
AFRICAN JOURNAL

of
DRUG
and
ALCOHOL STUDIES

In this Issue

ALCOHOL PROMOTION STRATEGIES IN NIGERIA

CONSTITUENTS OF STREET DRUG MIXTURE *NYAOPE*

DRUG USE AMONG LONG DISTANCE COMMERCIAL VEHICLE DRIVERS

SUBSTANCE USE AND ADLOESCENTS IN BOTSWANA

INJECTING DRUG USE AND HARM REDUCTION SUB-SAHARAN AFRICA

PATTERNS OF SUBSTANCE USE AMONG STUDENTS IN SOUTH AFRICA

PURPOSE AND SCOPE

The *African Journal of Drug & Alcohol Studies* is an international scientific peer-reviewed journal published by the African Centre for Research and Information on Substance Abuse (CRISA). The Journal publishes original research, evaluation studies, case reports, review articles and book reviews of high scholarly standards. Papers submitted for publication may address any aspect of alcohol and drug use and dependence in Africa and among people of African descent living anywhere in the world.

The term “drug” in the title of the journal refers to all psychoactive substances other than alcohol. These include tobacco, cannabis, inhalants, cocaine, heroin, prescription medicines, and traditional substances used in different parts of Africa (e.g., kola nuts and khat).

EDITORIAL AND MANAGEMENT TEAM

EDITOR-IN-CHIEF

Prof. Isidore Silas Obot
Centre for Research and Information
on Substance Abuse (CRISA)
E-mail: iobot@crisanet.org;
obotis@gmail.com

DEPUTY EDITORS

West Africa

Professor Hope Obianwu
Niger Delta University
Wilberforce Island, Nigeria

Southern & Central Africa

Professor Charles J. Parry
Medical Research Council
Cape Town, South Africa
E-mail: cparry@mrc.ac.za

Eastern Africa

Prof. David M. Ndeti
University of Nairobi
Nairobi, Kenya
E-mail: dmndetei@mentalhealthafrica.com

Francophone countries

Prof. Baba Koumare
Hopital Point G
Bamako, Mali
E-mail: babakoumare@hotmail.com

Rest of the world

Prof. James T. Gire
Virginia Military Institute
Lexington, VA, USA
E-mail: jtgire@vmi.edu

ASSOCIATE EDITORS

Dr Neo Morojele
Medical Research Council
Pretoria, South Africa
E-mail: neo.morojele@mrc.ac.za

Dr Nazarius Mbona Tumwesigye
Makerere University
Kampala, Uganda
E-mail: naz@iph.ac.ug

Dr Andrew Zamani
Psychiatric Hospital
Gwagwalada, Abuja, Nigeria
E-mail: zamaning@yahoo.com

MANAGING EDITOR

Akanidomo J. Ibanga, CRISA
E-mail: akjibanga@yahoo.com

EDITORIAL ASSISTANTS

Pam Cerff, *Cape Town, South Africa*
Danjuma Ojei, *Jos, Nigeria*

EDITORIAL ADVISORY BOARD

Dr Rey Chad Abdool, *Nairobi, Kenya*
Dr O.A. Ayo-Yusuf, *Pretoria, South Africa*
Prof. Moruf Adelekan, *Blackburn, UK*
Dr Yahyah Affinih, *New York, USA*
Prof. E. E. O. Alemika, *Jos, Nigeria*
Dr Pascal Bovet, *Seychelles*
Prof. Layi Erinosh, *Abuja, Nigeria*
Prof. A.J. Flisher, *Cape Town, South Africa*
Dr Axel Klein, *London, UK*
Prof. Hope Obianwu, *Benin, Nigeria*
D. A. Pritchard, *Swaziland*

CONTENTS

Prevalence of substance use and correlates of multiple substance use among school-going adolescents in Botswana	75
<i>Gobopamang Letamo, Motsholathebe Bowelo, & Rolang George Majelantle</i>	
Drug interactions in the constituents of street drug mixture “nyaope” in South Africa: a mini-review	91
<i>Aye Aye Khine & Kebogile Elizabeth Mokwena</i>	
Drug use disorders among long distance commercial vehicle drivers.....	103
<i>Christopher I. Okpataku</i>	
Patterns of substance use and its predictors among North-West University students Mafikeng campus	111
<i>Godswill N. Osuafor, Sonto M. Maputle & Natal Ayiga</i>	
The social context of injection drug use and harm reduction programmes in Sub-Saharan Africa	123
<i>Ediomo-Ubong E. Nelson</i>	
Anywhere, everywhere: alcohol industry promotion strategies in Nigeria and their influence on young people	135
<i>Emeka W. Dumbili & Clare Williams</i>	

Abstracting/Indexing services:

The journal is indexed/abstracted by the following services: Addiction Abstracts, African Journals Online (AJOL), DrugScope, Applied Social Sciences Index, Social Services Abstracts, Sociological Abstracts, Scopus, Embasse, and PsycINFO.

PREVALENCE OF SUBSTANCE USE AND CORRELATES OF MULTIPLE SUBSTANCE USE AMONG SCHOOL-GOING ADOLESCENTS IN BOTSWANA

Gobopamang Letamo, Motsholathebe Bowelo, & Rolang George Majelantle

Department of Population Studies, University of Botswana, Gaborone, Botswana

ABSTRACT

The purpose of the current study was to estimate the prevalence of substance use and correlates of multiple substance use among adolescents in Botswana. The study was a cross-sectional study in which a random sample of 3,763 students aged 10 to 19 years. A survey questionnaire was self-administered using a personal digital assistant in 15 education districts of Botswana. Bivariate and multinomial logistic regression analyses were used to analyse the data. The study results indicate that the lifetime prevalence was 18.1% for tobacco use and 15.9% for alcohol use. The multiple substance use among adolescents in descending order were: alcohol and tobacco (42.5%); illicit drugs and tobacco (26.6%); alcohol, tobacco and illicit drugs (18.7%); and illicit drugs and alcohol (12.3%). Male adolescents were more likely than their female counterparts to have experienced multiple substance use of drugs and alcohol (OR, 2.0; 95% CI, 1.3-3.3); alcohol, tobacco and drugs (OR, 2.4; 95% CI, 1.7-3.4), tobacco and alcohol (OR, 2.2; 95% CI, 1.6-2.8) and illicit drugs and tobacco (OR, 1.5; 95% CI, 0.9-2.3). Lifetime use of habit-forming substance and multiple substance use were common in Botswana and as such require immediate programme intervention.

Keywords: Smoking, drinking, drug prevalence, multiple substance use, adolescents, Botswana.

INTRODUCTION

Substance use among youths is becoming a global public health problem (Qadri, Goel, Singh, Ahluwalia, Pathak, & Bashir, 2013). Substance use exposes adolescents to the risk of unplanned pregnancy,

teenage childbearing, and contracting a sexually transmitted infection (STI), including HIV by inhibiting the use of contraception (World Health Organisation (WHO), 2011). Substance abuse contributes to intentional and unintentional injuries, mental health problems, sexual and

reproductive health problems, and HIV infections in high-income countries (WHO, 2011). Alcohol abuse is recognized as a major health risk in Botswana (Pitso and Obot, 2011). In both the Botswana National Strategic Framework for HIV/AIDS 2003–09 and the Substance Abuse and Drug Trafficking Strategic Plan 2003–07, alcohol abuse was identified as one of the key socio-cultural factors driving the HIV/AIDS epidemic (Pitso and Obot, 2011). The Botswana National Alcohol Policy Draft has been developed, and notes that the government has an over-riding duty of care to ensure that vulnerable members of the community (particularly young people) are, as far as possible, protected against the impact of alcohol abuse in all its manifestations (The National Policy on Alcohol, 2008).

Many researchers consider alcohol and tobacco to be a “gateway” to illicit drugs use in that their use most often precedes that of marijuana (Kandell, Yamaguchi and Chan, 1992; Clayton and Voss, 1982). Similarly, the use of marijuana precedes that of illicit drugs such as cocaine and heroin (Kandel, Yamaguchi and Chan, 1992). Alcohol use is the largest single contributor to health risks in young people, as measured by the number of disability-adjusted life years (WHO, 2011). Evidence from existing literature shows that tobacco use is a global problem because it is the leading preventable cause of premature mortality and is a risk factor for several diseases, including cancer, cardiovascular and respiratory diseases (United States Department of Health and Human Services (USDHHS), 2010; WHO, 2011). Second-hand smoking (SHS) is also linked to respiratory diseases such as bronchial diseases in children (International Agency for Research on Cancer (IARC), 2002; USDHHS,

2006). Of the 603,000 deaths attributable to SHS in 192 countries in 2004, 28% were children (Oberge, Jaakkola, Woodward, Peruga and Pruss-Ustun, 2011), making tobacco use and control important public health issues for adults and children, particularly because 80% to 90% of smokers start smoking during childhood (USDHHS, 2012).

Substance use and abuse, particularly among young people, have been identified as priority issues in improving the health and economy of a country (Madu and Matla, 2003). Substance use among adolescents in all parts of the world continues to be a significant health problem (Brook, Morojele, Pahl and Brook, 2003). This is particularly true in of Botswana. Lewis (1996) has highlighted that adolescents who become dependent on illicit drugs often experience disruption of relationships with family, teachers, peers; and a heightened deterioration of school and work performance. Road traffic accidents, suicide, violence and high-risk sexual behaviour are often attributed to adolescent substance use (National Institute on Alcohol Abuse and Alcoholism, 2003; Stolle, Sack, and Thmasius, 2009: cited in Moodley, Matjila and Moosa, 2012). The adverse health, behavioural, psychological and social consequences of alcohol consumption among the youth cannot be overemphasized (Pretorius, Ferreira and Edwards, 1999). Despite this evidence, there is limited data on the extent of substance use or abuse in Botswana among adolescents.

Very little information is available on the prevalence and use of polysubstances such as alcohol, smoking and drugs among adolescents in Botswana. Since the use of polysubstances compromise health, in particular the HIV and AIDS epidemic, it is

important to investigate the extent of the use of polysubstances particularly among the young people who are heavily affected by the scourge. This study is one of the few to provide scientific evidence on multiple substance use among adolescents in Botswana. It will enable policymakers to design evidence-based programmes targeting adolescents. This study aims to estimate the prevalence of multiple substance use and its correlates among adolescents in Botswana and inform health policies and interventions.

METHOD

Data

The data used in this study comes from the Botswana Youth Risk Behavioural Surveillance Survey (BYRBSS), which is a cross-sectional study. The BYRBSS was designed to assess awareness of the health-risk behaviours among learners aged 10-19 years; to establish baseline data that will be used track health-risk behavioural trends among learners in Botswana; to examine co-occurrence of risky behaviours exposing learners in Botswana to HIV infection such as drugs, alcohol, crime and sexual behaviour; and to identify exposure to and impact of various components of the Ministry of Education implemented prevention interventions among learners in Botswana (BYRBSS, 2011).

Sampling procedure and Participants

Since a complex sample design was used in this survey, the use of standard statistical procedures cannot be used to compute estimates of the desired parameters. The survey used a multi-stage stratified sampling design dictating that the analysis should use complex sample

module to account for multiple stages of sampling. In order to produce a nationally representative sample of learners, 15 educational districts were used as primary sampling sites and the secondary sampling sites were the schools. The schools were selected using probability proportional to size based on total school enrolment data of the year 2007. Five schools of upper primary (i.e. 10-12 year-olds) and five junior and senior secondary schools (i.e. 13-19 year-olds) were selected. In order to select classrooms, a list of classes in each type of school (i.e. upper primary, junior, and senior secondary schools) was ordered by grade and two classes in each sampled school were selected randomly. The school response rate was 92.9%; the student response rate was 88.3%, and the overall response rate was 82.1%. A total of 4,289 students participated in the BYRBSS (for more details on sampling see Republic of Botswana, 2011).

Measures

Three substance use measures were used in this study, namely, smoking, drug use, and drinking or alcohol use. All substance use measures are self-reported. Lifetime prevalence rates were estimated as stated below. Smoking was defined as having ever tried or experimented with cigarette smoking. It was derived from this question: "Have you ever tried or experimented with cigarette smoking, even one or two puffs?" Drug use was derived from this question: "Some people have tried a range of different types of drugs that are used to get high (feel good, relaxed). Which of the following, if any, have you tried?" The list of drugs which provided as items to choose from are the following: marijuana, glue, mandrax,

cocaine, ecstasy, sextasy, and other. Sextasy is a term used to refer to taking viagra and ecstasy together with the intention of increasing sexual drive when on ecstasy. Another measure of illicit drug use was injection drug use where respondents were asked: "Have you ever injected drugs"? The instruction following this question stated that drugs injected for medical purposes or treatment of an illness does not count. However, the results obtained from this variable yielded unbelievably high percentage of illicit drug use which was suspected to have been inflated mainly by including drugs (e.g. drugs for diabetes) used for medical purposes. As such this variable was not used in the paper to generate estimate of drug use. For alcohol use, our chosen outcome measure is derived from a "yes" answer to a question: "Do you sometimes take alcohol?" Current prevalence of alcohol consumption and smoking were estimated from the following questions: current alcohol consumption: "How often you take alcohol?" and current smoking status: "In the past 30 days, how often did you smoke?"

We derived variables indicative of multiple substance use by creating a multi-level variable of smoking, drug use and alcohol use. This resulted in four categories of multiple substance use: smoking and drinking; smoking and drug use; drinking and drug use; and used all three substances. For multinomial logistic regression analysis, no substance use was used as a reference category. Demographic data available in the survey were limited to gender, age, and education.

Analysis

The analysis in this study was done using IBM SPSS Statistics 22. Weighted data

were analysed using complex sample module in SPSS to account for the complex sampling designs. Bivariate analysis was conducted to estimate prevalence and multiple substance use rates with confidence intervals among school-going adolescents by selected characteristics. Multinomial logistic regression analysis, which is an extension of the binary logistic regression, was used to investigate correlates of multiple substance use among adolescents. The multinomial logistic regression was used in this instance because the categorical dependent variable has more than two levels.

Ethical considerations

Ethical clearance was sought through the Health Research Unit under the Ministry of Health in Botswana. The Ministry of Education and Skills Development performed community awareness building together with the Chief Education Officers of each district through letters and/or in person. The Chief Education Officers discussed the survey with the school heads, teachers, and parents through parent and teacher meetings. Outreach efforts to disclose how classes will be selected, the dates the survey management team will be on-site, implementation of passive informed consent to the parents, and the basic topics that will be covered in the questionnaire and the amount of time it will take were undertaken. Before the survey was to take place, the school head sent out letters to the participating learners' parents and on the day of the survey there were discussions about the survey to participating classes. Parental/guardian consent was sought and learners assent was obtained before being selected to participate or volunteer to take part in the

study (BYRBSS, 2011). The survey manager was responsible for data collection and management on a daily basis. The research assistants collected all letters sent to parents or guardians and verified that they were signed. The learners whose parents or guardian did not consent were then given the opportunity to answer the first part of the survey questionnaire which is mainly on their background characteristics only and the same applied to learners who did not assent even though their parents/guardians consented (BYRBSS, 2011).

Those that did not qualify to be part of the survey (under nine years old) were excused from the class rooms. Respondents were not coerced to take part in the study; all efforts were made to avoid deception or making false promises in order to woo participants to agree to be part of the study. All research participants were assured of anonymity/confidentiality, and that their individual and personal identities would be protected. Names or other personal identifiers were not recorded in any survey instruments. All survey records were marked with an automatically generated questionnaire identification number (BYRBSS, 2011). The study ensured that there was neither invasion of private space, physical nor social harm to human subjects participating in the study.

The learners completed a self-administered questionnaire in English during class sessions using individually issued personal digital assistants (PDAs) for the purpose. Each learner was able to take the survey at the same time. Because of the sensitivity of some of the questions, we expected some emotional reactions from the learners. Fortunately, HIV and AIDS Life Skills Education are

mainstreamed at all levels of the education system in Botswana from training of teachers and teaching of students. For example, each week, forty-minutes of Guidance and Counselling Lessons are set aside for each class and these lessons incorporate HIV and AIDS. Therefore, class teachers were nearby to assist with counselling during and after the survey in case the need arose. All the learners completed the survey, and the PDAs were collected for safekeeping and all the data were downloaded into computers for storage to avoid loss and public display of confidential information (BYRBSS, 2011).

RESULTS

The results are presented in two sections. The first presents the lifetime prevalence of single or individual substance use and the second section shows prevalence of multiple substance use.

Engagement in substance use

Lifetime prevalence of illicit drugs

This section presents results on the proportions of adolescents who reported engaging in the use of illegal drugs classified by gender. Marijuana was reported to have been tried by about 13.2% (10.9-15.8) of the adolescents and this proportion was dominated by male adolescents (15.3%) compared to female adolescents (11.4%). The next popular substance used was glue which was reported by 12.2% adolescents (13.9% males and 10.8% females) (see Table 1). According to the study results, common forms of drugs that appeared popular among the school-going adolescents were marijuana and glue (see Table 1).

Table 1. Percentages of male and female respondents who engaged in substance use by sex

	Male		Female		Total		N
	%	95% CI	%	95% CI	%	95% CI	
Marijuana	15.3	(12.4-18.7)	11.4	(8.6-15.0)	13.2	(10.9-15.8)	3763
Glue	13.9	(9.4-20.1)	10.8	(6.7-16.9)	12.2	(8.0-18.1)	3763
Mandrax	4.0	(1.9-8.1)	3.9	(1.8-7.9)	3.9	(1.9-7.7)	3763
Cocaine	5.8	(3.8-8.9)	5.2	(3.2-8.4)	5.5	(3.8-8.0)	3763
Ecstasy	3.3	(1.6-6.7)	3.6	(2.4-5.3)	3.4	(2.1-5.6)	3763
Sextasy*	5.6	(3.9-7.9)	5.3	(3.7-7.5)	5.4	(3.9-7.6)	3763
Other	1.8	(0.8-4.0)	0.6	(0.4-1.1)	1.2	(0.6-2.2)	3763
None	50.3	(38.5-62.0)	59.2	(44.7-72.3)	55.1	(42.0-67.6)	3763

***Sextasy** is a term used to describe taking viagra and ecstasy together with the intention of increasing sexual drive when on ecstasy.

From Table 1, it is clear that illicit drugs such as mandrax, cocaine and ecstasy were used by both female and male adolescents by almost similar proportions. About 4.0% of male and 3.9% of female adolescents reported using mandrax compared to 5.8% of male and 5.2% of female adolescents who reported using cocaine to get high. As such it is clear from these results that illicit drug use among adolescents does not vary much by gender.

Lifetime and current prevalence of smoking

This section contains summaries of survey data on cigarette smoking. The Botswana Youth Behavioral Surveillance Survey interviewed 3567 students for this section. Of the 3,567 students responding to the question on the use of cigarettes, 18.1% (15.0-21.7) reported having ever used or experimented with cigarette smoking. Of the 1565 male students who responded, about 23.3% (19.1-28.1) have experimented with cigarettes compared to 14.0% (11.3-17.1) of the 2002 female students (see Table 2).

The data shows that there are disproportionately lower percentages of younger

students who have ever tried smoking compared with older students. For instance, the percentages of students younger than 16 years who have ever experimented with tobacco ranged between 14.1%-17.1%. This compares with a range of 19.7%-30.5% among students who were older than 15 years. There are also variations within groups, where there are disproportionately more males than females who have ever experimented with cigarettes by age. On educational levels, a similar pattern could be said to emerge among students who have experimented with cigarette smoking during their lifetime (see Table 2).

The second section of Table 2 presents the current prevalence of smoking among adolescents. More male than female adolescents reported to be currently smoking cigarettes. The current consumption of cigarette was relatively high among adolescents aged 16-19 years and adolescents in senior secondary schools compared to those aged 10-12 and 13-15 and those from grade 5 till junior secondary. Current consumption of cigarette is almost half the lifetime prevalence of cigarette smoking.

Table 2. Lifetime and current prevalence of individual substance use among school-going adolescents by selected characteristics

Characteristic	Lifetime substance use		
	Injection drugs (% 95% CI)	Ever used alcohol (% 95% CI)	Ever smoked cigarette (% 95% CI)
Sex			
Male	23.3 (21.1-25.7)	18.7 (14.2-24.1)	23.3 (19.1-28.1)
Female	19.7 (16.2-23.7)	13.6 (9.9-18.5)	14.0 (11.3-17.1)
Age group			
10-12	22.1 (17.9-26.9)	9.7 (6.7-13.9)	14.1 (10.8-18.1)
13-15	22.2 (18.5-26.5)	13.6 (11.6-15.9)	17.1 (14.3-20.3)
16-19	19.0 (14.3-24.7)	27.2 (20.5-35.1)	24.7 (19.7-30.5)
Education			
Standards 5,6&7	23.9 (19.9-28.5)	10.8 (7.9-14.5)	15.3 (12.1-19.2)
Junior secondary	20.6 (17.2-24.4)	17.3 (15.2-19.7)	18.6 (15.8-21.6)
Senior secondary	11.9 (9.5-14.8)	37.0 (29.0-45.7)	30.4 (27.2-33.7)
Total	21.3 (18.6-24.4)	15.9 (12.0-20.8)	18.1 (15.0-21.7)
	Current substance use		
		Currently using alcohol (% 95% CI)	Currently smoking cigarette (% 95% CI)
Sex			
Male		8.7 (7.1-10.5)	9.1 (7.5-11.0)
Female		5.6 (4.4-7.1)	5.2 (4.2-6.4)
Age group			
10-12		6.9 (4.6-10.1)	6.2 (4.5-8.4)
13-15		5.0 (3.9-6.4)	6.3 (4.7-8.6)
16-19		10.2 (8.3-12.3)	8.9 (7.1-11.1)
Education			
Standards 5,6&7		6.4 (4.4-9.2)	6.6 (4.8-9.1)
Junior secondary		6.5 (4.6-9.0)	6.3 (4.9-8.1)
Senior secondary		11.4 (8.0-16.1)	10.9 (9.6-12.5)
Total		7.0 (5.9-8.3)	7.0 (5.8-8.3)

Lifetime and current prevalence of alcohol use

Out of the total of 3574 students responding to the question on ever use of alcohol, 15.9% (12.0-20.8) had ever used alcohol during their life. The percentage of male students who reported ever consuming alcohol in their lifetime was 18.7% (14.2-24.1) out of 1568 male students compared to 13.6% (9.9-18.5) of the 2006 female students.

The data showed that there were proportionately lower percentages of young-

er students who have ever used alcohol compared to older students. For instance, the percentages of students who have ever used alcohol ranged between 9.7% (6.7-13.9) and 13.6% (11.6-15.9) among those aged 10-12 and 13-15 years respectively. This compared with 27.2% (20.5-35.1) among students who were older than 15 years. On educational levels, a similar pattern emerged among students who had ever used alcohol during their lifetime (see Table 2).

The second section of Table 2 presents current prevalence of alcohol consumption among adolescents. Again, more male than female adolescents reported to be currently using alcohol, 8.7% (7.1-10.5) and 5.6% (4.4-7.1) respectively. The current consumption of alcohol was high among adolescents aged 16-19 years and adolescents in senior secondary schools, representing 10.2% and 11.4%, respectively.

Prevalence of multiple substance use

Multiple substance use was not uncommon among adolescents. Multiple substance use of alcohol and tobacco was the highest with 42.5% of all adolescents reported using both (see Table 3). A higher percentage of male compared to female adolescents reported the use of both tobacco and alcohol, 43.0% (30.3-56.6) and 41.8% (28.8-56.0), respectively. Multiple uses of both tobacco and alcohol increased with increasing age and educational levels of adolescents.

The next multiple substance use was of drugs and tobacco where 26.6% (21.1-32.9) of adolescents reported using both. A higher proportion of female rather than male adolescents reported using both drugs and tobacco, 30.0% (22.9-38.9) and 23.8% (18.5-30.0), respectively. A higher percentage of younger adolescents and those in lower schools reported using both drugs and tobacco compared to their older counterparts in secondary schools. For example, 33.9% (28.5-39.9) of adolescents in upper primary schools compared to 7.7% (3.8-14.9) of adolescents in senior secondary schools reported using both drugs and tobacco (see Table 3).

The consumption of both illicit drugs and tobacco was reported by 12.3% (8.9-16.7) of adolescents. Almost similar proportions of male and female adolescents, representing 12.8% and 11.5%, respectively, reported consuming drugs and alcohol. Higher proportions of younger adolescents and adolescents in lower schools reported using drugs and alcohol. The

Table 3. Prevalence of multiple substance use among school-going adolescents by selected characteristics

Characteristic	Multiple substance use			
	Illicit drugs & tobacco % (95% CI)	Tobacco & alcohol % (95% CI)	Illicit drugs & alcohol % (95% CI)	Alcohol, tobacco & Illicit drugs % (95% CI)
Sex				
Male	23.8 (18.5-30.0)	43.0 (30.3-56.6)	12.8 (9.2-17.6)	20.4 (10.6-35.6)
Female	30.3 (22.9-38.9)	41.8 (28.8-56.0)	11.5 (7.3-17.5)	16.4 (10.6-24.6)
Age group				
10-12	33.3 (24.6-43.3)	21.9 (13.6-33.3)	13.5 (10.4-17.3)	31.4 (19.0-47.1)
13-15	33.3 (27.3-39.9)	33.5 (23.6-45.1)	14.7 (9.0-23.0)	18.5 (10.6-30.3)
16-19	15.1 (9.8-22.6)	65.2 (53.4-75.3)	8.9 (5.0-15.5)	10.8 (7.1-16.0)
Education				
Standards 5,6&7	33.9 (28.5-39.9)	22.3 (16.5-29.5)	15.5 (8.9-25.7)	28.3 (17.2-42.7)
Junior secondary	27.3 (22.4-32.7)	48.4 (38.2-58.7)	12.2 (8.8-16.6)	12.2 (8.7-16.8)
Senior secondary	7.7 (3.8-14.9)	79.4 (75.0-83.1)	4.7 (1.3-15.7)	8.3 (5.3-12.6)
Total	26.6 (21.1-32.9)	42.5 (29.9-56.1)	12.3 (8.9-16.7)	18.7 (4.5-10.9)

concurrent consumption of alcohol, cigarettes, and drugs was reported by 18.7% (4.5-10.9) of adolescents (see Table 3).

Overall a high percentage of males reported multiple substance use compared to their female counterparts. Generally a higher percentage of school-going adolescents aged 10-12 years indicated multiple substance use compared to other adolescents, save for tobacco and alcohol. Similar patterns of multiple substance use can be observed with regards to the educational attainment of adolescents.

Factors that influence multiple substance use

In this section, we report factors influencing multiple substance use among school-going adolescents in Botswana. Table 4 presents the results on the determinants of multiple substance use among adolescents. From this table, it is apparent that male adolescents were more likely than female adolescents to report multiple substance use. Male adolescents are 2.0 times likely than females to report having tried both drugs and alcohol, and this relationship is statistically significant at 95% level. Adolescents aged 16-19 years were 2.8 times more likely to have

used drugs and tried alcohol concurrently, although this relationship was not statistically significant. Adolescents in Standards 5, 6 & 7 (upper primary) and those in junior secondary schools were more likely than those in senior secondary schools to report having tried drugs and alcohol.

Male adolescents were 1.5 times likely than females to report having tried both drugs and tobacco and this relationship was not statistically significant at 95% level. Adolescents aged 13-19 years were more likely to have tried both tobacco and drugs. However this relationship was not statistically significant at 95% level. Adolescents in Standards 5, 6 & 7 and those in junior secondary schools were more likely than those in senior secondary schools to report having tried drugs and tobacco and this relationship was not statistically significant at 95% level.

Male adolescents are 2.2 times more likely than females to report having tried both tobacco and alcohol, and this relationship was statistically significant at 95% level. Adolescents aged 13-15 and 16-19 years were more likely to have tried both tobacco and alcohol. These relationships were not statistically significant at 95% level. Adolescents in Standards 5, 6

Table 4. Correlates of multiple substance use among school-going adolescents using multinomial logistic regression

Characteristic	Illicit drugs & alcohol Odds ratio (95% CI)	Illicit drugs & smoking Odds ratio (95% CI)	Smoking & alcohol Odds ratio (95% CI)	Alcohol, smoking & illicit drugs Odds ratio (95% CI)
Sex				
Male	2.042 (1.253-3.329)	1.468 (0.946-2.279)	2.173 (1.680-2.810)	2.367 (1.660-3.377)
Age group				
13-15	1.719 (0.715-4.133)	1.452 (0.766-2.753)	1.338 (0.520-3.445)	1.019 (0.663-1.568)
16-19	2.774 (0.838-9.181)	1.608 (0.592-4.369)	2.343 (0.716-7.667)	1.481 (0.776-2.827)
Education				
Standards 5,6&7	2.435(0.429-13.831)	2.164 (0.633-7.400)	0.196 (0.078-0.491)	1.697 (0.721-3.995)
Junior secondary	1.523 (0.345-6.727)	1.733 (0.833-3.603)	0.369 (0.232-0.586)	0.804 (0.401-1.610)

& 7 and those in junior secondary schools were less likely than those in senior secondary schools to report having tried tobacco and alcohol, and these relationships were statistically significant at 95% level.

Male adolescents were 2.5 times more likely than females to report having tried alcohol, tobacco and injected drugs and this relationship was statistically significant at 95% level. Other relationships were not statistically significant at 95% level.

DISCUSSION AND CONCLUSION

The purpose of this study was to investigate the prevalence and correlates of multiple substance use among school-going adolescents in Botswana in order to inform health policies and interventions. The current study shows that marijuana use stands at 13.2% among adolescents in Botswana which is more or less similar to 12.7% among South African adolescents (Reddy et al, 2003; Reddy et al, 2011). The proportion of adolescents using glue, which is an inhalant, is 12.2% in Botswana, and is similar to the South African adolescents' use of inhalants which stood at 12.2% in 2008 (Reddy et al, 2011). In our view, marijuana may be commonly used for entertainment purpose because adolescents enjoy its effect, and because it helps them to socialize. In fact, Madu and Matla (2003) have argued that because of this, drugs (marijuana) fit conveniently in the social world of many adolescents, and play a prominent role in their recreational activities. This result is also consistent with other research showing that marijuana is the drug most likely to be used by adolescents in Europe and

the USA (Johnson et al, et al, 2001: cited in Parry et al, 2004).

The results have indicated that the majority of adolescents reported to have used marijuana and glue, while fewer reported the use of hard drugs such cocaine and mandrax. The fact of the matter is that some adolescents have experimented with habit-forming substances although the extent of use may be debated. Botswana Substance Abuse Support Network (BOSASNET) has observed that they were "experiencing a surge in the number of substance abuse addicts among young people who come to their offices seeking help to stop their drug habits" (p2). It observed that "most addicts confess to be hooked on marijuana, alcohol and/or tobacco. BOSASNET representative added that they have helped some young people who claim to be addicted to hard drugs such as cocaine and heroin. These statements clearly show that illicit drug use could be a problem in Botswana, especially among school-going adolescents.

The use of other illicit drugs such as mandrax, cocaine and ecstasy is higher among the South African adolescents compared to adolescents in Botswana. For example, 3.9% of adolescents in Botswana reported using mandrax compared to 7.4% of their South African counterparts, 5.5% Botswana adolescents compared to 6.7% South African adolescents reported using cocaine, and 3.4% adolescents in Botswana compared to 5.8% South African adolescents reported using ecstasy (Reddy et al, 2013).

The lifetime prevalence of cigarette smoking in Botswana (18.1%) is lower than that of the South African adolescents which stands at 29.5% (Reddy et al, 2013). The prevalence of cigarette smoking among adolescents in Botswana

is also lower than that in the US which stood at 44.7% in 2011 (Eaton et al, 2011). In this study, cigarette smoking is associated with the age and educational level of the student, and the same conclusions were drawn from other studies as well. The prevalence of having ever smoked cigarettes was lower among younger adolescents (14.1% for 10-12 year-olds) than older adolescents (24.7% for 16-19 year-olds). The prevalence of having ever smoked cigarette was 15.3% among adolescents in upper primary schools and 30.4% in senior secondary schools. These outcomes of the survey are consistent with those of previous studies (e.g. Eaton et al, 2011; Reddy et al, 2013).

The lifetime prevalence of alcohol consumption stands at 15.9%: 18.7% for males and 13.6% for females. These figures show that alcohol consumption among adolescents in Botswana is lower compared to that of their South African counterparts, which was estimated at 49.6% in 2008 (Reddy et al, 2011).

In Botswana, the lifetime prevalence of injection drugs among adolescents appears rather high (21.3%) compared to that of the consumption of alcohol (15.9%) and cigarette smoking (18.1%) and prevalence rates of all these from other countries. The lifetime prevalence of students who reported having injected illegal drugs into their body stood at 2.3% in the United States, with the prevalence being higher among male (2.9%) than female (1.6%) students. The South African Community Epidemiology Network on Drug Use (SACENDU) data from 2012 recorded 0.3% of the patients aged 18 or under in treatment as injecting (Barrett et al., 2013). Barrett et al (2013) observed that in South Africa, injecting drugs among under-18s appeared to be

rare. Because substance use prevalence between South Africa and Botswana are fairly comparable, it is suspected that the reported injection drug use of 21.3% in Botswana is exaggerated.

The plausible explanation is that adolescents did not follow the instructions when answering this question: "Have you ever injected drugs?" In responding to this question, adolescents may have included drugs injected for medical purposes or treatment of an illness even though the instruction clearly stated that these should not be counted. Because the respondents used self-administered questionnaires in answering the question, they may not have observed the instruction not to include drugs injected for medical purposes, which would inflate the figure. Because of this problem the authors used another question to capture drug use among adolescents. The drug use question used was: "Some people have tried a range of different types of drugs that are used to get high (feel good, relaxed). Which of the following, if any, have you tried"? Then the following list of options was provided for the respondent to choose from: marijuana, glue, mandrax, cocaine, ecstasy, sextasy, and other. The responses from this question were more plausible.

It is apparent that individual and multiple substance use are common among young people in Botswana. There are potential or possible consequences of high levels of substance use. For example, substance use can have undesirable consequences at different levels of society. One of the observed consequences involves school problems. School problems associated with substance abuse among young people include lowered commitment to education, declining grades, absenteeism

from school, increased potential for dropping out of school and higher truancy rates (Hawkins, Catalano and Miller, 1992).

Furthermore, the health and safety consequences of substance use among young people include accidental injuries, physical disabilities, diseases, and possible overdoses (National Health & Mental Health Research Council, 2001). The use of alcohol and other drugs increases the risk of young people contracting HIV and other sexually transmitted infections (Tsimako, 2003). The medical and health consequences include increasing the risk for mental and physical health problems, including addiction, death from substance-related accidents, homicides, suicide and engaging in other dangerous behaviours such as reckless driving, unsafe sex, and violence (Feinstein, Richter and Foster, 2012).

Previous studies have observed that the youth who use alcohol and other drugs may be alienated from and stigmatized by their peers (National Health & Mental Health Research Council, 2001). As a result, these may disengage from school and community activities because of their substance abuse, depriving their peers and communities of the positive contributions they might otherwise make.

In conclusion, it is apparent that individual and multiple substance use are common among young people in Botswana. The common substance used by adolescents is illicit drugs, followed by alcohol and tobacco. These findings are not consistent with other studies from the region where generally the most commonly used substance among learners is alcohol, followed by cigarette smoking and lastly illicit drugs, particularly marijuana or cannabis (Moodley et al, 2012;

Reddy et al, 2011; Atwoli et al, 2011). As previously stated the question on "Have you ever used drugs" may have been misunderstood by the learners hence the unusually high percentage of injecting drug users.

It was also observed that multiple substance use among adolescents in descending order were alcohol and tobacco; drugs and tobacco; alcohol, tobacco and drugs; and drugs and alcohol. Male adolescents were more likely than their female counterparts to have experienced the use of multiple substance such as drugs and alcohol; alcohol, tobacco and drugs; tobacco and alcohol, and drugs and tobacco. Some studies have shown gender differences in the rates and severity of substance use, with higher rates of alcohol, marijuana, and hard drug use among males (Dembo et al, 1991). However the gap between males and females may be closing as nicotine use among females may exceed use among males (Boyle, et al, 1992). A striking finding from the Atteridgeville study is the high lifetime prevalence of alcohol use in female learners when compared with black female learners in previous South African studies, and this higher rate may be part of a national trend of increased use of alcohol among black female learners (Moodley et al 2012). For these adolescents, professionally run programmes can help them stop using and help guard against long-term health and social problems.

ACKNOWLEDGEMENTS

The authors would like to sincerely thank the Ministry of Education and Skills Development for allowing them to use the data used in this paper.

CONFLICT OF INTEREST

None

REFERENCES

- Atwoli, L., Mungla, P.A., Ndung'u, M.N., Kinoti, A.C., and Ogot, E.M. (2011). Prevalence of substance use among college students in Eldoret, western Kenya: *BMC Psychiatry*, 11:34. DOI: 10.1186/1471-244X-11-34
- Barret, D., Hunt, N., and Stoicescu, C. (2013). *Injecting drug use among the under-18s: A snapshot of available data*. Harm Reduction International. The Global State of Harm Reduction
- Botswana Youth Risk Surveillance Survey 2010 (2011). Ministry of Education and Skills Development, Botswana. Republic of Botswana, Gaborone
- Boyle, M.H., Offord, D.R., Racine, Y.A., Szatmari, P., Fleming, J.E., & Links, P.S. (1992). Predicting substance use in late adolescence: Results from the Ontario Child Health Study follow-up. *American Journal of Psychiatry*, 149, 761-767
- Brook, J.S., Morojele, N.K., Pahl, K., and Brook, D.W. (2006). Predictors of drug use among South African adolescents. *Journal of Adolescent Health*. 38(1): 26-34
- Clayton, R.R. and Voss, H.L. (1982). *Technical review on drug abuse and drop-outs*. Report on a National Institute on Drug Abuse technical review meeting. Rockville, NM: National Institute on Drug Abuse: 1-44
- Dembo, R., Williams, L., Getreu, A., Genung, L., Schmeidler, J., Berry, E., Wish, E.D., and LaVoie, L. (1991). A longitudinal study of the relationship among marijuana/hashish use, cocaine use, and delinquency in a cohort of high-risk youths. *Journal of Drug Issues*, 21, 271-312
- Eaton, D.K., Kann, L., Kinchen, S., Shanklin, S., Flint, K.H., Hawkins, J., Harris, W.A., Lowry, R., McManus, T., Chyen, D., Whittle, L., Lim, C., and Wechsler, H. (2011). *Youth Risk Behavior Surveillance — United States, 2011*
- Feinstein, E.C., Richter, L., and Foster, S.E. (2012). Addressing the Critical Health Problem of Adolescent Substance Use Through Health Care, Research, and Public Policy. *Journal of Adolescent Health*: 50: 431-436
- Hawkins, J.D., Catalano, R.F., and Miller, J.Y. (1992). Risk and Protective Factors for Alcohol and Other Drug Problems in Adolescence and Early Adulthood: Implications for Substance Abuse Prevention, *Psychological Bulletin*, 112(1). 64-105
- Henderson, H., Nass, L., Payne, C., Phelps, A., and Ryley, A. (2013). *Smoking, drinking and drug use among young people in England in 2012*. Edited by Elizabeth Fuller. Health and Social Care Information Centre. <http://www.hscic.gov.uk/pubs/sdd12fullreport>. Date Accessed 12 September 2014
- International Agency for Research on Cancer (IARC) (2002). *Tobacco smoke and involuntary smoking*, IARC monograph on evaluation of carcinogenic risks to humans. 83. Lyon, France: IARC
- Kandel, D.B., Yamaguchi, K., and Chan, K. (1992). Stages of progression in drug involvement from adolescence to adulthood: further evidence for the gateway theory. *Journal of Studies on Alcohol*. 53(3): 447-457
- Madu, S.N. and Matla, M.Q.P. (2003). Illicit drug use, cigarette smoking and

- alcohol drinking behaviour among a sample of high school adolescents in the Pietersburg area of the Northern Province, South Africa, *Journal of Adolescence*, 26: 121-136
- Moodley, S.V., Matjila, M.J., and Moosa, M.Y.H. (2012). Epidemiology of substance use among secondary school learners in Atteridgeville, Gauten, *South African Journal of Psychiatry*. 18(1): 2-9. Retrieved from: <http://www.sajp.org.za/index.php/sajp/article/view/320/288>. Date accessed: 17 Sep. 2014. doi:10.7196/sajp.320
- National Alcohol Policy (2008). Ministry of Trade and Industry Botswana, Republic of Botswana, Gaborone
- National Health and Mental Research Council (2001). *Australian guidelines to reduce health risks from drinking alcohol*, Canberra, ACT. National Health and Mental Research Council
- Oberg, M., Jaakkola, M.S., Woodward, A., Peruga, A., and Pruss-Ustun, A. (2011). Worldwide burden of disease from exposure to second-hand smoke: A retrospective analysis of data from 192 countries. *Lancet*, 377, 139–146. doi:10.1016/S0140-6736(10)61388-8
- Parry, C.D.H., Myers, B., Morojele, N.K., Flisher, A.J., Bhana, A., Donson, H., and Pluddemann, A. (2004). Trends in adolescent alcohol and other drug use: findings from three sentinel sites in South Africa (1997-2001). *Journal of Adolescence*: 27: 429-440
- Pretorius, J.W., Ferreira, G.V., and Edwards, D.N. (1999). Crisis phenomena among African adolescents. *Adolescence*. 34(113): 139-146
- Pitso, J.M.N. and Obot, I.S. (2011). Botswana Alcohol Policy and the Presidential Levy Controversy. *Addiction*. Policy Case Studies: doi:10.1111/j.1360-0443.2011.03365.x
- Qadri, S.S., Goel, R., Singh, J., Ahluwalia, S.K., Pathak, R., & Bashir, H. (2013). Prevalence and pattern of substance abuse among school children in northern India: A rapid assessment study. *International Journal of Medical Science and Public Health*, 2(2). 273-282. doi:10.5455/ijmsph.2013.2.271-280
- Reddy, S.P., Panday, S., Swart, D., Jinabhai, C.C., Amosun, S.L., James, S., Monyeki, K.D., Stevens, G., Morejele, N., Kambaran, N.S., Omdien, R.G. and Van den Borne, H.W. (2003). Umthenthe Uhlaba Usamila – *The South African Youth Risk Behaviour Survey 2002*. Cape Town: South African Medical Research Council
- Reddy, S.P., James, S., Funani, I., Sifunda, S., Omdien, R., and Kambaran, N. (2011). *National Youth Risk Behaviour Survey 2008*. KwaZulu Natal Province, 17 and 18 February
- Reddy, S.P., James, S., Sewpaul, R., Sifunda, S., Ellahebokus, A., Kambaran, N.S., and Omdien, R.G. (2013). *Umthente Uhlaba Usamila: the 3rd South African National Youth Risk Behaviour Survey 2011*, Human Sciences Research Council, Pretoria, South Africa.
- Tsimako T. (2003) Tsogang Banna, Emang Basadi. *Report of the national workshop on alcohol and other substance abuse and HIV/AIDS*. Gaborone Sun Conference Centre, Ministry of Health, Gaborone, Botswana, 24–27 June
- United States Department of Health and Human Services (2006). *The health consequences of involuntary exposure to tobacco smoke: A report of the surgeon general*. Atlanta, GA: U.S. Department of Health and Human

Services, Centers for Disease Control and Prevention, Coordinating Center for Health Promotion, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health

United States Department of Health and Human Services (2010). *The biology and behavioral basis for smoking attributable disease: A report of the surgeon general*. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and

Health Promotion, Office on Smoking and Health

United States Department of Health and Human Services (2012). *Preventing tobacco use among youth and young adults: A report of the surgeon general*. Retrieved from <http://www.surgeongeneral.gov/library/reports/preventing-youth-tobacco-use/full-report.pdf>: Date accessed: 14 September 2014

World Health Organisation (2011). *WHO report about Global Tobacco Epidemic, 2011: Warning about dangers of tobacco*. Geneva, Switzerland: WHO

**DRUG INTERACTIONS IN THE CONSTITUENTS OF STREET DRUG MIXTURE
“NYAOPE” IN SOUTH AFRICA: A MINI-REVIEW**

Aye Aye Khine¹, Kebogile Elizabeth Mokwena²

¹Department of Chemical Pathology, Sefako Makgatho Health Sciences University,
NHLS, Dr. George Mukhari Academic Hospital, South Africa

²School of Public Health, Sefako Makgatho Health Sciences University

ABSTRACT

Nyaope is a unique South African street drug mixture thought to contain illicit drugs and other compounds and is usually inhaled after wrapping in the Cannabis leaf. Despite its illegalization in March 2014, abuse of Nyaope is on the increase. While highly addictive, withdrawal symptoms are very severe, unbearable and drive the user to desperately seek for the next fix. Due to the lack of knowledge in its composition and how the constituents interact with each other, treatment for withdrawal symptoms and rehabilitation has been a challenge. A mini-literature review was done to explore how the major constituents of Nyaope relate to each other in their actions and in their path of breaking down (metabolism). The literature suggests that the inside opiate group, in between opiates and benzodiazepines, in between opiates and cannabis group, in between benzodiazepines and phenobarbitals, and also amongst the minor constituents, there are extensively shared the metabolic pathways which lead to longer plasma half-life in each of these drugs and thus synergistic effects. These shared pathways are via the cytochrome P450 family of enzymes in the liver cell cytoplasm and these enzyme actions are to inactivate or detoxify the drugs or convert them to more water soluble compounds in order to excrete them through the kidneys. Not only sharing the metabolic pathways, but also the actions of these drugs at certain receptors in the brain have either opposing or stimulating effects on one another, making the complex nature of their combined actions. Such findings can explain the unique withdrawal symptom complex of Nyaope, which is important for the clinicians and public health workers who are dealing with the users. Understanding the biochemical

Corresponding Author: Dr AA Khine, MBChB, MMed (Chemical Pathology), Department of Chemical Pathology, PO Box 227, Medunsa 0204, Tel- 012-5214253, Fax- 012-5214157, Email- ayeaye.khine@smu.ac.za

Conflict of interest: None

Funding: None

Ethical approval was obtained from the Medunsa Research Ethics Committee (MREC/H/165/2012:IR)

and metabolic basis of Nyaope drug interactions provides valuable insight towards the development of withdrawal signs and symptoms which may contribute to the targeted treatment program.

Keywords: Nyaope, drugs of abuse, withdrawal symptoms, drug synergy, metabolism

INTRODUCTION

Nyaope is a mixture of street drugs commonly used in South Africa mostly consumed by the youth of poor socio-economic background due to its availability and affordability in the townships and informal settlement areas. In the recent years; the use of Nyaope has become a national crisis despite its illegalization in 2014. There have been assumptions that it contains low grade heroin, marijuana, cleaning detergents, rat poison and chlorine, although these cannot be confirmed due to lack of laboratory infrastructure to analyse the mixture and difficulty in obtaining the mixture samples (Tau, 2013). Nyaope is cheap, costing only around Rand 30 (about 2 USD) for one dose and easily accessible at the street corners and vendors in many townships. The Nyaope mixture is a brown coloured powder, thus can be easily disguised as soil or cement powder. This poses difficulty in prosecuting the users especially because they can claim it as a pack of sand or soil since it is common practice in African culture to eat soil. The fact that the laboratories to verify if it is sand/soil or drug mixture are not readily available, the consumers or dealers always get away with processing the mixture. Psycho-social factors such as unemployment, dropping out from school, lack of family and social support, homelessness and peer pressure are

amongst other factors driving the abuse of this drug cocktail (Maseko, 2015).

In the past, laboratory analysis of Nyaope was not available due to difficulties in obtaining specimens as well as the need to have a complex instrument and method to identify the individual component, thus the assumptions of what it may contain were based on the clinical presentation of the users after consumption and during withdrawal period. One study was done to analyse Nyaope samples in Gauteng province of South Africa recently to show the constituents and their patterns across the samples (Khine, Mokwena, Huma & Fernandes, 2015).

Nyaope users present with a unique withdrawal feature of severe unbearable abdominal cramps, but other symptoms and signs are variable from one area to the other. There is no specific medical treatment for the users during withdrawal and rehabilitation. It would be beneficial for the public health practitioners to understand what contributes towards the development withdrawal symptoms complex so that they may improve the medical treatment. This literature review is to explore how the major constituents of Nyaope share their metabolic pathways leading to interactions and synergistic effects that may explain the withdrawal symptoms, which is important for the clinicians and public health workers dealing with the users.

METHOD

This is an unsolicited submission where the researcher believes there is a need to review the available literature to close the gap in knowledge and report the findings. The study is a status quo review of the given topic (drug mixtures and interactions) on the most current and focussed studies which are compared and summarised on the basis of the author's experience and existing theories. Findings are qualitative nature and used to understand the nature of interactions between different drug classes found in the mixture.

The bibliographic databases used were Cochrane library and Google scholar and inclusion criteria were 1) full text articles and studies 2) period from 2003 to 2016 and 3) search words used were; drug mixtures, drugs of abuse, poly drug use, drug synergy, interactions, toxicity and metabolism. Search strategies were 1) using these words separately in the initial search, 2) then again by combining a few of these [e.g. poly drug use and metabolism] [drug synergies and metabolism], 3) lastly by specifying drug classes and combining phrases [e.g. opiates and opioids co-use and metabolism] [opiates and benzodiazepines co-use and metabolism] [central nervous system stimulants and depressants co-use and metabolism] [illicit drugs and alcohol] [hepatic enzyme induction by phenobarbital and alcohol] [poly drug use and withdrawal effects] [poly drug use and toxicity].

There were a few limitations. Since Nyaope is unique to South Africa and due to its recent development, there are no studies done about it especially with respect to its compositions either in the country or in the world literature. Thus other mixtures alike (containing opiates

and alcohol, opiates and benzodiazepines or Phenobarbitals were selected where available) and when literatures for the mixture format was not available, single drugs and their information were used. Moreover, two articles of 1996 were included despite being out of determined period because the information they provide was essential and could not be found in more recent periodicals.

In this review, also included was the important information from the interviews with the actual Nyaope users conducted by the co-author who is a public health practitioner as they may contribute in the understanding of withdrawal symptoms.

LITERATURE REVIEW

Reports on the metabolism of each of the drugs found in the Nyaope mixture is presented together with how the drugs share the enzymes in their metabolic pathway which impact on their blood level and excretion. Reports on the clinical effects of combining different class of drugs of abuse are also discussed. The findings are categorized in the following table and each is elaborated in the texts.

Nyaope constituents

In 2014 the analysis of Nyaope samples was attempted using two Mass Spectrophotometric methods to compare their performance in detecting the constituents. The time of flight mass spectrometry was found to be a faster and more cost-effective method. In this study the Nyaope samples were obtained from various townships and urban areas of Northern Gauteng and Mpumalanga provinces and analysis was done at the Perkin Elmer research laboratory in Midrand

	Findings	Source
1	Nyaope constituents	
	<u>CNS depressants (Major constituents):</u>	
	1) Opiates (Heroin, Codeine, Morphine and Acetyl Morphine, meconin)	Only one study found (Khine, Mokwena, Huma & Fernandes, 2015)
	2) Opioids (Methadone, Papaverine, Dimenoxitol, Benzitramide, thiofentanyl, tramadol)	
	3) Non-opiate CNS depressants (Dextromethorphan, Benzodiazepines, Phenobarbitone)	
	<u>CNS stimulants (Major constituents):</u>	
	Amphetamine, Meth-amphetamine (Kath/crystal meth), Cathine (beta hydroxyl amphetamine), Pipradrol (dopamine and Norepinephrine reuptake inhibitor), Fenelthylline (sympathomimetic bronchodilator).	
	<u>Minor constituents:</u>	
	Acetaminophen, caffeine, antibiotics (citorflex), anti-retroviral (zidovudine), local anaesthetics (duracaine/lidocaine), plasticisers and calcium oxide ground material for binding and stabilisation of drugs.	
2	Metabolism of Nyaope constituents	
2.1	Opiates and opioids shared metabolism via 3 phases of hepatic cytochrome P450 enzyme system in the liver and thus competition of enzymes amongst various drugs in these groups will lead to reduced conjugation and excretion.	Meyer (1996), Dean (2006), Smith (2009),
2.2	Cannabis and tetra hydro cannabis (THC) shared metabolism with opiates and opioids via P450 hydroxylation and oxidation systems.	(Sharma, 2012; Maurer, Saucer, & Theobald, 2006)
2.3	Benzodiazepines and opiates sharing metabolic paths via glucuronidation in the liver. When co-used with Phenobarbital, the latter produces tolerance of the former by inducing glucuronidation enzymes.	Oshiro (2013)
2.4	Phenobarbitals when co-used with opiates, alcohol or benzodiazepines, it stimulates the P450 enzymes for each of these co-used and metabolized them faster than usual leading to tolerance	Meyer (1996)
2.5	Amphetamine and methyl-amphetamine share demethylation pathway with opiates and opioids making their plasma levels higher	Maurer, Kraemer, Springer, & Staack, 2004)
2.6	Minor constituents such as caffeine and acetaminophen (paracetamol) as well as Dextromethorphan, and Lignocaine also shared certain P450 enzymes called CYP3A4 AND 1A2 with opiates and benzodiazepines.	Meyer (1996)
3	Synergies amongst major drug groups in Nyaope	
3.1	Opiates, opioids and benzodiazepines sharing metabolism leads to higher intensity of euphoria and addiction.	Dean (2006)
3.2	Cannabis and THC up-regulate the opiate receptors in brain and potentiates opiate's effect of CNS suppression, hence better pain relief and stronger addiction.	(Cichewicz, 2004; Chimalakonda, Seely, Bratton, Brents, Moran, Endres, & Moran, 2012)
3.3	Benzodiazepines and Phenobarbitals potentiate each other's CNS depressant activities leading to severe drowsiness and disorientation	National Institute on Drug Abuse, 2016
3.4	Amphetamine, Meth-amphetamine, Cathine-beta hydroxyl amphetamine, Pipradrol, and Fenelthylline synergize to give intense euphoria	United States Maine County Law Department, 2010
3.5	cocaine, morphine and heroin, when added with meth-amphetamine, they together cause unbearable and severe abdominal cramps	Tiwari, Moghal, and Meleagrow (2006)
3.6	Paradoxical effects of CNS depressants and CNS stimulants	Wise (1996)
3.7	Combination of anti-retro virals with drugs of abuse	(Pal, Kwatra, Minocha, Paturi, Budda, & Miltra, 2011), Thomas and Velaphi (2014)
3.8	Combination of anti-histamines with opiates	Sandor, 2000

Johannesburg South Africa with the assistance of a technical expert from the company. The details of the components consistently found in Nyaope are listed in the table 1. Rat poison and chlorine, previously thought to be in the mixture were not found in these samples. It was noted that the minor constituents were variable amongst the samples collected (Khine, Mokwena, Huma & Fernandes, 2015).

Metabolism of Nyaope constituents after consumption

Opiates, opioids and non-opiate CNS depressants

The usual way of consumption is by wrapping the drug powder mix in the cannabis leave and smoking it inhaling through the mouth. The plasticiser in the mixture is thought to be enhancing the combustion. How drug residues get into the blood via the oral cavity or respiratory epithelium is now known. There is no study found regarding blood levels of drugs contained in the Nyaope mixture in the users after smoking. However, there are references to explain the fate of constituent drugs in the user's body. The opiates and opioids are metabolised in the liver via two phases of reactions involving various groups of enzymes that belong to a family of cytochrome P450 in the liver cell cytoplasm.

Phase I is the conversion of functional groups such as dehydrogenation/hydrogenation, oxidation, hydrolysis (esterase), reduction and mono-oxygenation. The purpose of this phase is to reduce toxicity of each drug. Phase II is the process of derivitisation of functional groups in order to produce water soluble metabolites to be excreted through the kidneys. These are glucuronidation, sulphation, acetylation, Glutathione (GSH-Conjugation) and

Methylation. The metabolites produced from the two phases are less active than the parent drug or they may even be inactive. However, some may have enhanced activity or toxic effects, including mutagenesis, teratogenesis, and carcinogenesis, thus they need to be excreted through the kidneys efficiently.

In the context of opiates and opioids, only Morphine and its related compounds such as Hydromorphone and Oxo-morphone) go through the phase II directly via the enzyme uridine diphosphate glucuronyl transferrase 2B7 and its glucuronide conjugates are excreted in the urine. The Codeine, Hydrocodone, Oxycodone, Methadone, on the other hand have to go through the phase I conversion using cytochrome P450 series of iso-enzymes (Smith, 2009) and from there on, directly excreted in the urine. The same applies to Tramadol (narcotic like pain killer) and Fentanyl (synthetic opiate and tranquilizer). Certain CYP enzymes are shared amongst the opiates, Tramadol and Fentanyl (CYP2D6, CYP3A4 are shared by more than one drug) (Smith, 2009).

The shared metabolic pathways lead to a longer half-life for each of the drugs with a synergistic effect leading to a longer lasting euphoria (along with analgesia). Moreover, the rate of conversion and conjugation into water soluble metabolites would also be slower (as sharing the pathway), which lead to a reduced clearance from the body (Meyer, 1996)

Cannabis and tetra-hydro cannabis (THC)

These are the major active compound of Marijuana leaves which are used to wrap the Nyaope mixture; are also metabolised by the microsomal hydroxylation and oxidation pathway of the CYP450 isoenzyme complex as shown

in the figure 1. As Cannabis shares the metabolic pathway with most opiates and opioids via cytochrome enzymes CYP2D6 and 3D4, this causes sluggish renal excretion and increased blood levels of both groups which can result in a higher level of euphoria and a more severe addictive effect. The higher blood levels result in the tolerance to the effects of both drugs, making the user require another dose in a shorter time period (Maurer, Saucer, & Theobald, 2006).

Benzodiazepines

These are also found in Nyaope and they get metabolized in the liver through the CYP450 iso-enzyme complex, many of which are shared by the opiates and cannabinoids, and all metabolites of Benzodiazepines go through the final glucuronidation pathway in the liver before excreted by the kidneys. Due to extensive sharing of CYP metabolic enzymes between Benzodiazepines, opiates, opioids and cannabis, the CNS suppressant effects of each potentiates that of the others; may lead to severe drowsiness in the users (Oshiro, 2013).

Phenobarbitals

This has also been found in some Nyaope mixtures and if the users consume

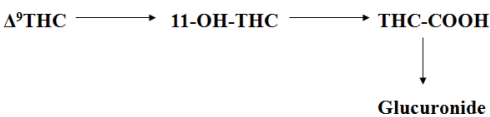


Figure 1. Metabolic route of Δ^9 -tetrahydrocannabinol (Δ^9 _THC), its primary active metabolite 11-hydroxy- Δ^9 -tetrahydrocannabinol (11-OH-THC) and the primary inactive metabolite, 11-nor-9-carboxy- Δ^9 -tetrahydrocannabinol (THCCOOH) (Sharma, 2012; Maurer, Saucer, & Theobald, 2006)

alcohol at the same time as smoking Nyaope, both can stimulate most of the P450 enzymes and enhance the metabolism of aforementioned drugs in Nyaope. This can lead to reduced plasma levels and increased tolerance, for example to Benzodiazepines (Meyer, 1996).

Amphetamine and methyl-amphetamine (CNS stimulants)

They constitute as major component of Nyaope and also get metabolized by the demethylation pathway of the CYP450 (2D6, 1A2, 2B6, 3A4) iso-enzymes, thus sharing with most of the opiates (Maurer, Kraemer, Springer, & Staack, 2004).

Other minor constituents

Amongst the minor constituents, caffeine and acetaminophen (paracetamol) as well as Dextromethorphan, and Lignocaine (local anaesthetics) have been found in the Nyaope mixture and they are metabolized by the CYP3A4 AND 1A2 enzymes (Meyer, 1996).

Drug Synergies between the major drug groups:

This means drugs with similar actions and when they are taken together, they potentiate each other's action and resultant effect is exponential. When opiate and Opioids are combined, based on the shared metabolic pathways of opiates mediated by cytochrome P450 liver enzymes, they inhibit the metabolism of each other, thus leading to longer plasma half-life and higher intensity of euphoria and addiction (Dean, 2006). Synergy between opiates and cannabis was found in animal studies where cannabis up-regulates the opiate receptor proteins in the brain. This evidence provided the basis of better strategies in pain management

of cancer patients (Cichewicz, 2004; Chimalakonda, Seely, Bratton, Brents, Moran, Endres, & Moran, 2012). Combination of Benzodiazepines and Phenobarbitone was also synergistic as both are in the sedative group that suppress CNS and when taken together, this action is profound as they synergise each other. They cause severe drowsiness and lack of orientation in time, place and person. During withdrawal, restlessness, sleep disturbance, irritability, increased tension and anxiety, panic attacks, hand tremor, sweating, difficulty in concentration, dry wrenching and nausea, some weight loss, palpitations, and headache are common (National Institute on Drug Abuse, 2016).

The synergy also manifests in the adverse effects of these combined drugs. For example, the gastro-intestinal symptoms are much more severe and sometimes unbearable when opiates such as cocaine, morphine and heroin are added with meth-amphetamine. There have been reports of life threatening abdominal complications that require surgery such as perforations due to mesenteric artery ischemia, reported by Tiwari, Moghal, and Meleagrow (2006) due to combination of opiates such as cocaine and heroin abuse. Severe chest pain due to ischemia of coronary vessels was also reported in another study by Burrows, Hagardorn, Harlan, Wallen, & Ferslew (2003) presented a case of a fatal drug interaction caused by ingestion of oxycodone and clonazepam. Oxycodone is an opium alkaloid used in long-term pain management therapy and Clonazepam is a benzodiazepine used for the treatment of seizures and panic disorders. The post-mortem shows pathologies consistent with severe central nervous system (CNS) and respiratory depression produced by

high concentrations of clonazepam and oxycodone including collapsed lungs, aspirated mucus, and heart failure.

When looking at the combination of CNS stimulants and suppressants, although it can be assumed that such combination would cancel each other's effect, paradoxical effect of synergy was reported (Wise, 1996). Wise claimed that there is a summative effect of brain reward (natural satisfaction as in food, sexual activity or change in chemical balance) of median forebrain bundle fibres in the human brain when they are exposed to the mixture of opiates (codeine, morphine, heroin) which are CNS suppressants and the CNS stimulants such as amphetamines, caffeine, nicotine, cannabis and phencyclidine. The reason behind this is because they share the site of stimulation in the brain through common mechanisms. The balance of these mixed effects is an enhanced stimulation in a shorter duration. This concept could be applicable in the case of Nyaope and also possible that since the amount of each drug is very small in the Nyaope mixture, the duration of stimulation is rather short but the height of euphoria causes stronger addiction.

In poly-drug use, the end result may lead to four possible outcomes such as null (cancelling effect), overlapping and addition (synergistic effect) and antagonistic effects (United States Maine County Law Department, 2010). For example, when central nervous system stimulants are combined (such as those found in Nyaope- Amphetamine, Meth-amphetamine, Cathine-beta hydroxyl amphetamine, Pipradrol, and Fenelthylline), they would lead to intense euphoria followed by severe side effects. Pupil size may be normal due to a cancellation of the constriction effect of narcotics

(opiates) and dilatation effect of stimulants and Cannabis. A lack of the pupil convergence effect however, can still be seen in the mixture of CNS suppressants and stimulant because the latter did not have any effect on it. A reaction to light would still be slow due to most of the drugs in the Nyaope mixture having this effect except Cannabis and anaesthetics. The pulse rate will depend on the proportion of Opiates, Opioids, Benzodiazepines, Phenobarbitone versus Amphetamine and Cannabis in the mixture the user has taken. The same goes for the blood pressure. Body temperature would be higher so long as there are CNS stimulant groups in the mixture, and the muscle tone (flaccid or rigid) would also depend on the proportion of suppressants and stimulants, although Cannabis has no effect on muscle tone. The drowsiness from Nyaope mainly comes from the combination of opiates, opioids and benzodiazepines as additive effect.

Combining Anti-retro viral therapy (ART) and drugs of abuse:

This was also seen in a few Nyaope mixture and although the rationale behind the mixing is not clear, some users during the interview, mentioned that the drugs help with the headache and insomnia caused by the ART (Mokwena & Huma, 2014). In the report of Thomas and Velaphi (2014) a combination of anti-retro viral (ARV) compounds and drugs of abuse such as Morphine and Nicotine enhances the CYP3A4 and MDR1 (multi-drug resistance protein) expression in vitro. Altered functions of efflux transporters within liver cells and CYPs in response to ARV and drugs of abuse may result in altered drug absorption and metabolism of both groups. Complexity underlying the relationship between efflux transporters and

CYP makes it difficult to predict the outcome of ARV therapy, particularly when HIV patients taking drugs of abuse do not adhere to this. HIV positive pregnant women on ARV medications and indulging in drugs of abuse, may develop a higher viral load due to such interactions, and lead to increase in mother to child transmission of HIV (Pal, Kwatra, Minocha, Paturi, Budda, & Miltra, 2011). Thomas and Velaphi (2014) reported two cases of neonatal abstinence syndrome and low birth weight of babies born to mothers who are on ARVs and known to be addicted to Nyaope in South Africa.

Combining antihistamines (cough syrup) in the Nyaope mixture:

The Dexamethorphen can be purchased as over the counter cough medicine and when co-used with opiates; it enhances the binding of opiates and opioids to their brain receptors potentiating the euphoria, but also contributes to the severity of combined drowsiness (Sandor, 2000)

DISCUSSION

It is not clear why the Nyaope mixture is formulated in this particular way. However, it can be postulated that it is based on the user's experience of synergistic effects, but other constituents such as acetaminophen and caffeine could be to avoid the side effect of headache. The fact that some samples contain Methadone is quite alarming as it is not known how chronic use of this drug would influence the Methadone treatment for Heroin in the rehabilitation (Braude & Ginzburg, 1986). Another author suggested that the rationale of combining CNS depressants and stimulants seems to lie with the

purpose of cancelling out each group's side effects as the former may lead to parasympathetic over activity and the latter, sympathetic counterpart (Armstrong & Cozza, 2003). Other minor components also seem to serve a specific purpose on their own, for example, plasticiser may enhance the stability of active ingredient powders in the mixture of ground cement or soil and it also accelerates the release of drugs from the matrix into the smoke upon burning. Plasticisers have been successfully used in the development of Transdermal drug administration such as skin patches for analgesics (Güngör & Erdal, 2011). The Local Anaesthetics (Duraaine/Lidocaine) is mildly euphoric and addictive (McLeod, 2015), but the rationale behind adding the antibiotics is not clear. In cases of Nyaope users who are already on ART, the rationale of mixing may be to curb the undesirable side effects of ARV such as headaches, insomnia or nausea. However, in cases where user is not HIV positive, the reason of adding it is not known. Interviews with the users showed that they were not aware that the mixture contained ARV.

The constituents were found to be variable from one area to another. This may be determined by the availability of raw material and also the demand pattern from the regular users. Some of the constituents such as local anaesthetics and medication for induction in general anaesthesia are only available at the hospital pharmacy, and drugs such as antibiotics and antiviral medication would need a prescription, implying that some dealers may have connections to these sources and that the operation of the Nyaope dealerships likely extends beyond the townships.

From the observations of Nyaope users at the Rehabilitation centres by the public

health practitioners (Mokwena & Huma 2014) the main presentation features are severe chest pain, abdominal cramps (a feeling of explosions in the stomach), tremendous drowsiness, vomiting and sometimes diarrhoea. On a physical level, small pupils and high blood pressure with tachycardia is usually seen. Moreover, poor personal hygiene, signs of malnutrition, dry skin and ulcers and marks due to old scars from obsessively scratching the skin (methyl amphetamine), thin and dehydrated face, burnt marks around the nostrils and mouth from combustion of certain drugs. There is also progressive weight loss from failure to eat and drink. Also reported are the feeling of irritability, insomnia, involuntary jaw clenching and tooth grinding.

In terms of treatment options for the withdrawal symptoms, it is mainly supportive and specific medication for substituting poly-drug use or the mixture is not available. A recommended treatment for chronic Heroin use is by substituting it with Methadone (United States National Institute of Health (On Drug of Abuse) Annual report, 2012), but this requires admission to a clinic for observation of treatment initially and followed by prescribing a maintenance dose of Methadone for a longer term (3-4 years) (Centre for Disease Control (CDC), 2002). The reason for observation is to ensure abstinence from Heroin and other drugs during therapy. The fact that the Nyaope mixture also contains Methadone defeats the purpose of Methadone based withdrawal treatment program as how a Methadone treatment would affect the other constituents in the Nyaope mixture has not been studied pharmacologically. Buprenorphine and Naltrexone are the other antidotes for opiates and they act

by antagonizing the opiate receptors, but due to the cannabis in Nyaope that increases the opiate receptors in brain, and these antidotes would not be as effective as expected (Cichewicz, 2004).

CONCLUSION

It is apparent from the literature review that the major drugs of abuse contained in Nyaope share the metabolic pathways leading to longer lasting plasma levels and synergistic effects of euphoria, but the trade-off is the tolerance and aggravation of side effects constituting the unique withdrawal symptoms. Treatment programs thus far are restricted to psycho-social therapy for behavioural change, and symptomatic treatment for withdrawal as specific medication for rehabilitation of Nyaope is still a complex phenomenon due to the mixture of various types of drugs. Understanding how metabolic pathways and drug interactions impact the clinical presentations in the users is thus important for the clinicians working in the withdrawal clinics and rehabilitation centres.

ACKNOWLEDGEMENT

I thank Prof KE Mokwena from the School of Public Health at Sefako Makgatho Health Sciences University for her observation and interview notes at the rehabilitation centres.

REFERENCES

- Armstrong, S., Cozza, K. (2003). *Pharmacokinetic drug interactions of morphine, codeine, and their derivatives: theory and clinical reality, Part II*. Psychosomatics 44(Dec.):515-520.
- National Institute on Drug Abuse. (2016). *Commonly Abused Drugs*. Retrieved April 15, 2016, from <https://www.drugabuse.gov/drugs-abuse/commonly-abused-drugs-charts>.
- Braude, M., & Ginzburg, H. (1986). *Strategies for Research on the Interactions of Drugs of Abuse*.
- Burrows, D.L., Hagardorn, A.N., Harlan, G.C., Wallen, E.D.B., Ferslew, K.E. (2003). *A Fatal Drug Interaction Between Oxycodone and Clonazepam*. J. For. Sci. 48(3):3–6.
- Centre for Disease Control (C.D.C.). (2002). *Methadone maintenance treatment*. Retrieved April 15, 2016 from <http://www.cdc.gov/idu>.
- Chimalakonda, K.C., Seely, K.A., Bratton, S.M., Brents, L.K., Moran, C.L., Endres, G.W., Moran, J.H. (2012). *Cytochrome P450-Mediated Oxidative Metabolism of Abused Synthetic Cannabinoids*. Am. Soc. Pharm. Exper. Ther. 41(11): 2174–2184.
- Cichewicz, D.L. (2004). *Synergistic interactions between cannabinoid and opioid analgesics*. Life Sc. 74:1317–1324.
- Dean, A. (2006). *Illicit drugs and drug interactions*. Pharm. 25(9):684–689.
- Güngör, S., Erdal, M.S. (2011). *Plasticizers in transdermal drug delivery systems*. Retrieved April 15, 2016 from www.intechopen.com :92-112.
- Khine, A., Mokwena, K., Huma, M., Fernandes, L. (2015). *Nyaope composition manuscript final*. Afr. J. Drug Ab. Alcohol Stud. 1(1).
- Maseko, N. (2015). *South African townships*. BBC. Retrieved April 04, 2015, from <http://www.bbc.com/news/world-africa-31620569>

- Maurer, H., Kraemer, T., Springer, D., Staack, R.F. (2004). *Metabolism of designer drugs of the amphetamine*. Ther. Drug Mon. 26(2):127–131.
- Maurer, H., Saucer, C., & Theobald, D. (2006). *Toxicokinetics of drugs of abuse: current knowledge of the isoenzymes involved in the human metabolism of Tetrahydrocannabinol, Cocaine, Heroin, Morphine, and Codeine*. Ther. Drug Mon. 28(3): 447–53.
- Meyer, U.A. (1996). *Overview of enzymes of drug metabolism*. J. Pharm. Biopharm. 24(5):449–459
- McLeod, I. (2015). *Local anaesthetics as recreational drugs*. Retrieved August 20, 2015, from <http://www.medscape.com/article/873879-overview>
- Mokwena, K., Huma, M. (2014). *Experiences of Nyaope users in three provinces of South Africa*. Afr. J. PHERD, Sept. (1):352–363.
- Oshiro, C. (2013). *Benzodiazepines metabolism*. Retrieved Feb 27, 2016 from <https://www.pharmgkb.org/pathway/PA165111375#PGG>
- Pal, D., Kwatra, D., Minocha, M., Paturi, D., Budda, B., Miltra, A. (2011). *Efflux transporters and cytochrome P450 mediated interactions between drugs of abuse and antiretrovirals*. Life Sci. 88(21):959–971.
- Phungula, S. (2013). *Nyaope addicts increase in Ermelo. The South African Health News Service*. Retrieved April 15, 2016 from <http://www.health-e.org.za>
- Sandor, I. (2000). *Antihistamine and anticholinergics to potentiate opiate effects and to curb the side effects*. Antihistamine Aficionado M. :3–30.
- Sharma, P. (2012). *Chemistry , Metabolism , and Toxicology of Cannabis : Clinical implications*. Iranian J. Psy. 7(4):149–156.
- Smith, H.S. (2009). *Opioid Metabolism*. Mayo Clinic Proceedings, 84(July):613–624.
- Tau, L. (2013). *Nyaope the drug of choice*. Health & Environment. Retrieved April 15, 2016 from <http://globalgirl-media.org/nyaope/>
- Thomas, R., Velaphi, S. (2014). *Abuse of antiretroviral drugs combined with addictive drugs by pregnant women is associated with adverse effects in infants and risk of resistance*. S. Afr. J. Child Health 8(2):78–79.
- Tiwari, A., Moghal, M., Meleagrow, L. (2006). *Life threatening abdominal complications following cocaine abuse*. J. R. Soc. Med. 99:51–52.
- United States Maine County Law Department. (2010). *Session xxiv Drug Combinations*. Retrieved February 27, 2016, from <http://www.maine.gov/dps/bhs/impaired-driving/lawresources/dre/documents/Session247DayStudent.pdf>
- United States National Institute of Health (On Drug of Abuse) Annual report. (2012). *Medical consequences of drug abuse*.
- Wise, R. (1996). *Addictive Drugs and brain stimulation reward*. Annual Reviews of Neuroscience, 19(3), 19–40.

DRUG USE DISORDERS AMONG LONG DISTANCE COMMERCIAL VEHICLE DRIVERS

Christopher I. Okpataku,

Department of Psychiatry, Bingham University Teaching Hospital, Jos, Nigeria

ABSTRACT

This study investigates substance use disorders among long-distance commercial vehicle drivers in Kaduna, Nigeria. Each consecutive 4th long distance driver who was to load his vehicle on each day was interviewed using the Schedule for Clinical Assessment in Neuropsychiatry (SCAN) to generate an International Classification of Diseases (ICD-10) substance use diagnosis until a sample size of 274 was attained. The data was analysed using the SPSS version 16.0. The current and life time prevalence of an ICD-10 diagnosis was 18.4%, and 21.2% respectively. None of them had received any form of medical treatment for drug problems. Substance use disorder occur among long distance commercial vehicle drivers, and there is a need to develop a system that identifies substance use disorders and provides treatment for drug users as part of a holistic approach against drugged-driving.

Keywords: Drug-use disorders, long-distance commercial drivers, Nigeria

INTRODUCTION

The use of psychoactive substances is common. Globally, it is estimated that in 2012, 3.5-7% of the world's population aged 15-64 had used an illicit drug mainly from the group of cannabis, opioid, cocaine and amphetamine-type stimulants, at least once in the previous year (UNODC, 2014a). The global prevalence of drug use has remained relatively same over the past 4 years, but there have been more

cases of problem drug users and drug dependence (UNODC, 2015). There has also been an increase in the production and consumption of new psychoactive substances (NPS), particularly synthetic cannabinoids, cathinones and phenethylamines (UNODC, 2015). Worldwide, men are thrice more likely than women to use illicit substances (UNODC, 2014b).

Substance use have huge negative health (Rehm et al, 2009) and economic consequences (Ezzati & Lopez, 2003;

Wuracel et al, 2015). It can reduce the quality of life through disability (Smith, & Larson, 2003; De Maeyer et al, 2010) and can lead to premature death (UNODC, 2015). A study estimated that the disability adjusted life years (DALY) for illicit drug dependence was responsible for 3.6 million years of life lost through premature death and 16.4 million years of life lived with disability (Degenhardt & Hall, 2012).

Commercial drivers have been documented to use psychoactive substances worldwide (Mathijssen & Houwing, 2005; Abiona et al, 2006; Beimesse & Davis, 2006; Labat et al, 2008; Bello et al, 2011; Girotto et al, 2014). Virtually all classes of substances have been involved. Long distance commercial driving is commonly practiced in Nigeria and elsewhere, mostly in the developing world where other means of transportation such as rail system is inadequate to meet demand. There are reports of on-the-job consumption of multiple substances substance use by drivers who engage in this pattern of driving (Makanjuola, 2007; Lasebikan & Baiyewu, 2009; Okpataku, 2015). These drivers could develop mental and behavioural disorders associated with substance use and may continue to offend or violate traffic regulations on drugs and driving as a result of a drug-induced brain disease which creates loss of control over substance use.

While so much may be known about the use of substances by drivers and its association with road traffic accidents (Adenekan & Osigbogun, 1999; Lowenstein & Koziol-McLain, 2000; Drummer et al, 2004; Movig et al, 2004; Mir et al, 2012) only little or nothing is known about the direct effect of these drugs on the mental health of these drivers and the behaviour that is likely to follow these disorders.

This study evaluates substance-induced disorders in long distance commercial vehicle drivers.

METHOD

The study was conducted in Kaduna, Northwest Nigeria. Kaduna is the 3rd most populous state in Nigeria, with a population of more than 6 million (NPC, 2006).

It was carried out among all long distance commercial vehicle drivers who consist mostly of young and middle aged men of diverse ethno-cultural origin with a slight Hausa-Fulani predominance. All licensed drivers who have been driving a minimum distance of 500km from Kaduna for at least 1 year and were registered members of the National Union of Road Transport Workers (NURTW) Kaduna branch, were eligible to participate. The NURTW among other roles regulates the activities of the motor parks and exercises authorities on its members.

It was a cross-sectional descriptive study of the drivers. Eligible drivers were identified by their vehicle numbers and a list of them created. The number of drivers to be selected from each motor park was determined by proportional allocation of a calculated sample size of 270. The sample size required was calculated using the formula for calculating sample size in cross-sectional studies when the population is less than 10,000. (Araoye, 2003). With a prevalence of psychoactive substance use in a similar study of about 43% (Lasebikan & Baiyewu, 2009), and an estimate of population of long distance drivers in Kaduna city put at about 1000 by the NURTW, an estimated minimum sample of 270 was obtained. However, 274 drivers were recruited.

For each of the 10 motor parks, a proportionate sample was taken. Beginning with the first driver who was to load his vehicle on an interview day at each of 10 designated motor parks, each consecutive 4th driver was interviewed until the sampling fraction for that park was attained. This process was repeated at the various motor parks until the sample size was attained.

It was a 2-stage assessment. Respondents were initially screened for alcohol and other substance use with 2 screening instruments after which those who had problem drug use based on cut-off scores were further assessed using a diagnostic tool. Drivers responded to the alcohol use disorder identification test (AUDIT) (Saunders et al, 1993) and the drug abuse screening test (DAST-10) (Skinner, 1982). Those with a total score of 8 and above on the AUDIT and or a total score of 3 or greater on the DAST indicating the likelihood of harmful use or dependence (Skinner, 1982; Yudko, 2007), were further evaluated for alcohol and other substance use disorders using the Schedule for Clinical Assessment in Neuropsychiatry (SCAN). The SCAN is a set of instruments aimed at assessing, measuring and classifying the psychopathology and behavior associated with the major psychiatric disorders of adult life (WHO, 1999). A computer program of the instrument was used in this study to generate diagnoses of the mental and behavioural disorders due to psychoactive substance use. The author administered the SCAN, having been trained in a World Health Organization Reference Centre on the use of the SCAN. Drivers were also asked to indicate if they had ever received medical treatment for drug-related health problems. The instruments were translated to Hausa

language and the interview conducted in Hausa, as this was the major language of communication by the study population.

Ethical clearance was sought and approved for the study by the Health Ethics Research Committee of the Ahmadu Bello University Teaching Hospital Zaria and the Kaduna state Ministry of Health. In addition, written informed consents were sought from the respondents and they were assured of confidentiality for participation in the study and that there was not going to be any consequence for non-participation.

The data obtained was analysed by means of descriptive statistics using the Statistical Package for Social Sciences (SPSS version 16.0) (SPSS 16.0).

RESULTS

Seventy nine subjects met the minimum cut-off score for the screening instruments requiring the application of the SCAN. Thirty subjects out of those who screened negative were administered the SCAN. None of them had an ICD-10 diagnosis. On the application of the SCAN, the current and life time prevalence of an ICD-10 diagnosis was 18.4%, and 21.2% respectively. The diagnosis found was harmful use and dependence (see Table 1).

No respondent had received any form of medical assistance with drug-related health problems.

DISCUSSION

The drivers in this study were found to be using various psychoactive substances. Some of the reasons for this is that drivers may wish to alter some basic physiologic process in order to meet other competing

Table 1. Psychoactive substance use disorders

Drug type	Harmful use						Dependence					
	PY		LB		NO USE		PY		LB		NO USE	
Alcohol	5	1.8%	6	2.2%	263	96.0%	1	0.4%	3	1.1%	269	98.2%
Cannabis	4	1.5%	4	1.5%	266	97.1%	1	0.4%	1	0.4%	272	99.3%
Opioids	3	1.1%	0	0%	271	98.9%	2	0.7%	0	0%	272	99.3%
Nicotine	8	2.9%	9	3.3%	257	93.8%	27	9.9%	5	1.8%	242	88.3%
Anxiolytics	0	0%	0	0%	274	100%	0	0%	0	0%	247	100%
Kolanuts	3	1.1%	1	0.4%	270	98.5%	0	0%	0	0%	274	100%
Solvent	0	0%	0	0%	274	100%	0	0%	0	0%	274	100%
Cocaine	0	0%	0	0%	274	100%	0	0%	0	0%	274	100%
Amphetamine	0	0%	0	0%	274	100%	0	0%	0	0%	274	100%
Caf.subs.	2	0.7%	0	0%	272	99.3%	0	0%	0	0%	274	100%

PY=past year, LB= lifetime before, Caf subs= Caffeinated substances

demand such as the need to take stimulants to stay awake to drive for longer period (Okpataku, 2015). Substances such as amphetamine and cocaine were not recorded as drugs currently used. Drug use is influenced by factors such as availability, affordability, accessibility and acceptability. Cocaine is an illicit drug in Nigeria and an important substance being hunted down by the drug law enforcement agents in the country. A World Health Organization global survey on psychoactive substances recorded low proportion of cocaine users in Africa, including Nigeria (Degenhardt et al., 2008). This could explain the near absence of these drugs among the respondents. Although it by no means eliminates the possibility of ongoing use nor does this undermine their wish to use these substances as this study was based on self-report of drug use with its limitations. Lowenstein et al in a study to determine crash responsibility in injured motorist found more subjects with serum levels of cannabis and alcohol than other drugs (Lowenstein & Koziol-McLain, 2000). Similarly, in the work done in France to determine the prevalence of

psychoactive substance use in truck drivers, the investigators found more urine samples with cannabinoids than other drugs (Labat et al, 2008)

About one of every five driver in this study was found to have a current ICD-10 substance use diagnosis. Lasebikan et al in their study found the prevalence of an ICD-10 diagnosis using the Composite International Diagnostic Interview (CIDI) to be 29.4% (Lasebikan & Baiyewu, 2009). This may partly be attributable to the different sociocultural settings in which these studies were conducted and the data collecting instruments. As both studies depended on self-reporting for screening substance users from non-users, underreporting could also be a factor.

There is relative dearth of studies of substance use disorders among vehicle drivers. Reports on substance use by drivers have largely been centred on the description and of the presence or otherwise of the various drugs. This is probably so because concerns about the use of psychoactive substances by drivers has essentially being related to traffic safe-

ty and the risk for injury it portends for passengers and other road users when drivers use substances and drive. The focus has not really been extended to the safety and personal health risks of these drugs on the user-the drivers in this case.

Transportation by road arguably still remains the most important means of movement for humans and goods in developing countries. Commercial vehicle drivers travel over hundreds of miles daily. This is a tedious job for drivers who are fatigue-prone and sleep on the wheels. Psychoactive substance use has been reported to be responsible for traffic injuries and death globally (Movig et al, 2008; Gjerde et al, 2011; Bogstrand et al, 2012). The direct impact of the drugs on the health of the driver may not have taken into consideration in these analyses. There perhaps could be an underestimation of the burden of substance use by vehicle drivers.

In most jurisdictions, law enforcement agents and road traffic authorities enforce the law against drugged-driving and apply punitive measures on drivers who violate laws as it relates to the use of substances. Drivers who abuse substances are not spared the mental and behavioural disorders arising from substance use. Drug-dependent drivers may be unable to adhere to traffic regulations on control or prohibition of substance use during driving as a result of a drug-induced brain disease. They should benefit from treatment just like other non-driver patients who are perceived as sick too. They would need medical assistance than mostly punitive measures. For a drug-dependent driver, medical referral and management may be an effective strategy to stay abstinent while driving than punishment. Several of the drivers had been arrested

for drugged-driving. However, from this study, none of the respondents had ever benefited from medical help for a drug use disorder even though they were in a major metropolis.

That some drivers had met the diagnosis of drug use disorders means a focused and purposeful intervention including drug treatment may be needed to assist drivers especially those dependent on drugs as part of a holistic approach to curtail the problems associated with the use of psychoactive substances among drivers.

ACKNOWLEDGMENTS

My sincere gratitude goes to the officials and the entire members of the National Union of Road Transport Workers, Kaduna chapter for their cooperation and assistance during the period of data collection. This work was funded from the personal resources of the author and should be credited to the Department of Psychiatry, Ahmadu Bello University Teaching Hospital, Zaria, Nigeria. The author declares no known conflict of interest.

REFERENCES

- Abiona, T.C., Aloba, O.O., & Fatoye, F.O. (2006). Pattern of alcohol consumption among commercial road transport workers in a semi-urban community in south western Nigeria. *East African Medical Journal*, 83(9), 494-499.
- Adenekan, A.K., & Osigbogun, A. (1999). Drug use and road traffic accident in Sagamu, Ogun State. *Journal of Community Medicine and Primary Health Care*, 11: 36-47.

- Araoye, M.O. (2003). Research methodology with statistics for health and social sciences. Ilorin: Nathadex Publisher; pp.117-120.
- Bello, S., Fatiregun, A., Ndifon, W.O., Ayo-Ita, A., & Ikpeme, B. (2011). Social determinants of alcohol use among drivers in Calabar. *Nigerian Medical Journal*, 52(4), 244-249.
- Beimess, D.J., & Davis, C.G. (2006). Driving under the influence of cannabis: Analysis drawn from the 2004 canadian addiction survey. Canada: Canadian Centre on Substance Abuse.
- Bogstrand, S.T., Gjerde, H., Normann, P.T., Rossow, I., & Ekeberg, Ø. (2012). Alcohol, psychoactive substances and non-fatal road traffic accidents- a case-control study. *BMC Public Health*, 3(12), 734.
- Degenhardt, L., & Hall, W. (2012). Extent of illicit drug use and dependence, and their contribution to the global burden of disease. *The Lancet*, 379 (9810), 55-70.
- Degenhardt, L., Chiu, W., Sampson, N., Kessler, R.C., Anthony, J.C., & Angermeyer, M. et al. (2008). Toward a Global View of Alcohol, Tobacco, Cannabis, and Cocaine Use: Findings from the WHO World Mental Health Surveys. *PLoS Medicine* 5(7), e141.
- De Maeyer J, Vanderplasschen, W., & Broekaert E. (2010). Quality of life among opiate-dependent individuals: A review of the literature. *International Journal of Drug Policy*, 21(5), 364-380.
- Drummer, O.H., Gerostamoulus, J., Batziris, H., Chu, M., Caplehorn, J., Robertson, M.D., et al. (2004). The involvement of drugs in drivers of motor vehicles killed in Australia road traffic crashes. *Accident Analysis and Prevention*, 36(2), 239-248.
- Ezzati, M., & Lopez, A.D. (2003). Estimates of global mortality attributable to smoking in 2000. *Lancet*, 362(9387), 847-852.
- Giroto, E., Mesas, A.E., Maffei de Andrade, S., & Birolim, M.M. (2014). Psychoactive substance use by truck drivers: a systematic review. *Occupational and Environmental Medicine*, 71(1), 71-76.
- Gjerde, H., Normann, P.T, Christophersen, A.S., Samuelsen, S.O., Morland, J. (2011). Alcohol, psychoactive drugs and fatal road traffic accidents in Norway: a case-control study. *Accident Analysis and Prevention*, 43(3), 1197-1203.
- Labat, L., Fontaine, B., Delzenne, C., Doublet, A., Marek, M.C., & Tellier, D. (2008). Prevalence of psychoactive substances in truck drivers in the Nord-Pas-de-Calais region (France) *Forensic Science International*, 174(2-3), 90-94.
- Lasebikan, V.O., & Baiyewu, O. (2009). Profile of Problems Associated with Psychoactive Substance Use Among Long Distance Commercial Automobile Drivers in Ibadan. *Nigerian Journal of Psychiatry*, 7(1), 9-13.
- Lowenstein, S.R., & Koziol-McLain, J. (2000). Drugs and Traffic Crash Responsibility: A Study of Injured Motorists in Colorado. *Journal of Trauma-Injury, Infection, and Critical Care*, 50(2), 313-320.
- Makanjuola, B.A., Oyeleke, S.A., & Akan- de, T.M. (2007). Psychoactive substance use among long distance vehicle drivers in Ilorin. *Nigerian Journal of psychiatry*, 5(1), 15-16.
- Mathijssen, R., & Houwing, S. (2005). The prevalence and relative risk of drink

- and drug driving in the Netherlands: a case-control study in the Tilburg police district Research in the framework of the European research programme IMMORTAL. Leidschendam: SWOV Institute for Road Safety Research.
- Mir, M.U., Khan, I., Ahmed, B., Abdul Razzak, J. (2012). Alcohol and marijuana use while driving-an unexpected crash risk in Pakistani commercial drivers: a cross-sectional survey. *BMC Public Health*, 12:145.
- Movig, K.L., Mathijssen, M.P., Nagel, P.H., van Egmond, T., De Gier, J.J., Leufkens, H.G., et al. (2004). Psychoactive substance use and the risk of motor vehicle accidents. *Accident Analysis and Prevention*, 36(4), 631-636.
- National Population Commission (NPC) (2006). Nigerian National Population Census 2006. National Population Commission of Nigeria.
- Okpataku, C.I. (2015). Implications of the pattern and reasons for psychoactive substance use among long distance commercial vehicle drivers in northern Nigeria, *Indian Journal of public health*, 59(4), 259-263.
- Rehm, J., Mathers, C., Popova, S., Thavornchareoensap, M., Teerawattananon, Y., & Patra, J. (2009). Global burden of disease and injury and economic cost attributable to alcohol and alcohol use disorders. *Lancet*, 373(9682), 2223-2233.
- Saunders, J.B., Aasland, O.G., Babor, T.F., Fuente, J.R., & Grant, M. (1993). Development of the Alcohol Use Disorders Identification Test (AUDIT): WHO collaborative project on early detection of persons with harmful alcohol consumption II. *Addiction*, 88(6), 791-804.
- Skinner HA. Guide for using the Drug Abuse Screening Test. Toronto, Canada. Center for Addiction and Mental Health. 1982; www.emcdda.europa.eu 1982. Assessed 25/05/2011.
- Smith, K.W., & Larson, M.J. (2003). Quality of life assessments by adult substance abusers receiving publicly funded treatment in Massachusetts. *American Journal of Drug and Alcohol Abuse*, 29(2), 323-335.
- SPSS for windows, version 16.0 Chicago, SPPS Inc.
- United Nations Office on Drug and Crime (UNODC) (2014a). World Drug Report, United Nations Publications.
- United Nations Office on Drug and Crime (UNODC) (2015). World Drug Report, United Nations Publications.
- United Nations Office on Drug and Crime (UNODC) (2014b). Early warning advisory on NPS, United Nations Publications.
- World Health Organization. (1999). Schedules for Clinical Examination in Psychiatry. Assessment, Classification and Epidemiology; Geneva.
- Wurcel, A.G., Merchant, E.A., Clark, R.P., & Stone, D.R. (2015). Emerging and underrecognized complications of illicit drug use. *Clinical Infectious Disease*, 61(12), 1840-1849.
- Yudko, E., Lozhkina, O., Fouts, A. (2007). A comprehensive review of the psychometric properties of the Drug Abuse Screening Test. *J Substance Abuse Treatment*, 32(2), 189-198.

PATTERNS OF SUBSTANCE USE AND ITS PREDICTORS AMONG NORTH-WEST UNIVERSITY STUDENTS MAFIKENG CAMPUS

Godswill N. Osuafor^{1,2} Sonto M. Maputle¹ and Natal Ayiga²

¹School of Health Science, University of Venda, South Africa

^{1,2}Population and Health Research Focus Area, Faculty of Human and Social Sciences,
North West University (Mafikeng Campus)

ABSTRACT

The aim of this study was to examine the pattern of substance use among university students in South Africa. A cross-sectional study of randomly selected 416 students was conducted. Data were analysed using descriptive statistics and binary logistic regression. The result of the study indicated that current alcohol use was reported by 67.5%, Cigarette, 21.4%, cannabis, 17.3% and glue 2.9%. Alcohol consumption was associated with sex, age, religious affiliation, home language, family influence, and substance experimentation. Sex and substance experimentation were predictors of cigarette smoking. Cannabis use was associated with respondent's sociocultural group and family influence. There is need to strengthen the family structure of homes as present substance use is rooted in family influences. Educational programmes that emphasise the dangers of experimenting with substance to young people may have great potential in minimizing substance use.

Key words: pattern, psychoactive, substance use, peer pressure, experimenting.

INTRODUCTION

The pervasiveness of the use of alcohol, tobacco, cannabis and other psychoactive substances remains a major concern among young people globally. Nearly 25% of the total death toll among people aged 25-39 years were related to alcohol use in 2014 (WHO, 2015). This percentage

is higher than that of the global alcohol related deaths which is recorded as 7.6% and 4.0% for men and women respectively. The United Nations Office on Drug and Crime (2015) reported about 187,100 drug-related deaths in 2013. Of a particular importance, the report indicated that cannabis use disorder is more dominant in several regions of the world.

In the Sub-Saharan African context, South Africa has a historic pattern of hazardous or harmful alcohol consumption which stems from the apartheid era. For example, the South African Youth Risk Behaviour Survey of 2002, indicates that 16% of the young participants commenced drinking of alcohol before the age of 13 years (Reddy et al., 2003). Further evidence suggests that 31.8% alcohol use and 23% binge drinking was recorded among people aged 14-18 years (Reddy et al., 2003). However, cases of binge drinking escalated from 23% in 2002 to 28.5% in 2008 (YRBS, 2010). Peltzer and Ramlagan (2009) review of five national and local surveys on the prevalence of alcohol use revealed that life time, current use and binge drinking remained constant for both adolescent and adult addicts for a period of 12 years. Given that alcohol and drug use are major causes of early death and disability among young people, substance use in South African is a demographic concern.

The illegal use of drugs has added a new dimension to substance use equation in South Africa. Different researchers have made diverse indications about the social context of drug use. For instance, Mudavanhu and Schenck (2014) link the unavoidable use of substances to cultural festivals which they argue makes substance use unavoidable in South African society. Similarly, Alhyas *et al.* (2015) indicate that there is evidence that experimenting with cigarette smoking which culminates to dangerous drug use such as cannabis often begins in school toilets. Other studies in South Africa reveal that substance use is often linked to easy access, family history of substance abuse, peer influences and developmental stage (Mudavanhu & Schenck, 2014; Rice &

Dolgin, 2008). Furthermore, the prevalence of substance use has been linked to the rapid urbanization, economic development, increased availability, corporate targeting, weak policy infrastructure and trade agreement driven by globalization (Ferreira-Borges, Dias, Babor, Esser, & Parry, 2015). Therefore, these complex interactions between cultural diversity and contextual factors may yield differential patterns on substance use.

Despite the multiplicity of patterns and background characteristics that influence substance use, there is a paucity of studies among university students in South Africa. In their research, Peltzer and Ramlagan (2009) observed that students residing in the educational institutions were excluded in the five national and local surveys on substance use. As a result of this gap in information, policy makers and interventionists are clueless about the patterns and factors influencing substance use in the university environment. This qualifies university students as a vulnerable group, specifically considering the freedom from parental guidance and the unlimited susceptibility to substance experimentation in the university environment.

A study conducted at the University of Venda reveals a 65% use of alcohol and 49% abuse of alcohol among the students (Kyei & Ramagoma, 2013). The study further documents peer pressure as the main determinant of alcohol consumption. A similar study by Ajao (2014) affirms a high use of illicit substances and the negative complications among students in Venda. Interestingly, this study indicates that individuals' affiliation to religion reduced the level of alcohol consumption. However, given the differentials in university environmental factors and norms, the findings of these studies cannot be generalised.

Therefore, this study is designed to assess the prevalence and identify the contextual factors associated with substance use at the Mafikeng Campus, of the North-West University, South Africa.

METHOD

A cross sectional survey was conducted among students of the North-West University, Mafikeng campus in November 2014. Lecture halls were randomly selected and self-administered questionnaire developed in the English language were distributed to students during the lecture periods. The aim was to incorporate the participation of students living both within and outside the campus. The returned 500 questionnaires were examined for consistency and the 416 correctly filled ones were used for analyses.

Measures

Substance use was assessed by asking participants questions on life time and current use of any of the substances. Current use is defined as the usage within the space of six-months prior to the survey. The responses were either "Yes" or "No". Those who reported that they consumed any of the substances were further asked to state the frequency of usage in the past six months. This was measured on a scale of 1 to 6 (1 = 1-2 times; 2 = 3-4 times; 3 = 5-6 times; 4 = 7-8 times; 5 = 9-10 times and 6 = daily). Based on the feedback received, substance use was examined on alcohol consumption, cigarette, cannabis and glue.

The background characteristics examined were age, sex, places of residence, year of study on campus, religious denomination and home language. Other variables examined were family and peer

influences on substance use, as well as testing and experimenting with substance. All the background characteristics were categorised and reported in the study findings.

Data Management and Analyses

Data were coded and analysed using the Statistical Package for Service Solutions (SPSS) version 22. Demographic characteristics and patterns of substance use were described using frequencies and percentages. Chi-square analyses were used to test the association between alcohol consumption, cigarette smoking, cannabis and glue by selected background characteristics. Binary logistic regression model was used to establish the predictors of current alcohol consumption, cigarette and cannabis smoking.

RESULTS

Demographic characteristics of the respondents

Table 1 presents the socio-demographic characteristics of the respondents by sex. More females participated than males in the study. About three-quarters (58%) of the sample were people aged 20-24 years. Slightly over half of the respondents were second year students and about two-fifth of the students were residents on the campus. Two-thirds of the students indicated that they were Tswana. Over three-fifths admitted that they lived alone. Majority of the students were Christians, with one-third professing Pentecostalism. Majority stated that neither family nor peer influences was responsible for their use of substances. However, nearly half (48%) commenced substance use by testing and experimenting.

Table 1. Demographic characteristics of the respondents.

Characteristics	Female	Male	Total
Age group			
< 20	31	13.5	23.8
20-24	55.9	60.8	57.9
25+	13.1	25.7	18.3
Year of study			
Year 1	14.3	10.5	12.7
Year 2	55.5	48	52.4
Year 3	11	12.9	11.8
Year 4	7.8	14.6	10.6
Postgraduate	11.4	14	12.5
Place of residence			
On campus	40.4	45.6	42.5
Off campus	59.6	54.4	57.5
Sociocultural group			
Tswana	69	62	66.1
Sotho	11	12.9	11.8
Xhosa	7.3	8.8	7.9
Zulu	8.6	9.4	8.9
English	4.1	7	5.3
Religious Affiliation			
None	10.2	25.1	16.3
Catholic	11	10.5	10.8
Methodist	16.3	7.6	12.7
Protestant	23.7	12.3	19.0
Pentecostal	31.8	35.1	33.2
Anglican	6.9	9.4	7.9
Family Influence on substance use			
No	88.3	86.4	87.5
Yes	11.7	13.6	12.5
Peers Influence on substance use			
No	86.1	77.8	82.7
Yes	13.9	22.2	17.3
Testing & Experimenting			
No	56.7	46.3	52.4
Yes	43.3	53.7	47.6
Total (n)	245	171	416

Lifetime and current use (in the last 6 months) among students.

Figure 1 shows lifetime and current substance use. Majority (90.6%) of the students reported life time ever tested alcoholic drink. With regard to the past six

months prior the interview, 67.5% stated that they consumed alcoholic drinks. The ever smoked and current cigarette smoking category showed significant differences. Ever used and current use of Cannabis was reported by 20.4% and 17.3% of the

students. Lowest percentages indicated ever used and current use of glue.

Prevalence of substance use in the last six-months before the survey.

Figure 2 demonstrates the prevalence in pattern of current substances use. Cigarette was the most widely daily used substance, followed by cannabis, glue and alcohol in decreasing order. In the previous six months before the survey, about a

quarter of the students admitted to using glue, cannabis, alcohol and cigarette once or twice.

Current substance use by selected background variables: Bivariate analyses.

The Chi-squared analyses in Table 2 below suggests that age, sex, religious denomination, family history of substance use, experimenting and testing alcohol

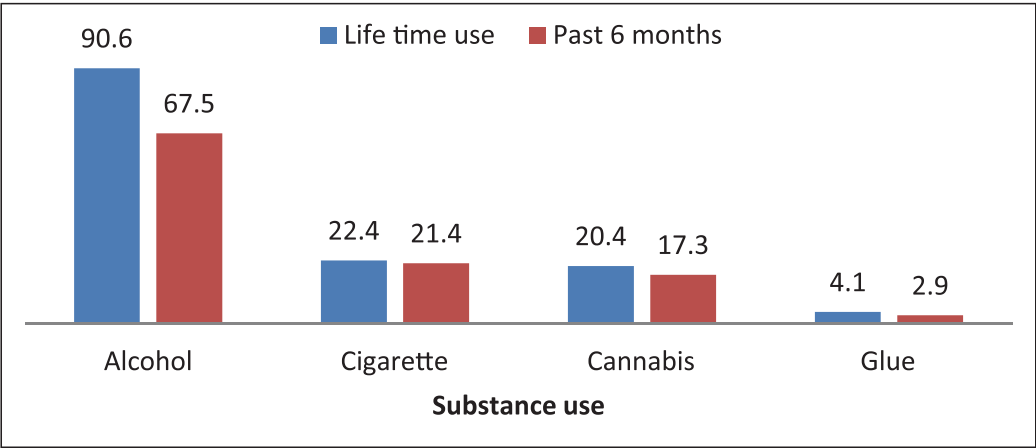


Figure 1. Lifetime and current substance use.

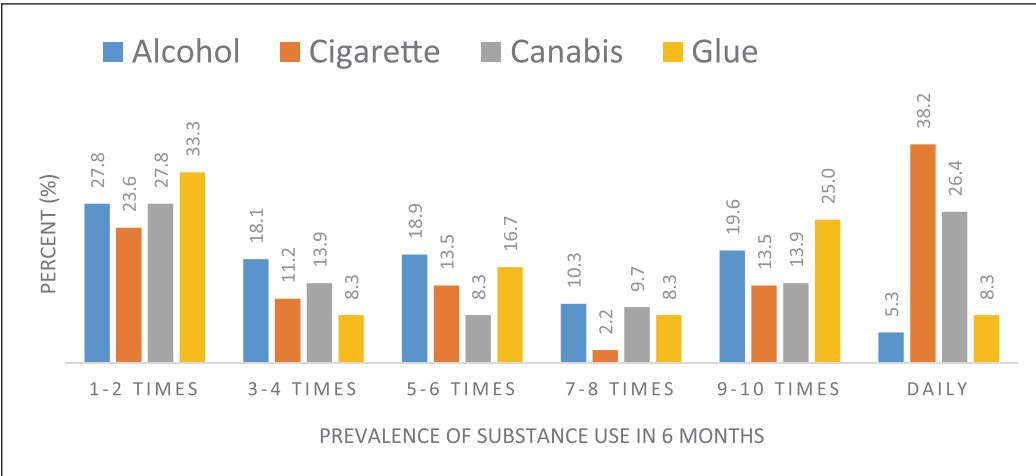


Figure 2. Prevalence of alcohol, cigarette, cannabis and glues use.

Table 2. Percentage distribution of substance use in the past six month by selected variable

Variables	N = 416	Alcohol	Cigarette	Cannabis	Glue
Age group					
< 20	99	51.5	16.2	8.1	4.0
20-24	241	73.9	20.3	18.1	2.5
25+	76	68.4	31.6	26.3	2.6
P- value		0.000	0.040	0.006	0.732
Sex					
Female	245	58.8	15.5	11.8	2.4
Male	171	80.1	29.8	25.1	3.5
P- value		0.000	0.000	0.000	0.525
Year of Study					
Year 1	53	50.1	15.1	13.2	1.9
Year 2	218	69.7	19.7	15.1	2.3
Year 3	49	71.4	20.4	18.4	2.0
Year 4	44	72.7	29.5	20.5	9.4
Postgraduate	52	67.3	28.8	26.9	1.9
P- value		0.091	0.278	0.283	0.146
Place of residence					
On campus	177	66.1	20.3	20.3	2.8
Off campus	239	68.6	22.2	15.1	2.9
P- value		0.588	0.652	0.160	0.950
Sociocultural group					
Setswana	275	70.5	21.1	14.5	2.2
Sotho	49	71.4	24.5	30.6	2.0
Xhosa	33	63.6	12.1	18.2	6.0
Zulu	37	48.6	24.3	16.2	0.0
English	22	59.1	27.3	22.7	13.6
P- value		0.077	0.623	0.091	0.018
Religious Affiliation					
None	68	80.9	27.9	20.6	5.9
Catholics	45	82.2	24.4	24.4	4.4
Methodist	53	64.2	17.0	7.5	0.0
Protestants	79	58.2	22.8	20.3	1.3
Pentecostal	138	62.3	15.2	13.8	2.9
Anglican	33	69.7	33.3	24.2	3.0
P- value		0.010	0.125	0.134	0.430
Family influence					
No	366	64.8	19.7	15.3	2.5
Yes	50	88.0	34.0	32.0	6.0
P- value		0.001	0.020	0.003	0.161
Peer influence					
No	348	65.8	19.0	15.5	2.3
Yes	68	76.5	33.8	26.5	5.9
P- value		0.086	0.006	0.029	0.106
Testing and Experimenting					
No	288	51.3	14.9	12.3	2.6
Yes	188	87.2	29.3	23.4	3.2
P- value		0.000	0.000	0.003	0.734

were significantly associated with current drinking. The highest percentage of alcohol consumption was reported by people aged 20-24 years. Males represented a higher percentage in comparison to females in this category in the past six months. Similarly, in comparison to Protestants, Catholics represented a higher percentage in alcohol consumption. Relatively higher percentages of alcohol drinking was reported by those with a family history of substance use or alcohol experimenting and testing. However, the year of study, place of residence, home language, and peer influences were not associated with alcohol consumption.

Furthermore, as Table 2 reveals, cigarette smoking was significantly associated with age, sex, family as well as peer influences, testing and experimenting with substances. The highest proportion of cigarette smoking was observed among males and those aged 25 years and above. As expected, those with family or peer influenced substance use and testing and experimenting with substance recorded higher percentages of cigarette smoking. A similar pattern was observed with regards to cannabis usage. In addition, year of study, place of residence sociocultural group and religious denomination were neither associated with cigarette smoking nor the use of cannabis. With the exception of home language, the use of organic solvents did not show association with the background characteristics. This could be due to the low proportions that reported the use of organic solvent.

Multivariate analyses

A binary logistic regression analysis was applied to identify salient variables which in combination predict the alcohol consumption in the past six months. Table 4

below shows that sex, age, religious denomination, sociocultural group, family history of substance use, testing and experimenting with substance are significantly associated with alcohol consumption. It also demonstrates that males were about 3 times more likely than females to report alcohol consumption. In a similar vein, teenage students were less likely to state alcohol consumption compared to those aged 20-24 years. In comparison to those with no religious denominations, Protestants and Pentecostals had 68% and 70% reduced odds of reporting alcohol use. The probability of alcohol consumption was lower among Zulus compared to the Tswana group. Respondents with a family history of substance use, testing and experimenting with substance were 4 times and 6 times more likely to consume alcohol unlike those with no family influence or testing and experimenting. However, peer influence, year of study and place of residence were not significantly associated with alcohol consumption.

The table further reveals that cigarette smoking was significant associated with sex, testing and experimenting with substance. On the other hand, the use of cannabis was associated with sociocultural group and family history of substance use. The likelihoods of reporting cigarette smoking were higher among males compared to females, and among those who started using substance by testing and experimenting. Similarly, in comparison to the Tswana sociocultural group, Sothos were 2 times more likely to use cannabis. Those with a family history of substance use were more likely to use cannabis compared to their counterparts with no family history of substance use. However, age religious denominations, home language, peer influence, year of study,

Table 4. Parsimonious logistic regression of current substance use.

Variables	Alcohol		Cigarette		Cannabis	
	ORs	95% C.I.	ORs	95% C.I.	ORs	95% C.I.
Sex						
Female (Reference)	1.00		1.00			
Male	2.75**	1.54- 4.89	2.39**	1.45 -3.94	-	-
Age group						
< 20	0.40**	0.22 - 0.74	-	-	-	-
20-24 (Reference)	1.00					
25+	0.62	0.30 - 1.27	-	-	-	-
Religious Affiliation						
None (Reference)	1.00					
Catholics	0.64	0.20 - 2.05	-	-	-	-
Methodist	0.41	0.14 - 1.15	-	-	-	-
Protestants	0.32*	0.12 - 0.82	-	-	-	-
Apostolic/Pentecostal	0.30**	0.13 - 0.72	-	-	-	-
Anglican	0.62	0.17 - 2.24	-	-	-	-
Sociocultural group						
Tswana (Reference)	1.00				1.00	
Sotho	1.10	0.49 - 2.45	-	-	2.38*	1.13 - 5.01
Xhosa	0.71	0.27 - 1.89	-	-	1.25	0.44 - 3.56
Zulu	0.20**	0.08 - 0.50	-	-	1.10	0.42 - 2.88
English	0.41	0.12 - 1.41	-	-	1.55	0.52 - 4.67
Family influence						
No (Reference)	1.00				1.00	
Yes	3.60*	1.20 - 10.79	-	-	2.79**	1.41 -5.54
Testing and Experimenting						
No (Reference)	1.00		1.00			
Yes	6.34**	3.60 - 11.15	2.39**	1.43 - 3.98	-	-

* Significant at 0.05 level; ** significant at 0.01 level; 1.00 is reference category and CI for confidence interval

place of residence and family history of substance use were not significant predictors of cigarette smoking. Furthermore, sex, age, religious denomination, peer influence, year of study, place of residence, testing and experimenting with substance did not predict the use of cannabis.

DISCUSSION

The study demonstrates that substance use is pervasive among the students.

Consistent with other studies in South Africa (Seggie, 2012) and Rwanda (Kanyoni, Gishoma, & Ndahindwa, 2015), this study agrees that alcohol and cigarette are the predominantly used substances among students. This assertion is attributable to the easy access of alcohol and cigarettes. The study further indicates a higher tendency of alcohol and cigarette use among males compared to females, this finding is in agreement with the findings of studies conducted among Haramaya University students in Ethiopia (Tesfaye, Derese, &

Hambisa, 2014). Higher alcohol and cigarette use among males suggests a natural predisposition of males towards pleasure-seeking beneficial behaviour especially substance use which has become a widely-normalised social activity.

The lower likelihood of substance consumption by teenage students could be explained by the fact that the national law prohibits under-age alcohol consumption. Therefore, although there is evidence of alcohol consumption among teenagers, the society rejects such behaviour. This finding suggests that alcohol consumption behaviour evolves over time among the students. These findings are pertinent because they could propel strategies that promote modest alcohol consumption among teenagers which would in turn have health benefit effects on teenagers.

Finding that professing Protestantism and Pentecostalism had deterrent effects on alcohol consumption was not unexpected. This finding concurs with previous studies in South Africa; (Kyei & Ramagoma, 2013), Nigerian universities (Makanjuola, Abiodun, & Sajo, 2014) and US (Vaughan, de Dios, Steinfeldt, & Kratz, 2011) which equally indicate that religion has effectively curbs the proclivity for alcohol consumption. The protective role of religion as is evident in the present study may be attributed to the proscriptive teachings on alcohol use by these religious denominations. Religious groups have been forthright in discouraging alcohol use despite the fact that some denominations use alcoholic drinks for spiritual ceremonies. We attribute this finding to the conservative liturgy and belief on alcohol use of Protestants and Pentecostals.

Cultural rituals which make substance use unavoidable in South African societies

can be characterised by the individual sociocultural groups. However, sociocultural groups were neither associated with alcohol use nor the use of cannabis at bivariate analyses. Conversely, alcohol consumption was associated with Zulus at multivariate level. Similarly, the use of cannabis was mostly associated with the Sothos. Arguably, this suggests that sociocultural whims worked through other variables to suppress alcohol consumption among Zulus, while enhancing the use of cannabis among the Sothos. It also appears that the public awareness on the harmful effects of alcohol consumption has had positive impacts on the Zulus. Furthermore, higher likelihood of cannabis usage by the Sothos may be partly explained by their sociocultural acceptability of cannabis use.

The study indicates that family influence is an important factor that underscores alcohol consumption and the use of cannabis. Students were more likely to use substances if members of their family were users. This finding reiterates the summations of previous reports on alcohol consumption (Makanjuola et al., 2014). It also strongly agrees with the study in Australia (Gilligan & Kypri, 2012; Ward & Snow, 2011) that linked family substance use as predisposing factor to the use cannabis among young people. This finding is not unexpected because the family is the baseline of socialisation and character formation of young people which extends into adulthood. This finding emphasises the need for the adults in families to be role models for the younger ones.

Current use of alcohol and cigarette smoking is associated with substance experimentation and use which is similar to related findings in South Africa

(Mudavanhu & Schenck, 2014) and Nigeria (Owoaje & Bello, 2010). This finding is not unexpected because the South African society is not forthright in regulating alcohol consumption and cigarette smoking. Consequently, alcohol consumption and cigarette smoking as is observed in this study is further perpetuated by illegal substance experimentation.

It is noteworthy that other substances such as amphetamines, cocaine/crack, khat, tranquilisers, hallucinogens, opium, sedatives and hypnotics were not reported. This suggests that these students have probably not been exposed to them. It is also possible that the location of the university may have made the access to these substances impossible due to far distance from mega business hub. This has widened the knowledge on the type of substances that are not currently used on the campus and may form a basis for sustained efforts in the prevention of substance use among university students.

CONCLUSION AND RECOMMENDATION

The study has presented the patterns of substance use which revealed that students use them on daily basis. It further characterised the contextual factors such as religion, family influences and socio-cultural background connected to substance use. Finally, individual factors such as sex, testing and substance experimentation which predict the current use of specific substances were demonstrated. The findings of the study proposes the urgency for programmes in the university that aim at educating young people about the dangers of substance use. To deter health compromising behaviour

among students, this study recommends the strengthening of the moral fabrics of homes and sociocultural backgrounds as present substance use is mostly rooted in unhealthy background influences. This measure will unquestionably go a long way in curbing substance experimentation and use among young people.

REFERENCES

- Ajao, B. (2014). Knowledge, attitude and practices of substance use among university students. Retrieved from http://reference.sabinet.co.za/sa_epublication_article/ajpherd_v20_n1_a19
- Alhyas, L., Ozaibi, N. A., Elarabi, H., El-Kashef, A., Wanigaratne, S., Almarzouqi, A., Ghaferi, H. A. (2015). Adolescents' perception of substance use and factors influencing its use: a qualitative study in Abu Dhabi. *JRSM Open*, 6(2), 2054270414567167. <http://doi.org/10.1177/2054270414567167>
- Ferreira-Borges, C., Dias, S., Babor, T., Esser, M. B., & Parry, C. D. H. (2015). Alcohol and public health in Africa: can we prevent alcohol-related harm from increasing? *Addiction*, 110(9), 1373–1379. <http://doi.org/10.1111/add.12916>
- Gilligan, C., & Kypri, K. (2012). Parent attitudes, family dynamics and adolescent drinking: qualitative study of the Australian parenting guidelines for adolescent alcohol use. *BMC Public Health*, 12, 491. <http://doi.org/10.1186/1471-2458-12-491>
- Kanyoni, M., Gishoma, D., & Ndahindwa, V. (2015). Prevalence of psychoactive substance use among youth in Rwanda. *BMC Research Notes*, 8, 190. <http://doi.org/10.1186/s13104-015-1148-2>

- Kyei, K., & Ramagoma, M. (2013). Alcohol Consumption in South African Universities: Prevalence and Factors at the University of Venda. *Journal of Social Science*, 36(1), 77–86.
- Makanjuola, A. B., Abiodun, O. A., & Sajo, S. (2014). Alcohol and Psychoactive substance use among Medical Students of the University of Ilorin, Nigeria. *European Scientific Journal*, ESJ, 10(8). Retrieved from <http://eujournal.org/index.php/esj/article/view/3008>
- Mudavanhu, N., & Schenck, R. (2014). Substance abuse amongst the youth in Grabouw Western Cape: Voices from the community. *Social Work*, 50(3), 370–392. <http://doi.org/10.15270/50-2-405>
- Owoaje, E. T., & Bello, J. (2010). Psychoactive Substance Use among Undergraduate Students of the University of Ibadan, Nigeria. *Tropical Journal of Health Sciences*, 17(2). <http://doi.org/10.4314/tjhc.v17i2.61034>
- Peltzer, K., & Ramlagan, S. (2009). Alcohol Use Trends in South Africa. *Journal of Social Science*, 18(1), 1–12.
- Reddy, S. ., Panday, S., Swart, Jinabhai, C., Amosun, S., James, S., Van den Borne, H. . (2003). Umthenthe Uhlaba Usamila – The South African Youth Risk Behaviour Survey 2002. Department of Health. Retrieved from <http://www.doh.gov.za>
- Rice, F., & Dolgin, K. G. (2008). *The adolescent: Development, relationships, and culture*. Allyn & Bacon.
- Seggie, J. (2012). Alcohol and South Africa's youth. *SAMJ: South African Medical Journal*, 102(7), 587–587.
- Tesfaye, G., Derese, A., & Hambisa, M. T. (2014). Substance Use and Associated Factors among University Students in Ethiopia: A Cross-Sectional Study. *Journal of Addiction*, 2014, e969837. <http://doi.org/10.1155/2014/969837>
- UNODC. (2015). World drug Report finds drug use stable, access to drug & HIV treatment still low. United Nations Office on Drugs and Crime. Retrieved from <https://www.unodc.org/en/frontpage/2015/June/2015-world-drug-report-finds-drug-use-stable-access-to-drug-and-hiv-treatment-still-low.html>
- Vaughan, E. L., de Dios, M. A., Steinfeldt, J. A., & Kratz, L. M. (2011). Religiosity, alcohol use attitudes, and alcohol use in a national sample of adolescents. *Psychology of Addictive Behaviours*, 25(3), 547–553. <http://doi.org/10.1037/a0024660>
- Ward, B. M., & Snow, P. C. (2011). Parents' plans to supply their adolescents with alcohol. *Australian Journal of Primary Health*, 17(2), 169–174.
- WHO. (2015). Global status report on alcohol and health 2014. World Health Organisation. Retrieved from http://www.who.int/substance_abuse/publications/global_alcohol_report/en/

THE SOCIAL CONTEXT OF INJECTION DRUG USE AND HARM REDUCTION PROGRAMMES IN SUB-SAHARAN AFRICA

Ediomo-Ubong E. Nelson

Centre for Research and Information on Substance Abuse (CRISA) Uyo, Nigeria

ABSTRACT

Sub-Saharan Africa has a documented significant burden of heroin and cocaine injection, and HIV transmission. But the region is behind in the implementation and scaling up of harm reduction measures such as syringe exchange programmes and opiate substitution therapy, due to political preference for the control of drug supply through legal prohibition. Though the policy environment is changing and small-scale programmes are emerging in some countries, large-scale programmes needed to stem HIV epidemic among people who inject drugs are bedevilled by social, cultural and political barriers. For example, current models of harm reduction are problematic in sub-Saharan Africa because they elevate the individual and his or her rights above the society and its needs, and they focus on behavioural changes and do not take into account the social factors that predispose people to drug harms. There is need to align harm reduction programmes with the realities of local contexts in order to guarantee local acceptance as well as increase the potentials for sustainability.

Key words: Harm reduction, public health, drug policy, sub-Saharan Africa

INTRODUCTION

There is significant disillusionment in many parts of the world with the dominant, prohibitionist approach to illicit drugs control. The approach, which rests on the three international conventions, namely the 1961 Single Convention on Narcotic Drugs, the 1971 Convention on Psychotropic Substances, and the 1988

Convention against Illegal Traffic in Narcotic Drugs and Psychotropic Substances, attempt to control the supply and use of illicit drugs by means of legal prohibition. After roughly six decades of attempting to control the use of drugs by suppressing production and distribution, it is now widely acknowledged that the approach is of limited effectiveness. Production and trafficking have been suppressed in some

places, but they have ballooned elsewhere. Demand for cocaine, heroin and new synthetic drugs are on the increase globally (UNODC, 2012).

Across the world, counter-narcotic operations have engendered political instability, violence, corruption, mass incarceration, and violations of the human rights of people who use drugs (PWUDs), including the right to health (Pollack & Reuter, 2014; WACD, 2014), which has been influential in undermining support for the global drug control regime, and strengthening the momentum for policy shift towards public health and harm reduction. A vast body of evidence suggests that harm reduction measures are effective in preventing HIV infection among people who use illicit drugs; such that these programs are considered an important factor in the prevention of HIV among people who inject drugs (PWIDs) (see the review by Csete et. al., 2016).

Consider, for example, syringe exchange and opioid substitution therapy. The former has been proven to be effective in reducing risk behaviour and the incidence of HIV and Hepatitis C (Des Jarlais et. al., 1996; Hagan et. al., 1995). It does not lead to increase in drug use, but is associated with substantial reduction in healthcare expenditures (Fisher et. al., 2003; Normand et. al., 1995). An international study revealed that cities with syringe exchange programs have 5.8% decline in HIV prevalence per year, while HIV prevalence increased by 5.9% in cities without such programs (Hurley et. al., 1997). Opioid substitution therapy (such as methadone) is associated with reduction in, and elimination of, illicit opiate use, reduction in risk behaviour, reduction in the transmission of HIV and viral Hepatitis, and in mortality

rates (MacAurthur et. al., 2014; Turner et. al., 2011).

Despite this evidence of effectiveness, harm reduction measures remain controversial and highly contested in many places, including Sri Lanka, Turkey, North Africa, Eastern Europe and Russia. They are unpopular among African countries, renowned for political preference for the prohibitionist approach to illicit drugs, which is due in part to political pressure from the United States. Although the policy environment is changing, and small-scale programs have emerged in some countries, large-scale implementation of harm reduction measures, which is needed to arrest the epidemic of HIV and viral Hepatitis among people who inject drugs (PWIDs), is faced with many obstacles including government opposition and/or indifference, stigma and discrimination of PWIDs, public discomfort, and socio-cultural and religious barriers (Klein, 2011; Kelly et al., 2006; McCurdy et al., 2007). This paper examines the socio-cultural context of harm reduction in Africa with a view to charting the way forward.

Epidemiology of injection drug use

Injection drug use (IDU) is a growing problem in Sub-Saharan Africa (SSA). SSA countries such as Kenya, Tanzania, Cote d'Ivoire, Mauritius, Morocco, Nigeria, Egypt, Mozambique, South Africa, Ghana, and Congo have a documented growing burden of injection drug use (Harm Reduction International, 2015). There are about 1,778,500 people who inject drugs (PWIDs) in the region, and about 221,000 of these people may be living with HIV (Mathers et. al., 2008). Most PWIDs in SSA are male, ranging from 66% in northern Nigeria to 93% in Nairobi, Kenya (DesJarlais, Perlis, Stimson & Poznyak,

2006; Aceijas et. al., 2006). There is a high prevalence of IDU among sex workers, ranging up to 74% in Mauritius, where a quarter of PWIDs are sex workers (Reid, 2009). HIV prevalence among PWIDs in SSA ranges from 22.9% to 50% in Kenya, 19.4% in South Africa, 8.9% in Nigeria to less than 1% in Zambia (Mathers et. al., 2008). There is a significant problem of drug injecting without sterile injection equipment, and high risk practices such as the sharing of blood with other users who cannot afford the drug (a practise known as 'flash blood') (Atkinson et al., 2011; McCurdy et al., 2007).

The most common drug injected in SSA is heroin, followed by cocaine and speedball, a combination of heroin and cocaine (Adelekan & Lawal, 2006). Heroin and cocaine were introduced to Africa in the 1980s through international trafficking in psychoactive drugs to European and North American drug markets from Southeast Asia in the case of heroin and South America in the case of cocaine (Akyeampong, 2005; Ellis, 2009). West African countries, especially Nigeria and Ghana, served as the major staging posts in the trafficking of these drugs, triggering growth in the domestic availability and consumption of the drugs. In 2006, an estimated 0.2% of adults in Africa were using heroin, approximating the global average (Dewing, Pluddemann, Myers & Parry, 2006).

Patterns of heroin use ranges from intermittent use among most Nigerian PWIDs to regular binging in Dar es Salaam, Tanzania (Adelekan & Lawal, 2006; Ross et. al., 2008). Among young heroin users, the pattern varies from non-injecting in coastal Kenya to widespread injecting in open-air youth hangouts and private settings in Tanzania (Beckerleg,

2005; Dewing, Pluddemann, Myers & Parry, 2006). IDU is common and particularly dangerous among street children. A study conducted among a small sample of street children in the Great Lakes region show that 43.5% reported sharing syringes and other drug injecting instruments (Leshabari & Kaaya, 2005). The age of onset of IDU ranges from 20 in South Africa to 25 in Kenya and Tanzania (DesJarlais, Perlis, Stimson & Poznyak, 2006; Ross et. al., 2008). In Nigeria, an estimated 2.4% of students of tertiary institutions had ever injected heroin, and student heroin use dates back to the 1980s (Obot, Karuri & Ibang, 2003).

PWIDs in SSA live in precarious conditions characterized by homelessness and destitution. The majority of PWIDs hold temporary jobs, while others rely on begging and crime to support their drug use habits (DesJarlais, Perlis, Stimson & Poznyak, 2006; Dewing, Pluddemann, Myers & Parry, 2006). Knowledge of the risk of HIV transmission through sharing of needles is limited among the growing population of PWIDs in SSA, and many AIDS prevention programs in the region have discountenanced injection risks in their public awareness communications, perceiving IDU to be uncommon. A large proportion of PWIDs regularly share syringes, and in Nigeria only 25% of PWIDs report knowing that sharing of syringes carries the risk of HIV transmission (Reid, 2009).

Harm reduction programmes

Drug use is criminalized in most SSA countries, and drug users are the target of spirited law enforcement operations. Government policies on psychoactive drugs reflect a political preference for controlling drug supply, with limited

resources devoted to demand reduction (Reid, 2009). National and regional drug policies, influenced by the US and the international conventions which are contradictory, often limit resources for harm reduction on the grounds that they condone drug use (Parry & Pluddemann, 2004).

Sub-Sahara Africa is behind in the global efforts to implement and scale up harm reduction measures. Only a few countries in the region have implemented harm reduction programmes. For example, Needle and syringe exchange programmes (NSPs) exists only in Mauritius, Tanzania and South Africa, while Opioid Substitution Therapy (OST) are available only in Tanzania, South Africa, Kenya, Mauritius, and Senegal (HRI, 2012). Mauritius has the greatest coverage of NST in the region with 83.8% of people who inject drugs using sterile injecting equipment in 2013 (Government of Mauritius, cited in Reid, 2009). The 2006 HIV & AIDS Act of Mauritius established the first needle exchange and methadone maintenance program in Africa in reaction to explosive HIV transmission among PWIDs in an otherwise low-prevalence population (Kilonzo & Simmons, 2005).

Most of these programmes are limited in scale and are far below estimates required to reverse the HIV epidemic among PWIDs in the region (Harm Reduction International, 2015). The services are mostly provided by CSOs, and there is limited government support for and involvement in the provision of harm reduction services. This has contributed in no small way to the exacerbation of unsafe injection practices and HIV transmission among PWIDs (Reid, 2009; Wolf & Csete, 2010). There has been intense advocacy for the adoption of harm reduction in SSA (Abdool,

2016; Tammi, 2004). The policy environment is slowly changing, with the spread of HIV and HCV among PWIDs stimulating domestic support for harm reduction programmes such as NSP and OST.

In 2007 the Sub-Saharan Africa Harm Reduction Network (SAHRN) was formed, and NGOs, researchers and UN representatives from eleven African countries met to deliberate on drug policies (IHRA, cited in Reid, 2009). The tempo of advocacy for harm reduction has increased and the policy environment is gradually changing. But barriers still exists, especially those related to moral panic and other socio-cultural factors which make current models of harm reduction programs problematic in SSA. We examine two of these 'conundrums' in the succeeding sections.

'Rights talk' and the individual/society conundrum

The provision of harm reduction services is an aspect of a public health response to drug addiction, understood as a chronic, relapsing brain disease. This approach is premised on a medical model of human behaviour where drug addiction is 'the result of disturbance in the proper functioning of neurological communication' (Perez & Esposito, 2010: 94). According to this perspective, although the drug user is regarded as an active agent in initial drug experimentation and use, addiction is thought to develop from factors that are largely independent of the actor's purposeful action (Ibid). According to Tatarsky, '[t]he disease is believed to have a life of its own, separable from the complex of issues that influence the life of the user. The disease is deemed a permanent, lifelong condition...' (2002: 19). For this reason, medical intervention to minimize the harms associated with

this 'permanent, lifelong condition' is not only a rational response, but also the 'right' of the individual who is addicted to drugs. Failure to provide these services is regarded as a denial of the health right of the individual.

The concept of human rights underlying harm reduction is rooted in liberal political theory. It reflects an atomistic and individualistic cultural ethos, where the rights of the individual are in perpetual conflict with the needs of the society. It "presupposes a society of people who are conscious of their separateness and their particular interests and are anxious to realize them" (Ake, 1987: 83). In this context, human rights are a "claim which the individual may make against the other members of society, and simultaneously an obligation on the part of society to uphold this claim" (Ibid). This concept emerged from the historical context of the western world as a measure to check the invasive and abusive modern state, leading to the "sacralisation of the individual and the supremacy of the jurisprudence of individual rights" (Mutua, 2013:71).

Claims about their universality notwithstanding, human rights are context-specific. Indeed, as Langlois (2009: 20) points out, "the reasoning from which the universality derives is a very particular way of thinking about what it is to be human, which might not legitimately apply to all human persons". Human rights concepts reflect the social context from which they emerged; they do not align with African cultures values. They are an essentially western concept, one at odds with the cultural and philosophical traditions of African peoples (Goodhart, 2009: 4). As Waters (1996: 593) puts it, "human rights is an institution that is specific to cultural and historical context just like any

other and... its very universality is itself a human creation".

Liberal human rights ascribe abstract rights to individuals (Ake, 1987), which are hardly realizable in non-western contexts. In African societies, only those who possess the power to actualize these rights enjoy them. Therefore, PWUDs do not enjoy liberal human rights because they do not have the means to realize them. Neither can the state be relied on to actualize human rights. It is common knowledge that the state is a major culprit in the violation of human rights in Africa, especially the rights of marginalized groups such as drug users. The abuse of drug users' rights is part of an abysmal record of human rights protection in most developing countries (Takahashi, 2009).

For the majority of drug users, human rights are vague, elusive and irrelevant because they are not realizable. For example, the right to health presupposes the availability of healthcare services. But in most countries of SSA, healthcare is either unavailable or unevenly distributed. PWUDs suffers double disadvantage because of stigma and discrimination. Health right is abstract and elusive for PWUDs in SSA because prevailing conditions render them implausible. This confirms Short's (2009: 93) argument that "'rights' are not simply givens, or necessarily beneficial to right holders; rather they are the products of social and political manipulation".

Furthermore, African societies exhibit what has been described as a 'collective value system' (Herskovits, cited in Goodhart, 2009), which place the group above the individual (Menkiti, 1990). The individual receives identity and status from his/her membership in the group. The individual is not granted any right that undermines the needs of the society.

African traditional cultures place premium on harmony and cooperation above competition and conflict. They emphasize the individual obligation to society above the rights he/she can claim against society (Ake, 1987). Individual entitlements are valid to the extent that they do not infringe on the rights of the group, and they are curtailed when they threaten the latter. The collective value system of African societies may be one of the reasons why African states prefer approaches to drug problems that address the concerns of the society to those that prioritize individual rights.

Moreover, in traditional African societies individuals are endowed with rights as well as obligations. The individual has rights by virtue of his or her membership in the group. The right is a claim to be exercised under specific conditions, and the society is expected to provide the conditions necessary for the realization of such rights. On the other hand, the obligations of the individual to the society are the duties he or she is expected to perform to enable the realization of the rights of other members of the society. As Cobbah (in Mutua, 2013: 83) has contended, “the right of one kinship member is the duty of the other and the duty of the other kinship member is the right of another”. The rights and obligations of group members constitute the basis of kinship system in African societies.

Liberal human rights are problematic in the African context because they divorce the rights of the individual from his or her obligation and responsibility to the society, including that of protecting the honour, safety and well-being of the family and community. This is part of the reason why harm reduction measures are unpopular in Africa. They perceived

as encouraging a behaviour that violates group values. They are at odds with African cultural values, which elevate the group above the individual (Mutua, 2013: 71). Harm reduction programs must reflect the collective value system of African societies in order to generate local acceptance.

‘Social suffering’ and the behaviour/structure conundrum

Harm reduction is conventionally regarded as a set of interventions aimed at reducing harms associated with the use of illicit drugs (Obot, 2007). It assesses actual harms resulting from the use of particular substances and proposes pragmatic and morally-neutral measures for minimizing them. Harm reduction is popular because it fosters improved understanding of drug use behaviour and supports the adoption of specific strategies to address them. But it also has an ideological component, which is the object of enormous criticisms.

It has been argued that harm reduction functions as a form of ‘governmentality’ (Foucault, 1979) or a way of exercising state power in late modernity (Gordon, 1991; Dean, 1999; Beck, 2000). It reflects the neoliberal shift from direct state intervention to the devolution of power throughout social institutions (Roe, 2005). In this context, government operates through non-governmental bodies such that all citizens play a role in the governance of self and others (Ibid, 246). Harm reduction therefore features as an approach to addressing drug-related harms that relies on self-regulation. Drug-related harms are minimized by means of individual behavioural adjustments as proposed by different harm reduction measures.

Harm reduction has also been labelled 'surveillance medicine' (Miller, 2001; Petersen & Lupton, 1996), where patients' monitor their life-styles for indicators of deviation from responsible citizenship, and conformity is enforced through medicalization (Tammi, 2004). This has the unintended consequence of diverting attention away from the culpability of the state in the creation of a 'risk environment' for drug-related harms. But reliance on behavioural adjustments, including the use of sterile injecting equipment and substitute drugs, while neglecting the risk environment for drug-related harms is disingenuous.

Current models of harm reduction, with its focus on behaviour, often overlooks the fact that human behaviour takes place within specific social contexts, and that behavioural changes without corresponding changes in the social context will produce no lasting results. The individual-centered, behaviourist paradigm of harm reduction does not adequately address the fact that the choices and actions of drug users are influenced by complex social factors. As Buchanan et. al. (2002: 40) pointed out, drug use behaviours are "largely symptom of deeper social structural inequalities and... efforts to eliminate illegal narcotics use are, and will continue to be, futile until we as a society address these fundamental antecedent political-economic problems".

From the perspective of political economy, it is socio-economic conditions that render particular sectors of the population vulnerable to drug use and harms. This includes socially marginalized groups such as youths, slum dwellers and commercial sex workers. Drug use and harms is therefore a "feature of the political

economy of social suffering" (Rhodes, 2009: 196). It is, in Singer's words, an 'oppression illness' (2004: 17), which is the "product of the impact of suffering from 'social mistreatment'; a type of stress disorder, where the source of the stress is 'being the object of widespread and enduring discrimination, degradation, structural violence and abusive derision; whether overt or hidden" (Ibid: 17). It is "a process through which an oppressive environment is incorporated into the everyday practices of those subjected to multiple subordinations" (Friedman et. al., 1998).

Sub-Sahara Africa is faced with numerous political economic problems, including poverty, unemployment, political instability and social conflicts. The growth of human population is not paralleled by economic growth and equitable distribution of income. The state in Africa operates like a criminal syndicate plundering public resources for private enrichment (Bayart, Ellis & Hibou, 1999), and relies on violence to curb threats to its existence. The populace live in precarious conditions characterized by scarcity of basic social services such as sanitation, clean water, healthcare and housing. The bulk of the population earn a living by manoeuvring a poorly regulated and squalid informal sector, where the lines between the licit and illicit are blurred (Klein, 2009).

Social suffering is a major explanation for illicit drugs use and harms in SSA. It has been hinted that psychoactive substances may be used as self-medication (Ibid), by individuals to treat the psychological symptoms from which they suffer (West, 2006). Living conditions in SSA are so traumatizing that "any substance helping to alleviate or control aggressive

impulses could be argued to be playing an important social function" (Ibid, 385). Singer suggests that drug use is a form of 'self-medication' for oppression illness (Singer, 2004: 17). Elsewhere he argues that oppression illness 'pressures sufferers to seek relief' through drug use, which is an 'action-oriented culture' emphasising 'gratification', 'pain intolerance', 'chemical intervention' and a 'solution' (Singer, 2001: 205).

Harm reduction programs incorporate this risk environment for drug harms. According to Ezard (2001), harm reduction must include not just reduction of harm and/or risk, but also the reduction of vulnerability and the 'complex of underlying factors' at the individual, community and societal level that 'constrain choices and limit agency' and thereby predispose one to the risk of drug-related harm. As noted by Elliot et. al. (2005: 119), this highlights the need for "positive action by states to address economic and social rights as part of the response to drug use in order to reduce vulnerability to, and risk of, harm". Any approach that divorces drug harms from the social context from which they arise will fail to improve the condition of PWUDs in a realistic way.

CONCLUSION

Although harm reduction programs present potentials for minimizing drug-related harms such as the transmission of HIV and viral hepatitis among PWIDs, current models are unpopular in SSA because they elevate individual rights above groups needs and neglect the risk environment for drug harms. They have to be adapted to the context through a contingent and variable construction of

rights claims that reflects the values of the societies, including values of social justice and collective good. Furthermore, harm reduction programs should be implemented as part of a broad-based response to drug use and related harms which incorporates the risk environment for drug harms in SSA. The good news is that the concept of harm reduction is adaptable to local situations to the effect that it is formulated not as "broad 'top-down' policies, but rather as specific, localized programmes" (Reuter & MacCoun, 1995).

REFERENCES

- Abdool, R. (2016). Policy change towards implementing harm reduction in sub-Saharan Africa. *International Journal of Drug Policy*, 20: 140-142.
- Adelekan, M. & Lawal, R. (2006). Drug use and HIV infection in Nigeria: a review of recent findings. *African Journal of Drug & Alcohol Studies*, 5(2): 118-129.
- Aceijas, C., Friedman, S., Cooper, H., Wiessing, L., Stimson, G. & Hickman, M. (2006). Estimates of injecting drug users at the national and local level in developing and transnational countries, and gender and age distribution. *Sexually Transmitted Infection*, 82(3): 10-17.
- Ake, C. (1987). The African context of human rights. *African Affairs*, 34(142): 5-13.
- Akyeampong, E. (2005). Diaspora and drug trafficking in West Africa: a case of Ghana. *African Affairs*, 104(416): 429-447.
- Atkinson, J., McCurdy, S., Williams, M., Mbwambo, J. & Kilonzo, G. (2011). HIV risk behaviours, perceived

- severity of drug use problems and prior treatment experience in a sample of young heroin injectors in Dar es Salaam, Tanzania. *African Journal of Drug & Alcohol Studies*, 10(1): 1-9.
- Bayart, J. F., Ellis, S. & Hibou, B. (1999) *The criminalization of the state*. Oxford: Currey.
- Beck, U. (2000). Risk society revisited: Theory, politics and research programmes. In: Adam, B., Beck, U., & Loon, J. (eds) *The risk society and beyond: critical issues for social theory*. London: Sage Publishers.
- Beckerleg, S. (2005). How cool is heroin injection at the Kenya coast. *Drugs: Education, Prevention & Policy*, 11(1): 67-77.
- Buchanan, D., Khoshnood, K., Stopka, T., Shaw, S., Santelices, C. & Singer, M. (2002). Ethical dilemmas created by the criminalization of status behaviour: cases examples from ethnographic field research with injection drug users. *Health Education & Behaviour*, 29(1): 30-42.
- Csete, J., Kamarulzaman, A., Kazatchkine, M., Altice, F., Balicki, M. et. al. (2016). Public health and international drug policy. *The Lancet*, 387: 1427-1474.
- Des Jarlais, D. C. et. al. (1996). HIV incidence among injecting drug users in New York City syringe-exchange programmes. *The Lancet*, 348: 987-991.
- Des Jarlais, D. C., Perlis, T., Stimson, G. & Poznyak, V. (2006). Using standardized methods for research on HIV and injecting drug use in developing/transitional countries: case study from the WHO Drug Injecting Study Phase 11. *BMC Public Health*, 6: 54.
- Dean, M. (1999). *Governmentality: power and rule in modern society*. London: Sage Publishers.
- Dewing, S., Pluddemann, A., Myers, B. & Parry, C. (2006). Review of injection drug use in six African countries: Egypt, Kenya, Mauritius, Nigeria, South Africa and Tanzania. *Drugs: Education, Prevention & Policy*, 13(2): 121-137.
- Hagan, H. et. al. (1995). Reduced risk of Hepatitis B and Hepatitis C among injecting drug users in Tacoma syringe exchange programme. *American Journal of Public Health*, 85: 1531-1537.
- Hurley, S. F. et. al. (1997). Effectiveness of needle exchange programmes for prevention of HIV infection. *The Lancet*, 349: 1797-1800.
- Elliot, R., Csete, J., Wood, E. & Kerr, T. (2005). Harm reduction, HIV/AIDS, and the human rights challenge to global drug control policy. *Health and Human Rights*, 105-138.
- Ellis, S. (2009). West Africa's international drug trade. *African Affairs*, 108(431): 171-196.
- Ezard, N. (2001). Public health, human rights and harm reduction paradigm: from risk reduction to vulnerability reduction. *International Journal of Drug Policy*, 12: 207-219.
- Fisher, D. G. et. al. (2003). Needle exchange and injecting drug use frequency: a randomized clinical trial. *Journal of Acquired Deficiency Syndrome*, 33/2: 199-205.
- Foucault, M. (1979). *Discipline and punish: the birth of the prison*. New York: Vintage Books.
- Friedman, S. R., Jose, B., Stepherson, B., Neagius, A., Goldstein, M., Mota, P. et. al. (1998). Multiple racial/ethnic subordination and HIV among drug injectors. In: Singer, M. (ed.). *The political economy of AIDS*. Amityville, N.Y.: Baywood, pp. 105-128.

- Gordon, C. (1991). Governmental rationality: an introduction. In: Burchell, G., Gordon, C. & Miller, P. (eds) *The Foucault effect: studies in governmentality*. London: Harvester Wheatsheaf, pp. 52.
- Goodhart, M. (ed.) (2009). *Human rights: politics & practice*. Oxford: Oxford University Press
- Goodhart, M. (2009). Introduction. In: Goodhart, M. (ed.) *Human rights: politics & practice*. Oxford: Oxford University Press, pp. 1-8.
- Harm Reduction International (2012). *The global state of harm reduction: towards an integrated response*. London: HRI.
- Kelly, J. A., Somlai, A. M., Benotsch, E. G. et. al. (2006). Programmes, resources and needs of HIV-prevention non-governmental organizations (NGOs) in Africa, Central/Eastern Europe and Central Asia, Latin America and the Caribbean. *Aids Care*, 18(1): 12-21
- Kilonzo, G. & Simmons, N. (2005). Development of mental health services in Tanzania: a reappraisal for the future. In: Heggenhougen, K. & Lugalla, J. (eds.) *Social change and health in Tanzania*. Dar es Salaam: Dar es Salaam University Press.
- Klein, A. (2009). Mules or Couriers: The Role of Nigerian Couriers in the International Drug Trade. In: Childs, Matt, D. and Falola, T. (eds). *The Changing Worlds of Atlantic Africa: Essays in Honor of Robin Law*. Durham: Carolina Academic Press, pp. 411-429.
- Klein, A. (2011). Harm reduction – the right policy approach for Africa? *African Journal of Drug & Alcohol Studies*, 10(1): 59-70.
- Leshabari, M. & Kaaya, S. (2005). Youth and development in Tanzania. In: Heggenhougen, K. & Lugalla, J. (eds.) *Social change and health in Tanzania*. Dar es Salaam: Dar es Salaam University Press.
- Langlois, A. J. (2009). Normative and theoretical foundations of human rights. In: Goodhart, M. (ed.) *Human rights: politics & practice*. Oxford: Oxford University Press, pp. 12-25.
- MacAurthur, G. J., Minozzi, S., Martin, N. et. al. (2012). Opiate substitution treatment and HIV transmission in people who inject drugs: systematic review and meta-analysis. *British Medical Journal*, 345: 5945.
- Mathers, B. et. al. (2008). The global epidemiology of injection drug use and HIV among people who inject drugs: a systematic review. *The Lancet*, 372(9651): 1733-1745.
- McCurdy, S., Kilonzo, G. Williams, P. & Kaaya, M. (2007). Harm reduction in Tanzania: an urgent need for multi-sectoral intervention. *International Journal of Drug Policy*, 18(3): 155-159.
- Miller, P. G. (2001) A critical review of harm minimization ideology in Australia. *Critical Public Health*, 11(2): 168-178.
- Menkiti, I. A. (1985). Person and community in African traditional thought. In: Wright, R. A. (ed). *African Philosophy: An Introduction*. University Press of America, pp. 171-182
- Mutua, M. (2002). *Human rights: a political and cultural critique*. Pennsylvania: University of Pennsylvania Press.
- Normand, J. et. al. (1995). *Preventing HIV transmission: the role of sterile needles and bleach*. Washington D.C.: National Academy Press
- Obot, I. S., Karuri, G. & Ibanga, A. (2003). Substance use and other risky behaviours of secondary school students in

- a Nigerian urban area. *African Journal of Drug & Alcohol Studies*, 2(2): 58-66
- Obot, I. S. (2007). Harm reduction – what is it? (Commentary). *Addiction*, 102: 691-692.
- Parry, C. & Pluddemann, A. (2004). Southern African development community epidemiology network on drug use (SENDU): January – June 2004. <http://www.Sahealthinfo.org/admodule/sendureportjun2004.pdf>.
- Petersen, A. & Lupton, D. (1996). *The new public health: Health and self in the age of risk*. St. Leonard, NSW: Allen & Unwin.
- Perez, F. & Esposito, L. (2010). The global addiction and human rights: insatiable consumerism, neoliberalism, harm reduction. *Perspectives on Global Development & Technology*, 9: 84-100.
- Pollack, H. and Reuter, P. (2014). Does tougher law enforcement make drugs more expensive? *Addiction*, 109(12): 1-8.
- Reuter, P. & MacCoun, R. J. (1995) Lessons from the absence of harm reduction in American drug policy. *Tobacco Control*, 4(2): 28-32.
- Reid, S. R. (2009). Injecting drug use, unsafe medical injection, and HIV in Africa: a systematic review. *Harm Reduction Journal*, 6: 24.
- Rhodes, T. (2009). Risk environments and drug harms: a social science of harm reduction approach. *International Journal of Drug Policy*, 20: 193-201.
- Roe, G. (2005). Harm reduction as paradigm: Is better than bad good enough? The origins of harm reduction. *Critical Public Health*, 15(3): 243-250.
- Ross, M., McCurdy, S., Kilonzo, G., Williams, M. & Leshabari, M. (2008). Drug use careers and blood-borne pathogen risk behaviour in male and female Tanzanian heroin injectors. *American Journal of Tropical Medicine and Hygiene*, 79(3): 338-343.
- Short, D. (2009). Sociological and anthropological approaches. In: Goodhart, M. (ed.) *Human rights: politics & practice*. Oxford: Oxford University Press, pp. 92-105.
- Singer, M. (2001). Towards a bio-cultural and political economic integration of alcohol, tobacco and drug studies in the coming century. *Social Science and Medicine*, 53: 199-213.
- Singer, M. (2004). The social origins and expressions of illness. *British Medical Bulletin*, 69: 9-19.
- Tatarsky, A. (ed.) (2002). *Harm reduction psychotherapy: a new treatment for drug and alcohol problems*. Nothvale, NJ.: Jason Aronson Inc.
- Tammi, T. (2004). The harm-reduction school of thought: three fractions. *Contemporary Drug Problems*, 31: 381-399.
- Takahashi, S. (2009). Drug control, human rights, and the right to highest attainable standard of health: by no means straightforward issues. *Human Rights Quarterly*, 31: 748-776.
- Turner, K. M., et. al. (2011). The impact of needle and syringe provision and opiate substitution therapy on the incidence of Hepatitis C virus in injecting drug users: pooling of UK evidence. *Addiction*, 106: 1978-1988.
- United Nations Office on Drug and Crime (2012). *West Africa – 2012 ATS Situation Report*. Vienna: UNODC.
- Waters, M. (1996). Human rights and the universalization of interests: towards a social constructionist approach. *Sociology*, 30(3): 593-600.

- West, R. (2006). *Theory of addiction*. Oxford: Blackwell Press.
- West Africa Commission on Drugs (2014). *Not just in transit: Drugs, the state and society in West Africa*. Addis Ababa: WACD.

- Wolf, D. & Csete, J. (2010). Political and systemic barriers increasing risk of HIV for injecting drug users in East Africa. *Addiction*, 105(10): 1859.

ANYWHERE, EVERYWHERE: ALCOHOL INDUSTRY PROMOTION STRATEGIES IN NIGERIA AND THEIR INFLUENCE ON YOUNG PEOPLE

Emeka W. Dumbili & Clare Williams

Department of Social Sciences, Media and Communications, Brunel University London,
United Kingdom

ABSTRACT

Despite the increase in alcohol marketing activities by the transnational alcohol corporations in Nigeria, little research has focused on their impact on young people's drinking behaviours. Using empirical data from in-depth interviews with 31, 19 to 23-year olds from a Nigerian university, this study explores students' awareness of promotional activities on and around campus and the extent to which sales promotion influences their alcohol consumption. The data were analysed to generate themes with the aid of NVivo software. Sales promotion is common on campus and around students' off-campus residential and leisure sites. Students' awareness of, and exposure to promotional activities were high, to the extent that they identified the sales promotion strategies that are particular to students' environments, the specific alcohol companies that use each strategy and the particular bars where promotions are held. Whilst sales promotions offering free alcohol and price discounts influenced men to buy and consume larger quantities of alcohol than they had intended, the actions of sales personnel also engendered impulse purchasing and the consumption of more potent brands. The women were also influenced by sales staff to consume more alcohol than originally planned, although their main motivation for participating in sales promotions was to win 'giveaways' such as cars, electronic gadgets and other branded paraphernalia. The findings indicate that while effective monitoring of alcohol promotions and related marketing strategies should be reinforced, the government may also give serious consideration to more evidence-based regulatory measures rather than relying on marketing self-regulations.

Key words: Alcohol Marketing, Nigeria, Policy, Sales Promotion, Students

INTRODUCTION

Internationally, research shows that students engage in heavy drinking rituals (Andrade et al., 2012; Kypri, Cronin, & Wright, 2005), and suffer diverse alcohol-related problems (Iwamoto, Cheng, Lee, Takamatsu, & Gordon, 2011; O'Brien et al., 2013). Growing evidence suggests that one of the reasons why alcohol consumption is high amongst students is due to the prevalence of marketing outlets, advertising, sales promotions and sponsorship of social events on campuses (Paek & Hove, 2012; Scribner et al., 2008; Stautz, Brown, King, Shemilt, & Marteau, 2016). Scholars (e.g. O'Brien et al., 2013; Ruddock, 2012) argue that these strategies facilitate the physical, economic and psychological availability of alcohol on campuses. Indeed, multinational alcohol corporations use sophisticated marketing tactics such as rebranding of glassware (Stead, Angus, Macdonald, & Bauld, 2014), price promotions (Babor et al., 2010; Gordon, Hastings, & Moodie, 2010; Hastings, Anderson, Cooke, & Gordon, 2005), giveaway alcohol-branded merchandise (Anderson, de Bruijn, Angus, Gordon, & Hastings, 2009; Hurtz, Henriksen, Wang, Feighery, & Fortmann, 2007), amongst others, to encourage young people (students and non-students) to initiate alcohol consumption or to use larger quantities if they already consume alcohol.

In Australia, scholars (e.g., Jones & Lynch, 2007; Jones, Barrie, Robinson, Allsop, & Chikritzhs, 2012; Pettigrew et al., 2015) revealed the ubiquity of point-of-sale promotions that offer free alcohol or price discounts and another where cash and other prizes are won. On the impact of sales promotion, evidence shows that those who participated in promotional

activities bought and consumed larger quantities of alcohol than those who did not participate (Jones, Barrie, Gregory, Allsop, & Chikritzhs, 2015). This is why Jones and Lynch (2007 p.478) argued that sales promotion engenders “a culture in which excessive alcohol consumption is seen as a norm”.

In a comparative study of Australian, German and Welsh female university students' susceptibility to promotional activities, Sharma et al. (2013) noted that although sales promotions affected students from Australia and Germany, Welsh students were more likely to purchase alcohol during promotions, because of their intention to take advantage of price discounts. In the Philippines, Swahn et al. (2013) revealed that promotional activities offering free drinks to students encouraged drunkenness amongst them. Additionally, research in New Zealand showed that price reductions and branded paraphernalia are some of the marketing strategies companies employed to reach young people (McCreanor, Greenaway, Barnes, Borell, & Gregory, 2005), and similar findings and their impact on alcohol purchases have been reported in Scotland (Nakamura et al., 2014).

Amongst American college students, research shows that diverse sales promotion strategies such as price discounts, giveaways, coupons or tickets, used to attract students to alcohol outlets, pervade college campuses (Kuo, Wechsler, Greenberg, & Lee, 2003; Wechsler & Nelson, 2008). Evidence shows that these promotion strategies increase alcohol availability on campus and also exacerbate college students' level of intoxication (Thombs et al., 2009) and binge drinking (Kuo et al., 2003). Thombs et al. (2009) noted that as female students took advantage of 'drink

specials' to buy and consume alcohol, their male counterparts used more alcohol and drank for longer periods during promotions.

In the emerging markets of Africa, reviews (e.g. Babor, Robaina, & Jernigan, 2015; Jernigan & Babor, 2015) consistently show that the number of marketing activities of multinational alcohol companies is increasing in number, and this is exacerbating alcohol availability and its related problems. Empirical research conducted in Zambia found that alcohol marketing that promotes free drinks facilitated drunkenness amongst 11-16-year old students (Swahn, Ali, Palmier, Sikazwe, & Mayeya, 2011), and this corroborates Anderson et al.'s (2009, p.299) assertion that "alcohol...promotion increases the likelihood that adolescents will start to use alcohol, and to drink more if they are already using alcohol". A related study (Swahn, Palmier, & Kasirye, 2013) amongst Ugandan youths found that marketers offer branded paraphernalia and free drinks. Additionally, Swahn et al. (2013 p.5) indicated that receiving free drinks resulted in "current alcohol use, problem drinking and drunkenness". One significant feature of the African continent is that alcohol marketing is largely unregulated due to a lack of alcohol control policies in many countries (World Health Organization- WHO, 2014). Although a few countries have alcohol policies, they are often lax or not enforced by the government (Ferreira-Borges et al., 2015; WHO, 2014) due to economic interests.

Alcohol Marketing in Nigeria

In Nigeria, there is a dearth of empirical research on sales promotions, but available studies revealed that alcohol

marketing activities targeting young men and women (Obot, 2013), especially students (Umoh, Obot, & Obot, 2012; Dumbili, 2015; 2016a) are increasing in number. In addition to being a part of the emerging markets, one other reason for the rise in marketing activities is that there is an increase in number of alcohol companies in Nigeria. For example, in addition to the multinational alcohol corporations such as the 'Nigerian Breweries/Heineken' and 'Guinness Nigeria' that were established in 1946 and 1962 respectively, other companies such as SABMiller and "Tradall SA" have fairly recently established their businesses in the country (Dumbili, 2015b; Obot, 2013).

Consequently, extreme competitions to gain and/or maintain brand loyalty amongst these companies have ensued, resulting in the burgeoning use of multi-platform strategies to sell their brands (de Bruijn, 2011; Dumbili, 2015a). Another reason is that Nigeria does not have written national alcohol control policies (WHO, 2014); thus, sales promotion is unregulated. Relatedly, alcohol advertising is not directly regulated by the government (Dumbili & Williams, 2017). Advertising Practitioners Council of Nigeria (APCON- an agency which registers practitioners, assesses advertising materials and recognizes self-regulations (APCON, 2014)) regulates advertising on behalf of the government (de Bruijn, Ferreira-Borges, Engels, & Bhavsar, 2014). Although the government recommended age at which alcohol can be purchased is 18 years, anybody can purchase alcohol in Nigeria because there is no effective means of proof of age (Dumbili, 2014). Due to this weak regulatory environment, alcohol companies have greater scope to engage in different promotional (Obot, 2013),

and other marketing activities (Dumbili & Williams, 2017; Dumbili, 2016b), many of which breach international standards (Farrell & Gordon, 2012).

To a large extent, this contributes to the easy accessibility (Obot, 2013) and the (mis)use of alcohol amongst Nigerian youths. According to WHO (2014), Nigeria ranks second in Africa for per capita consumption, and different patterns of, and motives for alcohol use amongst youths, especially students (Chikere & Mayowa, 2011; Dumbili, 2015c) and their consequences such as accidents and injuries to self and others are noticeable (Abayomi, Babalola, Olakulehin, & Ighoroje, 2016; Dumbili, 2015b). As indicated earlier, despite that a few studies on alcohol marketing exist, there is a paucity of empirical research on how sales promotion influences young people in Nigeria. This exploratory study attempts to fill this gap. The study explores two interrelated objectives. First, it examines the awareness of sales promotion amongst students aged 19-23 years in a Nigerian university. Second, it explores the extent to which sales promotion is perceived by the participants to facilitate students' alcohol consumption.

METHOD

Drawing on a large research exploring the interplay between young people's media consumption and alcohol use, the role of alcohol marketing in students' drinking behaviour and the gendering of alcohol, this paper focuses on the role alcohol marketing plays in students' drinking. The study was conducted on a university campus located in a city of Anambra State, south-eastern Nigeria. The Nigerian university and the Brunel University Lon-

don Ethics Board approved the study before the first author (DWE- a male, Nigerian) collected data between September and December 2013.

The participants were recruited from nine faculties on the university campus using word-of-mouth and snowballing methods. DWE used a word-of-mouth approach to recruit the majority of participants. A further five participants were recruited through friendship networks, which proved to be particularly successful methods of recruitment in relation to female participants. Alcohol consumption among young people is a sensitive topic in Nigeria. Young people, especially females are often reluctant to participate in such studies, and reaching them through any means that may expose their identity will hinder their participation. Indeed, this is related to the recruitment of only nine female participants. All participants' names have been replaced with pseudonyms.

Participants, interviews and data analysis

In-depth interviews lasting 33-90 minutes were conducted by DWE with 31 (22 males and 9 females) undergraduate students (aged 19-23 years), who are of legal drinking age (i.e. 18 years and above). These 31 participants were current drinkers (defined as having consumed alcohol at least once in the last 30 days). The interviews were conducted in English, were recorded with a digital device with the permission of the participants. The interviews were transcribed verbatim, and thematic analysis was undertaken (Braun & Clarke, 2006). Following Silverman (2011), a preliminary analysis was initiated immediately after the first interview. The field notes and audio recordings were reviewed to check for accuracy and

to identify additional areas to explore further in subsequent interviews.

Tentative coding schemes were developed at an early stage (Braun & Clarke, 2006) with initial extracts categorised into broad themes and subthemes, providing an early grasp of the data (Morse, 2012). Some of these subthemes grouped manually became the parent nodes while others were condensed (Saldaña, 2012) into different child nodes that formed the 'thematic coding framework' when the data were imported into NVivo 10 software. When the 31 interviews were completed, the transcripts were read many times, and searches were made in order to identify patterns of meaning in the data sets (Braun & Clarke, 2006). To enhance consistency and coherence, this process was repeated a number of times (Holloway & Todres, 2003) before coding was completed. Collaborative analysis between DWE, CW and another senior academic was also adopted to ensure analytical rigour (Cornish, Gillespie, & Zittoun, 2014). Here, DWE, CW and another academic met several times to discuss the coded data, the themes and subthemes that were identified. The key themes that were identified through these processes are presented in the section below.

RESULTS

Anywhere, everywhere, promotion is visible

The participants were asked to share their knowledge about alcohol marketing on this campus and in the city where the university is located. Although they mentioned seeing alcohol advertising on campus, the most discussed marketing strategy amongst all participants was sales

promotion. In their words: ***promo is not scarce** and **anywhere you go you'll see promos***. Many argued that it was not only common on this campus, but that it was also prevalent in other drinking spaces around students' off-campus hostels:

Promotion is happening; it's not scarce. There's this bar called [name of a bar] at [a popular site]; they normally do it every week... Maybe 'Star' [beer] will do this week, and next week might be 'Gulder' [beer]... They do promos where you drink two bottles, and they give you a 'raffle ticket', and anything you win, they'll give it to you (Ejike, male).

They do promo often...; let me say every night, because when the students resume fully, there is one bar down school called [name of bar]. It depends on the brand, but 'Harp' and 'Star' beers always do it there every night (Buchi, male).

The fact that promotional activities are widespread on this campus and its surroundings permeated the data, to the extent that all the participants were able to mention at least one strategy of sales promotion they knew. Whilst a few participants spoke in generic terms, using words and phrases such as 'promos', 'promotion' or 'alcohol promotion' to indicate that sales promotion is popular, others specifically mentioned the strategies they considered the most common:

...I know that any bar you go to, you'll see alcohol promotion... I have friends who drink regularly and when they come back [from the bar], they will be like, 'I went to this bar, and

there was a promo of 'buy-two-get-one-free', or 'what-you-see-is-what-you-win'... (Favour, male).

Alcohol promo is always going on here... Promotion is one major reason why people take alcohol, due to the 'buy-two-get-one-free' or 'buy-one-get-different-gifts' [prizes], which are rife... (Pretty, female)

Some of the male participants (whose female friends worked as 'beer promoters'- (see Dumbili, 2016b) revealed their perceptions of how sales promotion is planned and executed. For example, one of them stated that alcohol producers through their marketing representatives monitor sales, and if they discover that a particular brand is not receiving enough patronage, the producer will initiate a promotion to encourage buyers. Other male participants also added that they not only use the buy-two-get-one-free strategy, but they also combine it with price discounts. As such, students patronise them not only because the more you buy, the higher the numbers of free bottles you receive, but also due to the 'price specials'. Many participants also revealed that this type of promotion is rife mostly on campuses, especially when alcohol producers introduce new products to the market. They indicated that alcohol companies or outlet owners specifically initiate sales promotions that are not common outside student environments.

Whilst some of the participants noted that the aforementioned 'quantity deals' and 'drink specials' sales promotions are popular on campus, others highlighted the giveaway branded paraphernalia and other prizes that often accompany these strategies:

...Like in the last two months..., a bar where we guys normally go to drink had this promo where if you drink two bottles of Star beer you actually get a chance to have a 'lucky dip'. You dip into a container; a small container where you pick a paper, and when you open it, you actually win [what is written on the paper]. I mean you win something nice like umbrellas, T-shirts and free drinks... Almost every bar normally has this promo (Boniface, male).

...There is this stout that is doing it; if you buy a drink, you come and pick a paper. If you open the paper, they have gifts to give you like television sets, fridges, 'standing fans'... So the more you drink, the more chances you have to win... (Chimanda, female)

Indeed, another strategy of sales promotion was described by the participants, who noted that marketers employ the services of local artistes and DJs to play music for students to engage in dancing competitions:

...They come to do promotions here on campus; they will bring music for people to dance [dancing competition]. They do promos for students to dance and win phones, and sometimes you win drinks. They do it because it's something that will bring out [encourage] students [to drink] (Chisalum, female)

One of the most insightful dimensions of the data is that both male and female participants were aware that sales promotions, especially the ones that appear

to be sponsored by alcohol producers are publicised through television channels, and this appears to make them more popular and also increases their exposures and receptivity. In addition to the strategies noted above, they also identified another aspect of sales promotion, where 'secret codes' are concealed under 'crown corks'. For example:

...If you want to win something, you have to drink and open the crown cork. They want people to win, and that means that you have to drink more [bottles], and the thing [prize] encourages people to drink... (Chisalum, female)

The participants stated that in this type of promotion, more expensive prizes such as cars, money, shopping trips to Dubai or to European city to see a UEFA Champions League match can be won. Another insightful part of their accounts is that nearly all of the participants mentioned the names of the multinational alcohol companies that use this sales promotion strategy, suggesting that their awareness of promotional activities is high. To demonstrate the level of students' receptivity to promotions, one of the participants narrated how he had witnessed a fight during this type of promotion:

Promotion is very popular, and you see it all the time. It is what everybody knows because I noticed a lady and a guy... fighting over a crown cork just because of... gifts [prizes] they hope to win (Edulim, male).

Their accounts also reveal that whilst most of these promotions are held in bars and other drinking spaces such as

hotels and students' eateries, others are done through the use of companies' vans to drive around off-campus sites where students reside. That is, companies' sales representatives move around with sales personnel from one spot to another selling their brands and offering free drinks and other prizes such as branded T-shirts and caps to those who purchase their products. They also use this channel to invite students to the bars where promotions are held:

...When you're walking down the street to your lecture hall, you'll see a van. It is [promoting] either one brand of alcoholic drink or another, and they will be shouting on top of their voices, describing this promo or that promo, and telling people that they should come to this bar [where promotions are held]...(Favour, male).

Indeed, one of the participants who had revealed that sales promotions are popular on campus described how she had applied to work for an alcohol producer as a 'beer promoter'. Based on her experience, she noted that students' awareness of, and susceptibility to sales promotions are high, and when she was asked to explain why alcohol promotion is common on campus and why students like to participate, she said:

The main reason is because this is a student environment and a very good site for marketing such products. They go to other schools too. They see youths as their major target, so wherever they come around here people patronise them a lot, and being students as we are, we like free

things... So when you see someone marketing a product that is cheaper, and it might even get you a gift, you tend to patronise them even if you didn't originally intend to... (Pretty, female)

These accounts suggest that promotion is widespread on this campus, and both male and female students are aware of them. The participants also revealed that multiple sales outlets (e.g., bars) are located around student environments, and this appears to facilitate sales promotions and students' awareness of, and exposure to them.

Influence on alcohol use

The participants not only demonstrated that they were aware of the diverse sales promotion strategies around them, but many shared different experiences about how promotions had influenced them to consume alcohol:

...That was 'Life beer' when they did that 150 naira stuff [promo]. I actually entered the bar and requested Life [beer] and drank two [bottles], and they gave me one free bottle. On that day, the only brand on the tables was Life beer. You know students will always be students; any way they see to have the edge over someone, they'll do it. That's why we are students...(Boniface, male).

For many participants, sales promotion is perceived to have also influenced their change of brands. For example, one of the male participants drew on his recent experience to show how he and his friends changed brands after being persuaded by a saleslady:

...Last two months, one of my friends decided to take us out to drink. We were supposed actually to get Star and Hero [beer] but a lady approached us and was like, 'do you want to buy beer?' And we were like, 'we are already buying'. She said that she was from 'Legend stout' and that she was doing a promo of 'buy-two-get-one-free'. We were six guys, and the six of us had planned to have an average of two bottles each. So, everybody changed immediately. Everyone said, 'we'll have two bottles of Legend', and they gave us one more bottle each too. And then everyone actually drank three bottles instead of two (Chike, male).

In this study, we found that young people use the consumption of large quantities of alcohol to construct a range of gender identities in leisure spaces. The data revealed that what mattered most among men is the 'number of bottles' of an alcoholic beverage (mostly beer and stout) one consumes and not necessarily its potency. In this light, men strived to outdrink their peers in each drinking episode, to the extent that one of them had to change his brand from stout (that is more potent) to beer just to remain competitive (Dumbili, 2015c). Although the consumption of large quantities of alcohol permeated our data, the participants nonetheless demonstrated their awareness of the risks associated with heavy drinking. As the accounts above revealed, the integration of promotions into young people's leisure spaces and cultures which valorise free drinks as an integral part of daily life may exacerbate alcohol misuse among those who already use alcohol.

Additionally, many participants described the ways in which the combination of quantity deals and price discounts that were attached to a new product affected their drinking:

Actually, the drink that I had the opportunity of participating in their promotion was a new drink. I can't even remember the name because it's new. Just to give it a trial, [I decided to participate]. So if you buy two [bottles], they'll give you one free. Again, they sold it at 130 or 160 Naira [instead of 200 Naira] which was very cheap... We went there to catch fun..., so it made us buy more drinks that particular day (Jacob, male).

Our analysis shows the association between *taste* and *identity positioning*. Men, for instance, were found to use the reality of being the first among friendship networks to taste a new brand to construct superior masculine identity. In fact, tasting a new brand and afterward introducing it to one's friends during *masculinist banter* appeared to be embedded in men's drinking rituals on this campus (Dumbili & Williams, 2017). The prestige associated with this resonates in the fact that the person is seen as possessing *knowledge capital* (i.e. the ability to outsmart others). Because the number of the alcohol industry and their new brands are growing in Nigeria, this may contribute to the normalisation of drinking among young people on this campus.

More than half of the participants also revealed that quantity deal strategies had exacerbated their friends' alcohol use. For example, Ada drew on the experience of a friend to show how this strategy meant that he consumed more alcohol than he intended:

He went to the bar, took a bottle of Star [beer], and they told him that if he took more than two bottles, they would give him an extra bottle. That meant that he then started drinking so that they would give him extra bottles (Ada, female).

As indicated above, whilst some of the participants recalled that 'quantity deal' and 'drink specials' strategies meant that they or their friends drank more alcohol than originally planned, others described the reason why promotions offering free drinks were very influential:

...You know that we students like 'awu-ufu' [free things]... Maybe if you go to a 'beer parlour' [a bar], and they tell you that before you can get one free [bottle], you need to buy two bottles, instead of buying one, I can say, okay let me have two so that I can get one free... (Buchii, male)

One of the interesting common features in the data is that seven female participants also stated that the offer of free drinks was difficult to resist. For example:

...They will feel like, 'if I should buy two I will get one free', and they will definitely go to the place [bar] where they will buy two and get one free. And that extra one will make them drink another extra free bottle (Chioma, female).

The data indicate that these strategies influenced males' alcohol intake more than the females, and this may be because as they indicated, free alcohol is difficult to resist, and also because beer brands that are mainly consumed by males are

promoted more often to men. The participants stated that in the bars where sales promotions take place, alcohol producers or marketers add glamour by organising social events such as “show your talent”, concerts or parties. These events attract more students, especially those who originally had no intention of drinking, but who may consume alcohol on such occasions, because of the diverse sales promotions and the salespersons, who often encourage bar patrons to buy alcohol.

Changing brands to win prizes

Although quantity deals and price specials influenced participants to buy and use alcohol, some of them recalled how other sales promotion strategies including branded paraphernalia and expensive prizes such as cars and electronic gadgets also influenced their drinking. A culturally specific aspect of our data showed that whilst quantity deals influenced mainly men to purchase and consume more alcohol (as indicated above), the sales promotion strategy where branded merchandise could be won influenced women more, to the extent that some of them changed their brands and consumed beer. For example, a female participant who had identified ‘Smirnoff Ice’ (ready-to-drink alcoholic beverage) as her favourite brand, explained how she participated in the ‘open-and-win’ sales promotion in order to win giveaways:

The promo that has affected my drinking pattern is the one that you open a beer bottle, and you win anything [you see]. So most of the time, people just drink to open the cover [crown cork] so they might win... We students see it as an opportunity to win a car or something else... During

this promo, you’ll see people rushing to that brand of alcohol particularly just to win. So it makes you drink more of that particular alcohol... (Pretty, female)

Interviewer: Can you say a little more on why you changed your brand?

Everybody wants to be a winner...; I attended a function where there were varieties of alcoholic beverages but because that particular alcohol company was doing an open-and-win promo, I decided to go for the brand so that I could win something by chance (Pretty, female).

Another participant who had participated in this type of promotion described how her friend consumed more alcohol than planned because she wanted to win a prize:

...I went to see one of my friends, and she gave me a T-shirt. I now said, ‘where did you get it from?’ She said, ‘I was drinking, and a girl came to me and said, if you drink [more], you’ll have something to win’. So she was motivated to drink [more] because she wanted to get it [the prize]... And there are some chances to win big things. Some will promise you a fridge, and you will be like... ‘okay, let me keep drinking, I might be lucky today’. So... it is making people drink more... (Chimanda, female)

Together, these accounts shed light on sales promotion strategies, some of the motivations for young people’s participation and how they contribute to the use of alcohol amongst students.

DISCUSSION

The results of this study indicate that the increasing commercialization of alcohol on this campus and throughout Nigeria may be encouraging alcohol consumption in some Nigerian students. The findings show that promotional activities are common on this campus and also on students' off-campus residential and leisure sites, and students are aware of, and exposed to diverse sales promotion strategies. That sales promotion is popular on this campus supports Thombs et al.'s (2009) and Kuo et al.'s (2003) assertions that promotional activities often pervade campuses. The experiences of these participants not only indicated that promotional activities are common, but it also showed that they were well aware of the various sales promotion strategies that alcohol companies employ to reach this market, a factor that can be attributed to the globalization of alcohol marketing by global alcohol companies (Babor et al., 2010; Jernigan, 2010). Another factor that revealed participants' sophisticated level awareness of sales promotions is that they were able to identify the specific alcohol companies that engage in promotional activities, how these companies plan and execute each sales promotion and the bars where promotions are held.

While Pettigrew et al. (2015) found no clear evidence on whether alcohol retailers intentionally target youths with the strategies they identified in their study, the results of this study suggest otherwise, because participants stated that alcohol companies and retailers deliberately target students with unique strategies that are uncommon outside student settings. Globally, research shows that alcohol companies target youths (students

and non-students) with diverse marketing strategies (O'Brien et al., 2014; Babor et al., 2010; Jernigan, 2010), and their deliberate focus on the Nigerian youths is arguably to encourage them to drink, because alcohol use amongst this group is widely taboo in Nigeria. In the traditional era (i.e., before alcohol industry was established in Nigeria in 1946 and marketing of alcohol to youths started to grow), alcohol consumption amongst youths was not popular (Odejide, Ohaeri, Adelekan, & Ikuesan, 1987) due to the socio-cultural beliefs that "alcohol consumption was a sign of being an elder" (Heap, 1998 p.29). Additionally, adult women were restrained from drinking in many communities (Umunna, 1967). These beliefs, to a large extent, are resilient in contemporary Nigeria, especially in rural areas where young people live with their parents or guardians (Dumbili, 2015a). However, upholding such beliefs amongst youths, who are studying in cities, and as such are under little or no parental control, is becoming difficult, especially in the face of aggressive marketing activities (Dumbili, 2016a; Obot, 2013).

Similarly, the findings indicated that one factor that appears to encourage the growth in promotional activities is the numerous bars and other outlets that are strategically located around the campus. Studies conducted in Western countries found that the proximity of alcohol outlets on campus increased easy accessibility of alcohol, students' heavy episodic drinking and alcohol-related harms (Ky-pri, Bell, Hay, & Baxter, 2008). Although cultural context of alcohol, drinking practices, the regulatory landscape, and the nature of university students vary widely among countries, it can be argued that these outlets are exacerbating the easy

accessibility of alcohol and its consumption amongst these Nigerian students.

The findings also indicated that students may be susceptible to sales promotion strategies which influence them in terms of consuming larger quantities of alcohol than originally planned. Additionally, in this study, the sales promotion strategies appeared to produce gendered effects. For example, amongst men, the results reveal that quantity deals (e.g., buy-two-get-one free) encouraged them to consume more bottles of beer than they planned. Similarly, price discounts also resulted in the consumption of large quantities of alcohol. As marketing scholars argue, promotional activities, especially on products that have hedonic values (i.e., products that mainly provoke sensual or bodily pleasure) encourage more purchases (Kacen, Hess, & Walker, 2012; Liao, Shen, & Chu, 2009). Similarly, substance research shows that quantity deals and price specials encouraged more alcohol purchases (Jones et al., 2015; Pettigrew et al., 2015), higher consumption (Jones & Lynch, 2007) and binge drinking (Kuo et al., 2003), although these studies were conducted in different contexts and did not focus on their gendered effects.

Again, the activities of sales personnel influenced the interviewees to make impulse purchases, a recognised marketing strategy (Mohan, Sivakumaran, & Sharma, 2013; Muruganantham & Bhakat, 2013). Substance scholars also found that alcohol outlet staff can motivate impulse buying, which often increases the quantities of alcohol bought and consumed by youths (Pettigrew et al., 2015). In Nigeria, Dumbili (2016b) reported that alcohol companies and marketers are beginning to employ young and 'beautiful' women,

who they train to encourage men to buy and consume more alcohol.

Interestingly, the actions of the sales personnel in this study facilitated the consumption of more potent alcohol, in that the men changed their brands from beer to stout, which contains a higher alcohol percentage. Despite the fact that no definition of 'standard drinks' exists in Nigeria due to the lack of written alcohol policies (WHO, 2014), beer brands in the country contain between 5.1% and 5.5% alcohol by volume (ABV) while stouts contain 7.5% ABV (Dumbili, 2015c). Therefore, encouraging bar patrons to use more potent alcohol by promoting and upselling them a particular brand may be contributing to the heavy episodic drinking and alcohol-related problems that are increasing in Nigeria (Abayomi et al., 2016).

Amongst the females, an unexpected finding was that they were also influenced by sales promotion strategies and sales staff to consume alcohol, to the extent that they drank beer (which they would not ordinarily drink due to socio-cultural beliefs (Dumbili, 2015c)) in a bid to win branded merchandize. Although women's alcohol consumption is less stigmatised in contemporary Nigeria, consumption norms categorise beer as 'men's alcohol', and women who consume it can be labelled 'transgressors of femininity' (Dumbili, 2015c). Therefore, switching over to beer brands because of promotional prizes is unexpected, and can be theorised as contributing to a culturally specific understanding of the power of sales promotion and how it can produce gendered effects. Again, this suggests that alcohol marketing acquires specific meanings within particular contexts.

According to Casswell and Maxwell (2005 p.349), marketing "messages are

received and understood in the contexts of the recipients' lived experience". Pettigrew et al. (2015, p.116) also noted that the "primary function of sales promotion is to stimulate demand through the use of temporary sales tactics that include... gifts of related merchandise..." As the accounts of these women indicated, their participation in sales promotions was influenced primarily by expensive prizes such as cars, electric gadgets and money, in contrast to their male counterparts who were influenced mostly by free drinks. One undeniable fact is that the level of poverty is high in Nigeria, and women are more vulnerable due to gender inequalities (Fawole, 2008). As such, the unrealistic fantasies (cash and other expensive giveaways) that transnational alcohol industries propagate to sell their brands may be motivating their participation in promotional activities, and this may be contributing to women's intake of large quantities of alcohol that not only have health consequences but also social risks, especially in a patriarchal society like Nigeria. Indeed, the consequences of consuming large quantities of alcohol by adolescents or young adults have been well documented internationally. These include accidents, injuries, poor academic performance, sexual risk-taking (Danielsson, Wennberg, Hibell, & Romelsjö, 2012) and poor brain development (Ewing, Sakhardande, & Blakemore, 2014; Squeglia et al., 2015).

This study has a number of limitations. First, it did not elicit data from many females (due to the sensitive nature of the topic), and the study is further limited by its small sample. Quantitative studies should be conducted among the Nigerian student populations to identify the roles promotion plays in students' drinking.

Second, the study relied upon data elicited via self-reporting and did not observe how sales promotions were held in bars. Studies that directly observe sales promotions at drinking sites and the activities of sales personnel on campuses are needed.

Our findings support calls for effective monitoring of sales promotions that are specifically targeted at students. While our findings do not in themselves point to the recommendation of stringent measure in Nigeria (because of our limited sample), it is one option to be considered. As such, Nigerian government might consider formulating and implementing evidenced-based alcohol control policies, paying careful attention to alcohol marketing. Nakamura et al. (2014) noted that England, Scotland and Wales have banned price promotions. It can be suggested that the Nigerian government, which has never seriously attempted to regulate alcohol production or marketing via written and comprehensive policies (Ferreira-Borges et al., 2015) might also consider replacing self-regulation with strict policies on marketing activities that target young people and other vulnerable groups.

For comprehensive and evidence-based policies to be implemented, studies exploring whether the types of sales promotions that are initiated by alcohol companies produce different effects from that of outlet owners should be conducted. Studies should also be conducted in universities in other Nigerian regions, particularly as some of the strategies reported are executed nationally by alcohol companies. It is hoped that these findings will aid discussions around the effective monitoring and regulation of alcohol marketing that targets youth, instead of relying on the existing marketing self-regulations.

REFERENCES

- Abayomi, O., Babalola, O., Olakulehin, O., & Ighoroje, M. (2016). Drink driving and risky behavior among university students in southwestern Nigeria-implications for policy development. *Traffic Injury Prevention, 17*(4), 330-335.
- Anderson, P., de Bruijn, A., Angus, K., Gordon, R., & Hastings, G. (2009). Impact of alcohol advertising and media exposure on adolescent alcohol use: A systematic review of longitudinal studies. *Alcohol and Alcoholism, 44*(3), 229-243.
- Andrade, A. G. d., Duarte, Paulina do Carmo Arruda Vieira, Barroso, L. P., Nishimura, R., Alberghini, D. G., & Oliveira, L. G. d. (2012). Use of alcohol and other drugs among Brazilian college students: Effects of gender and age. *Revista Brasileira De Psiquiatria, 34*(3), 294-305.
- APCON. (2014). *Advertising Practitioners Council of Nigeria*. Retrieved March, 24, 2016, from <http://www.apcon.gov.ng/>
- Babor, T. F., Robaina, K., & Jernigan, D. (2015). The influence of industry actions on the availability of alcoholic beverages in the African region. *Addiction, 110*(4), 561-571.
- Babor, T., Caetano, R., Casswell, S., Edwards, G., Giesbrecht, N., Graham, K., et al. (2010). *Alcohol: No ordinary commodity: Research and public policy* (Second ed.). New York: Oxford Univ Press.
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology, 3*(2), 77-101.
- Casswell, S., & Maxwell, A. (2005). Regulation of alcohol marketing: A global view. *Journal of Public Health Policy, 26*(3), 343-358.
- Chikere, E. I. C., & Mayowa, M. O. (2011). Prevalence and perceived health effect of alcohol use among male undergraduate students in Owerri, south-east Nigeria: A descriptive cross-sectional study. *BMC Public Health, 11*(1), 118.
- Cornish, F., Gillespie, A., & Zittoun, T. (2014). Collaborative analysis of qualitative data. In U. Flick (Ed.). *The SAGE handbook of qualitative data analysis* (pp. 79-93). London: Sage Publications.
- Danielsson, A., Wennberg, P., Hibell, B., & Romelsjö, A. (2012). Alcohol use, heavy episodic drinking and subsequent problems among adolescents in 23 European countries: Does the prevention paradox apply? *Addiction, 107*(1), 71-80.
- de Bruijn, A., Ferreira-Borges, C., Engels, R., & Bhavsar, M. (2014). Monitoring outdoor alcohol advertising in developing countries: Findings of a pilot study in five African countries. *African Journal of Drug and Alcohol Studies, 13*(1), 13-29.
- De Bruijn, A. (2011). *Alcohol marketing practices in Africa: Findings from monitoring exercises in Gambia, Ghana, Nigeria and Uganda*. Brazzaville, Congo: WHO African Regional Office.
- Dumbili, E. W. (2014). Can brewer-sponsored "drink responsibly" warning message be effective without alcohol policies in Nigeria? *Drugs: Education, Prevention and Policy, 21*(6), 434-439.
- Dumbili, E. W. (2015a). *Media, alcohol consumption and young people in an eastern Nigerian university: A qualitative study*. Doctoral Thesis submitted to the Brunel University London, United Kingdom.

- Dumbili, E. W. (2015b). A review of substance use among secondary school students in Nigeria: Implications for policies. *Drugs: Education, Prevention and Policy*, 22(5), 387-399.
- Dumbili, E. W. (2015c). 'What a man can do, a woman can do better': Gendered alcohol consumption and (de) construction of social identity among young Nigerians. *BMC Public Health*, 15(1), 167.
- Dumbili, E. W. (2016a). Intoxicating entertainment? The influence of "Star music trek" on the drinking practices of Nigerian students. *Contemporary Drug Problems*, 43(1), 62-78.
- Dumbili, E. W. (2016b). "She encourages people to drink": A qualitative study of the use of females to promote beer in Nigerian institutions of learning. *Drugs: Education, Prevention and Policy*, 23(4), 337-343.
- Dumbili, E. W., & Williams, C. (2017). Awareness of alcohol advertisements and perceived influence on alcohol consumption: A qualitative study of Nigerian university students. *Addiction Research & Theory*, 25(1), 74-82.
- Ewing, S. W. F., Sakhardande, A., & Blake-more, S. (2014). The effect of alcohol consumption on the adolescent brain: A systematic review of MRI and fMRI studies of alcohol-using youth. *NeuroImage: Clinical*, 5, 420-437.
- Farrell, T., & Gordon, R. (2012). Critical social marketing: Investigating alcohol marketing in the developing world. *Journal of Social Marketing*, 2(2), 138-156.
- Fawole, O. I. (2008). Economic violence to women and girls: Is it receiving the necessary attention? *Trauma, Violence & Abuse*, 9(3), 167-177.
- Ferreira-Borges, C., Esser, M. B., Dias, S., Babor, T., & Parry, C. D. (2015). Alcohol control policies in 46 African countries: Opportunities for improvement. *Alcohol and Alcoholism*, 50(4), 470-476.
- Gordon, R., Hastings, G., & Moodie, C. (2010). Alcohol marketing and young people's drinking: What the evidence base suggests for policy. *Journal of Public Affairs*, 10(1-2), 88-101.
- Hastings, G., Anderson, S., Cooke, E., & Gordon, R. (2005). Alcohol marketing and young people's drinking: A review of the research. *Journal of Public Health Policy*, 26(3), 296-311.
- Heap, S. (1998). "We think prohibition is a farce": Drinking in the alcohol-prohibited zone of colonial northern Nigeria. *The International Journal of African Historical Studies*, 31(1), 23-51.
- Holloway, I., & Todres, L. (2003). The status of method: Flexibility, consistency and coherence. *Qualitative Research*, 3(3), 345-357.
- Hurtz, S. Q., Henriksen, L., Wang, Y., Feighery, E. C., & Fortmann, S. P. (2007). The relationship between exposure to alcohol advertising in stores, owning alcohol promotional items, and adolescent alcohol use. *Alcohol and Alcoholism*, 42(2), 143-149.
- Iwamoto, D. K., Cheng, A., Lee, C. S., Takamatsu, S., & Gordon, D. (2011). "Man-ing" up and getting drunk: The role of masculine norms, alcohol intoxication and alcohol-related problems among college men. *Addictive Behaviors*, 36(9), 906-911.
- Jernigan, D. H. (2010). Extent of global alcohol marketing and its impact on youth. *Contemp. Drug Probs.*, 37, 57-89.
- Jernigan, D. H., & Babor, T. F. (2015). The concentration of the global alcohol industry and its penetration in the

- African region. *Addiction*, 110(4), 551-560.
- Jones, S. C., Barrie, L., Gregory, P., Allsop, S., & Chikritzhs, T. (2015). The influence of price-related point-of-sale promotions on bottle shop purchases of young adults. *Drug and Alcohol Review*, 34(2), 170-176.
- Jones, S. C., Barrie, L., Robinson, L., Allsop, S., & Chikritzhs, T. (2012). Point-of-sale alcohol promotions in the Perth and Sydney metropolitan areas. *Drug and Alcohol Review*, 31(6), 803-808.
- Jones, S. C., & Lynch, M. (2007). Non-advertising alcohol promotions in licensed premises: Does the code of practice ensure responsible promotion of alcohol? *Drug and Alcohol Review*, 26(5), 477-485.
- Kacen, J. J., Hess, J. D., & Walker, D. (2012). Spontaneous selection: The influence of product and retailing factors on consumer impulse purchases. *Journal of Retailing and Consumer Services*, 19(6), 578-588.
- Kuo, M., Wechsler, H., Greenberg, P., & Lee, H. (2003). The marketing of alcohol to college students: The role of low prices and special promotions. *American Journal of Preventive Medicine*, 25(3), 204-211.
- Kypri, K., Cronin, M., & Wright, C. S. (2005). Do University Students Drink More Hazardously than their non-student Peers? *Addiction*, 100(5), 713-714.
- Kypri, K., Bell, M. L., Hay, G. C., & Baxter, J. (2008). Alcohol outlet density and university student drinking: A national study. *Addiction*, 103(7), 1131-1138.
- Liao, S., Shen, Y., & Chu, C. (2009). The effects of sales promotion strategy, product appeal and consumer traits on reminder impulse buying behaviour. *International Journal of Consumer Studies*, 33(3), 274-284.
- McCreanor, T., Greenaway, A., Barnes, H. M., Borell, S., & Gregory, A. (2005). Youth identity formation and contemporary alcohol marketing. *Critical Public Health*, 15(3), 251-262.
- Mohan, G., Sivakumaran, B., & Sharma, P. (2013). Impact of store environment on impulse buying behavior. *European Journal of Marketing*, 47(10), 1711-1732.
- Morse, J. M. (2012). The implications of interview type and structure in mixed-method designs. In J. F. Gubrium, J. A. Holstein, A. Marvasti & K. D. McKinney (Eds.), *The SAGE Handbook of Interview Research: the complexity of the craft*. Los Angeles: SAGE Pub.
- Muruganantham, G., & Bhakat, R. S. (2013). A review of impulse buying behavior. *International Journal of Marketing Studies*, 5(3), p149.
- Nakamura, R., Suhrcke, M., Pechey, R., Morciano, M., Roland, M., & Marteau, T. M. (2014). Impact on alcohol purchasing of a ban on multi-buy promotions: A quasi-experimental evaluation comparing Scotland with England and Wales. *Addiction*, 109(4), 558-567.
- Obot, I. (2013). Alcohol marketing in Africa: Not an ordinary business. *African Journal of Drug and Alcohol Studies*, 12(1), 63-73.
- O'Brien, M. C., McNamara, R. S., McCoy, T. P., Sutfin, E. L., Wolfson, M., & Rhodes, S. D. (2013). Alcohol-related injury among Greek-letter college students: Defining a target population for secondary prevention. *Journal of Health Psychology*, 18(4), 461-469.

- Odejide, O. A., Ohaeri, J., Adelekan, M. L., & Ikuesan, B. (1987). Drinking behaviour and social change among youths in Nigeria--A study of two cities. *Drug and Alcohol Dependence*, 20(3), 227-233.
- Paek, H., & Hove, T. (2012). Determinants of underage college student drinking: Implications for four major alcohol reduction strategies. *Journal of Health Communication*, 17(6), 659-676.
- Pettigrew, S., Biagioni, N., Jones, S. C., Daube, M., Kirby, G., Stafford, J., et al. (2015). Sales promotion strategies and youth drinking in Australia. *Social Science & Medicine*, 141, 115-122.
- Ruddock, A. (2012). Cultivated performances: What cultivation analysis says about media, binge drinking and gender. In H. Bilandzic, G. Patriarche & P. J. Traudt (Eds.), *The social use of media: Cultural and social scientific perspectives on audience research* (pp. 53-68). Chicago: Intellect Press.
- Saldaña, J. (2012). *The coding manual for qualitative researchers*. London: Sage Publications Ltd.
- Scribner, R., Mason, K., Theall, K., Simonson, N., Schneider, S. K., Towvim, L. G., et al. (2008). The contextual role of alcohol outlet density in college drinking. *Journal of Studies on Alcohol and Drugs*, 69(1), 112-120.
- Sharma, B., Raciti, M., O'Hara, R., Reinhard, K., & Davies, F. (2013). University students' perceived susceptibility to alcohol retail sales promotions. *Journal of Consumer Marketing*, 30(3), 283-294.
- Silverman, D. (2011). *Interpreting qualitative data* (4th ed.). London: Sage Pub.
- Squeglia, L. M., Tapert, S. F., Sullivan, E. V., Jacobus, J., Meloy, M., Rohlfing, T., et al. (2015). Brain development in heavy-drinking adolescents. *American Journal of Psychiatry*, 172(6), 531-542.
- Stautz, K., Brown, K. G., King, S. E., Shemilt, I., & Marteau, T. M. (2016). Immediate effects of alcohol marketing communications and media portrayals on consumption and cognition: A systematic review and meta-analysis of experimental studies. *BMC Public Health*, 16(1), 1.
- Stead, M., Angus, K., Macdonald, L., & Bauld, L. (2014). Looking into the glass: Glassware as an alcohol marketing tool, and the implications for policy. *Alcohol and Alcoholism*, 49(3), 317-320.
- Swahn, M. H., Palmier, J. B., Benegas-Segarra, A., & Sinson, F. A. (2013). Alcohol marketing and drunkenness among students in the Philippines: Findings from the nationally representative global school-based student health survey. *BMC Public Health*, 13(1), 1159.
- Swahn, M. H., Palmier, J. B., & Kasirye, R. (2013). Alcohol exposures, alcohol marketing, and their associations with problem drinking and drunkenness among youth living in the slums of Kampala, Uganda. *ISRN Public Health*, 2013, 1-9.
- Swahn, M. H., Ali, B., Palmier, J. B., Sika-zwe, G., & Mayeya, J. (2011). Alcohol marketing, drunkenness, and problem drinking among Zambian youth: Findings from the 2004 global school-based student health survey. *Journal of Environmental and Public Health*, 2011, 497827.
- Thombs, D. L., O'Mara, R., Dodd, V. J., Hou, W., Merves, M. L., Weiler, R. M., et al. (2009). A field study of bar-sponsored drink specials and their associations

- with patron intoxication. *Journal of Studies on Alcohol and Drugs*, 70(2), 206-214.
- Umoh, O. O., Obot, P. P., & Obot, I. (2012). Perception of alcohol availability, promotion and policy by nigerian university students. *African Journal of Drug Alcohol Studies*, 11(2), 107-116.
- Umunna, I. (1967). The drinking culture of a Nigerian community: Onitsha. *Quarterly Journal of Studies on Alcohol*, 28(3), 529-537.
- Wechsler, H., & Nelson, T. F. (2008). What we have learned from the Harvard School of Public Health college alcohol study: Focusing attention on college student alcohol consumption and the environmental conditions that promote it. *Journal of Studies on Alcohol and Drugs*, 69(4), 481-490.
- World Health Organization. (2014). *Global status report on alcohol and health*. Geneva: World Health Organization.

ACKNOWLEDGEMENTS

This volume of the *African Journal of Drug and Alcohol Studies* has been published with financial support from FORUT (Campaign for Development and Solidarity), Norway. The grant has made it possible for us to publish important scientific reports on alcohol and drug use in Africa at no cost to authors and readers all over the world. We are immensely grateful to FORUT for the generous support we have received and look forward to continued collaboration in the dissemination of important scientific information on psychoactive substance use in Africa.

The Editorial Board is also grateful to the many reviewers and others who have contributed in various ways to improving the quality of the papers published in the journal.

INSTRUCTIONS TO CONTRIBUTORS

Manuscripts. AJDAS solicits manuscripts on these and other aspects of substance use: epidemiology, prevention, treatment, psychopharmacology, health and socio-economic issues, drug trafficking, and drug law and policy. The Journal is particularly interested in manuscripts that report an association between substance use and other social and health-related problems, e.g., HIV/AIDS, crime and violence, injury, accidents, physical and mental health problems. The journal audience includes researchers, practitioners, policy makers, students and educated members of the public interested in alcohol and drug issues. Hence, whether reporting data from an empirical study or reviewing a particular research issue, authors should have in mind this diverse group of readers.

Preparing manuscripts. Authors are required to prepare manuscripts in accordance with the *Publication Manual of the American Psychological Association* (5th edition). All components of the manuscript should be double-spaced, including title page, abstract, references, author note, acknowledgement, and appendixes. Authors are encouraged to keep manuscripts as concise as possible, with a length of 15 pages or less, including tables, figures, and references. Unless it is absolutely necessary, tables and figure should not be more than four. Every manuscript must include an abstract containing a maximum of 120 words, typed on a separate page. The full name, address, telephone number and e-mail address of the corresponding author should be shown on the cover page.

Please refer to the Manual for specific instructions on preparing abstracts, figures, matrices, tables, and references. References should be cited in the text by author(s) and dates with multiple references in alphabetical order. Each in-text citation should be listed in the reference section. Here are examples of how articles and books should be referenced:

Journal article:

Abdool, R., Sulliman, F.T., & Dhannoo, M. I. (2006). The injecting drug use and HIV/AIDS nexus in the Republic of Mauritius. *African Journal of Drug and Alcohol Studies*, 5(2), 107-116.

Book chapter:

Tumwesigye, N. M., & Kasirye, R. (2005). Gender and the major consequences of alcohol consumption in Uganda. In I. S. Obot & R. Room (eds.), *Alcohol, gender and drinking problems* (pp. 189-208). Geneva: World Health Organization.

Book:

MacAllister, W.B. (2000). *Drug diplomacy in the twentieth century*. London: Routledge.

Website:

Include the date of access.

Submission of manuscripts. All manuscripts should be submitted by e-mail to the Editor-in-Chief at iobot@crisanet.org. You can also submit your manuscript to the deputy editor responsible for the region to which you belong.

Cover Letter. Every manuscript must be accompanied by a cover letter stating unequivocally that the manuscript and data have not been published previously or concurrently submitted elsewhere for consideration. In addition, authors must state that the participants in their study have been treated in accordance with ethical standards. In the case of manuscripts with multiple authors, the corresponding/lead author must state categorically that all listed authors contributed in significant ways to the work.

Reprints. The journal does not produce reprints for authors, instead the lead author will receive a copy of the journal in which his or her article appears.

Postal address: USA: *African Journal of Drug and Alcohol Studies*, P. O. Box 4230, University Post Office, Uyo, Nigeria; 10 Sandview Ct, Baltimore, MD 21209, USA.

Subscription information: Request for information on individual or institutional subscription should be sent to the Editor-in-Chief at iobot@crisanet.org.

CONTENTS

Prevalence of substance use and correlates of multiple substance use among school-going adolescents in Botswana 75
Gobopamang Letamo, Motsholathebe Bowelo, & Rolang George Majelantle

Drug interactions in the constituents of street drug mixture “nyaope” in South Africa: a mini-review 91
Aye Aye Khine & Kebogile Elizabeth Mokwena

Drug use disorders among long distance commercial vehicle drivers..... 103
Christopher I. Okpataku

Patterns of substance use and its predictors among North-West University students Mafikeng campus 111
Godswill N. Osuafor, Sonto M. Maputle & Natal Ayiga

The social context of injection drug use and harm reduction programmes in Sub-Saharan Africa 123
Ediomo-Ubong E. Nelson

Anywhere, everywhere: alcohol industry promotion strategies in Nigeria and their influence on young people 135
Emeka W. Dumbili & Clare Williams