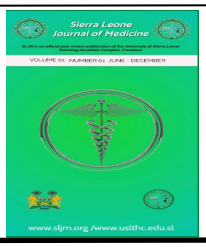
ORIGINAL ARTICLE

ISSN: 3007-4487

SIERRA LEONE JOURNAL OF MEDICINE

The Official Journal of University of Sierra Leone Teaching Hospitals Complex

Journal Homepage: www.sljm.org



Pattern of Psychoactive Substance Use in Sierra Leone: A Descriptive Retrospective Study.

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ARTICLE INFO

Article History

Received: June 1, 2024

Accepted: August 1, 2024

Published: August 19, 2024

Corresponding Author:
Dr. Onyishi Nnaemeka T.

Technical Information

How to Cite: Eze G.O. et al. Pattern of Psychoactive Substance Use in Sierra Leone, a Descriptive Retrospective Study: SLJM 2024;Vol 1(2) pp90-96.
https://doi.org/10.69524/sljm.v1i2.85

Editor-in-Chief: Prof. Kehinde S. Oluwadiya, University of Sierra Leone Teaching Hospitals Complex, Freetown, Sierra Leone.

Funding: No funding was received for this study.

Ethical Consideration

Conflict of interest: The authors declare they have no conflicts of interest that are directly or indirectly related to the research.

ABSTRACT

Background: Substance use, and pattern of consumption varies across population and may, within a particular population, show temporal variations in accordance with changing fads. Understanding the pattern of substance use in a population is key to any programme of demand reduction. Thus, we studied a consecutive series of patients with substance use disorders in our facility, aiming to determine the patient profile and pattern of substance use.

Methods: Hospital's digital register was consulted and data of patients who were seen over a 16-months period, and who had diagnosis of 'alcohol and substance use disorder' were retrieved and analyzed.

Results: Seven hundred and nineteen patients were treated for substance use disorder over a 16-months period. Age of patients ranged from 16 to 69 years with mean age (SD) of 28.7(9.2) years. Majority were males (91%), single (87%) and had been to secondary or tertiary school with or without graduation. Fifty nine percent (421/719) of the patients admitted being on 'Kush', 49% on alcohol, 47% on cannabis, 11% on tramadol and 5.6% on cocaine. About 71% of the patients were polysubstance users while 29 percent were on one agent. Alcohol, 'Kush' and cannabis were the most common preferences of those who use more than one agent.

Conclusions: Substance use disorder in Freetown was most prevalent in young, adult, secondary school educated males. 'Kush' was the most common agent of abuse and frequency of polysubstance use is high. Understanding the factors responsible for low substance use among females in the population might point to some preventive control measures.

Key words: Mental health; Substance abuse; cannabis; Tramadol; Kush.

1. INTRODUCTION

Substance use disorder (SUD) has been defined as unrestrained use of a psychoactive substance despite harmful consequences[1] The eleventh edition of WHO's international classification of diseases (ICD_11) features a section 'Disorders due to substance use' which is defined as those conditions that result from single or repeated use of psychoactive substance[2]. It identifies fourteen classes of psychoactive substances (Alcohol, Cannabis, Synthetic Cannabinoids, Opioids, Sedatives, hypnotics or anxiolytics, Cocaine, Stimulants including amphetamine, methamphetamine or methcathinone, Synthetic Cathinones, Caffeine, Hallucinogens, Nicotine, Volatile inhalants, MDMA or related drugs, including MDA, Dissociative drugs including ketamine and PCP) supposedly responsible for over 130 diagnosable entities under the category of disorders due to substance use [2,3]. Among these classes of psychoactive substance are illicit drugs, which are subject to international drug control conventions, as well as prescription drugs and substances legally consumed for recreational purposes. Psychoactive substances tend to affect mental processes such as perception, consciousness, cognition, mood, and emotions when ingested or injected[4]. Most have addictive potentials and tendency for loss of control over use.

Substance use disorders (SUD) represent a significant public health problem globally. For instance,

United Nations Office on Drugs and Crime estimates that in 2019, 1 in 18 people aged 15 to 64 years (about 284 million people world -wide) had used illicit drug or controlled substance the previous year. Same report attributes 11.9million deaths in 2019 to substance use[5]. This high prevalence of substance use produces severe health, economic and social consequences. Thus, in another global estimate, it was shown that substance use disorders contributed 35·1 million of the global disability-adjusted life years (DALYs) or 1·4% of all global burden of disease in 2019[6]. Alcohol use disorders caused 48·4% of the DALYs due to substance use disorder while drug use disorders contributed 51·6% of DALYs attributed to SUD.

On the African continent, West and Central Africa are estimated to have, in addition to other illicit drug problem, a 10% prevalence of cannabis use corresponding to 28.5 million users.[5]

A good number of Sub- Saharan African countries have inadequate data compilation and research output on Mental health and substance use. For instance, WHO's Mental Health Atlas[7] documents paucity of mental health data for most sub-Saharan African countries. For Sierra Leone, only two published research articles on Mental health and substance use was indexed in 2019[7]. However, available reports indicate substance use disorder in Sierra Leone contributed between 181-194 Age-standardized DALYs per 100 000 of the population6 Surveys conducted over a decade ago projected there may be up to 5000 people who use drugs (PWUD) in Freetown and over one million country wide[8].

The effects of substance use have been visible in communities and many neighborhoods in Freetown and have fittingly attracted the attention of the government, local and international press and non-governmental organizations[9]. In our earlier study focusing on epidemiology and pattern of mental health disorders in Sierra Leone (manuscript under review), substance use contributed about 38.9% of serious mental health illness presenting at Sierra Leone Psychiatric Teaching Hospital facility. The following report is descriptive study of a subset of those substance induced mental health disorders aimed at determining the demographic profile of patients, district of residence and types of substances used by the patients.

2. METHODOLOGY

The paper is a descriptive retrospective study and part of a wider study of epidemiology and pattern of mental health disorders in Sierra Leone, which was undertaken at Sierra Leone Psychiatric Teaching Hospital (SLPTH) Kissy, on of the hospital units constituting the University of Sierra Leone Teaching Hospitals Complex (USLTHC). SLPTH Kissy is the only specialist psychiatric hospital in Sierra Leone. Established in 1820, it has a long history in provision of mental health services to the country and its services extended to some other parts of British West Africa in colonial times[10].

Hospital's digital register was examined and patients who were registered within a 16 months period, from 1st April 2022 to 31st July 2023, and who had a diagnosis of 'alcohol and substance use disorder' were identified. Their case notes were retrieved from the hospital records and data was extracted. Abstracted variables include patient's age, sex, marital status, educational status, occupation, district of residence and type of psychoactive substance being taken which had been established by patient's history and drug test using Cypress Diagnostics® Drug Screen card. All patients met the ICD 11 criteria for harmful pattern of psychoactive substance use or substance dependence and substance induced mental disorders[2,3]. Diagnosis and patient management were carried out by qualified consultant psychiatrists two of whom have over 30 years of practice experience.

In pattern of harmful substance use, there was episodic use of substance over a period of at least 12 months or continuously for at least one month and substance use had caused damage to a person's physical or mental health or had resulted in behaviour occasioning harm to the health of others[2]. Harm to health of the user may have occurred due to behaviour related to intoxication, direct or secondary toxic effects on body organs and systems or a harmful route of administration while harm to health of others includes any form of physical harm, including trauma. Substance dependence was diagnosed when there had been repeated or continuous use leading to a strong internal drive or craving for continued use, impaired ability to control use, increasing priority given to use over other activities and persistence of use despite harm or negative consequences[2].

2.1 Data Analysis:

Data was entered initially into an Excel spreadsheet and was analyzed using IBM SPSS Statistics for windows. Charts were produced using Microsoft Excel. Categorical variables were presented in tables of frequency and bar charts while mean with standard deviation was calculated for continuous variables. Bivariate analysis and test of association was done by cross tabulation and chi square test of independence. For statistical tests, P value of 0.5 or less was accepted as statistically significant. Study was approved by hospital ethics review board.

2.2 Data Availability

Dataset analyzed in the current study is available from the corresponding author on reasonable request.

3. RESULTS

Within the period of 16 months, April 2022 to July 2023, 719 new patients were registered and treated for substance use disorder. This translates to an average of 45 patients per month. Substance use disorder represented 35% of the 2031 registered mental health patients seen within the study period. Most of the SUD patients presented with severe mental illness and were admitted or managed by multiple hospital visits. Number of hospital visits ranged from one off visit, after which patient was lost to follow up, to forty-eight visits. Mean number of hospital visits was 7 per patient.

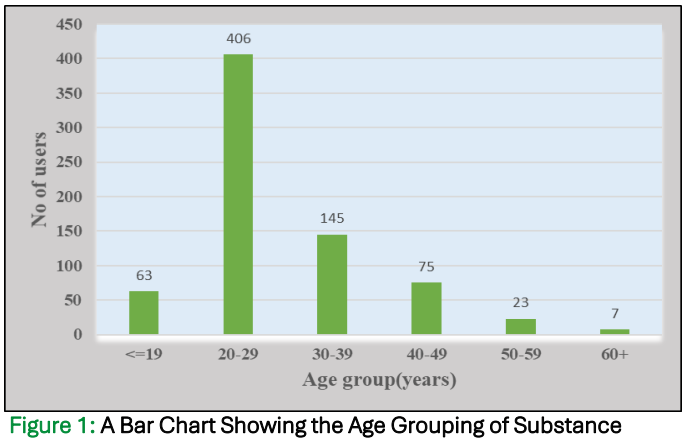

Figure 1: A Bar Chart Showing the Age Grouping of Substance Use Disorder Patients in Sierra Leone

Table 1: The Demographic Profile of Substance Use Disorder Patients in Sierra Leone.

		Frequency	Percent
Sex	Male	656	91.2
	Female	63	8.8
	Total	719	100.0
Marital Status	Single	625	86.9
	Married	83	11.5
	Divorced	3	1.1
	Not Stated	8	0.4
	Total	719	100.0
Highest Educational Level	Primary	64	8.9
	Secondary	438	61.0
	Post-Secondary and Tertiary	139	19.3
	No Education	52	7.2
	Not Stated	26	3.6
	Total	719	100.0
Occupation	Student	297	41.3
	Unemployed	253	35.2
	Business	48	6.7
	Technician	30	4.2
	Transporter	18	2.5
	Security Sector	10	1.4
	Teacher	9	1.3
	Agro Industry	6	0.8
	Accountant	1	0.1
	Footballer	1	0.1
	Medical Doctor	1	0.1
	Nurse	1	0.1
	Not Stated	44	6.1
	Total	719	100

Age of patients ranged from 16 to 69 years with mean age (SD) of 28.7(9.2) years. Figure1 is a bar chart depicting the age grouping of substance use disorder patients. Sixty-five (65) percent of patients were below 30 years and 85% of all users were aged less than 40 years.

Table 1 captures the demographic profile of SUD patients. Overwhelming majority were males (91%), single (87%) and had been to secondary or tertiary school with or without graduation. On employment status, 35% self-declared as unemployed while 41% declared as students. The rest were engaged in various kinds of occupation.

About 82% of the SUD patients reported western urban as their district of residence while 7% declared western rural (Table 2). The

Table 2: District of Residence of Substance Use Disorder Patients in Sierra Leone

District	Frequency	Percent
Western Urban	589	81.9
Western Rural	48	6.7
Kambia	14	1.9
Kenema	14	1.9
Port Loko	14	1.9
Bombali	13	1.8
Bo	12	1.7
Tonkolili	6	0.8
Moyamba	2	0.3
Pujehun	2	0.3
Koinadugu	2	0.3
Bonthe	1	0.1
Kailahun	1	0.1
Kono	1	0.1
Total	719	100

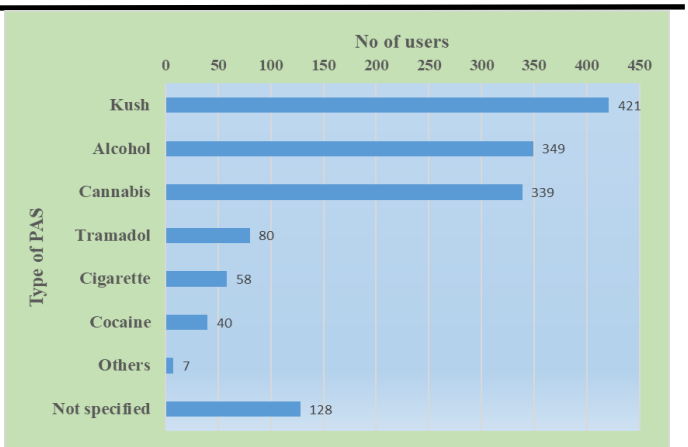

Figure 2: Type of Substance with the Number of Users

*Others: K2, Spark5, Pampers water, Diazepam, Ecstasy, Ataya and codeine

remaining 11% lived in the rest of the provinces.

Figure 2 is a bar chart listing the type of psychoactive substance (PAS) with number of users. Fifty nine percent (421/719) of the patients admitted being on Kush, 49% on alcohol and 47% on cannabis. About 11% of the users admitted being on tramadol while 5.6% took cocaine. Most often, patients were simultaneous or concurrent users of more than one agent (Figure 3). About 71% of the patients were poly-substance users while 29 percent admitted to only one agent. The number of people who admitted to being on two or three agents is as many as those who used single agent. There were forty combinations of psychoactive substances by users. Table 3 shows fourteen most common combinations of psychoactive substances. Alcohol, Kush and cannabis were the most frequent components or preferences of those who use more than one agent. For patients who gave a history of being on one agent, 58% (100/172) were on Kush alone, 21.5% on alcohol, 14% on cannabis, 4.1% on tramadol alone, 1.7% on cocaine alone and 5.1% on other agents.

Bivariate analysis exploring the association between sex and pattern of substance use is presented in Table 4. Males were 2 times more likely to be polysubstance users compared with women. Also, Kush and cannabis users are 3 and 2 times, respectively, to be males rather than females.

4. DISCUSSION

The present effort which is an attempt at addressing the dearth of research on the topical subject of substance abuse in Sierra Leone shows that there were 719 new cases registered within the 16moths study period, all of whom had serious mental illness. Our result shows young adult males to be mostly affected. Eighty five percent of the patients in our study were aged less than 40 years while over 90 percent of the patients were males. These epidemiological patterns broadly agree with available literature from other climes[11,12]. Demographic health surveys and metanalysis of East African studies report preponderance of male substance users[13,14]. The odds of lifetime or current substance use in young males was threefold compared to females[14]. Similarly, UNODC world drug report 2022 documents that young people continue to use more drugs than adults and that majority of people who use drugs are males[5]. Specifically for the African continent, it states that majority of people treated for drug use disorders are under the age of 35 years and that a large gender disparity in the use of drugs

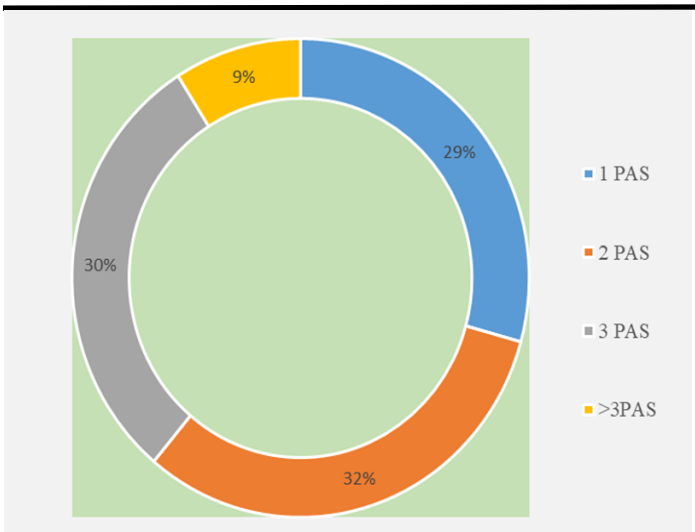

Figure 3: A Figure Showing The Distribution of Single Agent and Poly-substance Users. *PAS: psychoactive substance*.

Table 3: A Table Showing the Fourteen Most Common Combinations Out of the Forty Preferred Mixtures of Psychoactive Substances by Poly-substance Users

Combination of psychoactive agents	No of Patients	Percent
Alcohol, Kush and Cannabis	126	30.1
Alcohol and Cannabis	57	13.6
Kush and Cannabis	44	10.5
Alcohol and Kush	43	10.3
Alcohol, Kush, Cannabis and Tramadol	23	5.5
Kush, Cannabis and Tramadol	14	3.3
Alcohol, Kush, Cannabis and Cocaine	12	2.9
Alcohol, Kush and Tramadol	11	2.6
Kush and Tramadol	10	2.4
Alcohol and Cigarette	8	1.9
Kush, Cannabis and Cigarette	7	1.7
Alcohol, Kush, Cannabis and Cigarette	6	1.4
Alcohol, Cannabis and Cocaine	5	1.2
Cannabis and Cigarette	5	1.2

exists with 9 men using cannabis for every 1-woman user. Concerning the age of substance users, population structure may partly explain the preponderance of young people as substance users. In Sierra Leone for instance, about 39.4% share of the population are youths aged 15 to 35 years while up to 42% are children below 15 years[15].

Globally, it was reported that male to female ratio in drug use is dependent on type of substance, the ratio being narrower for non-medical use of pharmaceutical stimulants, opioids, sedatives and tranquilizers compared with controlled substances[5]. In our study, the statistically significant difference among males and females with respect to the use of cannabis and Kush and no significant difference with respect to the use of alcohol and tramadol mirrors this trend. Also, our finding of male to female ratio of 10: 1 corroborates established patterns. Various explanations for the relative sobriety in the female gender have been advanced: females are said to be conditioned by societal norms and perceived social undesirability such that female substance users are faced with the prospects of greater stigmatization[16]. While this normative bias has persisted to some extent across cultures, the gender gap in the prevalence of substance use has been narrowing [17,18]. Our findings support the evidence of far greater prevalence of males as psychoactive substance users or at least users of psychotomimetic substance users. This is because most of our subjects were patients of substance induced serious mental illness who were brought in by relatives and thus, had little personal choice in deciding whether to present or not. Thus, the male: female ratio of 10:1 supports marked male predominance. Identifying the specific factors that discourage female substance use in Sierra Leone and in other places and applying them to the male segment of the population might reduce the scourge.

Sierra Leone has five administrative regions (four provinces and western area) which are subdivided into sixteen districts. The western urban is the capital city. Most of the districts are rural but there are urban populations in the provincial capitals. Most of our SUD patients declared the urban areas of Freetown as their place of residence such that substance use in Sierra Leone appeared to be essentially an urban problem. However, cases from the provinces might have been underrepresented in the sample due to distance and logistics of access to the study site, Sierra Leone Psychiatric Teaching hospital, which is in Freetown urban area. The predominant urban origin of our SUD patients contrasts with reports from East Africa, which ascribe more substance users to the rural rather than urban areas[13,19]. This disparity in finding between our study and those reports may be explained by the nature of data that was analyzed. While their data was derived from demographic survey of households, ours was hospital-based analysis of SUD patients presenting with serious mental illness. Also, some types of substance of abuse may sometimes enjoy some level of social or cultural acceptance leading to widespread use in rural areas[20,21]. Thus, it seems that higher urban or rural prevalence of a particular type of substance depends on its place in the cultural elements of the community. Social or cultural acceptability of a substance as an explanation for disparity in its use between two communities was evident in a previous survey in Sierra Leone, in which Bøås and Hatløy reports differences in alcohol use between rural communities in Bo and those in Yoni[22].

In any given community or location, the trend and pattern of substance abuse is hardly static, and the changing pattern often involves shifts in preference with respect to the type of substance consumed. New agents are often added to the menu as unscrupulous suppliers seek illicit financial gains and addicted users explore and crave for novel experiences. Bøås and Hatløy, in 2005, estimated that only about 10 percent of Sierra Leoneans were current users of alcohol and that 1.2 percent and 0.3 percent used cannabis and hard drugs respectively[22]. The harmful substances uncovered within the surveyed communities were cannabis sativa (Jdamba), alcohol and crack cocaine. More recently, another study commissioned by a non-governmental organization, Open Society Initiative for West Africa (OSIWA), discloses a significantly changed drug scene with cannabis, Kush, K2, Tramadol and cocaine/crack identified in field observations8. Our study confirms some of the findings of OSIWA report. Kush was the most common harmful substance in use, followed by alcohol, cannabis, and tramadol. Kush, in Sierra Leonean context, seems to be a synthetic cannabinoid, which might be composed of a cocktail of psychoactive substances and consumed by smoking8. Concerning Kush, the OSIWA reports predicted: 'It's a really popular drug and most specifically for youth. It would be an important public health issue'[8]. This prediction seems borne out by our documentation of its potent psychotomimetic effects and its large contribution to our cases of substance-induced mental illness. In fact, Kush was re-

Table 4: Bivariate Analysis Showing the Relationship Between Sex and Number and Type of Substances Used

Pattern and Type of Substance Use		Sex		Total	Statistics	
		Male	Female		Chi square	Unadjusted Odds ratio (95%CI)
Pattern of Use	Poly	394(93.4%)	24(5.7%)	418(100%)	χ^2(df 1)=6.01; P=.01	2.15 (1.15-4.0)
	Mono	153(88.4%)	20(11.6%)	173(100%)		
	Total	547(92.6%)	44(7.4%)	591(100%)		
Alcohol	Yes	321(92.0%)	28(8.0%)	349(100.0%)	χ^2(df 1)=464; P=.49	1.20 (0.71-2.01)
	No	335(90.5%)	35(9.5%)	370(100.0%)		
	Total	656(91.2%)	63(8.8%)	719(100.0%)		
Kush	Yes	399(94.8%)	22(5.2%)	421(100.0%)	χ^2(df 1)=15.89; P<.001	2.89 (1.68-4.97)
	No	257(86.2%)	41(13.8%)	298(100.0%)		
	Total	656(91.2%)	63(8.8%)	719(100.0%)		
Cannabis	Yes	319(94.1%)	20(5.9%)	339(100.0%)	χ^2(df 1)=6.57; P=.01	2.04 (1.17-3.55)
	No	337(88.7%)	43(11.3%)	380(100.0%)		
	Total	656(91.2%)	63(8.8%)	719(100.0%)		
Tramadol	Yes	76(95.0%)	4(5.0%)	80(100.0%)	χ^2(df 1)=1.59; P=.20	1.93 (0.68-5.47)
	No	580(90.8%)	59(9.2%)	639(100.0%)		
	Total	656(91.2%)	63(8.8%)	719(100.0%)		
Cocaine	Yes	38(95.0%)	2(5.0%)	40(100.0%)	Fisher's Exact Test; P=.57	1.86 (0.44-7.96)
	No	618(91.0%)	61(9.0%)	679(100.0%)		
	Total	656(91.2%)	63(8.8%)	719(100.0%)		

sponsible for 58% of 'single agent' substance induced mental health disorder in the current series. None of our patients admitted being on heroin and this is consistent with the previous reports stating that heroin is quite rare on the country's drug scene[8]. However, this absence of illicit opioid seems to have been compensated for by availability of prescription opioid-tramadol.

Prevalence of poly-substance use has varied widely depending on the nature of the sample studied. It has ranged from 2.4 to 47% in population surveys, to between 57 and 84% among club goers and patients on treatment for SUD[12,23–26]. Our 71% proportion of poly-substance user among patients on treatment is far more than 19% presented in an Ethiopian study but is very much in agreement with figures reported in some other studies of similar target group[12,19]. Poly-substance use has been attributed to substance availability and craving for a lasting high[12]. In a review aimed at understanding the patterns and motivations for polysubstance use, Boileau-Falardeau et al[27] identified multiple reasons and motivations for poly-substance intake. Reasons identified include attempts at alleviating withdrawal symptoms of one agent; desire to prolong the euphoric experience; attempt to counterbalance the effects of a substance with another agent; attempt to recreate the effect of an unavailable or a more expensive substance; and self- medication for a disease condition[27]. High prevalence of poly-substance use among our cases adds a complicating dimension to the substance problem as it is known to confer higher risk of psychiatric and physical morbidity as well as increased health resource utilization[28,29].

About reports from neighbouring countries, a recent systematic review of epidemiological studies on substance abuse in Nigeria observed some gaps in literature: "most of the epidemiological studies were conducted among secondary school students and only a few studies were performed among the general population to identify other vulnerable groups of people involved in drug abuse. Only three studies were conducted on psychiatric admission related to drug abuse. Of the three studies, the most recent was published in 1986"[30]. Selected for the review were 30 records published between 1976 to 2018, consisting of 23 journal articles and 7 grey literatures. Commonly reported risk factors for substance use were largely in agreement with the findings of our study and included male gender, younger age, poor economic status, unemployment, parental deprivation and lower education level[30]. Cannabis, codeine, amphetamine/ dexamphetamine, heroin, cocaine and diazepam were the most frequently used substances[30]. A study in Ghanian adolescents aged 10-17 years, reported alcohol, cigarettes, tramadol, marijuana and codeine as the most common substances used while being a male and currently working were significant risk factors for substance use[31].

4.1 Conclusion

Epidemiology of substance use disorder in Sierra Leone largely corresponds with the global picture. Mostly affected are single, young adult males who are students or unemployed and residing in the city. Kush, alcohol, and cannabis are the most common substances abused and majority of the patients are polysubstance users. Understanding the factors responsible for relative continence to substance use in the female population might generate some preventive control measures.

Conflicts of Interest

All authors declare that we do not have any financial or personal relationship which may have inappropriately influenced us in writing this article.

Funding

No funding was received for this study.

Contributor Roles Taxonomy (CRediT) Statement

Eze GO: Conceptualization, Project administration, Supervision, Validation, Data Curation, Review & Editing.

Onyishi NT: Conceptualization, Project administration, supervision, Validation, Methodology, Formal analysis, Visualization, Original draft, Review and Editing.

Nnaji FC: Data curation, Review, Editing.

Jalloh Abdul: Data curation, Review, Editing

Kpallu KK: Data curation, Review, Editing

Kinie Goba: Data curation, Review, Editing

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