

## PATTERN AND CORRELATES OF PSYCHOACTIVE SUBSTANCE USE AMONG NEW PRISON INMATES IN NIGERIA

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### ABSTRACT

Psychoactive substance disorders among prison inmates are challenges to the prison authority, and this may interfere with the processes of reformation and rehabilitation therein. The study assessed the prevalence, pattern, and correlates of psychoactive substance use in a cross-sectional study involving 552 new inmates in a custodial center in Enugu, Nigeria. Diagnoses were made using the MINI-Plus (version 6) in line with the ICD 10. Lifetime and 12-month prevalence of psychoactive substance disorder were 57.4% and 50.7%, respectively. The commonest substance disorders were tobacco (48.2% lifetime and 41.1% 12-month), cannabis (36.8% lifetime, and 32.4% 12-month), and alcohol (7.2% lifetime, and 6.9% 12-month).

Descriptive statistics, Mann-Whitney U test, Chi-squared test, and regression analyses were performed to assess the extent to which socio-demographic characteristics, type of offence, and family dysfunction predicted psychoactive substance use or disorder. Four hundred and seventy eight (86.6%) of participants had used psychoactive substance in their lifetime, while it was 405 (73.4%) in the last 12 months prior to imprisonment. Lifetime and 12-month rates of psychoactive substance disorder were 57.4% (n=317) and 50.7% (n=280), respectively. Male gender, unemployment, parental divorce, and parental drug use respectively, significantly predicted 12-month psychoactive substance disorder [ $\beta = 0.12$ , 95% (CI: 0.04, 0.39)], [ $\beta = 1.79$ , 95% (CI: 1.24, 2.60)], [ $\beta = 0.29$ , 95% (CI: 0.14, 0.59)], and [ $\beta = 0.56$ , 95% (CI: 0.39, 0.81)]. Lifetime disorder was significantly predicted by male gender [ $\beta = 0.12$ , 95% (CI: 0.04, 0.35)], unemployment [ $\beta = 1.60$ , 95% (CI: 1.10, 2.32)], parental divorce [ $\beta = 0.23$ , 95% (CI: 0.10, 0.52)], and parental drug use [ $\beta = 0.49$ , 95% (CI: 0.34, 0.72)]. Similarly, lifetime psychoactive substance disorder was associated with older age ( $U = 33355$ ,  $Z = -2.104$ ,  $p = 0.035$ ), while the prevalence of

12-month use of psychoactive substance was significantly associated with charges of violent offences ( $\chi^2=13.55$ ,  $p<0.01$ ).

Conclusively, there is a high prevalence of psychoactive substance use and disorders among new prison inmates with tobacco, cannabis and alcohol as the commonest. Given that male gender, unemployment, parental divorce and parental drug use increase the likelihood of these disorders, it will be worthwhile for any drug intervention program to address these factors.

**Keywords:** Psychoactive substances; drug; inmates; crime; Nigeria.

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## INTRODUCTION

Data from the United Nations Office on Drugs and Crime (UNODC) suggest that the annual global prevalence of any psychoactive substance use in 2016 was 5.6% (UNODC, World Drug Report 2018). The situation appears more alarming in Nigeria as a higher number of people have recently been reported to be using psychoactive substances. This observation was made in the 2018 National Drug Use Survey in Nigeria, where the annual prevalence of any psychoactive substance use in 2017 was 14.4% (UNODC, Drug Use in Nigeria 2018).

The global pattern of psychoactive substance use reported the most frequently used substances to be cannabis, opioids and stimulants, whereas cocaine use was the least frequent (UNODC, World Drug Report 2018). While the National Drug Use Survey in Nigeria corroborated the global pattern of use, a community-based study (Gureje et al, 2007) earlier conducted in Nigeria reported a different pattern of use, where alcohol and tobacco were the most frequently used substances, while cocaine had the least frequency of use (Gureje et al, 2007). Cannabis use was the fourth most prevalent after the use of seda-

tives which was reported as the third most prevalent in this same community-based study (Gureje et al, 2007). Further research evidence has supported this pattern of use in the Nigerian general population (Ani, 2014; Babalola et al., 2014; Omoluabi, 1995).

Several prison-based studies, both globally (Bronson et al, 2017; Esmaili, 2016; Khalooei et al, 2016; Long et al., 2004; Stover & Michels, 2010; Vicens et al, 2011) and in Nigeria (Ogunwale et al, 2012), have reported the prevalence of psychoactive substance use between 66.7% and 77%, which is comparatively higher than the general population findings that ranged between 3.4% and 14.4% (Steel et al, 2014; UNODC, Drug Use in Nigeria 2018).

Some of these psychoactive substance users experience disorders such as abuse and dependence (Fazel et al., 2017). In one prison-based study in Ireland, 58% of the participants had substance dependence (Mohan et al, 2006); whereas in India, 47.1% of the prison inmates had substance use disorder (Ayirolimeethal et al, 2014). More so, about one quarter of the prison inmates that participated in a prison-based study in the United States had substance use disorder (James & Glaze, 2006). In Nigeria, 20.1-54% of prison

inmates have been reported to have suffered from these disorders (Abdulmalik et al, 2014; Armiya'u et al, 2017).

A prison is a stressful environment associated with regimented life style, overcrowding, social deprivation, and bullying from other inmates (Mansoor et al, 2015; Sykes, 1958). More so, it is a high-risk environment for initiation (Boys et al., 2002) and continuation of drug use (Rowell et al., 2012; Rowell-Cunsolo et al., 2016). While some offenders with psychoactive substance use were remanded in prison due to drug use (Clarke et al., 2001; Rowell et al., 2012), others got remanded on account of offences not related to drugs. In either case, they may continue to use psychoactive substance (Clarke et al., 2001; Cope, 2003; Rowell et al., 2012; Rowell-Cunsolo et al., 2016) as a coping strategy despite prohibition by the institution (Caulkins & Sevigny, 2005; Skowronski & Talik, 2018).

Some demographic and family factors such as age, adverse childhood experiences, polygamous family setting, and parental deprivation following parental separation or divorce have been found to increase the likelihood of psychoactive substance use and other behavioural problems (Akanni & Adayonfo, 2015; Al-Sharfi et al, 2016; Fatoye, 2003; Jogdand & Naik, 2014; McGee et al., 2011).

Adverse childhood experiences which include childhood maltreatment, parental separation or divorce, parental drug use, and exposure to domestic violence in the family are important aspects of life that largely affect the process of human development, and which may further lead to psychoactive substance use and other health risk behaviors (Francisco et al., 2013; Bellis et al., 2014; Hughes et al., 2017).

Gender influence on psychoactive substance use in the prison population has been inconsistent. While some authors found the use of psychoactive substance to be higher among female prison inmates than among the male inmates (Bronson et al, 2017; Fazel et al, 2017); others have reported a higher prevalence among male inmates (Mendes dos Santos, 2014; Rowell-Cunsolo et al, 2016).

Similarly, a higher prevalence of psychoactive substance use has been associated with social disadvantages such as unemployment, poverty, and low level of education (Rowell-Cunsolo et al, 2016). The majority of the prison inmates prior to their imprisonments experienced these social disadvantages which, in the presence of the stressful prison environment, may account for the overrepresentation of psychoactive substance users in the prison (Mendes dos Santos, 2014; Fazel et al., 2017; Lukasiewicz, 2007; Rowell-Cunsolo et al, 2016).

This study was relevant following the dearth of studies on associated factors of drug use among new prison inmates especially in Sub-Saharan Africa; the benefit of early recognition of these problems and concerted effort toward intervention and policy making in custodial centers; the barriers posed by these problems to any meaningful rehabilitation and intervention in a correctional facility (Baltieri, 2014); and the need to address the gap in literature. Hence, our study was guided by the following objectives (1) to determine the prevalence of psychoactive substance use and disorder (2) to assess the pattern of use and disorder (3) to address its association with type of offence (4) and to evaluate its relationship with family and socio-demographic factors.

## METHOD

### Study design and setting

This was a cross-sectional study conducted in Enugu Maximum Security Custodial Center (formerly known as the Enugu Maximum Security Prison); and which was established in 1915 with a statutory capacity of 638 (Okoro et al., 2018). However, there were between 1901 and 2097 prison inmates in its custody during the time of the study. It accommodates all classes of prison inmates including those on death row, life sentences, awaiting-trial prison inmates, short and long term sentences. It also accommodates both the male and female inmates, but in different wings (Okoro et al., 2018). There are different cells for the different classes of inmates; and in addition, all new inmates are first kept in a different cell until they appear before the prison admission board. Thereafter, they are assigned to their respective cells according to their offences.

### Participants and sample size calculation

The sample size for the study was calculated using the formula:  $n = Z^2 P (1-P)/d^2$  (Araoye, 2003).

Where:  $n$  = Sample Size.  $P$  = the proportion of the target population with the problem.

$Z$  = the Standard normal deviate, set at 1.96 which corresponds to the 95% confidence level.

$d$  = precision, tolerable margin of error set at 5% (0.05).

To calculate ' $n$ ', we used the value of ' $p$ ' in the study done by Armiya'u et al., (2017) in a Maximum Security Prison in Jos, Nigeria. They found substance use disorder in 54% of the participants. Thus,

sample size ' $n$ ' was calculated as:  $n = (1.96)^2(0.54)(1 - 0.54)/(0.05)^2 = 382$

Though 382 was the estimated minimum sample size. However, this was a part of a larger study design that followed the participants up for 6 months, and in which dropout rate was expected to be high as a result of inmates being released from the prison, we used a sample size of 552 which makes allowance for 30% attrition at the 6<sup>th</sup> month.

A total of 552 inmates were recruited by a convenient sampling between 3<sup>rd</sup> of May and 4<sup>th</sup> October, 2019, and this represented 95.5% of the total 578 inmates (25 females versus 553 males, 546 awaiting-trial inmates versus 32 sentenced inmates) remanded in custody during this period. Twenty six inmates (4.5%) did not participate in the study, out of which 19 (3.3%) were already discharged from prison custody before the day of interview for several reasons including the completion of their prison sentences, and the fulfillment of their bail conditions; while the remaining 7 (1.2%) declined to give consent after the purpose of the interview was explained to them.

### Data collection procedure

The study lasted between 3<sup>rd</sup> May and 4<sup>th</sup> October, 2019, and all new inmates brought to prison custody within this period appeared before the prison admission board within their first 24-72 hours of imprisonment. The interview which was done twice a week occurred within their first week of imprisonment after they had gone through the prison admission process. On each interview day a list of all new prison inmates that attended the preceding prison admission process was obtained from the prison record, and with the assistance of a staff of the

custodial center, they were all brought to the medical unit of the center, where the interview was done. The aim of the study was explained to these new inmates that were usually between 10 and 15 for every interview day; thereafter, consent was obtained from them, and those who consented were selected for the study.

The interview was done in 2 stages; the first was the administration of the socio-demographic questionnaire designed by the researchers to all the selected participants. Those that could read and write had the questionnaire self-administered, while those that could not read or write were assisted by the researchers who read the questions out to them and guided them in ticking their responses.

Those that responded “yes” to the item on the socio-demographic questionnaire that enquired if they had ever used any psychoactive substance proceeded to the second stage which was the administration of the substance and alcohol modules of the MINI-Plus to them by two of the researchers who are psychiatrists.

The interviews with the MINI-Plus commenced when the 5<sup>th</sup> co-author who is a specialist psychiatrist had achieved satisfactory inter-rater reliability with the corresponding author, a consultant psychiatrist with experience in the use of the MINI-Plus. Thereafter, they conducted each interview simultaneously, in which one interviewer carried out the interview and the other was an observer who nevertheless, asked necessary questions during the interview for further clarification. Each participant was independently scored by the two interviewers. The collation of the results of the two interviewers was done in such a way that any agreement in the two interviews was recorded

as a case (having the diagnosis), while where there was no agreement between the two interviewers, the participant was recorded as having no case (not having the diagnosis). The average time spent on the two stages of the interview on each participant was 20 minutes.

### **Inclusion criteria**

All the new inmates that had not spent more than 1 week and had gone through the prison admission board were included in the study.

All inmates who gave written informed consent were selected for the study.

### **Exclusion criterion:**

All new inmates who were transferred from other custodial centers to the study center during the period of the study were excluded.

### **Ethics**

Permission for the study was sought and obtained from the authority of the Nigerian Correctional Service, Enugu State Command, and ethical approval was obtained from the State Ministry of Health, Enugu State, Nigeria. The objectives of the study were explained to the participants and they were assured of confidentiality of their information. They were made to understand that participation in the study was voluntary and that they could withdraw at any point even after they had given their consent and that such withdrawal wouldn't affect them negatively. Thereafter, both verbal and written consent were obtained from them. Furthermore, with the consent of those with drug use problems and in need of therapy, they were referred to the prison authority, with the hope of good health care services for them.

## Instruments

### Socio-Demographic Questionnaire:

A socio-demographic questionnaire designed by the researcher was used to elicit socio-demographic and forensic information from each consenting participant. The information elicited were age, sex, religion, marital status (never married, married, or separated/divorced/widowed), level of education (no formal education, primary school, secondary school, or tertiary education), and ethnicity (Hausa, Igbo, Yoruba, Other ethnicity in Nigeria, or countries other than Nigeria). Others were prison category (awaiting-trial versus sentenced), type of offence (violent versus non-violent), and family setting (polygamous versus monogamous family setting). In the remaining questions, the participants had a “yes,” or “no” option to choose from. Sample items of such questions were: Did you live in the state capital before your imprisonment? Have you ever used any psychoactive substance (this includes the use of alcohol)? As a child (before you turned 18 years), did any of your parents use drug? As a child (before you turned 18 years), were your parents divorced or separated?

### Mini International Neuropsychiatric Interview-Plus (MINI-Plus) English version 6.0.0

The Mini International Neuropsychiatric Interview – Plus (MINI – Plus) is a modified version of the original MINI which was designed as a brief structured interview for major axis 1 psychiatric disorders in DSM-IV and ICD-10 (Sheehan et al., 1998). The MINI was developed jointly by psychiatrists and clinicians in the United States and Europe, and designed for epidemiological studies and multicentre

clinical trials. Validation and reliability studies have been done comparing the MINI to the Structured Clinical Interview for DSM-III-R (SCID) and the Composite International Diagnostic Interview (CIDI)-a structured interview developed by the World Health Organization for lay interviewers for International Classification of Diseases, ICD-10 (Sheehan et al., 1998).

The results of these studies showed that the MINI has high validity and reliability, and can be administered in a much shorter period of time (usually an average of 15 minutes) than the SCID and CIDI (Sheehan et al., 1998). It has a satisfactory psychometric property including a good inter-rater reliability of 0.67-0.85 and a satisfactory concordance (Kappa value greater than 0.88) between it and expert diagnoses (Mukhtar et al., 2012).

Each module of the MINI (e.g., the psychoactive substance use module) has two parts. The first is a screener, consisting of two or three main symptoms to assess the probability of the presence of the disorder; while the second is the diagnostic part which is applied if the subject tests positive to the screener (Sheehan et al., 1998).

The MINI-plus has additional modules for somatization disorders, lifetime alcohol dependence, lifetime alcohol abuse, lifetime substance (non-alcohol) dependence, and lifetime substance (non-alcohol) abuse (Black et al., 2004).

The MINI – Plus has been used in Nigeria to conduct a study in the prison population (Abdulmalik et al., 2014), and our study utilized it to make diagnoses of psychoactive substance use disorders among the participants.

### Data analysis

The data collected were entered into the Statistical Packages for Social Sciences,

version 20 (IBM-SPSS). A frequency check was run on the data to check for missing data. A test of normality done using the Kolmogorov-Smirnov test showed that age distribution was not normally distributed ( $p<0.05$ ). A Mann Whitney U test was used to assess the relationship between age and psychoactive substance use/disorder, while a Chi-squared test was used to demonstrate the association between psychoactive substance use/disorder and all independent categorical variables. Binary regression was further applied for all socio-demographic variables that had significant association with psychoactive substance disorder on univariate analysis. All tests of significance were two-tailed

at the 5% level of significance and confidence interval estimation of 95%.

## Results

Table 1: The mean age of the participants was  $28.09\pm8.92$ , with 528 (95.7%) of them being males and 24 (4.3%) being females. Three hundred and sixty eight (66.7%) were unemployed, while 184 (33.3%) were employed; 206 (37.3%) never had secondary education, and the remaining 346(62.7%) had at least secondary education.

The 12-month prevalence of any psychoactive substance disorder was significantly higher among the male inmates (52.3%) than the female inmates (16.7%).

**Table 1.** Association between socio-demographic factors and psychoactive substance disorder.

Variables	Lifetime prevalence of any substance disorder			12-month prevalence of any substance disorder			$\chi^2$	P value
	Absent Freq (%)	Present Freq (%)	$\chi^2$	Absent Freq (%)	Present Freq (%)	$\chi^2$		
<b>Gender</b>			13.74	<0.01*			11.6	0.01*
Female	19(79.2)	5(20.8)		20(83.3)	4(16.7)			
Male	216(40.9)	312(59.1)		252(47.7)	276(52.3)			
<b>Settlement</b>			2.47	0.12			0.63	0.43
Rural	100(46.7)	114(53.3)		110(51.4)	104(48.6)			
Urban	135(39.9)	203(60.1)		162(47.9)	176(52.1)			
<b>Marital status</b>			1.45	0.49			0.24	0.89
Never married	139(44.1)	176(55.9)		154(48.9)	161(51.1)			
Married	78(41.9)	108(58.1)		94(50.5)	92(49.5)			
Sep/div/widow	18(35.3)	33(64.7)		24(47.1)	27(52.9)			
<b>Job status</b>			4.54	0.03*			7.67	0.01*
Unemployed	145(39.4)	223(60.6)		166(45.1)	202(54.9)			
Employed	90(48.9)	94(51.1)		106(57.6)	78(42.4)			
<b>Education</b>			1.42	0.23			1.75	0.19
None/Primary	81(39.3)	125(60.7)		94(45.6)	112(54.4)			
Sec/tertiary	154(44.5)	192(55.5)		178(51.4)	168(48.6)			
		Mean Rank	U		Mean Rank	U		
<b>Age(mean=28)</b>			33355	0.035*			37853	0.90
No	235	259.9		272	275.66			
Yes	317	288.8		280	277.31			

\*=Significant value. Sep=separated. Div=Divorced. Freq=Frequency. %=%Percent.

$\chi^2$ =Chi-squared test. U=Mann-Whitney test. Sec=Secondary education.

Similarly, lifetime prevalence of any psychoactive disorder was significantly higher among male (59.1%) than female (20.8%) inmates ( $p<0.05$ ). The participants who lived in the urban areas had higher lifetime (60.1%) and 12-month (52.1%) prevalence of any psychoactive substance disorder than the rural settlers that had 53.3%, and 48.6%, respectively.

The prison inmates that were unemployed were significantly more likely than the employed ones to have lifetime (60.6% versus 51.1%); and 12-month (54.9% versus 42.4%) prevalence of any psychoactive substance disorder. One hundred and sixty eight (48.6%) of the 346 inmates that attended at least secondary school had 12-month prevalence of psychoactive substance disorder, while

112 (54.4%) of the 206 that did not attend secondary school had the disorder.

Lifetime disorder was seen in 192 (55.5%) of the 346 that attended at least secondary school, whereas 125 (60.7%) of the 206 that did not attend secondary school had the disorder. A Mann-Whitney U test was done to determine if there were differences in age between those with lifetime psychoactive substance disorder and those without. The difference in age for those with lifetime disorder (mean rank = 288.8) and those without (mean rank = 259.9) were statistically significant ( $U = 33355$ ,  $Z = -2.104$ ,  $p = 0.035$ ).

Table 2 is the prevalence and pattern of psychoactive substance use, and it shows that 478 (86.6%) of the participants have used any psychoactive sub-

**Table 2.** Prevalence and pattern of psychoactive substance among the participants

N=552

Prevalence of psychoactive substance disorder	Lifetime Frequency(percent)	Annual Frequency(percent)
Ever used any psychoactive substance	478(86.6)	405(73.4)
Non-alcohol psychoactive substance use	287(52.0)	255(46.2)
<b>Any psychoactive substance disorder</b>	317(57.4)	280(50.7)
Substance (excluding alcohol) disorder	276(50.0)	243(44.0)
Tobacco disorder	266(48.2)	227(41.1)
Cannabis disorder	203(36.8)	179(32.4)
Alcohol disorder	40(7.2)	38(6.9)
Opioid disorder	23(4.2)	15(2.7)
Cocaine disorder	12(2.2)	7(1.3)
Tranquilizer disorder	5(0.9)	4(0.7)
<b>Any drug abuse</b>	71(12.9)	66(12.0)
Tobacco abuse	37(6.7)	32(5.8)
Cannabis abuse	50(9.1)	47(8.5)
Alcohol abuse	7(1.3)	5(0.9)
Opioid abuse	2(0.4)	1(0.2)
Cocaine abuse	2(0.4)	1(0.2)
<b>Any drug dependent</b>	276(50.0)	241(43.7)
Tobacco dependent	229(41.5)	195(35.3)
Cannabis dependent	153(27.7)	132(23.9)
Alcohol dependent	33(6.0)	33(6.0)
Opioid dependent	21(3.8)	14(2.5)
Cocaine dependent	10(1.8)	6(1.1)
Tranquilizer dependent	4(0.7)	4(0.7)
<b>Multiple psychoactive substance disorder</b>	180(32.6)	156(28.3)

stance in their lifetime, while 405 (73.4%) used it in the last 12 months. The lifetime and 12-month prevalence of any psychoactive substance disorder were 57.4%, and 50.7%, respectively. Tobacco disorder had the highest lifetime (48.2%) and 12-month (41.1%) prevalence. The second most prevalent was cannabis lifetime (36.8%) and 12-month (32.4%) disorders. This was followed by alcohol lifetime (7.2%) and 12-month (6.9%) disorder. The lifetime prevalence of opioid disorder was 4.2%, while its 12-month prevalence was 2.7%.

Table 3 shows the association between family factors and the prevalence of psychoactive substance disorders. Though not statistically significant, the prison inmates from a polygamous family setting were more likely than those from a monogamous family setting to have lifetime (61.5% versus 55.3%) and 12-month prevalence (52.6% versus 49.7%) of any psychoactive substance disorder.

Comparing those whose parents were divorced to those whose parents were not divorced, there was significant higher lifetime (82.7% versus 54.8%) and 12-month

(75.0% versus 48.2%) prevalence of any psychoactive substance disorder ( $p<0.01$ ).

Those that their parents used drugs were significantly more likely than those whose parents did not use drugs to have higher lifetime (68.2% versus 50.4%) and 12-month (59.9% versus 44.8%) disorders ( $p<0.05$ ).

Table 4 shows the association between psychoactive substance use history and socio-demographic factors. More men (87.9%) than women (58.3%) have used any psychoactive substance in their lifetime; and this was statistically significant. The 12 month prevalence of the use of any psychoactive substance was also found to be significantly higher among the male (74.8%) than the female (41.7%) inmates ( $p<0.05$ ).

The inmates that were widowed/separated/divorced (78.4%) had the highest 12 month prevalence of any psychoactive substance use compared to those who were never married (74.3%) and those who were married and still living with their spouse (70.4%).

While the 12 month rate of any psychoactive substance use was higher among

**Table 3.** Association between family factors and psychoactive substance history

Family factors	Lifetime prevalence of any substance disorder				Annual prevalence of any substance disorder		$\chi^2$	P value
	Absent Freq(%)	Present Freq(%)			Absent Freq(%)	Present Freq(%)		
<b>Family setting</b>								
Monog (n=360)	161(44.7)	199(55.3)			181(50.3)	179(49.7)		
Polyg (n=192)	74(38.5)	118(61.5)			91(47.4)	101(52.6)		
<b>Parental Div</b>								
No (n=500)	226(45.2)	274(54.8)			259(51.8)	241(48.2)		
Yes (n=52)	9(17.3)	43(82.7)			13(25.0)	39(75.0)		
<b>Parental drug</b>								
No (n=335)	166(49.6)	169(50.4)			185(55.2)	150(44.8)		
Yes (n=217)	69(31.8)	148(68.2)			87(40.1)	130(59.9)		

Monog=Monogamy. Polyg=Polygamy. Div=Divorce. Freq=Frequency.  $\chi^2$ =Chi-squared test

\*=significant value.

**Table 4.** Association between psychoactive substance use history and socio-demographic factors.

Variables	Lifetime use of any substance		Annual prevalence of any substance use					
	Absent Freq(%)	Present Freq(%)	$\chi^2$	P value	Absent Freq(%)	Present Freq(%)	$\chi^2$	P value
<b>Gender</b>			17.3	<0.01*			12.9	<0.01*
Female	10(41.7)	14(58.3)			14(58.3)	10(41.7)		
Male	64(12.1)	464(87.9)			133(25.2)	395(74.8)		
<b>Settlement</b>			0.48	0.49			0.35	0.56
Rural	26(12.1)	188(87.9)			54(25.2)	160(74.8)		
Urban	48(14.2)	290(85.8)			93(27.5)	245(72.5)		
<b>Marital status</b>			1.94	0.34			1.63	0.44
Never married	47(14.9)	268(85.1)			81(25.7)	234(74.3)		
Married	23(12.4)	163(87.6)			55(29.6)	131(70.4)		
Sep/div/widow	4(7.8)	47(92.2)			11(21.6)	40(78.4)		
<b>Job status</b>			0.20	0.66			3.38	0.07
Unemployed	51(13.9)	317(86.1)			89(24.2)	279(75.8)		
Employed	23(12.5)	161(87.5)			58(31.5)	126(68.5)		
<b>Education</b>			1.93	0.16			1.50	0.22
None/pry	33(16.0)	173(84.0)			61(29.6)	145(70.4)		
Sec and above	41(11.8)	305(88.2)			86(24.9)	260(75.1)		
<b>Type of offence</b>			8.69	<0.01			13.55	<0.01
Non-violent	50(17.5)	235(82.5)			95(33.3)	190(66.7)		
Violent	24(9.0)	243(91.0)			52(19.5)	215(80.5)		
	Mean Rank		U		Mean Rank		U	
<b>Age</b>			12355	<0.01			28800	0.56
No	74	204.5			147	283.1		
Yes	478	287.7			405	274.1		

those that were unemployed (75.8) than those who were employed prior to incarceration (68.5%); the lifetime use was higher among the employed (87.5%) than the unemployed (86.1%).

Those that attended at least secondary school (88.2%) were more likely to have used any substance in their lifetime when compared to those that did not attend secondary school (84.0%). Those with lifetime use were significantly more likely to be older (mean rank = 287.7) than those without (mean rank = 204.5). U = 12355, Z = -4.18, p<0.001. Furthermore, of the 267 participants charged with violent offences, 215 (80.5%) of them had

used psychoactive substance in the last 12 months prior to incarceration, while 190 (66.7%) of the 285 charged with non-violent offences had used psychoactive substance in the past 12 months. Lifetime psychoactive substance use was among 243 (91%) of those charged with violent offences, and among 235 (82.5%) of those charged with non-violent offences. These differences were statistically significant ( $p<0.01$ ).

Table 5 shows that all the variables that were significantly associated with 12-month prevalence of psychoactive substance disorder on univariate analysis were also predictive of the presence

**Table 5.** Predictors of drug disorder using logistic regression

12 months prevalence of PS disorder	B	S.E	Wald	df	Sig	Exp(B)	95% C.I Exp(B)	
							Lower	Higher
Intercept	1.199	0.373	10.321	1	0.001	3.317		
Gender	-2.097	0.591	12.573	1	<0.001*	0.123	0.039	0.391
Job status	0.584	0.190	9.471	1	0.002*	1.794	1.236	2.602
Parental divorce	-1.240	0.360	11.851	1	0.001*	0.289	0.143	0.586
Parental drug	-0.572	0.185	9.581	1	0.002*	0.564	0.393	0.811
<b>Lifetime prevalence of PS disorder</b>								
Intercept	1.866	0.429	18.922	1	<0.001*	6.462		
Gender	-2.157	0.561	14.786	1	<0.001*	0.116	0.039	0.347
Job status	0.470	0.191	6.047	1	0.014*	1.599	1.100	2.325
Parental divorce	-1.464	0.414	12.518	1	<0.001*	0.231	0.103	0.520
Parental drug	-0.704	0.190	13.693	1	<0.001*	0.495	0.341	0.718

\*=Significant value. df = Degree of freedom. C.I=Confidence interval. PS=psychoactive substance.

of psychoactive substance disorder 12 months prior to incarceration on further analysis using the logistic regression. Unemployment with an OR of 1.8(95% C.I: 1.24 – 2.60) puts the inmates at greater odds of having psychoactive substance disorder 12 months prior to incarceration. More so, the odds of this disorder in the 12 months preceding incarceration is less likely among female inmates ( $\beta=0.12$ , 95% [CI: 0.04, 0.39]); inmates without history of parental divorce ( $\beta=0.29$ , 95% [CI: 0.14, 0.59]); and those without history of parental drug use ( $\beta=0.56$ , 95% [CI: 0.39, 0.81]).

It also shows that, while unemployment with an OR of 1.6(95% C.I: 1.10 – 2.33) puts the inmates at greater odds of having psychoactive substance disorder in their lifetime, the odds of the prevalence of lifetime psychoactive substance disorder was less likely among female inmates ( $\beta=0.12$ , 95% [CI: 0.04, 0.35]); inmates without history of parental divorce ( $\beta=0.23$ , 95% [CI: 0.10, 0.52]); and those without history of parental drug use ( $\beta=0.5$ , 95% [CI: 0.34, 0.72]).

## DISCUSSION

Our study explored the prevalence and pattern of psychoactive substance disorders or use, and the extent to which these are associated with socio-demographic characteristics, the type of offence, and family dysfunction and setting.

Globally (Bronson et al., 2017; Rowell-Cunsolo et al., 2016; Sahajian et al., 2006) and in Nigeria (Armiya'u et al., 2017), evidence from research has shown a high prevalence of psychoactive substance use and disorder in the prison population. Our result of a high rate of psychoactive substance use is consistent with these findings. While it was observed that our participants had stayed about 4 days in prison custody and as such our result may be likened to that of the general population, it is also noteworthy to emphasize the large difference between our rate and the rate of Nigeria's national survey. For example, our finding of 73.4% annual prevalence of any psychoactive substance use far exceeds the 14.4% annual prevalence of the 2017 national survey

in Nigeria (UNODC, Drug Use in Nigeria 2018). This implies that psychoactive substance use is increasing and this poses a serious challenge not only to the prison authority, but also to the other components of the justice system (the judiciary and the police), as well as to the society at large.

Specifically, the pattern of psychoactive substance use among new prison inmates (Sahajian et al., 2006), other prison inmates (Armiya'u & Perez, 2016; Ugwuoke & Ifeanyichukwu, 2016), and the general population in Nigeria (Ani, 2014; Babalola et al., 2014; Gureje et al., 2007) found tobacco, cannabis, and alcohol as the most commonly used drugs. Our study replicates this pattern, and this reflects the ease of access of these psychoactive substances. The vital social roles and acceptance of alcohol, the few laws in Nigeria governing the use and restriction of alcohol and cigarette, and the low cost of cigarette and cannabis further explain the high prevalence of these specific substances.

Previous studies found that males were more likely than females to report psychoactive substance use and disorder (Tsekane & Amone-P'Olak, 2019; Ugwuoke & Ifeanyichukwu, 2016). In one study to determine the factors contributing to psychoactive substance use among medical students in Nigeria, men were found to be more likely than women to have psychoactive substance use (Babalola et al., 2014). Other studies (Becker & Hu, 2008; Eggen, 1994) echoed similar report of a higher prevalence of disorder among men compared to women. Our finding in which males were three times as likely as females to have psychoactive substance disorders lend more support to the literature findings. This was unsurprising given that the society frowns at the

use of drugs such as alcohol and cigarette by a female, while it accommodates such act by a male; and that more males than females have access and opportunity to drug availability.

Previously, it has been established that increasing age (Eggen, 1994) and unemployment (Lee et al., 2015) were associated with psychoactive substance disorder. Our result corroborates the findings of a previous study in which unemployment was a predictor of drug use (Henkel, 2011), and also agrees with the report of another study in which there was a positive correlation between psychoactive substance use and age (Ugwuoke & Ifeanyichukwu, 2016). Given the youthful age of our participants, the explanation for our result may not be unconnected to the fact that drug use increases with age at initial stage, then peaks at early adulthood before declining. A possible reason for high drug prevalence among the unemployed in our study can be attributed to the fact that employed individuals are more likely to be occupied with their jobs and as such, dedicate little or no time to drug use; the reverse could be inferred for those unemployed. Our study further contributes to the stress hypothesis of unemployment as a cause of drug use in which unemployment, through worsening of stress, predisposes an individual to the use of drug as a way of coping with the stress (Nagelhout et al., 2017; Wills, 1986; Wills & Hirky, 1996).

This implies that while the design of a drug treatment program in the prison should focus more on the youth, all prison inmates especially those with a history of drug use, should be equipped with vocational skills so that upon discharge from prison custody they can be meaningfully engaged.

Previous research findings (Armiya'u et al., 2017; Armiya'u & Adole, 2015) have also associated psychoactive substance use and violent offence. This was confirmed in our study in which the use of psychoactive substance was commoner among those charged with violent offences. This finding is not unexpected given that substance abuse can impair cognitive, social and psychological functions such that emotional and intellectual abilities are compromised (Jiloha, 2009). In the presence of this impairment, there is also impaired ability to assess risk, which further increases impulsivity, with violence as its resultant effect (Armiya'u et al., 2017).

More so, the complications of psychoactive substance use such as craving, intoxication, and psychosis, may drive an individual to violence and other criminal behaviors as was reported in the U.S study in which 30% of drug users were found to have committed violent crimes under the influence of alcohol (Daderman et al, 2002).

Finally, we observed that psychoactive substance disorder was predicted by exposure to parental drug use and divorce. This is in tandem with several reports in the literature (Akanni & Adayonfo, 2015; Anderson, 2014; Hemovich & Crano, 2009; Lander et al., 2013). The interaction between risk (parental divorce and parental drug use) and protective (parental affection, monitoring, and reward) factors in the family are pivotal in predicting psychoactive substance use in adult life (Muchiri & dos Santos). Therefore, if this interplay between protective and risk family factors is understood, interventions should be tailored to address it. Thus, policies and awareness programs aimed at preventing or reducing drug use

should consider the promotion of positive child rearing practices, friendly family environment, and other protective factors in the family.

Our study which has the potential to contribute to the body of knowledge in forensic psychiatry is not without limitations. Therefore, the interpretation of our results should be guided by the following limitations. First, reports from our participants on family dysfunctions may raise concern about response bias as they may not want to present themselves in negative light before the correctional officers. Second, participants for the study were recruited from just one prison in Nigeria; therefore, the results cannot be generalized as representative of all new prison inmates in Nigeria. Third, caution should be applied while interpreting the relationship between gender and psychoactive substance use since the number of males outnumbers that of the females. Finally, the retrospective nature of the responses to questions that assessed family dysfunction raises concern about recall bias.

## CONCLUSION

This study has shown a high rate of psychoactive substance use among newly admitted prison inmates; with the pattern showing that tobacco is the most used followed by cannabis and alcohol. This study has also elaborated the socio-demographic distribution of psychoactive substance among the study population. This information will help prison administrators and policy makers to incorporate and institute psychoactive substance use assessment as well as treatment programs for newly admitted prisoners.

## RECOMMENDATION

Authors recommend that for efficient rehabilitation and reformation of prison inmates, screening of new inmates for history of drug use or disorder should be routinely done. Also, inmates should be equipped with vocational skills as this will keep them engaged after they are released from prison; thus, preventing recidivism, relapse of drug use/disorder, and violent offences.

Finally, future studies should consider a national survey in which the data obtained can be a representation of the nation's drug use history among new prison inmates.

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## CONFLICT OF INTEREST

There is no conflict of interest in the work.

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