



Demographic Mapping of Multiple Psychoactive Substance Abusers in a Federal Neuropsychiatric Hospital in Nigeria

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Authors' contributions

This research work was carried out in collaboration between authors JDO, MMM and SL. Author JDO designed the study, wrote the protocol, guided the data collection and wrote the first draft of the manuscript. Author MMM managed the data collection. Authors JDO and MMM managed the literature search. Authors JDO and SL performed the statistical analysis. All the authors read and approved the final manuscript.

Article Information

DOI: 10.9734/INDJ/2016/28507

Editor(s):

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Complete Peer review History: <http://www.sciencedomain.org/review-history/15986>

Original Research Article

Received 22nd July 2016
Accepted 24th August 2016
Published 30th August 2016

ABSTRACT

Background: Adopting strategies to curb the menace of substance abuse in any given locality would require clear and detailed population based understanding of the patterns of abuse so as to guide comprehensive preventive and control measures.

Objectives: The objectives of the study are to survey the various substances abused and their patterns of abuses through the demographic characteristics of abusers.

Methods: The prospective study surveys the pattern of abuse of several psychoactive substances that have caused hospitalization and/or hospital visits. The demographic characteristics of patients and how they relate to the pattern of abuses were demonstrated.

Results: The distribution for most agents rises between the second and the third decades of life

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before declining. Agents like cannabis, tramadol, rohypnol, diazepam, benzhexol, codeine, suck and die were abused in the proportion of 68(54.4%), 75(55.6%), 9(64.3%), 33(58.9%), 24 (66.7%), 10 (66.7%) and 13(61.9%) respectively by those in their third decades of life. The age dependent declines in the proportion of abusers of agents like cannabis, tramadol, rohypnol, diazepam, benzhexol, codeine, suck and die after 30 years were significantly correlated ($P<0.05$). The occupational distribution showed that the quartet of nicotine, tramadol, cannabis and diazepam were abused across all occupational lines but alcohol was the main substance abused by civil servants. Both stimulants and depressants are co-abused by students, farmers, and artisans. Out of 551 cumulative substances abused, the educational distribution are primary 42(7.6%), secondary 179(32.5%), tertiary 123(22.3%), informal education 179(32.5%), adult education 4(0.7%) and uneducated 24(4.4%). The influence of education on the pattern of abuse was only demonstrated with nicotine and alcohol which recorded a progressive increase as one moves from primary to tertiary levels of education. However, abusers with secondary level of education recorded the highest cases with nitrazepam, diazepam, benzhexol, and caffeine while alcohol, rohypnol and codeine are higher in abusers with tertiary level of education compared to abusers with other educational levels. The distributions for single, married and the divorced are 396(71.9%), 148 (26.9%) and 7(1.3%) respectively. The odds values of single to married for the abusers of cannabis, tramadol, rohypnol, nitrazepam, diazepam and benzhexol are 3.4, 3.0, 6.0, 3.0, 4.6, and 2.6 respectively.

Conclusion: Substance abuse affects all age strata but the critical ages of abusers are those in their third and fourth decades of life. The distribution cut across diverse occupational background and for many individuals, the distribution pattern of substance abuse and the occupation appeared to be well correlated whereas educational association played marginal role in some few instances.

Keywords: Cannabis; tramadol; substance abuse; suck and die; benzhexol.

1. INTRODUCTION

Substance abuse has taken pandemic dimension affecting every age stratum with untoward socio-economic consequences. Substance abuse encompasses those involving the abuse of illicit drugs, alcohol and cigarettes. The problems associated with substances abuse and their negative effects affect individuals and the society in many ways. A population based understanding of the people affected and the detail problem is required in order to guide comprehensive strategy to curb the menace.

Substance abuse has in some instances been linked to increase in death rate. More than 100, 000 deaths annually can be attributed to excessive alcohol consumption [1]. Cigarette smoking has similarly been observed to be associated with health risk. In countries like the USA, more than 400 000 people die from illnesses directly related to cigarette use, a value considered to be higher than deaths associated with AIDS, car crashes, murder, and suicide combined [2]. Substance abuse affects individual, the society and the nation at large. The estimated total overall costs of substance abuse, including productivity and health- and crime-related costs was reported to exceed \$600 billion annually, which includes approximately

\$193 billion for illicit drugs [3], \$193 billion for tobacco [4], and \$235 billion for alcohol [5].

Substance abuse may also induce psychiatric disorders which may affect the usual mental or behavioural patterns of functioning including those relating to how one feels, acts, thinks or perceives [6]. Many drugs can induce psychosis and substances abuses or their withdrawals may often cause psychosis. Alcohol for example can cause psychotic disorders during acute intoxication, chronic usage and its withdrawal as well as exacerbation an existing disorders or causing acute idiosyncratic reactions [7]. Alcohol abuse causes an eight-fold increased risk of psychotic disorders in men and a three-fold increased risk of psychotic disorders in women [8]. Many cases are acute and resolve fairly quickly upon treatment and/or abstinence, but others can occasionally become chronic and persistent. Many other disorders caused by substances vary depending on the substances, but the most common ones being amphetamine (or amphetamine-like) related disorder, caffeine-related disorder, cannabis-related disorder, cocaine-related disorder, hallucinogen-related disorder, inhalant-related disorder, nicotine-related disorder, opioid-related disorder, phencyclidine (phencyclidine-like) related disorder, sedative-hypnotics or anxiolytic-related

disorder, Polysubstance-related disorder, and other (or unknown) substance-related disorder [9].

Drug use also represents one of many risky behaviours that occur during adolescence: teenagers who report that at least half of their friends are sexually active are 31 times more likely to drink, five times more likely to smoke, and 22 times more likely to try marijuana than are teenagers who do not report such a high prevalence of sexual activity among friends [10].

Several substances including marijuana are ingested by smoking and put abusers at increased risk of chronic cough, bronchitis, and lung and upper airway cancers. The long-term adverse effects of cigarette smoking are such that they reduce life expectancy by an average of ten years [11]. Use and abuse of substances such as cigarettes, alcohol, and illegal drugs may begin in childhood or the teen years. Certain risk factors may increase someone's likelihood to abuse substance. Substance abuse may arise from chaotic home environment, genetic risks (drug or alcohol abuse sometimes can run in families), Lack of nurturing and parental attachment and factors related to a child's socialization outside the family may also increase risk of drug abuse. Poor social coping skills, poor school performance, and association with a deviant peer group are outcome of substance abuse [12].

Substance abuse has caused several other problems such as aggressiveness and irritability, declining grades and eventual drop out in school, forgetfulness, feeling hopeless, depressed and suicidal tendency, risky behaviours, and criminal acts. Substance abuser is 18 times more likely to be involved in criminal activity than someone in the general population. Most violent crimes are often linked to the mind-altering effects of drugs. Substance abuse can also lead to domestic violence as well as sexual assault. In addition to psychopharmacological effects, substance use may lead to violence through social processes such as drug distribution systems (systemic violence) and violence used to obtain drugs or money for drugs (economic compulsive violence) [13].

1.1 Objectives

The objectives of the study are to survey the various substances abused in the region and to assess their patterns of abuses through the demographic characteristics of abuser.

2. METHODS

The study was conducted at the Federal Neuro-Psychiatric Hospital Maiduguri (FNPH), in North-Eastern Nigeria. The tertiary health institution lies between latitude 11°51'56" North and 13°7'7" East. Ethical approval was obtained from the Ethics and Research Committee of FNPH before the commencement of the study. The study design was prospective and was targeted at patients who have being on admission or those who are previously diagnosed with cases of drug induced psychiatric disorders that visit the clinic. Only patients diagnosed of psychiatric illnesses associated with substance abuse or its withdrawal were included in the study. Patients with mental disorders that are not linked to substance abuses were excluded from the study. The three months investigational study took a period of May to July, 2015 as a pilot study during which all folders of patients were reviewed immediately after each clinic visit. All data are retrieved from the patients' case note. A total of 200 patients (all males) were studied comprising those hospitalised and those undergoing ambulatory care. Convenient sampling method was used and included all patients during these periods into the study. The scope of the areas covered includes patients' demographic profile, social history, family history, medication information, laboratory investigations, and other relevant medical or clinical information. Descriptive statistics using Statistical Package for Social Sciences (SPSS) version 19 was used to analyse the data obtained. Odds of variables were determined where appropriate. Correlations of trends in some data were similarly determined where necessary. Chi square tests were done.

3. RESULTS

Table 1 describes the age, ethnic, marital, educational and the family history distribution of patients. The distribution for the age is skewed toward low frequency of higher age strata with the mean age and standard deviation of 29.3 ± 9.82 years. Those between the ages of 20 and 30 years accounted for 103(51.5%) while those who are above 60 years were the least with 4(2.0%). The age range of substance abusers is from 14-65 years. All the subjects are males (200, 100.0%), and the majority of them are Moslems (176, 88.0%).

The ethnic distribution of patients on hospital visit or hospitalization due to substance abuse in the region indicated that the Kanuri ethnic group

accounted for the highest proportion of while the Mandara ethnic group was 9(4.5%) (Table 1). Table 1 further describes the occupational distribution of patients. Apart from the student population which accounted for 44(22.0%), other occupation like business men, artisans, labourers, motor cyclists/tri-cyclists, civil servants and cattle-rearers or shepherd boys, traders, drivers, applicants/unemployed and butchers are similarly involved in substance abuse in their various as shown in Table 1.

The marital status of patients showed that the proportion of single and married individuals are 72.5% (n=145) and 26.0% (n=53) respectively. The divorced accounted for 2(1.0%) of the population studied (Table 1). People with an informal education accounted for 71 (35.5%). All types of educational levels including primary, secondary, tertiary, adult education and those that are uneducated are involved in the abuse of several substances at varying degrees (Table 1).

About 190(95.0%) of patients have no family history of psychiatric disorders in contrast to the 10(5.0%) of the studied patients with positive family history psychiatric disorders, which ranges from one member of close relative to as high as three members of close relatives (Table 1). In a similar vein, no positive family history of substance abuse was observed with 151(75.5%) patients while 49(24.5%) have positive family history.

The age mapping of substance abuse which relates the total number of substances abused per individual is shown in Table 2. The patterns of abuse by age strata showed predominant abusers 295(53.5%) to fall within the age range of those in their third decades of life which correspond to 20-29.9 years. The least age stratum was observed in those in their sixth decades of life. Agents like cannabis, tramadol, rohypnol, diazepam, benzhexol, codeine, suck and die were abused in high proportions by those in their third decades of life.

Table 1. Demographic characteristics of patients (N=200)

Parameters	Variables	Frequency n (%)	Parameter	Variables	Frequency n (%)	
Age (yrs)	<10	0 (0)	Marital status	Single	145 (72.5)	
	10.0-19.9	21 (10.5)		Married	53 (26.5)	
	20.0-29.9	103 (51.5)		Divorced	2 (1.0)	
	30.0-39.9	58 (29.9)	Gender	Total	200 (100)	
	40.0-49.9	4 (2.0)		Male	200 (100)	
	50.0-59.9	10 (5.0)		Female	0 (0)	
	60.0-69.9	4 (2.0)	Religion	Islam	176 (88.0)	
	>70	0 (0)		Christian	24 (12.0)	
	Total	200 (100)		Total	200 (200)	
	Occupation	Artisans	12 (6.0)	Ethnic Group	Babur	12 (6.0)
Students		44 (22.0)	Marghi		15 (7.5)	
Shepherd-boy		7 (3.5)	Shuwa-Arab		21 (10.5)	
Tri-cyclists		14 (7.0)	Fulani		13 (6.5)	
Drivers		6 (3.0)	Hausa		21 (10.5)	
Farmers		22 (11.0)	Higgi		7 (3.5)	
Traders		15 (7.5)	Kanuri		86 (43.0)	
Labourers		18 (9.0)	Kibaku		6 (3.0)	
Ex-officers		6 (3.0)	Mandara		9 (4.5)	
Civil servants		16 (8.0)	Others		10 (5.0)	
Businessmen		19 (9.5)	Total		200 (100)	
Unemployed		15 (7.5)	Family history of psychiatry illness		No family member	149 (74.5)
Butchers		6 (3.0)			One family member	34 (17.0)
Total		200 (100)			Two family members	7 (3.5)
Educational status		Primary			15 (7.5)	Three family members
	Secondary	62 (31.0)		Total	200 (100)	
	Tertiary	40 (20.0)	Family history of drug abuse	No family member	190 (95.0)	
	Informal edu	71 (35.5)		One family member	8 (4.0)	
	Adult educ	2 (1.0)		Two family members	0 (0)	
	Uneducated	10 (5.0)		Three family members	2 (1.0)	
Total	200 (100)	Total		200 (100)		

Table 2. Age mapping of various cumulative substances abused (n=551, as per total number of substances abused per patient)

Substance	Age strata distribution of abusers (years)						Total N (%)	P-value
	10-19.9 n (%)	20-29.9 n (%)	30-39.9 n (%)	40-49.9 n (%)	50-59.9 n (%)	60-69.9 n (%)		
Nicotine	7 (7.9)	41 (46.1)	29 (32.6)	2 (2.2)	8 (9.0)	2 (2.2)	89 (100)	0.390
Alcohol*	0 (0)	11 (44.0)	3 (12.0)	2 (8.0)	7 (28.0)	2 (8.0)	25 (100)	0.000
Cannabis	12 (9.6)	68 (54.4)	35 (28.0)	2 (1.6)	8 (6.4)	0 (0)	125(100)	0.313
Tramadol*	14 (10.4)	75 (55.6)	41 (30.4)	3 (2.2)	0 (0)	2 (2.2)	135(100)	0.000
Rohypnol	1 (7.1)	9 (64.3)	4 (28.6)	0 (0)	0 (0)	0 (0)	14 (100)	0.850
Nitrazepam*	0 (0)	2 (25.0)	2 (25.0)	2 (25.0)	0 (0)	2 (25.0)	8 (100)	0.000
Diazepam	3 (5.4)	33 (58.9)	15 (26.8)	2 (3.6)	1 (1.8)	2 (3.6)	56 (100)	0.265
Benzhexol	3 (8.3)	24 (66.7)	9 (25.0)	0 (0)	0 (0)	0 (0)	36 (100)	0.274
Codeine	1 (6.7)	10 (66.7)	4 (26.7)	0 (0)	0 (0)	0 (0)	15 (100)	0.785
Janki	0 (0)	0 (0)	2 (100)	0 (0)	0 (0)	0 (0)	2 (100)	-
Caffeine*	1 (8.3)	5 (41.7)	2 (16.7)	2 (16.7)	0	2 (16.7)	12 (100)	0.000
Cold remedy	0 (0)	2 (100)	0 (0)	0 (0)	0 (0)	0 (0)	2 (100)	-
Suck and die	1 (4.8)	13 (61.9)	6 (28.6)	0 (0)	1 (4.8)	0 (0)	21 (100)	0.825
Solvents*	5 (45.5)	2 (18.2)	4 (36.4)	0 (0)	0 (0)	0 (0)	11 (100)	0.004
Total	48 (8.7)	295 (53.5)	156 (28.3)	15 (2.7)	25 (4.5)	12 (2.2)	551 (100)	

*Age related abuse of substance is significant at (P<0.05) level by Chi square analysis

Table 3. Educational mapping of substance of abuse (n=551, as per total number of substances abused per patient)

Substance abused	Educational status of abusers						Total N (%)	P-value
	Primary n (%)	Secondary n (%)	Tertiary n (%)	Info-edu n (%)	Ad edu n (%)	Uneduc n (%)		
Nicotine	9 (10.1)	23 (25.8)	24 (27.0)	26 (29.0)	2 (2.2)	5 (5.6)	89 (100)	0.240
Alcohol*	2 (8.0)	6 (24.0)	12 (48.0)	1 (4.0)	0 (0)	4 (16.0)	25 (100)	0.000
Cannabis	12 (9.6)	33 (26.4)	25 (20.0)	49 (39.0)	2 (1.6)	4 (3.2)	125(100)	0.381
Tramadol*	7 (5.2)	43 (31.9)	23 (17.0)	58 (43.0)	0 (0)	4 (3.0)	135(100)	0.002
Rohypnol	1 (7.1)	3 (21.4)	7 (50.0)	2 (14.3)	0 (0)	1 (7.1)	14 (100)	0.093
Nitrazepam*	2 (25.0)	6 (75.0)	0 (0)	0 (0)	0 (0)	0 (0)	8 (100)	0.017
Diazepam*	2 (3.6)	26 (46.4)	12 (21.4)	12 (21.4)	0 (0)	4 (7.1)	56(100)	0.019
Benzhexol	2 (5.6)	18 (50.0)	7 (17.4)	9 (25.0)	0 (0)	0 (0)	36 (100)	0.096
Codeine	0 (0)	5 (33.3)	6 (40.0)	3 (20.0)	0 (0)	1 (6.7)	15 (100)	0.322
Janki	0 (0)	2 (100)	0 (0)	0 (0)	0 (0)	0 (0)	2 (100)	-
Caffeine	1 (8.3)	6 (50.0)	0 (0)	4 (33.3)	0 (0)	1 (8.3)	12 (100)	0.483
Cold remedy	0 (0)	2 (100)	0 (0)	0 (0)	0 (0)	0 (0)	2 (100)	-
Suck and die	3 (14.3)	4 (19.0)	6 (28.0)	8 (38.1)	0 (0)	0 (0)	21 (100)	0.436
Solvents	1 (9.1)	2 (18.2)	1 (9.1)	7 (63.6)	0 (0)	0 (0)	11 (100)	0.461
Total	42 (7.6)	179 (32.5)	123 (22.3)	179 (32.5)	4 (0.7)	24 (4.4)	551 (100)	

Key: Info-edu (Informal education), Ad edu (Adult education, Unedu (Uneducated)

*Educational level related abuse of substance is significant at (P<0.05) level by Chi square analysis

The mapping for abuse substances along with the levels of education (Table 3) indicated a significance differences across the various educational backgrounds in substances like alcohol (P=000), tramadol (P=0.002) and nitrazepam (P=0.017). The mapping of substance abused based on marital status distribution (Table 4) showed that in nearly all cases, the proportions of abusers who are single dominate over those who are married. The odds value of single to married for various substances abused are nicotine (1.6), alcohol (1.1), cannabis (3.4), tramadol (3.0), rohypnol (6.0), nitrazepam (3.0), diazepam (4.6), benzhexol (2.6), caffeine (1.4), suck and die (1.0) and solvents (2.7).

These findings may have suggested that marital status plays a role in the pattern of abuses of most substances.

The mapping of substance abuse for various occupational backgrounds (Tables 5a and 5b) showed a significance differences in the pattern of abuse of some substances along occupational line. These substances are alcohol (P=0.001), tramadol (P=0.000), rohypnol (P=0.041), nitrazepam (P=0.009), diazepam (P=0.001), bezhexol (P=0.000), and codeine (P=0.000). These findings may have suggested that some substances are abused because of the occupational activities of the abusers.

4. DISCUSSION

Our study does not find reported cases of women with substance abuse associated disorders during the three months duration of the pilot study. This however does not imply that such cases do not exist. Both genders are known to abuse substances although male abusers are more prevalent than the female. According to SAMHSA [14], men are more likely than women to use almost all illicit drugs and illicit drug use is more likely to result in emergency departmental visits for men than for women. Men of all age strata also have the likelihood of substance abuse than women [15]. The result of this study is in contrast to some researchers who reported

cases of psychiatric disorders like bipolar disorder (mania), unipolar disorder (depression), and dementia to be higher in women than men [16].

All forms of agents are identified to be abused in the study including agents that are locally sourced. Most of the substances abused are cheap and readily available. They generally fall under the subclass of stimulants, depressants, opioid, inhalants, and cannabis and so on. There were no reported cases of hard substances like cocaine, heroin or morphine used by abusers. A high proportion of abusers in this study use tobacco possibly for various reasons. But generally, reasons attributed to use of tobacco

Table 4. Mapping of substance of abuse using marital status (n=551, as per total number of substances abused per patient)

Substance abused	Marital status of abusers			Total N (%)	Odds
	Single n (%)	Married n (%)	Divorced n (%)		
Nicotine	54 (60.7)	33 (37.1)	2 (2.2)	89 (100)	1.6
Alcohol	13 (52.0)	12 (48.0)	0 (0)	25 (100)	1.1
Cannabis	95 (76.0)	28 (22.4)	2 (1.6)	125(100)	3.4
Tramadol	100 (74.1)	33 (24.4)	2 (1.5)	135(100)	3.0
Rohypnol	12 (85.7)	2 (14.3)	0 (0)	14 (100)	6.0
Nitrazepam	6 (75.0)	2 (25.0)	0 (0)	8 (100)	3.0
Diazepam	46 (82.1)	10 (17.9)	0 (0)	56(100)	4.6
Benzhexol	26 (72.7)	10 (27.8)	0 (0)	36 (100)	2.6
Codeine	15 (100.0)	0 (0)	0 (0)	15 (100)	-
Janki	2 (100.0)	0 (0)	0 (0)	2 (100)	-
Caffeine	7 (58.3)	5 (41.7)	0 (0)	12 (100)	1.4
Cold remedy	2 (100.0)	0 (0)	0 (0)	2 (100)	-
Suck and die	10 (47.6)	10 (47.6)	1 (4.8)	21 (100)	1.0
Solvents	8 (72.7)	3 (27.3)	(0)	11 (100)	2.7
Total	396 (71.9)	148 (26.9)	7 (1.3)	551 (100)	2.8

Table 5a. Mapping of substance of abuse with occupational status (n=551, as per total number of substances abused per patient)

Substance abused	Occupational status of abusers						
	Artisans n (%)	Students n (%)	Cat-Shep n (%)	Tricyclist n (%)	Driver n (%)	Farmer n (%)	Traders n (%)
Nicotine	6 (6.7)	20 (22.5)	2 (2.2)	4 (4.5)	0 (0)	9 (10.1)	8 (9.0)
Alcohol	3 (12.0)	6 (24.0)	0 (0)	1(4.0)	0 (0)	0 (0)	3 (12.0)
Cannabis	9 (7.2)	29 (23.2)	3 (2.4)	8 (6.4)	2 (1.6)	17 (13.6)	10 (8.0)
Tramadol	4 (3.0)	31 (23.0)	6 (4.4)	11 (8.1)	8 (5.9)	20 (14.8)	4 (3.0)
Rohypnol	2 (14.3)	6 (42.9)	0 (0)	3 (21.4)	0 (0)	0 (0)	0 (0)
Nitrazepam	0 (0)	0 (0)	0 (0)	2 (25.0)	0 (0)	2 (25.0)	0 (0)
Diazepam	2 (3.6)	14 (25.0)	1 (1.8)	9 (16.1)	4 (7.1)	2 (3.6)	4 (7.1)
Benzhexol	0 (0)	12 (33.3)	0 (0)	9 (25.0)	0 (0)	3 (8.3)	1 (2.8)
Codeine	0 (0)	4 (26.7)	0 (0)	4 (26.7)	0 (0)	1 (6.7)	0 (0)
Janki	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Caffeine	1 (8.3)	1 (8.3)	0 (0)	0 (0)	0 (0)	3 (25.6)	1 (8.3)
Cold remedy	0 (0)	2 (100)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Suck and die	1 (4.8)	3 (14.3)	0 (0)	0 (0)	0 (0)	6 (28.6)	4 (19.0)
Solvents	2 (18.2)	2 (18.2)	1 (9.1)	0 (0)	0 (0)	4 (36.4)	0 (0)
Total	30 (5.4)	130 (23.6)	13 (2.4)	51 (9.3)	14 (2.5)	67 (12.2)	35 (6.4)

Table 5b. Mapping of substance of abuse with occupational status (n=551, as per total number of substances abused per patient)

Substance abused	Occupational status of abusers						P-values	
	Labourer n (%)	EU-men n (%)	C/servant n (%)	Business n (%)	Unemp n (%)	Butcher n (%)		Total N (%)
Nicotine	7 (7.9)	2 (2.2)	12 (13.5)	11 (12.4)	6 (6.7)	2 (2.2)	89 (100)	0.451
Alcohol*	0 (0)	0 (0)	8 (32.0)	2 (8.0)	2 (8.0)	0 (0)	25 (100)	0.001
Cannabis	10 (8.0)	2 (1.6)	10 (8.0)	12 (9.6)	8 (6.4)	5 (4.0)	125 (100)	0.659
Tramadol*	13 (9.6)	4 (3.0)	5 (3.7)	17 (12.6)	10 (7.4)	4 (3.0)	135 (100)	0.000
Rohypnol*	0 (0)	0 (0)	0 (0)	0 (0)	3 (21.4)	0 (0)	14 (100)	0.041
Nitrazepam*	0 (0)	2 (25.0)	0 (0)	2 (25.0)	0 (0)	0 (0)	8 (100)	0.009
Diazepam*	1 (1.8)	2 (3.6)	2 (3.6)	8 (14.3)	7 (12.5)	0 (0)	56 (100)	0.001
Benzhexol*	4 (11.1)	2 (5.6)	1 (2.8)	2 (5.6)	0 (0)	2 (5.6)	36 (100)	0.000
Codeine*	0 (0)	0 (0)	0 (0)	0 (0)	6 (40.0)	0 (0)	15 (100)	0.000
Janki	2 (100)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	2 (100)	-
Caffeine	3 (25.0)	1 (8.3)	0 (0)	2 (16.7)	0 (0)	0 (0)	12 (100)	0.362
Cold remedy	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	-
Suck and die	1 (4.8)	0 (0)	3 (14.8)	3 (14.8)	0 (0)	0 (0)	21 (100)	0.067
Solvents	2 (18.2)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	11 (100)	0.130
Total	43 (7.8)	15 (2.7)	41 (7.4)	59 (10.7)	42 (7.6)	13 (2.4)	551 (100)	

Key: EU-Men-ex uniform men, C/servant-civil servants, unemp-unemployed

*Occupational related abuse of substance is significant at ($P<0.05$) level by Chi square analysis

include pleasure, improved performance and vigilance, relief of depression, curbing hunger and weight control [12]. Although nicotine is the primary addicting substance in cigarettes, the smoke also contains several other chemicals that are also hazardous to health and may cause or exacerbate conditions like heart disease, lung cancer and emphysema, peptic ulcer disease, and stroke while the withdrawal symptoms of smoking include anxiety, hunger, sleep disturbances, and depression [12].

It is also a common problem among individuals as the first illegal drug use to show an increased risk of progressing to other more powerful and dangerous agents like cocaine and heroin [12]. For instance, most users of marijuana in this study also co-abuse tramadol. The reasons for multiple substance co-abusers may be due to the tolerance that easily developed among the substances as well as the fear of the withdrawal syndrome of such substance. The risk for marijuana abusers progressing to harder agents like cocaine is reported to be 104 times higher if one had smoked marijuana at least once than if one never smoked marijuana before but the non-affordability/availability of these harder agents may have prompted many abusers to resort to using multiple agents since abusers tends to often use agents they can afford or available [17].

Substance abuse affects all age strata but the critical ages of abusers in this study are in those

in their third and fourth decades of life which correspond to 20-40 years and accounted for majority of all the substances abused. The distribution for most agents rises between the second and the third decades of life before declining. The age dependent declines in the proportion of abusers of agents like cannabis, tramadol, rohypnol, diazepam, benzhexol, codeine, suck and die were significantly correlated with age ($P<0.05$). Generally, for all agents, the proportion of abusers significantly decrease ($P<0.05$) when the abusers who are below 40 years of age were compared with those above 40 years. This may be attributable to influence of peer groups and drug experimentations which may peak during this age brackets. Similarly the number of substances abused decreases with increasing age strata. For instance, out of 14 substances identified in this study, nearly all of them were abused by those below 40 years whereas about half or less of these substances was abused among those who are above 40 years of age.

The distribution of some substance of abuse cuts across all the age strata while others are not. For instance, the distribution of cannabis and tramadol, caffeine, nicotine and diazepam, suck and die affected all age strata. Abusers of agents like alcohol, nitrazepam also had a good spread across the age strata but the teens are not affected. No abusers of agents like rohypnol, benzhexol, codeine, and 'solvents' in those 40 years and above. Nicotine, alcohol, cannabis and

diazepam are agents mostly abused by those above 50 years of age. Study has similarly indicated decline incidence of substance abuse with advancing age [18]. Early age of substance abuse can however progress to addiction or substance abuse disorder [19,20]. There was a significant difference ($P < 0.05$) when the various age strata was compared in substances like alcohol, tramadol, nitrazepam, caffeine, and solvents while other substances showed no age dependent differences.

Patients with adult education recorded no cases of abuse with all other substance of abuse except nicotine and cannabis only. Agents commonly abused among those in the category of uneducated are nicotine, alcohol, cannabis, diazepam, codeine, caffeine, tramadol and rohypnol and these cases are in the minority when compared to the high cases observed among those with primary, secondary and tertiary levels of education, which may have suggested that peer pressure may have influenced the pattern of abuse. The influence of education on the abusive pattern was only demonstrated with nicotine and alcohol which recorded a progressive increase as one moves from primary to tertiary levels of education. However, abusers with secondary level of education recorded highest cases with substances like nitrazepam, diazepam, benzehexol, and caffeine. Alcohol, rohypnol and codeine are higher in abusers with tertiary level of education than other abusers with other educational levels. Surprisingly, those with an informal education (defined as a form of education that is not western form) recorded higher abusive cases on substances like nicotine, cannabis, suck and die and solvents. There was a significant difference ($P < 0.05$) when the various age strata was compared in substances like cannabis, tramadol, nitrazepam and diazepam while other substances showed no age dependence differences.

A particular pattern of abuse was observed in those having secondary levels of education where all the 14 agents identified in this study were abused. Many factors may have contributed to the observed pattern among this group. For instance, for those in school, peer pressure from addicted friends may be a strong factor. But for those who may have started the habit while in secondary school and unable to quit, the addictive and dependence natures of the substances may play a role. But generally, most of these agents are relatively cheap and

available and most young addicts may want to experiment by trying several agents. In contrast to what is observed among holders of secondary school levels, only few of the substances were abused by those with adult education.

The mapping of the abusers based on their marital status indicated that more than three-quarter each of abusers of cannabis, rohypnol, nitrazepam and diazepam are single. All abusers of codeine are single while the abusers of alcohol are nearly in equal proportion between the single and the married population. The proportions of the abusers of nicotine, tramadol, benzehexol and caffeine were also observed in the majority among the single class compared to the married class. The overall distributions between the two categories of people indicated that the single population accounted for more than two-third of the patients while the married class are slightly above one-quarter. A minority of patients are divorced in this study. Although the association between substance abuse that may lead to addiction and ability to keep family was not evaluated in the study, but keeping family can pose a great deal of problem among many substance abusers particularly substance abuse that have advanced to addiction. This is particularly so when most family fortune is lost to addiction or abuse of substance. The findings in this study may partly explain why most African societies do not consider most unmarried adults as being responsible citizen particularly those that are involved in vices associated with substance abuse.

The occupations of the abusers cut across several types. We observed that people of low economic class are mostly affected and the entire substances abused are the cheap, readily available and cost effective agents. Student abuse all the agents in this study except janki (an adulterated form of heroin) and nitrazepam. The quartet of nicotine, cannabis, tramadol and diazepam is abused in all occupation but students are the worst abusers of nicotine, cannabis and tramadol as judged by the high abusive rate. Farmers ranked second to students in the abuse of cannabis and tramadol but ranked highest in suck and die, solvents, caffeine and nitrazepam. Surprisingly, the applicant and the unemployed group ranked highest in the abuse of codeine usually contained in cough syrups. Labourers take stimulants like caffeine, cannabis and nicotine in high proportion possibly because they decrease tolerance to fatigue and improve work activity. This also explained why

farmers use stimulants in high proportion while they tend to use sedatives like diazepam and nitrazepam to counter the effects of stimulants and to achieve sleep putting them in the abusive cycle that oscillate between stimulant and depressants. Many agents are abused in this study due to the euphoric effect abusers derived from them at high doses. Students, applicants and the commercial tri-cyclist or motorcyclist riders (also known as 'okada riders') and 'artisan' (describe as apprentice and manual self-employed job) to a lesser degree are the only abusers of rohypnol. Although the reasons for the use of rohypnol were not assessed in this study, but the agent has been implicated as date-rape drug and many of the okadas's activities have been banned or restricted in many states of Nigeria due to the criminal activities carry out while on the influence of substances. The major agents abused by civil servants is alcohol while most business men abuse nicotine, cannabis, tramadol, caffeine and diazepam and nitrazepam mostly which is possibly influenced by their occupational demands. The occupational related abuse of substances was found to be significant ($P < 0.05$) in nearly all the substances except alcohol, cannabis, caffeine and solvents.

5. CONCLUSION

Substance abuse affects all age strata but the critical ages of abusers are those in their third and fourth decades of life which correspond to between 20 and 40 years since the influence of peer groups and drug experimentations are at their peak during this age bracket. The distribution of abusers also cuts across diverse occupation backgrounds and for many individuals, the distribution pattern of substance abuse and the occupation appeared to be well correlated. Gender influence as a risk factor for substance abuse is unequivocally demonstrated by all-male subjects in the study. Similarly, the abusers who are single and unmarried are higher than the married patients. The relatively distinct profiles of the patients who abuse single agent and those who abuse more than one substance suggest the need for preventive educational programs specifically tailored to each of these two groups and their age of risk. These findings underscore the need for intensive educational measures to curb the menace as well as for our national drug enforcement agency to also focus more attention on in-door substance abuse of substance in addition to the street drug abuses they have always focussed on.

CONSENT

All authors declare that 'written informed consent was obtained from the patient or their care giver'.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Doyle R. Deaths due to alcohol. *Sci Am.* 1996;275(6):30–31.
2. American Academy of Pediatrics, Committee on Substance Abuse (AAP). Tobacco use: A pediatric disease. *Pediatrics.* 2009;124(5):1474–1487.
3. National Drug Intelligence Center (NDIC). The Economic Impact of Illicit Drug Use on American Society. Washington D.C.: United States Department of Justice; 2011. Available: <http://www.justice.gov/archive/ndic/pubs44/44731/44731p.pdf>
4. Centers for disease control and prevention. Smoking-attributable mortality, years of potential life lost, and productivity losses—United States, 2000–2004. *Morbidity and Mortality Weekly Report.* Available: <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5745a3.htm>
5. Rehm J, Mathers C, Popova S, Thavorncharoensap M, Teerawattananon Y, Patra J. Global burden of disease and injury and economic cost attributable to alcohol use and alcohol-use disorders. *Lancet.* 2009;373(9682):2223–2233.
6. American Psychiatric Association. Text Revision (DSM-IV-TR): In *Statistical and Diagnostic Manual of Mental Disorders; Fourth Edition*, Washington, DC; American Psychiatric Association; 2000.
7. Puri BK. Medication- and substance-induced disorders. *Textbook of Clinical Neuropsychiatry and Behavioral Neuroscience.* London, United Kingdom: Hodder Arnold. 2012;70(6):786-804.
8. Cargiulo T. Understanding the health impact of alcohol dependence. *Am J Health System Pharmacy.* 2007;B4 (Suppl):S5-11.
9. Dilal PK, Sivakumar T. Moving toward ICD-11 and MSM-5 concept and evolution of psychiatric classification. *Ind J Psychiatry.* 2009;51(4):310-319.

10. National Center on Addiction and Substance Abuse (NCASA). National Survey of American Attitudes on Substance Abuse IX: Teen Dating Practices and Sexual Activity. New York, NY: National Center on Addiction and Substance Abuse; 2004.
11. Doll R, Peto R, Boreham J, Sutherland I. Mortality in relation to smoking: 50 Years' observations on male British doctors. *British Medical Journal*. 2004;328(7455): 1519–1528.
12. Daily KP, Richards J. Substance abuse and addiction Health Center; 2016. Available: <http://www.webmd.com/mental-health/addiction/substance-abuse?page=4> (Accessed August 2016)
13. Sharon MB, Karen M. Substance abuse and violence: A review of the literature. *Aggression and Violent Behavior*. 2003; 8(2):155-174.
14. Substance Abuse and Mental Health Services Administration (SAMHSA). Results from the 2013 National Survey on Drug Use and Health: Summary of National Findings. Rockville, MD: Substance Abuse and Mental Health Services Administration. HHS Publication No. (SMA) 14-4863. NSDUH Series H-48; 2014.
15. Center for Behavioral Health Statistics and Quality, Substance Abuse and Mental Health Services Administration, Treatment Episode Data Set (TEDS). Substance Abuse Treatment Admissions by Primary Substance of Abuse, According to Sex, Age Group, Race, and Ethnicity, Year = 2012, United States. Available: www.dasis.samhsa.gov/webt/quiclink/US12.htm (Accessed July 7, 2015)
16. Lambert MT, Griffith JM, Hendrickse W. Characteristics of patients with substance abuse diagnoses on a general psychiatry unit in a VA Medical Center. *Psychiatr Serv*. 1996;47(10):1104-7.
17. Szalavitz M. Marijuana as a gateway drug: The myth that will die; 2010. Available: <http://healthland.time.com/2010/10/29/marijuana-as-a-gateway-drug-the-myth-that-will-not-die/> (Accessed on Aug, 2016)
18. Substance Abuse and Mental Health Services Administration (SAMHSA), Office of Applied Studies. The DAWN Report: Emergency Department Visits Involving Illicit Drug Use by Older Adults; 2008. Available: <http://oas.samhsa.gov/2k10/DAWN015/IllicitAbuse.cfm> (Accessed April 19, 2012)
19. Dennis M, Babor TF, Roebuck C, Donaldson J. Changing the focus: The case for recognizing and treating cannabis use disorders. *Addiction*. 2002;97:(S1): 4–15.
20. McCabe SE, West BT, Morales M, Cranford JA, Boyd CJ. Does early onset of non-medical use of prescription drugs predict subsequent prescription drug abuse and dependence? Results from a national study. *Addiction*. 2007;102(12): 1920–1930.

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Peer-review history:
The peer review history for this paper can be accessed here:
<http://sciedomain.org/review-history/15986>