL-BREF on an adolescent population in Bangladesh. *Qual Life Res*. 2005 Sep;14(7):1783-1789. DOI: <https://doi.org/10.1007/s11136-005-1744-z>.

17. Rahimi Movaghar A, Mohammad K, Razzaghi EM. Trend of drug abuse situation in Iran: a three decade survey. *Hakim Res J.* 2002;5(3):171-81. URL: https://www.researchgate.net/publication/289118050_Trend_of_drug_abuse_situation_in_Iran_A_three_decade_analysis.
18. Izutsu T, Tsutsumi A, Islam AM, Kato S, Wakai S, Kurita H. Mental health, quality of life, and nutritional status of adolescents in Dhaka, Bangladesh: comparison between an urban slum and a non-slum area. *Soc Sci Med.* 2006 Sep;63(6):1477-1488. DOI: <https://doi.org/10.1016/j.socscimed.2006.04.013>.
19. Krishnappa K, Singh NP, Jain PK, Kumar S, Shukla SK, Bajpai PK. A study of Substance Abuse and Quality of Life among Street Children in District Etawah. *Indian Journal of Community Health.* 2019 Oct 1;31(4):484-489. <https://doi.org/10.47203/IJCH.2019.v31i04.011>.
20. Johnson JG, Spitzer RL, Williams JB, Kroenke K, Linzer M, Brody D, deGruy F, Hahn S. Psychiatric comorbidity, health status, and functional impairment associated with alcohol abuse and dependence in primary care patients: findings of the PRIME MD-1000 study. *J Consult Clin Psychol.* 1995 Feb;63(1):133-140. DOI: <https://psycnet.apa.org/doi/10.1037/10248-015>.
21. Kaminer Y, Bukstein OG. Adolescent substance abuse: Psychiatric comorbidity and high-risk behaviors. Taylor & Francis; 2008. <https://psycnet.apa.org/record/2008-05667-000> (Access date: 18 Nov 23).
22. Ahsan MS, Mullick MS, Begum K, Arafat SM, Shah MA, Podder BR, Roy J. Substance Use among the Patients with First Episode Psychosis. *Mymensingh Med J.* 2018 Apr;27(2):313-320. URL: <https://pubmed.ncbi.nlm.nih.gov/29769496/>.
23. Vederhus JK, Pripp AH, Clausen T. Quality of Life in Patients with Substance Use Disorders Admitted to Detoxification Compared with Those Admitted to Hospitals for Medical Disorders: Follow-Up Results. *Subst Abuse.* 2016 May 18;10:31-37. DOI: <https://doi.org/10.4137/SART.S39192>.
24. Gureje O, Degenhardt L, Olley B, Uwakwe R, Udofia O, Wakil A, Adeyemi O, Bohnert KM, Anthony JC. A descriptive epidemiology of substance use and substance use disorders in Nigeria during the early 21st century. *Drug Alcohol Depend.* 2007 Nov 2;91(1):1-9. DOI: <https://doi.org/10.1016/j.drugalcdep.2007.04.010>.
25. Sawhney N, Kaur G. Socio-demographic profile and pattern of drug abuse among adolescents of de-addiction centers. *Journal of nursing and care.* 2016;5(4):149-52. <https://www.worldwidejournals.com/global-journal-for-research-analysis-GJRA/article/sociodemographic-profile-and-pattern-of-drug-abuse-among-adolescents-of-de-addiction-centers/NDczMQ==/?is=1&b1=145&k=37>.
26. Whitesell M, Bachand A, Peel J, Brown M. Familial, social, and individual factors contributing to risk for adolescent substance use. *J Addict.* 2013;2013:579310. DOI: <https://doi.org/10.1155/2013/579310>.