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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

CONTENTS

A COMPARISON OF ALCOHOL USE AND CORRELATES OF DRINKING PATTERNS AMONG MEN AND WOMEN AGED 50 AND ABOVE IN GHANA AND SOUTH AFRICA

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ABSTRACT

Alcohol use is an important part of the health profile of older adults, and little is known about the prevalence and correlates of drinking among this population in Ghana and South Africa. This study aimed to describe and compare the prevalence and correlates of drinking patterns among adults aged 50 and above in Ghana and South Africa, and to determine which correlates explain differences in drinking patterns between the two countries. We used data from the WHO Study on global AGEing and adult health (SAGE) conducted in Ghana and South Africa. The sample of participants aged 50+ was 4289 in Ghana and 3666 in South Africa. Alcohol measures included a self-report of the number of standard drinks consumed over the previous 7 days, from which we constructed the mutually exclusive drinking categories of lifetime abstainers, low risk and at risk drinkers by gender. We used multivariate analysis to identify independent correlates for the different drinking patterns and those contributing to drinking differences between countries. Lifetime abstainers comprised 41.9% and 74.6% of the Ghana and South Africa samples, respectively. Among current drinkers, there were significantly more at risk drinkers among both genders in South Africa compared to Ghana. Factors independently associated drinking patterns differed between countries and by gender, although similarities included religion and smoking. Smoking status contributed to the difference in drinking patterns between Ghana and South Africa more than socio-demographics. Different patterns of drinking and associated correlates exist among older adults between Ghana and South Africa, and differences in drinking patterns were more strongly associated with smoking than socio-demographics. Drinking may increase in Ghana as economic development continues, although other health behaviors such as smoking may also play an important role and should be monitored in future surveys.

INTRODUCTION

Diverse patterns of drinking alcohol exist in Africa, and use is generally most common among middle-aged and older adults (Clausen, Rossow, Naidoo, & Kowal, 2009). Drinking alcohol in older age can influence the symptom severity and disease progres-

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sion of chronic conditions such as cancer and cardiovascular diseases common among older adults (Moore et al, 2006, Parry, Patra, & Rehm, 2011). Further, different drinking patterns, such as moderate consumption or heavy drinking, can have differential health consequences among middle-aged and older adults relative to younger populations (Klatsky 2007, Russell, Cooper, Frone, & Welte, 1991).

Changes at the personal or societal level can change the ways in which one uses alcohol (Room, 2006, Combes, Gerdtham, & Jarl, 2011), such that comparisons between societies that have undergone different degrees of economic change can allow for projections of alcohol trends at different developmental stages. Ghana and South Africa represent two distinct places on the scale of national economic development in Africa. The World Bank classifies South Africa as an upper-middle income country, and Ghana was recently upgraded to a lower middle income classification (World Bank, 2011). Ghana currently has a stable government, and will likely develop further in the coming years. Some alcohol regulations exist, and the government is in collaboration with various stakeholders, including the alcohol industry, to develop a national alcohol policy (AfroNews, SABMiller). These circumstances make this a crucial time for observing where alcohol use stands today and projecting possible future trends through comparisons with other countries in the region that are more economically developed, such as South Africa. General population estimates present Ghana with "moderate" consumption and South Africa with "hazardous" consumption, characterized by a higher rate of binge drinking (Martinez, Røislien, Naidoo, & Clausen, 2011). However, drinking patterns among older adults in both Ghana and South Africa are lacking, and there is a gap in knowledge on the differences in the associated factors for drinking between countries at different stages of development in the region. Identifying commonly co-occuring and modifiable behavioral factors, such as tobacoo smoking, would present an opportunity to target interventions for risky health behaviors concomittently and with potential synergistic effects.

The purpose of this study is to compare alcohol use and associated factors among men and women aged 50 and above in Ghana and South Africa. We aim to observe the prevalence of different patterns of drinking, describe differences in determined associated factors, and to identify which factors contribute to differences in drinking patterns between Ghana and South Africa.

METHOD

Data collection

Data were collected through Wave I of the Survey on Global Ageing and Adult Health (SAGE) version 1.1.0, developed and implemented by the World Health Organization. The Survey was conducted in 2007-2009 in six countries, including Ghana and South Africa. The Survey collected individual data from nationally representative samples using a multi-stage cluster sampling design, approaching respondents aged 18+ years and oversampling among those aged 50 and above. Oversampling was achieved by having a target sample of 50+ households 5 times larger than that for younger households, and inviting all 50+ persons in an older household to participate. A standardized questionnaire collected data, and included measures of risk factors for health and current health status. SAGE protocols and procedures were approved by the ethics committees in each participating country and informed consent was obtained from all participants. The SAGE Survey is described in detail elsewhere (World Health Organization [WHO], 2011).

Sample

A total of 5092 participants comprised the Ghana sample, and 4037 the South Africa sample. In Ghana, 4289 (84%) were 50+ years of age, and 3666 (91%) in South Africa, for a total sample of 7955 persons aged 50 and above.

Alcohol measures

Alcohol measures included lifetime abstinence based on the response to the question "have you ever consumed a drink that contains alcohol?". If the participant responded positively, they were asked if they had consumed in the last 12 months and further queried on the number of standard drinks consumed on each of the previous 7 days. Based on these answers we made the following mutually exclusive frequency (F)-based variables: lifetime abstainers (never had a drink), previous drinkers (ever had a drink but not in the last 12 months), and 12 month drinkers (had a drink in the last 12 months but not in the last 7 days). We also constructed two mutually exclusive quantity-frequency (QF)-based variables among respondents who reported alcohol use in the last 7 days: low risk drinkers, defined as only 1-2 drinks per day over the last 7 days and no more than 7 in total for women and 14 in total for men, and at risk drinkers, defined as either at least 4 drinks on one day of the previous 7 for women and 5 drinks on one day for men, or 8 drinks in total for women and 15 for men. These definitions are based on the guidelines from the NIAAA for adult men and women (National Institute on Alcohol Abuse and Alcoholism, 2003). A country specific showcard was used with pictures to illustrate to the participant what was meant by a "standard drink", including alcohol equivalents, i.e. – 1 bottle of beer is 1 standard drink.

Other measures

The question "do you currently use any tobacco products?" was used to define current smokers as those who responded "yes, daily" and "yes, but not daily". Self-assessed health was based on the question "in general, how would you rate your health today?", and we constructed a dichotomous variable of self assessed good health to represent very good and good responses versus moderate, bad and very bad responses. Any chronic illness in the last 12 months was based on self-reported symptoms in the previous 12 months for arthritis, angina, diabetes, chronic lung disease and asthma.

Statistical Analysis

This is a secondary analysis of data from Wave I of the SAGE Survey. All data were weighted, with post-stratification adjustments for age and gender based on UN population estimates. Given the documented differences in drinking patterns between men and women, all analyses were stratified by gender. Frequencies are presented as weighted proportions, weighted means with standard errors, and sample sizes are unweighted raw numbers. Prevalences for lifetime abstainers, previous drinkers and 12 month drinkers are presented out of the total sample, and low risk and at risk drinkers are presented out of respondents who reported drinking in the last 7 days. Comparisons are presented among the two countries by gender. We estimated bivariate associations between sociodemographics, other variables of interest and the different F- and QF-based drinking variables using the Pearson chi-square test of independence, and we estimated adjusted associations with multinomial regression models relative to lifetime abstainers for each country by gender. To explore if and to what extent sociodemographic and health measure variables explained differences in QF-based drinking variables between the two countries, we fitted logistic regressions among the whole sample for country assignment in age adjusted models and models additionally adjusted for marital status, religion, ethnicity, education, work status, having any chronic illness in the last 12 months, self assessed good health and a final model further including smoking.

Upon descriptive analysis, the observed total number and weighted proportion of previous drinkers in South Africa was 51 and 1.5%, respectively. This group did not differ significantly on any sociodemographic variable from persons who drank in the last 12 months but not in the last 7 days (12 month drinkers), and was thus included in this group for all statistical analysis for South Africa. The resulting sample size and weighted proportion of the 12 month drinker group for South Africa was 248 and 12.0%, respectively.

Approximately 10% of the cases were missing data on ethnicity and religion in South

Africa. We used multiple imputation to handle these missing data. Correlation matrices between missingness for ethnicity and religion and other covariate values showed data were missing at random. We imputed 10 datasets using multinomial regression models for ethnicity and religion including all independent, dependent and structural sampling variables (ie – strata, probability sampling unit, weights) in the model. We used the imputed datasets for all the regression models.Statistical analysis and imputation was conducted using STATA version 11.0 (StataCorp, 2009), using the survey (svy) and multiple imputation (mi, mi svyset) command structures.

RESULTS

Prevalences of both the F-based and QF-based variables differed significantly between Ghana and South Africa (Table 1). Ghana and South Africa also differed significantly (p<0.001) on several sociodemographic and health measure variables, where South Africa had more people between 50 and 65 years of age (66.8% vs 55.5%), who were ever educated (75.3% vs 46.2%), Christian (86.4% vs 69.7%), urban residents (65.2% vs 41.0%), not currently working (65.0% vs 29.9%), did not have a chronic illness in the last 12 months

(44.6% vs 34.9%), and were current smokers (23.8% vs 10.7%).

Prevalence of drinking

Lifetime abstention was higher among women than men in both countries, and in South Africa compared to Ghana in total (74.6% vs. 41.9%, p<0.001). Overall, being a previous drinker and 12 month drinker was more common in Ghana than South Africa (p<0.001), and there were no statistically significant gender differences in either country on these measures. Among those who ever drank, there were were 303 (33.7%) who drank in the last 7 days among women in Ghana, 175 (36.3%) among women in South Africa, 875 (56.1%) among men in Ghana and 315 (54.5%) among men in South Africa. Among those who drank in the last 7 days, estimates of the QF-based drinking variables, that is, 'low risk drinker' and 'at risk drinker' differed statistically significantly between South Africa and Ghana, where low risk drinkers were more common in Ghana (74.4% vs 62.8%) and at risk drinkers were more common in South Africa (37.2% vs 25.6%). There were no statistically significant differences between men and women on both the QF-based drinking variables in Ghana but there was a significantly higher proportion of at risk drinking among women relative to men in South Africa.

Table 1: Drinking prevalence by country and gender

Drinking status	Ghana			South Africa			
	Women (n=2052) % (SE)	Men (n=2237) % (SE)	Total (n=4289) % (SE)	Women (n=2108) % (SE)	Men (n=1558) % (SE)	Total (n=3666) % (SE)	p-value
Lifetime abstainer	52.2 (1.9)	32.5 (1.8)	41.9 (1.5)*	80.9 (1.5)	66.5 (2.1)	74.6 (1.4)*	0.000
Previous drinker	12.7 (1.0)	12.0 (0.8)	12.4 (0.7)	1.4 (0.4)	1.6 (0.5)	1.5 (0.3)	0.000
12 month drinker	18.9 (1.2)	17.6 (1.0)	18.2 (0.8)	10.8 (1.1)	13.6 (1.2)	12.0 (0.8)	0.000
Drank in the last 7 days	16.1 (1.3)	37.9 (1.7)	27.5 (1.3)	6.9 (0.9)	18.2 (1.7)	11.9 (1.0)	0.000
Low risk drinker[a]	73.9 (3.2)	74.7 (1.9)	74.4 (1.6)	52.8 (6.5)	67.6 (4.2)	62.8 (3.7)*	0.002
At risk drinker[a]	26.1 (3.2)	25.3 (1.9)	25.6 (1.6)	47.2 (6.5)	32.4 (4.2)	37.2 (2.1)*	0.002

[a] proportion estimated over persons who drank in the last 7 days.

*chi square test of independence between men and women, significant at the p≤0.05 level.

p-values presented are for chi square tests between country totals.

Table 2: Prevalence of drinking patterns among adults aged 50 and above in Ghana by selected demographics and gender

Demographics	Women (n=2052)										Men (n=2237)										Total (N=4289)
	Lifetime abstainer		Previous drinker		12 month drinker		Low risk drinker		At risk drinker		Lifetime abstainer		Previous Drinker		12 month drinker		Low risk drinker		At risk drinker		
	(%)[a]	SE	(%)	SE	(%)	SE	(%)	SE	(%)	SE	(%)	SE	(%)	SE	(%)	SE	(%)	SE	(%)	SE	n[b] (%)[c]
Age (years)																					
50-64	51.4	1.9	48.5	3.6	57.8	2.5	59.8	3.7	69.0	5.8*	51.0	2.7	44.6	3.9	43.1	3.1	42.5	2.2	35.4	4.0*	**2321 (54.5)**
Married	30.3	1.8	25.3	4.0	31.1	2.9	31.7	3.9	44.3	7.2	87.5	1.5	87.7	2.1	80.5	2.3	82.8	1.6	84.3	2.9	2422 (58.9)
Ethnicity																					
Akan	60.2	2.9	52.4	4.2	47.4	3.5	30.7	4.2	39.4	7.0*	38.0	3.4	51.6	3.5	57.3	3.3	42.1	3.0	50.3	4.5*	2054 (48.7)
Ewe	4.7	0.8	8.9	2.5	13.2	3.0	11.5	2.1	6.4	3.2	4.7	1.2	5.0	1.6	8.5	1.5	8.0	1.3	9.6	2.5	291 (7.3)
Ga-Adangbe	7.0	1.1	15.9	2.7	14.2	2.4	16.8	2.9	12.3	4.1	5.7	1.1	17.0	3.1	8.1	1.6	12.4	1.9	13.5	2.9	437 (10.5)
Other	28.1	2.3	22.9	3.7	25.3	3.0	41.1	4.8	41.9	8.3	51.6	3.8	26.5	3.3	26.2	2.9	37.6	2.9	26.6	4.3	14.3 (33.5)
Religion																					
None/other	3.1	0.6	5.4	1.8	5.4	1.4	3.8	1.4	9.9	4.4*	4.0	0.9	3.1	1.0	6.6	1.5	9.0	1.7	16.7	3.1*	**240 (5.6)**
Christian	71.9	2.4	88.5	2.7	80.9	2.4	69.2	3.7	61.6	9.1	46.0	3.6	83.8	2.5	78.8	2.4	67.5	3.0	71.5	3.5	**2942 (69.7)**
Muslim	21.2	2.4	1.9	0.9	2.2	0.8	39.3	1.2	5.8	2.9	48.5	3.9	6.8	1.6	5.5	1.2	4.1	1.1	3.0	1.1	**678 (15.8)**
Indigenous	3.8	0.9	4.3	1.7	11.5	2.0	23.1	3.1	22.8	9.3	1.5	0.5	6.4	2.0	9.1	1.6	19.4	2.4	8.8	1.9	**416 (8.8)**
Ever schooled	30.6	1.8	45.8	3.9	41.2	3.1	30.7	3.8	31.7	6.3*	42.7	2.9	68.2	3.4	66.7	3.1	56.9	2.8	73.1	3.7*	1932 (46.2)
Residency																					
Rural	57.9	2.1	48.8	4.3	58.4	3.2	66.8	4.5	71.6	5.6	53.1	3.3	55.5	3.3	59.6	2.8	67.4	2.4	61.6	4.4*	**2535 (59.0)**
Currently working	67.0	1.8	55.4	3.3	66.1	3.0	70.7	3.3	79.9	5.4*	71.3	2.3	66.7	3.3	70.0	2.9	76.5	2.2	87.5	2.7*	**2963 (70.1)**
Any chronic illness <12mo	69.3	1.9	81.3	3.0	64.8	2.7	72.6	3.5	67.2	6.0*	59.9	2.8	67.5	3.4	58.4	2.7	58.6	2.7	61.7	4.2	**2701 (65.1)**
Self assessed good health	34.2	2.1	28.0	3.2	36.9	2.6	40.3	3.7	54.8	6.0*	48.2	2.4	38.8	3.2	45.4	2.5	47.7	2.5	47.5	4.1	1738 (41.2)
Current smoker	2.2	0.6	5.5	1.5	6.9	1.7	12.4	2.3	17.8	4.2*	8.9	1.2	7.5	1.7	10.8	1.5	26.1	2.3	26.0	3.5*	**533 (10.7)**

*significant at the p≤0.01
[a] proportions are weighted estimates
[b] sample sizes are unweighted numbers
[c] bold face type indicates significant difference from South Africa total values, p<0.000

Table 3: Prevalence of drinking patterns among adults aged 50 and above in South Africa by selected demographics and gender

Demographics	Women (n=2108)								Men (n=1558)								Total (n=3666)
	Lifetime abstainer		12 month drinker		Low risk drinker		At risk drinker		Lifetime abstainer		12 month drinker		Low risk drinker		At risk drinker		
	(%)	SE	(%)	SE	(%)	SE	(%)	SE	(%)	SE	(%)	SE	(%)	SE	(%)	SE	n (%)
Age (years)																	
50-64	64.3	1.9	59.6	4.6	72.3	5.8	68.8	9.4	69.4	2.5	63.2	4.2	78.6	3.6	78.9	5.1	**2246 (66.8)**
Married	35.9	1.8	33.2	5.0	42.7	7.1	42.1	10.2	80.6	2.2	81.9	3.2	73.4	6.0	73.9	5.2	1914 (55.2)
Ethnicity																	
African/Black	75.3	2.1	67.2	4.9	72.1	6.9	65.9	12.7	73.8	3.1	68.9	4.2	73.4	5.9	82.6	5.2	1987 (73.9)
White	7.4	1.3	9.6	3.3	18.2	6.3	11.6	8.4	10.2	2.8	12.2	2.7	12.4	3.7	9.5	4.7	255 (9.2)
Coloured	12.6	1.4	21.3	4.3	7.7	2.9	21.8	12.0	11.4	2.1	17.0	3.5	12.3	4.6	5.9	2.3	649 (13.1)
Indian/Asian	4.4	1.0	1.9	0.7	2.0	1.3	0.7	0.7	4.6	0.9	1.9	0.6	1.8	0.6	2.0	0.8	289 (3.8)
Religion																	
None/other	6.6	0.9	9.9	2.9	5.9	2.8	11.6	5.7	10.3	2.3	13.9	3.7	12.3	3.0	17.9	5.2*	**329 (9.0)**
Christian	87.7	1.7	87.0	3,1	92.2	3.4	85.3	6.4	86.5	2.5	83.8	3.8	81.1	4.0	74.1	6.5	**2706 (86.4)**
Muslim	3.4	1.1	0.5	0.5	0.0	0.0	0.0	0.0	2.6	0.9	0.3	0.2	0.0	0.0	0.0	0.0	**95 (2.4)**
Indigenous	2.3	0.6	2.6	2.6	1.9	1.9	3.1	2.2	0.6	3.6	2.1	1.0	6.5	2.7	6.8	4.4	**55 (2.2)**
Ever schooled	74.9	2.2	67.5	4.9	57.4	8.6	76.3	8.2	77.4	3.0	80.6	3.6	81.4	4.4	75.6	6.7	**2314 (75.3)**
Residency																	
Rural	36.1	2.6	33.2	5.0	28.8	5.9	46.8	11.1	32.9	3.2	38.3	4.6	35.6	5.8	22.5	5.3	**1208 (34.8)**
Currently working	29.0	2.0	18.2	4.0	27.2	6.6	27.5	8.5	44.9	3.7	39.0	4.7	43.7	7.7	45.9	8.1	**967 (35.0)**
Any chronic illness																	
<12mo	56.2	2.5	73.4	4.6	59.3	8.7	49.4	10.6*	48.7	3.3	56.9	4.9	56.2	7.9	64.8	7.0	**1733 (55.4)**
Self assessed																	
good health	34.3	2.0	35.2	5.2	40.7	7.1	41.9	10.5	42.6	2.6	39.7	4.5	38.7	7.6	46.1	7.7	1413 (37.9)
Current smoker	15.1	1.4	37.8	4.8	39.5	7.2	70.2	10.5*	14.0	1.8	41.0	5.0	69.7	5.0	68.0	6.9*	**951 (23.8)**

*significant at the $p \leq 0.01$
[a] proportions are weighted estimates
[b] sample sizes are unweighted numbers
[c] bold face type indicates significant difference from Ghana total values, $p<0.000$

Drinking patterns and associated correlates

Weighted proportions and bivariate associations between selected sociodemographics, health measures and the F-based and QF-based drinking variables in each country by gender are presented in Tables 2 and 3. Adjusted associations are presented among each country by gender in Tables 4 and 5.

Table 4: Adjusted ORs for F- and QF-based drinking patterns among women and men aged 50+ in Ghana

Demographic variables	Women (n=2052)				Men (n=2237)			
	Previous drinker (vs lifetime abstainer)	12 month drinker (vs lifetime abstainer)	Low risk drinker (vs lifetime abstainer)	At risk drinker (vs lifetime abstainer)	Previous drinker (vs lifetime abstainer)	12 month drinker (vs lifetime abstainer)	Low risk drinker (vs lifetime abstainer)	At risk drinker (vs lifetime abstainer)
	OR (SE)	OR (SE)	OR (SE)	OR (SE)	OR (SE)	OR (SE)	OR (SE)	OR (SE)
Age (years)								
50-64 (vs 65+)	-0.04 (0.19)	-0.17 (0.16)	-0.32 (0.21)	-0.60 (0.31)	-0.41 (0.22)	**-0.45 (0.20)**	**-0.46 (0.19)**	-0.44 (0.24)
Married (vs not married)	-0.28 (0.21)	-0.04 (0.19)	0.03 (0.23)	0.46 (0.30)	0.09 (0.27)	-0.51 (0.27)	-0.33 (0.26)	-0.25 (0.30)
Indigenous tribe								
Akan (vs other)	**-0.88 (0.28)**	**-0.79 (0.25)**	**-1.49 (0.27)**	**-1.01 (0.44)**	-0.17 (0.26)	-0.00 (0.24)	-0.37 (0.28)	-0.25 (0.34)
Ewe (vs other)	0.13 (0.41)	0.45 (0.39)	-0.18 (0.39)	-0.83 (0.68)	-0.27 (0.56)	0.30 (0.44)	-0.06 (0.48)	0.32 (0.58)
Ga-Adangbe (vs other)	0.24 (0.33)	0.09 (0.27)	-0.06 (0.34)	-0.11 (0.48)	0.49 (0.39)	-0.23 (0.32)	0.10 (0.33)	0.30 (0.45)
Religion								
Christian (vs other)	-0.08 (0.38)	-0.01 (0.34)	0.03 (0.43)	-1.06 (0.67)	0.62 (0.43)	-0.18 (0.37)	-0.41 (0.36)	**-1.18 (0.42)**
Muslim (vs other)	**-3.03 (0.60)**	**-2.69 (0.53)**	**-2.51 (0.60)**	**-2.97 (0.86)**	**-1.84 (0.53)**	**-2.76 (0.45)**	**-3.51 (0.56)**	**-4.38 (0.63)**
Primal indigenous (vs other)	-0.71 (0.47)	0.59 (0.41)	**-0.56 (0.34)**	0.36 (0.77)	**1.75 (0.66)**	**1.19 (0.57)**	**1.45 (0.54)**	0.04 (0.62)
Ever schooled (vs never)	**0.39 (0.18)**	0.29 (0.17)	0.08 (0.24)	0.01 (0.33)	**0.52 (0.24)**	**0.46 (0.23)**	0.30 (0.36)	**0.87 (0.28)**
Residency								
Rural (vs urban)	-0.28 (0.21)	-0.14 (0.19)	-0.03 (0.24)	0.11 (0.30)	0.14 (0.19)	0.17 (0.20)	0.23 (0.20)	0.05 (0.26)
Currently working (vs not)	**-0.42 (0.19)**	-0.18 (0.16)	0.06 (0.21)	0.26 (0.42)	-0.22 (0.24)	-0.18 (0.20)	0.20 (0.20)	0.95 (0.32)
Any chronic illness <12mo (vs none)	0.56 (0.22)	-0.13 (0.14)	0.37 (0.23)	0.23 (0.30)	0.35 (0.18)	-0.07 (0.19)	-0.25 (0.20)	0.10 (0.25)
Self assessed good health (vs moderate/bad/very bad)	0.06 (0.18)	0.18 (0.16)	0.47 (0.22)	**0.92 (0.29)**	**-0.43 (0.18)**	-0.13 (0.17)	-0.10 (0.19)	-0.12 (0.23)
Current smoker (vs not)	**1.51 (0.39)**	**1.56 (0.39)**	**1.84 (0.37)**	**2.51 (0.47)**	0.43 (0.32)	**0.65 (0.29)**	**1.58 (0.27)**	**1.78 (0.30)**

Bold typeface indicates significance at $p<0.05$ for comparison between drinking patterns

Table 5: Adjusted ORs for F- and QF-based drinking patterns among women and men aged 50+ in South Africa

Demographics	Women			Men (n=1558)		
	12 month drinker (vs lifetime abstainer)	Low risk drinker (vs lifetime abstainer)	At risk drinker (vs lifetime abstainer)	12 month drinker (vs lifetime abstainer)	Low risk drinker (vs lifetime abstainer)	At risk drinker (vs lifetime abstainer)
	OR (SE)	OR (SE)	OR (SE)	OR (SE)	OR (SE)	OR (SE)
Age (years)						
50-64 (vs. 65+)	-0.01(0.01)	**-0.04 (0.02)**	-0.04 (0.03)	0.02 (0.01)	-0.02 (0.02)	-0.01 (0.02)
Married (vs. not married)	-0.14 (0.26)	0.23 (0.32)	0.07 (0.52)	0.07 (0.26)	-0.45 (0.31)	-0.46 (0.30)
Indigenous tribe						
White (vs. African/Black)	0.37 (0.41)	**.95 (0.49)**	0.65 (0.91)	0.21 (0.39)	0.45 (0.48)	-0.68 (0.66)
Coloured (vs. African/Black)	0.39 (0.39)	-0.51 (0.55)	0.65 (0.53)	-0.01 (0.35)	0.10 (0.53)	**-1.71 (0.54)**
Indian/Asian (vs. African/ Black)	-0.55 (0.89)	-0.46 (0.82)	-1.56 (1.07)	-0.71 (0.66)	-1.12 (0.82)	**-2.10 (0.72)**
Religion						
Christian (vs. other)	-0.51 (0.49)	0.15 (0.51)	-0.48 (0.64)	-0.31 (0.41)	-0.13 (0.42)	-0.52 (0.43)
Muslim (vs. other)	**-2.48 (1.19)**	-17.28 (10.6)	**-18.28 (9.95)**	**-2.52 (0.79)**	**-3.84 (1.60)**	-0.71 (1.30)
Primal indigenous (vs. other)	-0.73 (0.84)	-0.68 (1.19)	-0.28 (1.14)	0.75 (0.93)	**2.14 (0.91)**	2.01 (1.36)
Ever schooled (vs. never)	**-0.76 (0.23)**	**-1.46 (0.44)**	-0.16 (0.49)	0.20 (0.23)	0.18 (0.31)	-0.13 (0.45)
Residency						
Rural (vs. urban)	-0.38 (0.27)	-0.73 (0.39)	0.48 (0.49)	0.21 (0.22)	0.04 (0.35)	-0.75 (0.38)
Currently working (vs. not)	-0.37 (0.30)	-0.18 (0.33)	-0.62 (0.62)	0.13 (0.26)	0.25 (0.35)	**-1.01 (0.35)**
Any chronic illness <12mo (vs. none)	**0.62 (0.23)**	0.19 (0.38)	-0.14 (0.56)	0.26 (0.26)	0.17 (0.27)	0.10 (0.36)
Self-assessed good health (vs. moderate/bad/very bad)	0.20 (0.24)	0.27 (0.41)	0.34 (0.47)	0.07 (0.27)	-0.08 (0.29)	0.49 (0.41)
Current smoker (vs. not)	1.27 (0.24)	1.49 (0.30)	2.24 (0.50)	1.47 (0.27)	2.62 (0.29)	2.80 (0.38)

Bold typeface indicates significance at p<0.05

Among women, being a member of the Akan ethnic group significantly reduced the likelihood of being any kind of drinker in Ghana, while being White increased the likelihood of being a low risk drinker in South Africa. Subscribing to the primal indigenous religion significantly reduced the likelihood of being a low risk drinker compared to a lifetime abstainer among women in Ghana. Additionally, being ever schooled among women in Ghana increased the likelihood of being a previous drinker while it reduced the likelihood in South Africa for being a 12 month and low risk drinker. Having self-assessed good health increased the likelihood of being an at risk drinker in Ghanian women. Among men, subscribing to a primal indigenous religion was associated with an increased likelihood of engaging in previous, 12 month and low risk drinking in Ghana, and low risk drinking in South Africa. Additionally, being an at risk drinker was associated with ever being schooled and currently working among men in Ghana, while being Coloured reduced the likelihood among men in South Africa. In both countries among both genders being Muslim statistically significantly reduced the likelihood of engaging in any kind of active drinking pattern while being a current smoker increased the likelihood.

Differences for between-country drinking patterns

Table 6 shows differences in drinking pattern indices relative to lifetime abstainers between South Africa and Ghana after adjusting for models progressively including sociodemographic and health measures. Ghana shows statistically lower odds of participating in all drinking patterns, and these differences are partially explained by the introduction of smoking status for at risk drinking among women, and low risk and at risk drinking among men. For example, the proportion of at risk drinking among women in Ghana was 12.6% compared to 22.1% in South Africa, and the estimate changed from 0.68 in model 2 to 1.33 in model 3.

DISCUSSION

The results show marked differences in the prevalences of drinking patterns among men and women aged 50 years and above between Ghana and South Africa. Factors associated with the different drinking patterns also varied between genders and countries. The notable similarity between the countries and genders for all drinking patterns, however, is a positive association with smoking. Also, differences in at risk drinking among women, and low and at risk drinking among men were explained more by differences in smoking status than socioeconomic differences between the two countries.

The relatively low prevalence of lifetime abstinence and high prevalence of low risk drinking among older adults in Ghana is consistent with reports of a generally moderate drinking culture compared to South Africa (Clausen et al., 2009, WHO, 2011, Ghana Statistical Service, 2008). The lack of a gender difference in drinking patterns, including at risk drinking, among older adults in Ghana suggests equality of habits among those who engage in alcohol use even though lifetime abstention is more common among women.

The higher proportion of at risk drinkers in South Africa is also consistent with reports of an overall hazardous consumption culture, and demonstrates this pattern of drinking among older adults as well (WHO, 2011, South Africa Demographic and Health Survey, 2003). Higher rates of at risk drinking among older women compared to older men is also consistent with previous reports, including the 1998 Demographic and Health Survey (Parry et al., 1998). As our at risk drinker variable was a gender-specific composite of drinking behaviors, lower estimates may be expected if such drinking behaviors were examined individually (ie – binge drinking only) or if the same criteria were applied to women as men. For example, a US study among primary care patients aged 60 and above who reported drinking in the past 3 months identified 25% of women and 56% of men as at risk drinkers using the Comorbidity Alcohol Risk Evaluation Tool (Barnes et al., 2010). Besides a methodological artifact, the

Table 6. Differences in drinking patterns between Ghana and South Africa by gender in model s adjusted for 1. age, 2. plus marital status, ethnicity, religion, education, work status, chronic illness <12 months, good self-reported health, 3. plus smoking

Drinking pattern*	Women			Men		
	Ghana (vs South Africa) Model 1	Ghana (vs South Africa) Model 2	Ghana (vs South Africa) Model 3	Ghana (vs South Africa) Model 1	Ghana (vs South Africa) Model 2	Ghana (vs South Africa) Model 3
	OR (SE)	OR (SE)	OR (SE)	OR (SE)	OR (SE)	OR (SE)
Low risk drinker	1.65 (0.19)	1.41 (0.20)	1.71 (0.23)	1.60 (0.17)	1.92 (0.26)	2.61 (0.25)
At risk drinker	0.72 (0.28)	0.68 (0.36)	1.33 (0.45)	1.29 (0.19)	1.75 (0.25)	2.47 (0.24)

* Lifetime abstention is the reference for each drinking pattern

gender difference could also be due to women having experienced more physical and psychological trauma relative to men in South Africa, and further to women in Ghana, which may be an important risk factor for drinking in this context.

Subscribing to the primal indigenous religion reduced the likelihood of being a drinker among women and increased the likelihood among men in both countries. This association could be understood as participation in traditional gender roles around alcohol use, where women brewed alcoholic beverages but did not imbibe and men would be the consumers (Willis, 2002). In Ghana, currently working and being educated were associated with at risk drinking among men and not women. This finding is consistent with a report by Blunch and Blunch which reported average per capita community expenditures as well as cultural factors to be associated with any alcohol consumption in male- and female-headed households, although the association between economy and consumption was stronger in male-headed households (Blunch & Blunch, 2009).

Overall, the differences in sociodemographic correlates of the different drinking patterns between Ghana and South Africa likely reflect differences in national cultures in general and the cultures around drinking in particular, with the exception of Muslim's consistent abstinence overall. The other common factor of current smoking for both genders in both countries represents an important correlate as it is modifiable and associated with the growing epidemic of non-communicable diseases in Africa (Dalal et al., 2011). Other large surveys have identified smoking as a correlate of harmful drinking among middle-aged and older adults (Choi & DiNitto, 2011) and there are concerns about the growing consumer market in Africa for the tobacco industry (Bitton, Green, & Colber, 2011).

In comparing South Africa and Ghana from the perspective of national economic development, on the surface the findings suggest drinking patterns may change among older adults in Ghana with economic gains. Specifically, an overall increase in at risk drinking may occur, particularly among women. Higher alcohol-related disability-adjusted-life-years have been documented in countries at higher levels of development, and among the higher socio-economic groups within lower income countries (Rehm, Taylor & Room, 2006, Rehm et al., 2009). On the other hand, the associations within each country of proxy measures of economic environment, namely working for pay and being educated, with drinking pattern are few and inconsistent. Furthermore, these factors in conjunction with other sociodemographics contributed little to the relationship between drinking pattern and country assignment, suggesting economic differences at this stage of development between Ghana and South Africa may not directly influence differences in drinking behavior. Moreover, we observed cultural components such as religion and tribal affiliation as consistently associated with drinking patterns within each country, suggesting culture plays a stronger role than economy. There is also evidence asserting stability in drinking patterns over time even when total consumption varies, so while drinking overall may increase, the adoption of "risky" drinking among one particular group may not necessarily follow (Skog & Rossow, 2006). However, the breadth and depth of social, political and economic change rapidly underway in Ghana and other parts of Africa questions the applicability of this Western model in an African context. It is widely anticipated that these changes will mediate increases in alcohol consumption across populations, such that the dynamics of drinking behavior may change or become more apparent than observed here. Thus, surveillance of alcohol consumption should be monitored as Ghana and other emerging African economies move through stages of economic development to better understand the influence of development on drinking habits in the context of culture and other health behaviors.

In addition to contextual factors, smoking may explain changes in drinking patterns in Ghana as they occur, given the association between smoking and drinking among older adults

in Ghana and the contribution of smoking to the difference in drinking patterns between Ghana and South Africa,. Interestingly, a recent article from Ghana reported an increase in alcohol use and decrease in smoking between 2003 and 2008 in the general population attributable to a national healthy lifestyle program (Tagoe & Dake, 2011). However, it did not investigate the association between the two behaviors. If indeed smoking continues to decline in Ghana, it will be informative to observe if the decline occurs similarly among drinkers.

This study has limitations that deserve mention. Firstly, self-reports of alcohol use are commonly under-reports of actual alcohol use, particularly in contexts where alcohol use is stigmatized, and thus drinking prevalences among those who reported any drinking are likely underestimates, and lifetime abstention an overestimate. This may be particularly relevant in South Africa, where women are culturally and socially predisposed to denying alcohol use (Pretorius, Naidoo & Reddy, 2009). Secondly, the consumption of traditional homebrews was not queried in this survey, and it is known to make up a considerable proportion of what alcohol is consumed in both Ghana and South Africa (Luginaah & Dabkubo, 2003, Onya, Flisher, & Mashamba, 2009). Thirdly, the quantity-frequency drinking measures were based on guidelines derived from the epidemiology of alcohol use in a Western context and may not be optimal in measuring drinking in an African setting. Finally, the lack of a household, personal or community-level economic measure limited accounting for the contribution of economic variables with the different drinking patterns. With these considerations in mind, this study's strengths remain due to its representativeness, comparability, use of standard criterion and provision of relevant, useful information on the epidemiology of alcohol use among an important sector of the general population in Ghana and South Africa.

Given how common drinking is among older adults in Ghana and the anticipated growth of this group, further research is needed to understand the consequences of regular alcohol use. In South Africa, efforts should continue to identify and curb at risk drinking among older adults, in particular women. In both countries, clear and accurate public health messages about both the beneficial (Sun et al., 2011) and detrimental effects of different drinking habits should be conveyed to older adults. Brief screenings and primary care-based interventions for smoking and risky alcohol use simultaneously may be useful in synergistically mitigating harms from these behaviors.

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PATTERN OF URINE TOXICOLOGY SCREENING IN A LAGOS PSYCHIATRIC HOSPITAL

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ABSTRACT

Toxicology screening has clinical and forensic applications in evaluating severe or life-threatening symptoms in patients presenting with signs and symptoms suggestive of intoxication or overdose. In both acute psychiatric and medical settings, urine toxicology has been found helpful in detection of substances of abuse. The aim of this study was to determine the pattern of substance use as detected by urine toxicology screening amongst patients at a psychiatric facility in Lagos Nigeria. A Total of 1555 subjects made up of males (1480) and females (75) were screened using the one step multi-6 drug test panel immunoassay for qualitative detection of Methadone, Methamphetamine, Benzodiazepine, Cocaine, Morphine and Tetrahydrocannabinol. 927 (59.6%) subjects were positive with one or more drugs passing the concentration cut off. Tetrahydrocannabinol (42.3%) and Benzodiazepine (49%) were found to be predominant in the population studied. This study shows the most common psychoactive substance used in this environment is cannabis and also, the significant agreement between clinical diagnosis and urine toxicology screening.

Key Words: Urine screening, Toxicology, Substance use, clinical diagnosis.

INTRODUCTION

Drug testing can be done using a variety of samples such as hair, saliva and sweat. Blood samples are very useful but the half-life of many chemical compounds in the blood is short. As such, many toxicology laboratories have a preference for urine samples. Apart from the fact that large volumes are available for testing, many drugs and /or their metabolites remain detectable for a longer period in urine. For instance, tetrahydrocannabinol remains positive in urine for several weeks, especially in chronic users (Regional Laboratory for Toxicology, 2007).

Toxicology screening has clinical and forensic applications. Clinically, they are used in confirming diagnosis in patients presenting with a history or symptoms suggestive of intoxication or overdose. Substances

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tested for include opiates, sedatives, cocaine, amphetamines, cannabinoids and alcohol. Competitive immunoassays are common analytical approach to urine drug screening. In these, specific antibodies bind to targeted chemical atoms and functional groups. Confirmation analysis is done with chromatographic procedures e.g. thin-layer, liquid and gas chromatography. Both the parent drug and the metabolites which can be useful in distinguishing recent from residual use are detectable in urine depending on the drug in question (Fraser *et al.*, 2002). In urine toxicology screening, metabolites can be tested in substances of abuse such as benzodiazepine, oxazepam and nor diazepam are primary metabolites detected in testing of this drug (Green, 1995).

In cannabinoids testing 11-nor-delta-9-tetrahydrocannabinol-9-carboxylic acid (9-carboxy-THC) and other metabolites of THC are detectable. Cocaine ingestion can be detected by presence of the metabolite benzoylecgonine in urine. Metabolite of morphine such as 3-morphine-glucuronide and 6-morphine are detectable in urine. In case of methadone, parent drug is detected because one third of the drug is passed out in urine without being metabolized (Moeller *et al.*, 2008).

In both acute psychiatric and medical settings, urine toxicology has been found helpful in determining prevalence and influence of drugs of abuse (Mordal *et al.,* (2008). With respect to illicit drug use, Walsh *et al.* (2005) found that among drivers admitted to a level – 1 trauma centre, 65.7% tested positive for either commonly abused drugs or alcohol. Toxicology is generally more reliable than self-report in substance users. Vitale et al (2006) recorded 30% illicit drug use from urine toxicology as opposed to 9% self-report. Cocaine and cannabis were most prevalent, with greater prevalence of cocaine in the USA than in other countries where cannabis was most common. Illicit use was more common in men 20 – 40 years and strongly associated with violence-related injuries. Urine toxicology, together with self-report, continued group attendance, and improved social functioning has been found useful in monitoring response in patients (Nigam *et al.,* 1992), comparing favourably with case manager ratings among outpatients with dual diagnosis (Ries *et al.*, 2005).

In our environment, few studies have highlighted the role of urine toxicology screening in the management of patients presenting with a putative history of substance use. It is also important to investigate the proportion of patients referred for toxicology screening who actually turn out to be positive for substances of abuse. The pattern of substance use is also important as this has implications for clinical intervention.

Aims

The aim of the study was to investigate the pattern of substance use as reflected by urine toxicology. Specific objectives included finding the proportion of patients referred for toxicology for putative substance use who actually test positive, and determining the proportion of the common substances screened for.

METHOD

Study design/sample collection.

This is a cross-sectional study in which fresh urine samples were collected from 1555 psychiatric patients sent to the laboratory on doctors' request for urine toxicology screening at the Psychiatric Hospital Yaba, Lagos, Nigeria between October 2006 and September 2009. The referrals were usually occasioned either by self-reported or proxy-reported substance use. A number of cases were also referred when the pattern of presentation of the patient suggested that substance use was a possible differential diagnosis. Ethical approval was obtained from the hospital ethical committee prior to commencement of the study.

Laboratory procedure

The test device is a one- step multi-6 Drug Test panel (Accubiotech), which is an immunoassay for the qualitative detection of methadone, methamphetamine, morphine, benzodiazepine, cocaine and tetrahydrocannabinoid.

These substances are detected in urine that passes the concentration cut-off. The protocol was followed according to the manufacturer manual. The test device was removed from the protective pouch and brought to room temperature. The urine sample produced by the patients was then poured inside the test container. The strip which contained the specific drug to be tested was then immersed into the urine for 10 seconds and the device was then placed on flat surface for about three to eight minutes, after which the results were interpreted. A drug strip with band in the control and test area is negative meaning no drug intoxication while drug strip with one band in the control area only was positive meaning presence of drug intoxication. Test results were only valid within ten minutes of processing. Results after ten minutes were not readable.

RESULTS

Out of the 1555 patients tested, 1480 (95.2%) were male and 75 (4.8%) were female patients. From the total number of patients tested, 927(59.6%) were positive with one or more substances. Altogether 1199 urine samples were positive for substance use and were detected from these patients (Table 3), while 628 patients were negative with no substance intoxication. Patients tested were between ages 15 to 65years, with mean age 28.7years [SD 8.4]. Tables 1 and 2 represent the age and sex distribution of the patients tested, while table 4 shows the pattern of substances screened for with respect to age.

Table 1: Relationship between sex and drug screen

Sex	Number of patients	Positive	Negative
Male	1480	878	602
Female	75	49	26
Total	1555	927	628

Positive= drug intoxication, Negative= No drug intoxication

Table 2: Age and sex distribution of patients

Age group (years)	Number of patients	Male	Female
<20	115	113	2
21-35	841	822	19
36-50	161	148	13
51-65	22	20	2
Unknown Age	416	377	39
Total	1555	1480	75

Table 3: Pattern of substance in urine samples

Drug/Substance	Number of substance positive in urine	Percentage of substance positive in urine
Methamphetamine	12	1.0%
Benzodiazepine	588	49.0%
Cocaine	44	3.7%
Morphine	45	3.75%
Methadone	3	0.25%
Tetrahydrocannabinol	507	42.3%
Total number	1199	100%

Table 4: Distribution of drug use in urine samples among males and females

Drug	Number of patients	Male	Female
Methamphethamine	12	10 (0.8%)	0 2(0.2%)
Benzodiazepine	588	554 (46.2%)	34 (2.8%)
Cocaine	44	39 (3.3%)	05 (0.4%)
Morphine	45	41 (3.4%)	04 (0.3%)
Methadone	3	3 (0.3%)	---
Tetrahydrocannabinoids	507	492 (41.0%)	15 (1.3%)
Total	1199	1139 (95%)	60 (5.0%)

Of the total sample, a sub-sample was selected randomly for comparison with clinical diagnosis from the patient health records file. This included a total of 129 predominantly male (96.8%) patients. Their diagnoses, following the International Classification of Diseases (ICD-10), were mainly mental and behavioural disorder following psychoactive substance use (83.3%), while 14.3% had a diagnosis of schizophrenia. The remaining 2.4% comprised of mood, personality and anxiety disorders.

Level of association between clinical diagnosis and urine toxicology findings was determined using Pearson chi squares. A clinical diagnosis of Mental and Behavioural Disorder was significantly associated with a positive urine toxicology (p = 0.014). History of cannabinoid use was also associated with positive tetrahydrocannabinol urine toxicology finding (p = 0.032).

DISCUSSION

The study reveals the pattern of psychoactive substance use among patients referred for possible use in a psychiatric hospital in Lagos, Nigeria. Majority of subjects referred for urine toxicology were males. In this setting, use of various psychoactive substances tends to be associated more with the male gender. This may be a reflection of prevailing societal values, considering that substances like alcoholic beverages are generally considered acceptable for men while drinking alcohol among women tends to be frowned at especially in religious settings. The number of women who drink alcohol is however increasing, a reflection of the adoption of liberal values among the younger generation. It is noteworthy that a proportion of the women screened were positive for various substances including cannabis, cocaine and opiates.

The study showed that patients between ages of 21 - 35years were more often found testing positive to one or more of the substance tested. This is understandable considering that this age bracket is made up mostly of single students and young workers who have financial access, and are strongly influenced by peers. The party culture which encourages substance use in groups finds many adherents among this age bracket. This is also the backbone of the country's workforce, with major implications for productivity.

Cannabis was found to be the most commonly use out of the substances screened for, followed by benzodiazepines, cocaine and opiates. Studies in other parts of the world such as the United States also showed cannabis to be the most abused substance (Nordstrom and Levin, 2007). The relatively small proportion of cocaine and opioid use suggests a change in trend from twenty years ago, when these substances were quite common (Ladapo, 1987). This may be a reflection of the deterioration in the country's economic status, the high prevalence of cannabis in this study possibly being because of ease of accessibility of the substance as it is widely grown in most parts of the country.

Most patients presenting with agitation or aggressiveness often in the context of acute psychosis are sedated with benzodiazepines, which may account for the large proportion who tested positive for these substances.

The study showed a good association between a diagnosis of substance use disorder and positive urine toxicology findings. Specifically, a diagnosis of cannabis related illness correlated well with positive finding of tetrahydrocannabinol in the urine. It should however be noted that urine toxicology was done for patients who were putative substance users: it was not a routine investigation for all patients. The duration since last use was not entered into analysis. No attempt was also made to compare patient's self-report with urine toxicology finding.

Conclusion

This study underscores the importance of urine toxicology screening in diagnosis of substances of abuse. The study found cannabis to be the most commonly used psychoactive substance in a clinic population.

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REVIEW OF INTERVENTIONS TO REDUCE ALCOHOL USE-RELATED SEXUAL RISK BEHAVIOUR IN AFRICA

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ABSTRACT

The harmful use of alcohol has long been recognised as a major contributor to mortality and morbidity in many parts of the globe, and in various parts of Sub-Saharan Africa in particular. During the past decade, numerous studies have pointed to alcohol's potential role in sexual risk behaviours and HIV infection. Consequently, there is an urgent need for the identification, development and implementation of efficacious and effective HIV prevention interventions to reduce levels of sexual risk behaviour that are associated with alcohol use. A systematic literature review was conducted to locate and synthesize peer-reviewed, published and unpublished studies addressing the effectiveness of HIV prevention interventions that have been conducted among alcohol-users in Africa. Eight published studies were found, comprising school, community, STI clinic, and bar-based interventions. The studies provided some evidence for the effectiveness of the interventions within those settings, but were limited by methodological issues, including the intervention designs (lack of control groups), short follow-up periods, and the use of self-report measures of sexual risk behaviour outcomes. The results have implications for policies and programmes, and for further research on interventions to reduce sexual risk behaviour among alcohol users in South Africa.

KEY WORDS: alcohol, harmful use, sexual risk behaviours, South Africa

INTRODUCTION

The harmful use of alcohol has long been recognised as a major contributor to mortality and morbidity in many parts of the globe, and in various parts of Sub-Saharan Africa in particular (WHO, 2004). Levels of alcohol consumption among those who consume alcohol are extremely high (Roerecke, Obot, Patra, & Rehm, 2008; WHO, 2004), and in some regions of Sub-Saharan Africa, those who drink are particularly involved in heavy/binge drinking patterns of consumption (Clausen et al., 2009), which make them prone to acute problems such as intentional injuries, unintentional injuries and a range of other social and health problems (Babor et al., 2003; Rehm et al., 2010).

Alcohol consumption is increasingly being recognized to be associated with HIV infection in various parts of Africa (Fritz, Morojele & Kalichman, 2010), and particularly, in those

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regions of the continent, such as Southern and Eastern Africa, that have the greatest burden of HIV (UNAIDS & WHO, 2009). A recent meta-analysis of studies globally found that alcohol consumption was associated with incident HIV (Baliunas et al., 2009), and its findings were similar to those of a meta-analysis (Fisher et al., 2007) and a descriptive review (Pithey & Parry, 2009) of studies in Africa which showed strong associations between alcohol consumption and HIV infection. Sexual risk behaviour is understood to be the main mediator between alcohol consumption and HIV infection (Kalichman et al., 2007a). Indeed, Kalichman et al.'s systematic review of studies conducted in Africa provides substantial evidence of alcohol's association with sexual risk behaviour. Qualitative and quantitative research has uncovered some of the moderators of the relationship between drinking and sexual risk behaviour. They suggest that alcohol's link with sexual risk behaviour may be a function of (a) the quantities consumed, with heavy users being more likely to be at risk (Fisher et al., 2007; Morojele et al., 2006); (b) the drinking contexts, with people's risk of engaging in sexual risk behaviour being related to the contexts, such as drinking venues (Fritz, et al., 2002; Kalichman et al., 2008; Lewis et al., 2005; Morojele et al., 2006); (c) the consumers of alcohol, with commercial sex workers and people who sell and serve alcohol being at particular risk (Fisher et al., 2008; Morojele et al., 2006); and (d) intra-personal factors, with norms, alcohol expectancies/outcome beliefs, and sensation seeking, playing an apparent role in sexual risk behaviour (e.g. Kalichman et al., 2007a; Kalichman et al., 2008a; Morojele et al., 2004).

Given these associations, interventions are urgently needed to reduce sexual risk behaviour among alcohol users (Fritz, Morojele & Kalichman, 2010). A variety of both structural and behavioural interventions are needed to address the particular needs of different target populations (Fritz, 2009; Fritz, Morojele & Kalichman, 2010). Knowledge about what works and what does not work can have implications for policies and programmes for reducing sexual risk behaviour among alcohol users on the continent. The primary objective of this review was to locate and synthesize peer-reviewed, published and unpublished studies that have evaluated the effectiveness of HIV prevention interventions among alcohol-users in Africa.

METHOD

In conducting the systematic literature review we largely followed the five key steps utilised by Bimrose et al. (2005), namely: searching, screening, data-extraction, synthesis and reporting. The first stage of the process involved searching for potentially relevant studies in nine public research databases and through Google and Google Scholar. We identified appropriate electronic databases and websites to be searched, a list of which is shown in Table 1.

We developed a search strategy to ensure that all the searches of each database were consistent and comparable. We decided on keywords and phrases based on the topic being examined i.e HIV prevention interventions that have been conducted among alcohol-users in Africa. These included: HIV prevention OR HIV/AIDS prevention AND drinking OR alcohol use OR alcohol abuse AND Africa. The documents (peer-reviewed, published and unpublished studies) yielded from the keyword searches were screened online, to determine whether they met our inclusion criteria, and hence, their suitability for inclusion in the systematic literature review. Our inclusion criteria were: (1) Year: Conducted from 1990 onwards; (2) Types of reports: Published and unpublished articles, conference papers, abstracts, theses, books; (3) Population: Alcohol using populations; (4) Countries: Studies conducted anywhere in Africa; (5) Primary focus of intervention: HIV/AIDS or sexual risk reduction; (6) Type of intervention: Structural or behavioural intervention; (7) Design: Randomised-controlled trials; controlled trials without randomisation; pre- and post-intervention data collection with no control; and (8) Language: English.

Table 1: List of electronic databases searched

Database	Region covered
Ebsco Information Services: Ebscohost Web	International and Africa
Elsevier Science: ScienceDirect	International
SABINET: Sabinet Online complete list of databases	South Africa
ProQuest: ProQuest databases (institution had access to only to 3 business databases thus irrelevant)	International
IngentaConnect	International
JSTOR	International
Oxford journals	International
PubMed	International
Springerlink	International
Google scholar	International and South Africa
Google	International and South Africa

We also browsed through the reference lists of the articles that we found initially, to identify further relevant articles. We developed and agreed on a summary table designed to provide a framework for extracting, assessing and analysing the data contained within the relevant publications/reports. The data were synthesised according to four types of interventions that emerged, in relation to the reduction of alcohol use-related sexual risk behaviour in Africa.

RESULTS

From the 65 "hits", a total of 8 publications/reports met the inclusion criteria. These publications were categorized based on their target populations and settings of implementation. Three studies evaluated school-based interventions (Cupp et al., 2008; Karnell et al., 2006; Smith et al., 2008;); another three involved community-based interventions (Deveau, 2008; Wechsberg et al., 2006; 2008); one involved an STI clinic-based intervention (Kalichman et al., 2007b); and one was an intervention involving individuals who were recruited from shebeens (informal alcohol-serving establishments), referred to for present

purposes as a bar-based intervention (Kalichman et al., 2008b).

School-based interventions

All three evaluations of school-based interventions were conducted in South Africa. None of the interventions were limited to alcohol users, but the studies were included because they all aimed to intervene with respect to participants' alcohol consumption, as well as their sexual risk behaviours. Smith et al. (2008) tested an adapted version of the HealthWise programme which sought to reduce students' sexual risk and substance use, and increase their leisure experiences. This programme consisted of 12 lessons/sessions in Grade 8, and 6 booster lessons/sessions in Grade 9. Participants comprised Grade 8 students in nine township-based high schools in Cape Town. A controlled trial without randomisation was conducted; five schools were assigned to receive the intervention, and four schools served as comparisons. The paper reports on five waves of data collection, at approximately 6-monthly intervals, which were ongoing for over 24 months; and about 62% of the original sample (1350/2176) were followed up at Wave 5.

Karnell et al. (2006) tested an adapted alcohol and HIV prevention intervention among 9th

Grade students in Pietermaritzburg. The aim of the intervention was to impact on knowledge and skills regarding alcohol consumption and HIV-related issues. The curriculum was delivered in 10 lessons (of 30 minutes each) over 8 weeks. A pre-post quasi-experimental design was employed with three schools randomly assigned to the intervention and two schools to the comparison condition. Students in the intervention schools received the curriculum, and those in the comparison schools continued to receive the standard life orientation classes. A total of 81% of the original participants (536/661) who received the intervention were followed up 5 months after baseline, approximately 1.5 months after the end of the intervention.

Cupp et al. (2008) tested the same alcohol and HIV prevention intervention also in schools in Pietermaritzburg. The intervention was delivered to 9th Grade students in 15 lessons over 8 weeks. The format was didactic and interactive. A cluster randomised controlled trial was conducted; four schools were randomly assigned to receive the intervention while four schools served as comparisons. The comparison schools received standard life orientation classes and additional information on alcohol and HIV. There were 3 waves of data collection: baseline (Time 1), 4-6 months (Time 2), and 15-18 months (Time 3). The response rates were 69% (754/1095) and 45% (492/1095), for the Time 2 and Time 3 follow-up periods, respectively.

The results of the school-based intervention studies can be seen in Table 2. The three studies examined four different sexual

Table 2: School-based intervention studies - Key findings

Sexual behaviours	Smith et al. (2008)	Karnell et al. (2006)	Cupp et al. (2008)	
	Wave 5	Wave 2	Wave 2	Wave 3
	Experimental vs comparison	Experimental vs comparison	Experimental vs comparison	Experimental vs comparison
Initiated sex (%)				
Overall	22 vs 21	---	16.4 vs 28.3*[b]	28.3 vs 45.0*
Males	26 vs 29*	---	--	--
Females	19 vs 14	---		--
Sex in past month, among sexually active (%)	NS[a]	---	---	---
Consistent condom use, among sexually active (%)	NS[a]	---	---	---
Condom use at last sex (%)	---	---	36.9 vs 45.4	24.9 vs 33.4
Condom use at last sex (% change scores)				
Overall	---	4.2 vs 2.2	---	---
Males	---	3.5 vs -0.5	---	---
Females	---	2.5 vs 2.5	---	---
Had had sex at pre-test	---	-2.1 vs -5.5	---	---
Had not had sex at pre-test	---	5.7 vs 6.4	---	---
Alcohol use by self or partner at last sex (% change scores)				
Overall	---	-0.9 vs 4.5	---	---
Male	---	-2.7 vs 11.1	---	---
Female	---	2.6 vs -1.3	---	---
Had had sex at pre-test	---	-0.6 vs 0.7	---	---
Had not had sex at pre-test	---	-0.1 vs 14.9*	---	---

--- Not assessed/reported; NS - Not significant; [a]Actual figures not shown in report

behaviour outcomes: initiation of sex among those who were not sexually active at baseline (Cupp et al., 2008; Smith et al., 2008), condom use at last sex (Cupp et al., 2008; Karnell et al., 2006; Smith et al., 2008), sex in the past month amongst those who were sexually active (only for the HealthWise study; Smith et al., 2008), and self or partner drinking at last sex (Karnell et al., 2006). The two papers reporting on this outcome found significant reductions in the onset of sexual activity among virgins at baseline; for males only in the HealthWise study (Smith et al., 2008), but for both males and females in the Pietermaritzburg study (Cupp et al., 2008). However, no intervention effects were evident with respect to participants' levels of sex in the past month (only the Health-Wise study examined this outcome), or their condom use at last sex (for all studies). Karnell et al. (2006) found no significant intervention effects on self or partner drinking at last sex for the total sample, males or females, or among those who had been sexually active at baseline. However, significant intervention effects were in evidence for the sub-sample who were virgins at baseline (p<.05).

The very few effects on sexual behaviour that were evident in the HealthWise study were attributed to the experimental group's higher rates of sex than the control group's at baseline, the problematic measurement of condom use, and the non-random assignment of schools to the intervention and control conditions. Karnell et al. (2006) reported that their study was limited by possible 'intervention decay' since the follow-up period was short; baseline differences with the experimental group having had higher levels of HIV-related knowledge and condom use self-efficacy than the control group; the reliance on self-reports; the lack of privacy among many participants to complete the questionnaire; and possible limitations in the validity of the instrument. Cupp et al. (2008) reported that the failure to impact on sexual behaviour in the past month and condom use at last sex could be due to attrition, with those remaining in the study having had safer attitudes and behaviours at baseline than those who did not remain in the study.

Community-based interventions

We found three studies of interventions in community settings (Deveau, 2008; Wechsberg et al., 2006; Wechsberg et al., 2008). Deveau (2008) reported on the Academy for Educational Development (AED) Capable Partners Programme in Kenya. This overall programme provided support to eight non-governmental organisations (NGOs) to reduce HIV transmission among substance abusers via outreach; community education; HIV testing and case management; addiction treatment; and HIV treatment centre-based services. Deveau (2008) presented data from one NGO that delivered outreach services to substance users in urban areas in Kenya, including Malindi, Lamu and Kilifi. The participants comprised substance abusers, some of whom were alcohol users. A pre- and post-intervention design was used, with an apparent 15-month follow-up period (February 2007 to May 2008). Follow-up data were reported for 1,104 out of an original sample of 2,623 individuals (42%).

Wechsberg et al. (2006) compared a standard HIV intervention, with a woman-focused intervention which aimed to increase knowledge and skills regarding sexual and drug risk, and violence prevention. The Standard Intervention consisted of two, one-hour, educational and skills building sessions. The Woman-Focused intervention consisted of two individual sessions, lasting for over one hour each, and had a special emphasis on gender issues, sexual risk behaviour, violence prevention, and issues particularly of relevance to sex work. The participants compromised sex working and cocaine-using women in Pretoria, South Africa.

Wechsberg et al.'s (2008) sample consisted of women in Cape Town who had used alcohol or illicit drugs during at least 13 of the past 90 days, with results reported for 'black African' and 'coloured' women separately. The Woman-focused intervention that was implemented was an adaptation of the Pretoria intervention. The study compared group and individual formats of the intervention.

Both studies utilised a pre- and post-intervention design, and a one-month follow-up

period, and they both had excellent follow-up rates of 86% (Wechsberg et al., 2006) and 98% (Wechsberg et al., 2008).

The three community-based studies examined the effects of the interventions on four main sexual risk behaviour outcomes, namely: (1) number of sexual partners; (2) number of sexual episodes; (3) condom use; and (4) alcohol and other drug (AOD) use before sex. The results of the studies are summarised in Table 3.

Number of sexual partners:

Deveau (2008) reported reductions among participants in the mean number of sexual partners in the past 30 days, and past six months. Wechsberg et al. (2006) did not report on the Pretoria-based participants' number of sexual partners. Wechsberg et al. (2008) found non-significant changes in the mean number of sexual partners, and the mean number of male sexual partners the black African and coloured participants had had in the past 30 days.

Number of sexual episodes:

Only one of the studies (Wechsberg et al., 2008) reported on the effects of the intervention on participants' number of sexual episodes. The black African women had a non-significant reduction in the mean number of episodes of sex in the past month, while for the coloured women there was a significant reduction (p < .01) in the mean on this measure.

Condom use:

Varied measures of condom use were employed in the three studies. Deveau's (2008) study reported large increases in condom use in the past week, and modest increases in condom use at least 50% of the time during sex in the past week. Wechsberg et al. (2006) reported a significant increase in the proportion of women reporting condom use at last sex, but no significant change in the other condom use measures (consistent condom use in the past month with clients and with the partner).

Table 3: Community-based intervention studies - Key findings: Baseline to follow-up scores

Risky behaviours	Deveau (2008)	Wechsberg et al. (2006)	Wechsberg et al. (2008)	
			Black	Coloured
Number of sex partners in past 30 days (mean)	1.7-1.2[a]	---	0.98-1.02	1.53-1.60
Number of sex partners in past 6 months (mean)	3.9-2.4[a]	---	---	---
Number of sex episodes in past month (mean)	---	---	9.72-8.48	5.75-2.08*
Number of unprotected sex episodes in past month (mean)	---	---	5.50-3.80	3.79-0.73*
Frequency of condom use during vaginal/anal sex in past week (%)	19-55[a]	---	---	---
Condom use at least 50% of the time during vaginal/anal sex in past week (%)	11-23[a]	---	---	---
Consistent condom use with clients in past month (%)	---	94-97	---	---
Consistent condom use with boyfriends in past month (%)	---	23-33	---	---
Condom use at last sex (%)	---	28-55[b]*	50-66[c]*	15-27[c]
Times AOD use before sex (sex work) past month (mean)	---	---	7.70-6.50	1.47-0.12*
AODs used during sex in the last week (%)	---	65-54	---	---
Any female condom use with clients in past month (%)	---	12-68*	---	---
Any female condom use with boyfriends in past month (%)	---	3-48*	---	---

--- Not reported/asked; [a]Statistical comparisons not reported; [b]condom use with boyfriends; [c]partner(s) not specified*Statistically significant.

In Wechsberg et al.'s (2008) Cape Town study, a significant increase in condom use at last sex with their partner was observed for the black African women, but there were no significant changes in the number of episodes of unprotected sex they had had in the past month. The converse results were observed for the coloured women in that they evidenced a significant decrease in the number of unprotected episodes of sex in the past month, but there was no change in the proportions reporting having used a condom at last sex. The strongest intervention effects related to the women's use of female condoms with both clients and partners (as shown in Table 3).

Sex after consuming alcohol and/or other drugs:

One group (coloured sub-sample; Wechsberg et al., 2008) experienced a reduction in the mean number of times in the past 30 days that they had used alcohol and/or other drugs before/during sex, while there was no change on this variable for either the black African women in the same study, or the women in the Pretoria study (Wechsberg et al., 2006).

A limitation of two of the community-based studies was their lack of control groups (Deveau, 2008; Wechsberg et al., 2008). Wechsberg et al. (2006; 2008) had a very short (one month) follow-up period. Wechsberg et al. (2008) indicated that their Cape Town study may have been limited by a small sample size,

the use of self-reports, and "the risk of Hawthorne effects and competing history with media efforts" (page 137).

STI clinic intervention

We found one study of an HIV intervention in an STI clinic in Cape Town, South Africa (Kalichman et al., 2007b). Kalichman et al. tested an HIV risk reduction counselling intervention, with a specific component on alcohol use in sexual contexts. The sample comprised 122 men and 21 women (Total=143). Eligibility criteria for enrolment included, current drinking, and being seen for an STI diagnosis or treatment service at the STI clinic. A randomised controlled trial design was used. Participants were assigned either to a 60-minute behavioural skills building HIV and alcohol risk reduction counselling session, or a 20-minute HIV information/education control intervention. Participants were followed up at 3 months and 6 months post-intervention.

The three-month follow-up rates were 72% and 69% for participants in the intervention and comparison conditions, respectively; at six months they were 74% and 69%, respectively. The sexual risk behaviour outcomes included (a) number of sexual partners, (b) unprotected sex/condom use; and (c) alcohol use in sexual contexts. The results of the study are shown in Table 4. Between baseline and the three-month post-intervention point, there was no change in the participants' mean number of

Table 4: STI Clinic-based intervention (Kalichman et al., 2007b) - Key findings

Risky behaviours	Baseline-3 Month Follow-Up	Baseline-6 Month Follow-Up
Number of sexual partners in past month (mean)	2.5-1.9	2.5-1.6
Condom use/Unprotected sex		
Unprotected vaginal sex occasions in past month (Mean)	3.6-0.8*	3.6-1.3*
Unprotected anal sex occasions in past month(Mean)	0.2-0.2	0.2-0.1
Percent intercourse occasions protected by condoms in past month (%)	64.8-90.5*	64.8-87.8*
Condom use at last sex (%)	37-49*	37-46
Occasions of alcohol use in sexual contexts in past month (Mean)	3.7-1.5*	3.7-2.1

*Significantly greater change in experimental group than control group.

sexual partners. With respect to condom use, there were significant reductions in unprotected vaginal sex, percentage of condom use, and condom use at last sex; however, there was no change in the participants' level of reported unprotected anal sex. Finally, there was a significant reduction in alcohol use in sexual contexts. For the six-month follow-up period fewer of the differences between the experimental and control groups' outcomes were statistically significant. The only statistically significant differences that remained at six months related to the unprotected vaginal sex and percent intercourse protected by condoms outcomes. Among possible limitations of the study were the reliance on self-reports of sexual behaviours, the longer contact time for those in the intervention than control intervention (60 minutes versus 20 minutes), and the lack of blinding of participants to condition.

Bar-based intervention

A single-session, 3-hour HIV-alcohol risk-reduction skills intervention was tested in Kalichman's et al. (2008b) study. This intervention was delivered in group formats in community sites to patrons recruited from shebeens (informal alcohol-serving establishments) in a township in Cape Town. The participants consisted of adult males (n =117) and females (n=236), and they were eligible if they were 18 years or older, recruited from a shebeen, and had consumed alcohol during the previous month. A randomised controlled design was employed in which a one-hour HIV-alcohol education only control condition was compared with the three-hour HIV-alcohol risk reduction intervention condition. Participants were followed up at 3 months and 6 months after the intervention. Follow-up rates for the comparison and intervention groups at three months were 85% and 81%, respectively, and at six months they were 89% and 90%, respectively.

The results of the study can be seen in Table 5. The sexual risk behaviour outcomes that were reported on included (a) condom use/ unprotected sex; (b) number of sexual partners; and (c) alcohol use prior to sex. At three months, there were no significant intervention effects on the number of sexual partners. There were significant changes in the desired direction in the condom use/unprotected sex-related outcomes. Finally, there was a significant change in the number of episodes of alcohol use in sexual contexts. At the six month follow-up period, all of the results had dissipated, except for those pertaining to the alcohol use before sex outcome.

Additional analyses revealed that the intervention had a stronger effect on the light drinkers than the heavier drinkers in terms of most variables: at three months, the lighter drinkers in the experimental condition were most likely to exhibit the best outcomes on five of the seven outcomes (namely, unprotected vaginal and anal sex; % intercourse condom protected; alcohol use before sex; consistent condom use; and completely protected). However, at the six month follow-up these results were maintained for the consistent condom use and completely protected outcomes only.

DISCUSSION

To the best of our knowledge, this is the first systematic review of studies of HIV prevention interventions that have been implemented amongst alcohol users in Africa. Our search only uncovered eight articles of interventions that have been evaluated, most of which were adaptations of evidence-based interventions from the USA. These interventions were focused on target populations in a variety of settings, including schools (x3), communities (x3), an STI clinic (x1), and a drinking establishment (x1).

A number of the studies' main strengths were their use of randomized controlled designs (Cupp et al., 2008; Kalichman et al, 2007b; 2008b), and very high follow-up rates of about 70% or above (Kalichman et al., 2007b; 2008b; Karnell et al., 2006; Wechsberg et al., 2006; Wechsberg et al., 2008). However, some of the studies had a number of limitations. First, the pre-post test intervention designs employed by some of the studies limited the reliability of their results (Deveau, 2008;

Table 5: Intervention among bar patrons (Kalichman et al., 2008b) – Key findings

Risky behaviours	Baseline-3 month follow-up	Baseline-6 month follow-up
Unprotected vaginal sex	Significant	NS
% intercourse condom protected	Significant	NS
Alcohol use before sex	Significant	Significant
Consistent condom use	Significant	NS
Completely protected	Significant	NS
2+ sexual partner	NS	NS

Significant: Significantly greater change in experimental group than control group; NS: Not significant

Wechsberg et al., 2008). Second, the duration of the follow-up period was extremely short in some cases (i.e. between one, and one and a half months for Karnell et al., 2006; Wechsberg et al., 2006; Wechsberg et al., 2008), thus limiting the generalisability of the results to the longer term. As seen in Kalichman et al.'s (2007b; 2008b) studies, for example, it is possible that short-term intervention gains disappear over time. Third, all the studies' reliance on self-reports of outcomes is of concern.

Putting aside the studies' limitations, the results of this review suggest that HIV prevention interventions delivered in different settings can be effective for changing certain sexual risk behaviours amongst alcohol-using populations in various contexts in Africa. Although the use of non-comparable measures of sexual risk behaviour made it impossible to pool the results of the studies, the findings suggest different trends dependent on the age group of the target population. Among adolescents, the interventions were more likely to affect (delay) initiation of sex among those who were not sexually active at baseline, than to affect condom use behaviours among those who were already sexually active. This concurs with the results of a review of intervention impact on condom use in Sub-Saharan Africa and Asia, indicating less consistent intervention success in increasing levels of condom use among young people than among adults (Foss et al., 2007). The interventions targeting adults were more likely to decrease levels of unprotected sex than to have an impact on fre-

quency of sexual episodes or number of sexual partners; none of the studies measuring number of sexual partners showed significant intervention effects on this behaviour (Kalichman et al., 2007b; Kalichman et al., 2008b; Wechsberg et al., 2006; 2008). Foss et al.'s (2007) review showed consistent evidence of improved post-intervention condom use behaviours in many studies, particularly among sex workers, but less consistent intervention effects on condom use within casual relationships and within primary partnerships. Interestingly, a national HIV prevalence and incidence survey conducted in South Africa has shown that levels of condom use among the general population increased significantly between 2002 and 2008, but that minimal change occurred over the same period in individuals' number of sexual partners (Shisana et al., 2009).

In some cases, the interventions were differentially effective among males and females (e.g. Smith et al., 2008). Smith et al. (2008) found that males, but not females, were less likely to initiate sex following the school-based HealthWise intervention. Unfortunately, the other studies did not provide results for each gender separately. In line with the work of Wechsberg et al. (2006; 2008), there is a need for more gender-sensitive intervention approaches to take account of differential effects on males and females (Fritz, Morojele & Kalichman, 2010).

In terms of the target population's drinking behaviour, one study (Kalichman et al., 2008b) found the intervention to be more ef-

fective among lighter than heavier drinkers. In keeping with other recommendations (Fritz, 2009) and frameworks for addressing alcohol problems (e.g. Babor et al., 2001), these findings suggest that more intensive intervention and/or treatment may be required for individuals with possible dependence on alcohol, whereas briefer interventions may suffice for lighter drinkers.

The interventions for adults were implemented mainly by outreach workers, lay counsellors, and other para-professionals. In the case of one intervention (Wechsberg et al., 2008), the group format was as effective as the individual format. These results have particular appeal regarding intervention delivery in resource-constrained settings (common in Africa) where professional staff are limited and their work demands reduce their ability to deliver more time-consuming individual services (Wechsberg et al., 2008).

Of further significance was the fact that many of the interventions involved a single session (or only two sessions) delivered over a few hours (Kalichman et al., 2007b; Kalichman et al., 2008b; Wechsberg et al. 2006; 2008). The studies with very short follow-ups (e.g. Wechsberg et al. 2006; 2008) showed evidence of change in some areas, while in the studies with repeat follow-ups (e.g. Kalichman et al., 2007b; 2008b), the short-term effects disappeared over time. Brief interventions may need to be revised and supplemented by booster sessions to maintain their short-term gains.

We found very few completed studies conducted among alcohol-using populations in Africa that met our inclusion criteria. While it may be the case that very few such studies have been completed, and that non-significant findings are less likely to be published (Csaga et al., 1996), it is also conceivable that our findings were limited by the search terms and strategies used, and the reliance on articles written in English. Moreover, we only relied on published and easily accessible sources, but 'grey literature' may exist reporting on results of evaluations of related interventions.

Given alcohol's role in HIV infection (Fisher et al., 2007), and in sexual risk be-

haviour (Kalichman et al., 2007), there is an urgent need for the development, pilot testing and evaluation of HIV prevention interventions for alcohol users. As proposed by a number of commentators, we would recommend that more interventions should be implemented and tested among staff working at drinking venues (Fisher et al., 2008), and patrons of such establishments (Lewis et al., 2005; Kalichman et al., 2007). We would also recommend that more high quality evaluations of interventions should be conducted using RCT designs, biological outcomes, and long-term follow-ups. Of value would be an evaluation of an intervention in multiple sites across the continent, using equivalent designs, methods and procedures, to assess the effectiveness of the intervention across different settings with populations at risk of alcohol use-related HIV risk behaviour. Identification and incorporation of indigenous intervention approaches within the existing interventions would be an additionally worthwhile pursuit (Karnell et al., 2006).

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DETERMINANTS OF ALCOHOL, KHAT, AND BHANG USE IN RURAL KENYA

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ABSTRACT

The study investigated local determinants of substance use in rural Kenya. Over the years, there has been a growing concern over increased use of substances across ages, gender, religious persuasions, and social class in Kenya. It is still unclear what psychosocial individual and/or community factors might be that offer some explanation for the high levels of alcohol and drug use. The study investigated community members' social status in areas of gender, education, employment, self–esteem, and availability of substances. The sample was comprised of Kenyan rural participants, and included 153 men and 64 women with a mean age of 34.2 years. The participants completed a survey measuring possible psychosocial determinants of alcohol, khat and bhang (i.e., marijuana) use patterns. The sample evidenced high levels of substance use particularly involving the locally available substances (i.e., bottled beer, local brews, chewing khat, smoking bhang). Males in comparison to females were more likely to drink alcohol, chew khat, and smoke bhang. Women compared to men reported higher education and employment status, which were associated with less substance use. Females had higher self-esteem when they did not use bottled beer whereas males had higher self-esteem when they use bottled beer. The implications of these findings are discussed.

KEY WORDS: psychosocial determinants, substance use, rural, age, gender, social class

INTRODUCTION

Research suggests that patterns of substance abuse are found in both developed and developing countries. For example, Saunders, Aasland, Amundsen, and Grant (1993) evaluated substance use in Australia, Bulgaria, Kenya, Mexico, Norway, and USA. Among the participants, 48% were classified as "drinking patients" and 16% were termed alcoholics. Among the drinking patients, 62% were men and 38% women. The alcoholic category was male dominated as 72% were men and 28% were women. These findings suggest that alcohol dependence occurs across culturally diverse areas (Hall, Saunders, Babor, Aasland, Amundsen, Hodgson, & Grant, 1993).

A number of studies indicate that alcoholic substances are the most used intoxicant in Kenya. A majority of these studies that report substance and substance related prevalence

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are from hospital and school settings. For example, Ndetei (1984) found that among first time admissions of patients aged 18-65 in Kenyatta national hospital, only two of 83 participants had been diagnosed and treated for alcoholism. However, 50% of the sample was classified as alcoholics, and among this group, 80% felt guilty about their drinking, 73% of patients' families objected to their drinking patterns, and 69% were unable to stop drinking even when they wanted.

Studies by NACADA (2002) in school settings and Adelekan (2006) in rural village settings concur that the most commonly used substances among the rural and urban communities in Kenya are traditional alcohol brews. Local brewing occurs extensively in poor families, and the availability of these brews is enhanced by the easy availability of ingredients needed, such as, maize, sorghum, and sugar. Although most traditional brews are illegal by the laws of Kenya, some locally brewed beer is sold by individuals after obtaining the licenses to do so. In addition to local brews, alcohol use includes western style types of alcoholic beverages produced and marketed through breweries and distillers such as branded spirits, gins, and wines.

Besides western style alcohol and locally brewed alcohol, there are a number of other common substances used in Kenya. They include khat and bang, two substances grown by local farmers in Kenyan families. Khat is a perennial shrub, indigenous to east and southern African and Arabia whose fresh leaves and soft twigs are chewed to release a juice that has pharmacological effects induced by cathinone and *cathine*, the active chemicals that alters the mood of the user. Khat is clinically known to induce a state of mild euphoria and excitement (Kalix, 1994), but long-term use causes serious problems to the user's body. There is considerable debate in Kenya surrounding the ever-expanded use and trade of khat. Carrier (2008) argues that as khat is legal in Kenya, it is a commodity of great value to the country's economy, particularly among the growing population and through its international trade. Carrier (2008) further indicates

that khat is also associated with gender differences where men are more likely to chew it compared to women.

Another substance frequently used by the rural population in Kenya is the plant cannabis sativa, which is the source of marijuana or bhang. Bhang is prepared from the leaves and flowers (buds) of the female cannabis plant that is consumed either as a smoked powder or as a beverage. A study by NACADA (2007) noted that bhang is locally grown on around the Mount Kenya region, and is easily available to the local population. A NACADA (2007) study indicated that use of these substance Kenya were high among children both in rural and urban settings.

Ndetei (2009) studied 1,328 students from 17 high schools in 49 registered public schools in Nairobi and found that 33.9% of the sample had used substances in varying forms. The abuse of a wide range of psychoactive substances in the African continent today is a public health concern, and the government has regarded the pattern of substance use as a "growing epidemic". Many poorer neighborhoods have liquor-brewing households, and they sell local brews as a means of supplementing their income. Additionally, individual, community, and psychosocial factors may also contribute to engaging in risky sexual practices, drug use, and alcoholism. Substance abuse might contribute to a breakdown of the community, which could affect both the sense of community and collective self-esteem. It certainly is also possible that the cultural, political, economic, social, and religious transitions in Kenya from a traditional system to a modern life style might have contribute to lower self-esteem and vulnerability to drug and alcohol use.

NACAD (2010) recently explored the risk factors that can account for the alcohol use across Kenyan districts. The study found that alcohol use was due to idleness in 76.4 % of individuals, peer pressure in 64.8% of participants, unemployment in 61.2% of their sample, and work related stress for 56.3% of respondents. In addition, NACADA (2010) found that marital problems and poverty each

explained 49% of the alcohol related reasons for alcohol use. Finally, parental problems were identified as a reason 28.2 % of adults use alcohol, and 14.3% use alcohol because of media influence. While this study is important in helping understanding problems Kenya is facing due to substance abuse, it does not address the social psychological factors that may lead individuals to be more predisposed to substance abuse. The current study intends to bridge that gap by examining relationships between psychosocial and structural factors and increased substance use.

In addition to the paucity of studies on the psychological processes at the individual and community level, few investigatrions have looked at rural community substances abuse trends and the relationship of gender; employment and education variables. Moreover, relationships such as substance use and self-esteem in males and females have not received attention in studies in rural African samples. The aim of this cross-sectional study was to explore the psychosocial and structure factors behind patterns of alcohol, khat, and bhang use in a predominantly Kenya rural population. We hypothesized that males would have higher use of alcohol, khat and bhang than females. We also hypothesized that participants with higher education and employment status would have lower use of substances. Lastly, we explored whether use of substances by males and females would have any differential effects on self-esteem.

METHOD

Participants

We conducted this study in a rural residential setting, among the Meru of Eastern Provence of Kenya. The Meru tribe is comprised of seven sub-tribes; Igembe, Tigania, Imenti, Chuka, Mwimbi, Tharaka, and Muthambi. The entire tribe speaks Kimeru as their native language, with each tribe having a different dialect. However, all the tribes understand and speak Kiswahili. In addition, the majority of the Meru people can understand English although

they do not necessarily speak English. The sample ($n = 217$) included 153 men (71%) and 64 women (29%). Participants' ages ranged from 18 to 73 years old, with a mean age of 34.2 years (SD = 12.9).

Procedures

Data collection occurred from December 2009 until January 2010. Participants were approached through snowball or chain sampling in which the researcher approached village cluster settings across this rural area including schools, shopping centers, car washes, religious center environments, and families. From these settings, individuals who were using and not using substances were approached. These individuals were asked to bring in other participants to be interviewed. All the participants who were approached to do the survey indicated they were willing to take part in the study. Participants were given copies of the informed consent in both English and Kiswahili. Upon completing consent forms, individuals were provided a paper and pencil survey that was in English or Kiswahili as per participant's preference. The first author guided all the participants through the survey clarifying each question and was available to translate or explain unfamiliar terms and phrases to the participants. Finally, the first author was available to read items aloud if any of the participants were unable to read. The survey took approximately fifty minutes to complete. All participants approached completed the survey.

Measures

All measures were translated into Kiswahili. In addition, the English version was back translated into Kenya-familiar English by an independent Kenyan bilingual researcher. Corrections where made to align the back-translated version to the original instrument.

Demographic Questionnaire. The demographics questionnaire assessed age, gender, relationship status (married, divorced, widowed, single), number of children, highest level of education attained, employment status, and tribal affiliation. Participants' employment rates were assessed by an employment status

question that had seven possible responses (i.e., permanent, temporary, student, disabled, not employed, self-employed, do not want to disclose). Employment status was placed into one of two categories: one involving being employed (i.e., self-employed, or temporarly employed) and a second category of not employed (i.e., not employed or student). Questions assessed use of local brewed alcohol, western style bottled alcohol, khat and bhang.

Collective self-esteem scales (CSES). The cultural orientation of rural Kenya is considered collectivistic (Vaunne me et al 1997), so we used a collective self-esteem scale in this study and evaluated its association with drug and alcohol use. The CSES is a 16-item self-report measure that assesses one's thoughts and feelings regarding the self and social group (Luhtanen & Crocker, 1992). With a 7-seven point scale (anchored by 1 = strongly disagree and 7 = strongly agree), participants responded to several statements about their collective self-esteem. The CSES has four subscales. The membership subscale items assess how "good or worthy" one feels about being in a particular social group. For example, "I am a worthy member of the social groups I belong to". The CSES private subscale assesses how well one views one's own social group, for example: "I feel good about the social group I belong to." The CSES public scale assesses how one believes others outside the social group judges one's own group. For example: "In general, others respect the social groups I am a member of". Finally, the CSES Identity subscale assesses how important one's social group is to one's self concept. For example: "The social groups I belong to are an important reflection of who I am". Luhtanen and Crocker (1992) report CSES' internal consistencies of .71 to .88 for all four subscales over a series of three studies consisting of college students. Kim and Omizo (2005) reported alpha levels of .72 to .86 with a sample of Asian American college students. Downie, Mageau, Koestner, and Liodeden (2006) reported alpha levels of .78 to .92 with a sample of multiple ethnic Canadians.

The original scale was designed to capture a global assessment regarding one's social group. Moreover, research by Fischer and Holz (2007) demonstrated rewording items for a specific group does not compromise its psychometric properties. In this study, items were worded to indicate that the rural Meru Kenyan community is the social group of interest. The entire scale was used, with higher scores indicating more collective self-esteem.

RESULTS

Table 1 provides data from our sample compared to a national Kenyan sample (NACADA, 2010), so that we can examine how representative our sample was to the national norms of substance use in Kenya. It is clear from the findings that rates of substance use, particularly for bottled beer and khat, were higher in our sample than the more representative NACADA sample. NACADA'S (2010) sample examined age and gender for general alcohol use (See Figure 1). Males indicated much higher alcohol use compared to females across all ages

Gender Effects

We predicted there would be a difference between males and females in levels of substance use behavior with males reporting higher use. Table 2 provides data concerning the association between gender and substance use behavior related to alcohol (bottled beer, local brews) and drugs (khat and bhang). Males used significantly more substances

Table 1: Analysis examining substance use (alcohol, khat, and bhang) in our sample and National NACADA sample

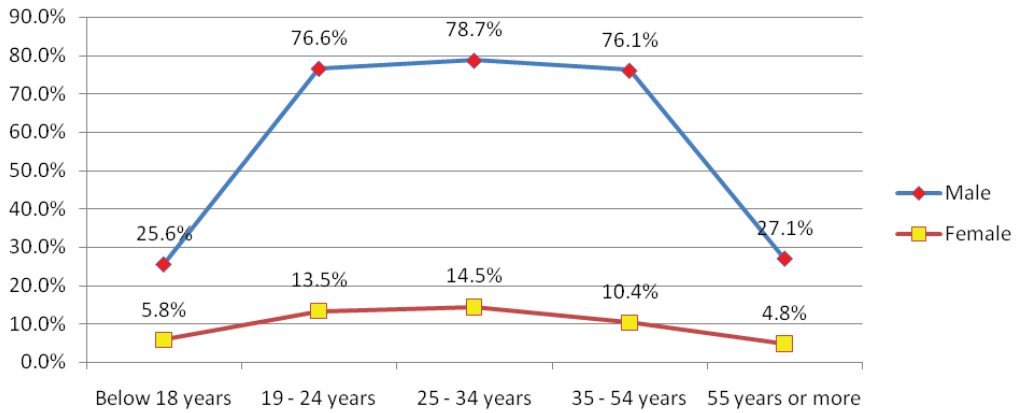| Substances	Kenya National sample (N = 3,356)		Our sample (N = 217)
	Rural %	Urban %	Rural %
bottled beer	21.6	31.6	64.8
local brew	39.9	29.6	41.6
Khat	9.9	9.9	41.6
bhang	5.7	8.9	13.7

Figure 1: Alcohol use across age and gender (NACADA 2010)

Table 2: Analysis examining participant's gender and substance use of bottled beer, local brew, khat, and bhang

Substances	Gender				χ^2	df	Sig	K's tau-b
	Men		Women					
	%	(Users/Total)	%	(Users/Total)				
bottle beer	83.3	(120/144)	37.3	(22/59)	42.21	1	.000	.46
local brew	62.5	(85/136)	10.5	(6/57)	43.54	1	.000	.48
khat	62.6	(87/139)	7.0	(4/57)	50.20	1	.000	.51
bhang	21.4	(28/131)	3.6	(2/56)	9.23	1	.002	.22

than females for the substance use variables. Chi-square analysis indicated a significant relationship between gender and drinking bottled beer [χ^2 (1, N = 203) = 42.21, p < .01]. Males (83.3%) were significantly more likely to use bottled beer than females (37.3%). A Kendall's tau-b value of .46 indicated that there was a strong positive relationship between gender and the consumption of bottled beer. There was also a significant relationship between consuming local brew and gender [χ^2 (1, N = 193) = 43.54, p < .01]. Males were significantly more likely to use local brew (62.5%) than females (10.5%). Kendall's tau-b value of .48 indicated a strong positive relationship between gender and the consumption of local brew. There was also a significant relationship between gender and khat chewing such that males were more likely to use khat (62.6%) than females (7.0%) [χ^2 (1, N = 196) = 50.20, p < .01], and Kendall's tau b value of .51 indicated it was a strong positive relationship. Finally, gender was significantly related to smoking bhang [χ^2 (1, N =187) = 9.23, p <.01], Males were more likely to use bhang (21.4%) compared to females (3.6%) but a Kendall's tau-b value of .22 indicated that this relationship was weak.

Gender and Education level

To analyze the relationship between education level and gender, education levels were recoded into lower education level (no school, primary, or high school) versus higher education level (i.e. technical, college, and university level) (See Table 3). Women were more

Table 3: Education and gender analysis summary

| Gender | Education | | | | χ^2 | df | Sig | K's Value |
| | Low Education | | High Education | | | | | |
	%	(Lower/Total)	%	(Lower/total)				
Men	67.1	(100/149)	32.9	(49/149)	4.40	1	.03	-.15
Women	51.6	(32/62)	48.4	(30/62)				

likely obtain a higher education level than men, with 48.4% of females having a higher education as compared to 32.9% of males. Although the relationship was statistically significant [χ^2 (1, N=211) = 4.50, p = .03], Kendall's tau-b value of -.15 indicates it was a weak negative relationship.

Gender and Employment

The analysis revealed that employment status was significantly associated with gender such that women were more likely to be employed (84.8%) compared to men (56.0%) [χ^2 (1, N = 200) = 14.98, p < .01] (See Table 4). Further examination of Kendall's tau-b value -.27 indicated a negative weak association between employment status and gender.

Association Between Substance Use and Education

In Table 5, summary information indicates that there was no statistical significant relationship between education levels and use of bottled beer [χ^2 (1, N= 197) =.01, p = .95. There was a statistically significant relationship between education level and local brew beer use [χ^2 (1, N= 187) = 4.31, p < . 05] such that those with lower education levels were more likely to use local brew (53.4%) than those with high education levels (37.7%). However, Kendall's tau-b value of -.15 signified a weak negative relationship. There was a borderline statistically significant relationship between education level and khat use [χ^2 (1, N = 190) = 3.44, p = .06)]. Those who reported lower levels of education were more likely

Table 4: Employment and gender analysis summary

| Gender | Employment | | | | χ^2 Value | df | Sig | K's t-b |
	%	(Employed/total)	%	(Unemployed/total)				
Men	56.0	(79/141)	44.0	(62/141)	14.98	1	.00	-.27
Women	84.8	(50/59)	15.25	(9/59)				

Table 5: Relationship between Education Level and Substance Use summary table

| Variable | Lower Education Level | | Higher Education Level | | χ^2 | df | Sig | Ks tau-b |
	%	(Lower/Total)	%	(Higher/Total)				
bottled beer	70.7	(87/123)	70.3	(52/74)	.01	1	.95	-.01
local brew	53.4	(63/118)	37.7	(26/69)	4.31	1	.038	-.15
Khat	52.5	(63/120)	38.6	(27/70)	3.44	1	.064	-.14
Bhang	22.1	(25/113)	5.9	(4/68)	8.32	1	.004	-.21

to use khat (52.5%) than those who reported higher levels of education (38.6%). A Kendall's tau-b test of -.14 indicated a weak association between education levels and khat use. There was a statistical significant relationship between level of education and bhang use [χ^2 (1,N= 181) = 8.32, p < .01)], such that those who reported low levels of education are more likely to use bhang (22.1%) compared to those who have higher levels of education (5.9%). The direction and magnitude of the relationship as indicated by Kendall's tau-b test of -.21 showed it to be a weak negative relationship.

Association between Substance Use and Employment

Table 6 presents summary data information on the relationship of bottled beer use with employment status. Those not employed were more likely to be using bottled beer (79.1%) compared to those employed (65.0%) [χ^2 (1, N = 187) = 4.08, p < .05]. Although the relationship between employment and beer use was significant, the direction of the relationship as suggested by a Kendall's tau-b value -.15 was of a weak negative relationship. There was a significant relationship between employment and use of local brew, χ^2 (1, N= 178) = 6.88, P < .01. Those unemployed were more likely to use local brew (58.7%) compared to those employed (38.3%). A -.20 Kendall's tau- b value indicates a weak negative relationship between employment status and use of local brew. There was a statistically significant association between employment status and chewing khat [χ^2 (1, N= 181) = 19.13, p < .01]. Those who are unemployed

were more likely to be using khat (66.7%) than those employed (33.0%). The direction of the relationship as indicated in a Kendall's tau-b test value of -.33 was moderately negative. There was a statistically significant association between employment status and bhang smoking [χ^2 (1, N= 172) = 11.44, p < .01]. Those unemployed were more likely to smoke bhang (27.4%) compared to (8.1%) of those employed. A Kendall's tau- b test value -.26 indicated that employment status and bhang smoking had a weak negative relationship.

Self-Esteem

We evaluated whether collective self-esteem would be negatively associated with substance use behavior, alcohol (local brew and bottled beer) and drug abuse (bhang and khat). For each ANOVA, we entered dichotomized substance use and gender as between-subjects factors and collective self–esteem as the dependent variable. There was not a significant main effect of either gender [(F (1, 189) = .20, p = .66, partial η^2 < .01)] or use of bottled beer on collective self-esteem [(F (1, 189) = .68, p = .41, partial η^2 < .01)]. However, there was a significant interaction between the gender and use of bottled beer on collective self-esteem [(F (1, 189) = 6.59, p = .01, partial η^2 = .03] (see Figure 2). Females had a higher self-esteem when they did not use bottled beer and males had a higher self-esteem when they used bottled beer. For the other substances, no significant effects were found.

To test for any unique and / or combined effect of gender, education, employment status and the level of collective self-esteem on

Table 6: Relationship between Substance Use and Employment Status

Substance	Employment				χ^2	df	Sig	KI's
	%	(Unemployed/total)	%	(Employed /total)				
bottled beer	79.1	(53/67)	65.0	(78/120)	4.08	1	.04	-.15
local brew	58.7	(37/63)	38.3	(44/115)	6.88	1	.00	-.20
khat	66.7	(44/66)	33.0	(38/115)	19.13	1	.00	-.33
bhang	27.4	(17/62)	8.1	(9/110)	11.44	1	.00	-.26

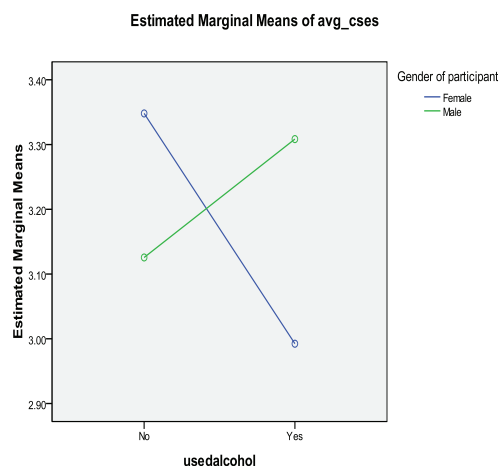**Estimated Marginal Means of avg_cses**

Figure 2. Gender and bottled beer use on collective self esteem

substance abuse, we performed a standard logistic regression in which substance use; alcohol use, local brew and miraa were entered as the dependent variables with gender, education, employment and collective self-esteem as predictor variables, respectively.

Table 7 provides odds ratios, beta weight, confidence intervals and Wald for the gender variable logistic regression. 219 cases were analyzed, the full model significantly predicted gender X ^{2} = 44.63, df = 1 *p <.005*. The model accounted for between 22.5% and 31.9 % of the variance for the gender, 66.0 % of ether gender being non-alcohol use predicted; however, 85.2% of gender predictions on alcohol use are accurate. Overall 79.4 % of predic-

tions were accurate. This shows that gender is a reliable predictor of bottled beer use.

Table 8 provides odds ratios, beta weight, confidence intervals and Wald for the local brew use logistic regression, 219 cases were analyzed and the full model significantly predicted bottled beer use X ^{2} = 43.20, df = 1, *p* <.005. The model accounted for between 22.9% and 30.6% of the variance in local brew status, with 51.1% of non-local brew users successfully predicted. However, majority 93.4% of predictions for the local brew use group were accurate. Overall 70.5% of predictions were accurate. This indicates that gender is a reliable predictor of local brew use. In addition, a marginally significant model predicting local brew use X ^{2} = 3.0, df, = 2, *p* = .084. The model accounted for between 24.3% and 32. 5 % of variance in local brew use, with 51.1% of the non-local brew users successfully predicted. Additionally, 93.4% of the predictions for the local brew users group were accurate. Overall 70.5% of predictions were accurate. This indicates that level of education is a reliable predictor of local brew use.

Table 9 provides odds ratios, beta weight, confidence intervals and Wald for the local khat/ miraa logistic regression. A total of 219 cases were analyzed and the full model was significantly predicting use of khat/ miraa, X ^{2} =54.90, df = 1, *p <.005*. The model accounted for 27.6% and 36.9 % of the variance in khat use, with 52.2% of non-khat users successfully predicted. In addition, 96.2 % of the predictions for the khat use group were accurate.

Table 7: Logistic regression Analysis of 219 rural Kenyan adults Bottle beer alcohol use

Predictor	β	OR / e^β	CI	SE	Wald's X²	df
STEP 1						
Gender	2.42~	11.24	5.27, 23.96	.386	39.19	1
STEP 2						
Gender	2.44	11.42	5.10, 25.54	.411	35.10	1
Education	-.212	.81	.364, 1.799	.407	.270	1
Employment	.074	1.08	.46, 2.540	.438	.029	1
Collective Self-esteem	.030	1.030	.543,1.954	.327	.008	1

Note: N=219, ~ < .10 * < .05.

Table 8. Logistic regression Analysis of 219 rural Kenyan adults Local brew alcohol use

Predictor	β	OR / e^β	CI	*SE*	Wald's X^2	df
STEP 1						
Gender	2.70~	14.85	5.48, 40.22	.508	28.15	1
STEP 2						
Gender	2.65	14.10	5.18, 38.40	.511	26.80	1
Education	.64	1.90	.903,4.01	.380	2.86	1
Employment	.83	1.086	.516,2.30	.380	.048	1
Collective Self-esteem	.49	1.63	.838, 3.175	.340	2.08	1

Note: N=219, ~ < .10 * < .05.

Table 9. Logistic regression Analysis of 219 rural Kenyan adults Khat use

Predictor	β	OR / e^β	CI	*SE*	Wald's X^2	df
STEP 1						
Gender	3.306~	27.27	2.02, 92.78	.625	28.01	1
STEP 2						
Gender	3.263~	26.13	7.66, 89.11	.626	27.19	1
Education	.351*	1.42	.656, 3.071	.394	.793	1
Employment	.854	2.350	1.104, 5.004	.386	4.908	1
Collective Self-esteem	.339	1.404	.719, 1.740	.341	.987	1

Note: N = 219, ~ < .10 * < .05.

Overall 72.4% of predictions were accurate. This indicates that gender is a reliable predictor of khat use.

Likewise, a full model logistic regression for khat / miraa use and employment was conducted with 219 cases analyzed. The full model significantly predict use of khat, X ^{2} = 5.54, df = 1, p <.005. The model accounted for 30.4% and 40.6% of the variance in khat use, with 65.2% of non-khat users successfully predicted. Moreover, 83.3% of the predictions for khat use group were accurate. Overall 73.5 % of predictions were accurate. This shows that employment is a reliable predictor of khat use.

DISCUSSION

Our study found high levels of substance use particularly involving bottled beer, local brews, khat, and bhang. We used Snowball or chain-sampling method of data collection, which in some sense can be argued to have had an influence on participants' responses. However, with this limitation in our method of collecting data, we did find that males compared to females were more likely to drink alcohol, chew khat, and smoke bhang. In addition, women in comparison to men had more education and higher levels of employment. Higher education and employment were generally associated with less substance use. We also found that females had a higher self-esteem when they did not use bottled beer and males had a high self-esteem when they use bottled beer. These are complex findings, and suggest some important gender effects of employment, education, and ultimately alcohol use and self-esteem.

Our study found gender differences in alcohol consumption, with males reporting more substance use than females. Combining alcohol abuse and dependence, the gender

difference widened with males being three times more likely to be diagnosed with alcohol abuse or dependence than women, (Grant, Harford, Dawson, Chou, et al., 1994). A number of societal factors explain this difference between genders in substance abuse. One such major factor is the social response to women with alcoholism and drug problems. Although there is a general stigmatization that comes with alcoholism and drug problem disorders, women using alcohol and other drugs are more stigmatized than males (Blume, 1986).

Additionally, an interaction of gender alcohol and occupation is an important direction in gender differences in alcoholism and drug problems. With modernization, equal rights and equal pay for days work have accorded women places in the workplace that were previously male dominated. In addition, the changing roles of men and women are contributing to differential patterns of substance (Wilsnack, Vogeltanz, Wilsnack, & Harris, 2000). These changes has also afforded women opportunities to drink away from home, thus increasing the likelihood of drinking among females. We found higher education and employment of women, which point to growing use of alcohol by women although not as prevalent compared to males.

Certainly, there is a biological cause of some of these sex difference. There is a natural difference of the body metabolism and amount of water in men's body as compared to that of women, which contribute to differences in the amount and frequency of alcohol intake for men and women. Numerous studies have shown a gender difference in alcohol effects because of physiological factors. Frezza, di Padova, and Pazzato (1990) point out that woman have a lesser gastric alcohol dehydrogenase than males. The biological function of this enzyme is metabolism of a substantial amount of alcohol before entry into the body's circulation. This contributes to higher blood-alcohol concentrations and a possible link to psychological and medical consequences in women. Women become intoxicated quickly after smaller quantities of alcohol as compared to males who get intoxicated after larger amounts of alcohol intake. Similarly,

Marshall, Kingstone, and Boss (1983) demonstrated that there is a relationship between the biological fact that females have less total body water than males of similar size, which means females bodies achieve higher blood-alcohol concentrations than males after ingesting equivalent amount of alcohol.

Moreover, females had higher self-esteem when they did not use bottled beer alcohol and males had high self-esteem when they used bottled beer alcohol. First, it is important to understand that drinking bottled beer is different from drinking local brew in Kenya. Alcohol consumption behavior was formerly a reserve of the colonial master's experience. After independence for Kenya, alcohol use involving bottled beer, wines, and spirits was considered as modern and superior. Different attitudes towards internally and externally produced alcohol is evident in legal frameworks in which two distinct systems of licensing of Western bottled alcohol and traditional brews still exists. Kenya sought largely to ban traditional liquor favoring bottled beer and branded spirits. The expressions of this western lifestyle appear in behaviors such as drinking imported wines, spirits, and beers. Beer drinking became a way of celebrating achievements in politics and businesses that fit in with a Western or modern lifestyle of clothing, cars, and other imported goods (Haugerud, 1995).

The male versus female differences on self-esteem for bottled beer may be partially explained by social cultural socialization that drinking Western bottled beers is a male way of celebrating power and success. Additionally, the changing social gender roles, men are losing the status and prestige that defined them as having privileges such as power, prestige, and ownership of property. In today's rural Kenya society, there is an equalizing of gender status, so that women are gaining access to property ownership, power, and status. This resource gain possibly provides them with more self-esteem. On the other hand, males psychologically experience equity as a reduction of their traditional bases of self-esteem. The use of bottled beer possibly becomes a means for males to acquire a false sense of self-esteem.

Africa is in social, cultural, political, and economic transition. The circumstances of such transitions rarely prepare populations for the cultural shocks inherent in the change. There is little preparation for either males or females to acquire the self-understanding for the new equalized gender roles. These transitional experiences comprise stressors for males who have lost status and have had to adopt equal or even subordinate status with women. It is possible that male self-esteem has been reduced, whereas, for women who had previously been subjected to male domination, have now gained status and power. Increasing use of substances by men might be a result of these changes.

Another way of understanding these gender differences involves exploring contrasts between individualistic and collectivistic styles (Bontempo, Lobel, & Traindis, 2001). Allocetrics enjoy doing what the in-group expects of them, and their self-esteem is more based on 'getting along' as in traditional collectivistic culture. In contrast, in a more individualistic culture, success involves trying to get a head. Serbin (1993) explains that men have self-esteem that is anchored to their social role as defined by the collectivistic society. Because self-esteem is built upon what is validated by the in-group, getting along as an attribute it is often lost in the transition from collective traditional culture to individualistic culture. For those with a collectivistic self-esteem, such as an African male self-esteem, which was embedded with more meaning in the hierarchical gender differentiated culture structure, the stressors of the new individualistic culture might be contributing to increasing substance use.

There were several limitations in the present study. First, the original version of the questionnaires was developed in English. Different language versions might be literally equivalent but not exactly meaningfully equivalent. Even upon translation into local language Swahili and back translation to common English, the sample from a population with majority who had no or very little reading and writing skills may have compromised the accuracy of participants' responses. In addition, many of the participants in this study were diverse, as they were recruited through convenient samples in different rural community in Kenya. In other words, using snow ball recruiting at five rural village settings (i.e., family, shopping center, primary school, church, and a car wash) does not represent a randomized sample. Therefore, the sampling method might have identified more substance users (as individuals were requested to identify others that they knew as to be users) than if a completely random sample had been utilized. The sample therefore might not have been representative of the rural Kenya substance abuse experiences. Future studies in rural Kenya should try to recruit larger, random samples that are more representative of the population.

ACKNOWLEDGEMENTS

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STREET LIFE INVOLVEMENT AND SUBSTANCE USE AMONG "YANDABA" IN KANO, NIGERIA

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ABSTRACT

Representative members (N=173) of yandaba (young, male, urban gangs in Kano, Nigeria) aged 13-29 years (mean age= 19.3years, SD = 3.81), recruited through street outreach, were invited to complete self-report anonymous questionnaires about their patterns of drug and alcohol use. Of these, nine participants were randomly reselected to participate in oral interviews about their motivation towards psychoactive drug/alcohol use. High rates of cannabis, tobacco (nicotine), rophynol, codeine, and alcohol misuse appear to exist among this group, in addition to other improvised local drugs. The choice of certain types of drugs or intoxicants among the group could be affected by their cost implication (i.e., affordability), availability and commonality. A thematic analysis of the qualitative interviews suggests "strategic intoxication" to get the job done, the need to maintain cohesion and/or increase solidarity, and relationships with politicians as the probable risk factors to explain substance misuse among this group.

KᴇY Woʀᴅꜱ: street life, substance misuse, alcohol and drug use, yandaba, youth gangs

INTRODUCTION

The extent of "yandaba" involvement in various antisocial activities and health compromising behaviours (notably, excessive psychoactive substance use) has been an enduring social problem that requires adequate attention and control. Although there is no standard definition of yandaba, those belonging to the group can be described as young male urban gang members in the Northern parts of Nigeria (mainly Kano) who take to street crime because educational and employment opportunities are unavailable to them (Matusitz & Repass, 2009). The members of this group come mainly from the lower socioeconomic class and from polygamous families that are characterized by many siblings (Dan-Asabe, 1991; Salaam, 2011; Ya'u, 2000). Due to their socioeconomic condition, in addition to religious and cultural orientation; some parents may decide to enroll their children in Islamic education, called *almajiri* (Abdulmalik, Omigbodun, Beida, & Adedokun, 2009; Salaam, 2011). *Almajiri* is a corrupt spelling of the Arabic word, *al-muhajirin*, which describes someone who leaves home in search of knowledge or for the sake of advocating Islamic knowledge.

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This tradition (i.e., *almajiri*) is common in northern Nigeria, where young boys--some as young as four or five-- are sent far from home to study the Quran, Hadith and other branches of Islamic knowledge in an informal setting (mostly in makeshift tents, under trees or on mosque verandas) without financial support from their wards or parents (Awofeso et al., 2003; Usman, 2008). The schoolteachers (Mallams), who may have between 50 and 100 children under their care, are expected to take care of these children, and might be compelled to send them onto the streets to beg because there are few resources at the teachers' disposal (Abdulmalik, Omigbodun, Beida, & Adedokun, 2009; Awofeso et al., 2003). It is plausible, therefore, that when such children grow up they are vulnerable to "graduating" to the yandaba and subsequently becoming involved in other antisocial activities.

Prominent among the activities of the group include hanging out together to harass innocent commuters, acting as unofficial security guards for wealthy individuals or politicians, engaging in turf wars with rival gangs or amongst themselves, pimping for prostitutes, pocket picking and or petty thievery, and fomenting and participating in ethno religious violence (Dan-Asabe, 1999; Kushee, 2008; Matusitz & Repass, 2009; Salaam, 2011; Ya'u, 2000). During their involvement in these activities, majority of the gang members also engage in excessive drug and alcohol use.

Although alcohol intake and any substance of abuse may be regarded as an abomination among the Hausa tribe (predominantly the Muslim faithful in northern Nigeria) due to the perceived Islamic injunctions against the use and sale of alcohol and all forms of intoxicants among its adherents, many members of yandaba are addicted to alcohol consumption. The efforts of *"Hisbah"* (Task Force on Islamic Law Implementation) in enforcing alcohol proscription in Kano and the control of illicit drugs by the National Drug Law Enforcements Agent (NDLEA) in Nigeria cannot persuade the members of the group to cease their alcohol and drug use habits.

While it is appreciated that cannabis and other illicit drugs was not originally observed in the Moslem North of Nigeria (Ebie & Pela, 1981), at present, contrary to the religious and cultural taboos, the use of alcohol and other illicit drugs is not limited to a particular group or section of Nigeria, partly due to urbanisation and acculturation. In fact, the United Nations International Drug Control Programme's (UNDCP, 2001) report on Nigeria, and findings from other studies (e.g., Abdulmalik, Omigbodun, Beida & Adedokun, 2009; Ekpo et al. 1995; Gureje, et al. 2007; Morakinyo & Odejide, 2003; Salaam & Brown, 2010) confirm that street children and youth gangs in the country do abuse illicit drugs and other locally improvised substances, which may be one of the major causes of delinquent behaviour and crime.

Although the phenomenon of substance misuse amongst street children and youth gang members is well established in academic literature, there is a complete lack of empirical information about the yandaba's alcohol and drug use experience. Much of what is known about yandaba substance misuse has been based on media reports that are neither scholarly nor scientific, coupled with the use of strong emotive language that may presents a distorted view of this group. It is in response to this, and to fill the isolated research gap, that the current study adopted mixed methods of data collection (i.e., self report anonymous questionnaire and in-person qualitative interviews) to explore the patterns of alcohol and other substances abuse among the yandaba, and by extension determine the probable risk factors for initiation into this behaviour among the gang members. It is hoped that the findings from the present study will establish the need to fashion public policies aimed at targeting those risk factors. To achieve this objective, the following research questions were raised and answered in the current study:

- What are the patterns of alcohol and other psychoactive substance abuse (i.e., conventional and non-conventional) among the gang members?

- Is there any significant difference between the patterns of drug use across various demographic characteristics (e.g., duration of gang membership and age group)?
- What are the probable risk factors for drug and alcohol use by the participants?

METHOD

Study area

The city (Kano) is one of the ancient cities in Nigeria located in the North Western part of the country. Although the city is chiefly inhabited by the Hausa tribe, it has a good number of Yoruba and Igbo communities who are considered immigrants or settlers. Out of the major Hausa States in Nigeria, Kano State has the largest population (National Bureau of Statistics, 2008) and the city of Kano is the capital of Kano State.

Ethics Considerations and Data Collection Procedures

Serious considerations were given to the ethical issues involved in the current study. These include the rights of the respondents to refuse to participate, the protection of confidentiality, and the participants' right to be fully informed about the nature of the study before giving their consent. Despite the assurance that the participants' responses would remain confidential and that their anonymity would be respected, only 173 (i.e., 81.6%) of the 212 potential participants approached for the interviews agreed to participate in the study. For those who gave their consent to partake, the local vernacular (i.e., Hausa) through backward translation was mainly used to conduct the interviews.

Research Instrument

The self-report questionnaire used for data collection was generated from a pilot study of a convenient sample of ten gang members who agreed to participate in a semi structured interview designed to assess their psychoactive substance use experience. A list of all of the participants' responses was drawn up and

these responses were reworded concisely to design a close-ended questionnaire on demographic profiles, different types of drug and alcohol used by the gang members. The respondents were asked to indicate which from a list of illegal drugs (e.g., cannabis, heroin, cocaine, amphetamines): (a) they had ever used in their life; (b) they had used during the past twelve months. Further to the list of illegal drugs, the participants were asked to indicate whether they had used any alcoholic beverages (e.g., dry gin, kokino), solvents (e.g., glue, petrol, rubber solution), legal drugs other than alcoholic beverages (tobacco, over the counter/patent medication), and non conventional intoxicants (madaran sukudie, gadagi, dan kamaru, kokino, etc.) during the past twelve months.

Structured Oral Interviews

Qualitative oral interviews was adopted as an additional data collection technique in order to allow the participants to describe their drug use experience in ways that are meaningful to them, rather than asking them to use the categories and dimensions established by the researcher. A semi structured interview protocol with select members of the yandaba included the following questions:

1. Can you narrate your first experience of taking drugs and/or alcohol?
2. What do you think are the gains derived from drug/alcohol use as a member of the yandaba?

Sampling

Given the violent nature of and difficulties associated with contacting the yandaba gang, the sampling technique employed for the current study was opportunistic. The system of opportunistic sampling (i.e., the non-probability technique) is justified in this type of research because the often chaotic nature of street life among youth gangs in Nigeria does not lend itself to systematic random sampling (e.g., see Aderinto, 2000; Morakinyo & Odejide, 2003; Olley, 2006; Salaam, 2011; Salaam & Brown, 2010). A total number of 173

members of the gang participated in the present study, with the age range from 13 to 29 (*M*= 19.32, *SD*=3.81) recruited from Doraye (35 or 20.3%), Tundun Wada (26 or 15.03%), Sabon geri market (31 or 17.91%), Kabuga (18 or 10.04%), Warure (16 or 09.25%), Wambai (14 or 08.9%), Panshekara (12 or 6.93%), Faggae (11 or 6.36%), and Dan Agundi (10 0r 5.78) areas of Kano metropolis. For the qualitative interview, 9 members of the gang (one from each of the above named locations) were randomly reselected to participate in the oral interviews on motivation towards psychoactive drug/alcohol use.

Analytical Strategies

The Statistical Package for Social Sciences (SPSS) was used for the quantitative analysis. This includes the use of univariate (i.e., descriptive statistics) to determine the patterns of drug and alcohol use among the participants. Patterns of polydrug use were described by means of cross tabulation. Crude associations between the patterns of multiple drug use and various demographic characteristics (e.g., duration of gang membership and age group) were tested using chi square tests at the alpha level of 0.05 by outcome status. For the qualitative analysis, the content of the participants' responses was transcribed using thematic content analysis.

RESULTS

Personal Demographic Characteristics

The participants recruited for the present study were all male with a mean age of 19.3 years. None of the participants had progressed beyond secondary education and the overwhelming majority (72.3%) had previously enrolled through the process of *almajiri* (*i.e., sending the children for Arabic education without providing the means to accomplish such a mission*). Regarding the duration of their gang membership, almost half of the sample (48.5%) had belonged to the gang for up to 3 years; 30.0% for 4-6 years; and 29.5% for more than 6 years. On

the participants' perceptions of the motivating factors for street life involvement, the majority of them blamed it on their family/guardian difficulties (43.7%); followed by the perceived benefits of street life (32.2%), parental death (7.0%) and a combination of other factors (17.1%).

Psychoactive substance use prevalence and patterns

The descriptive analysis suggests that a substantial majority of the participants had ever used and currently using cannabis, codeine and rohypnol. Only a few admitted to having taken cocaine, amphetamines and diazepam in the past, or being a current user of these drugs. The same pattern was observed for heroin use. However, an overwhelming majority of the participants admitted to the current use of alcohol, tobacco, quick patch solution, petrol, glue solvents, and methylated spirits. Other local substances that were stated to be in current use were *gadegi*, *madaran sukudie*, *dan kamaru*, kola nut and *kokino* (see Tables 1 & 2).

Table 2 summarises the self reported patterns of alcohol use, smoking and other improvised local intoxicants use by the sample.

Patterns of Multiple Drug Use

The majority of the participants were poly-drug users with almost half (44.5%) of them taking at least two drugs; 18.5% admitted taking three drugs; 16.2% admitted taking only one drug; and the remaining 20.8% admitted taking more than three drugs (see, Table 3 & Figure 1). Regarding the perceived associations between the patterns of multiple drug use and various demographic characteristics, the computed outcomes from the chi square analysis suggest that there was a statistically significant relationship between patterns of multiple drug use and their duration of membership (X^2=17.2, df=2, p=<.0001), but no statistically significant relationship was observed between the patterns of multiple drug use and the age group of the participants (X^2=2.84, df=2, p=>.0092 (see table 3).

Table 1: Self report illegal drug use, prevalence and patterns among Yandaba gang (N=173)

Drugs	FLU	Percentage	(95% CI)	FCU	Percentage	(95% CI)
Cannabis	151	87.2	(81.7, 92.8)	141	81.5	(77.3, 85.7)
Codeine*	138	79.8	(75.3, 84.3)	151	87.3	(85.2, 89.4)
Amphetamine	92	53.2	(51.9, 54.4)	31	17.9	(9.7, 26.1)
Heroin	61	35.3	(31.04, 39.5)	20	11.6	(4.41, 18.79)
Cocaine	57	32.9	(29.8, 36.2)	26	15.0	(7.29, 21.7)
Rohypnol*	112	64.7	(60.4, 63.7)	133	76.9	(73.7, 80.1)
Diazepam*	40	23.1	(19.5, 26.7)	26	15.0	(9.4, 20.6)

Note: FLU= Frequency of Life Users; FCU= Frequency of Current Users; CI =95% confidence intervals
* Drugs bought over the counter or from street hawkers of pharmaceutical products.

Table 2: Self report patterns of alcohol use, smoking and other substance (conventional and unconventional) use by the sample (N=173)

Drugs	Frequency	Percentage	(95% CI)
Alcohol	159	91.8	(90.7,93.03)
Tobacco	162	93.6	(92.53,94.67)
Rubber Solution	148	85.5	(82.8, 88.2)
Petrol	86	49.7	(43.5, 55.9)
Glue Solvent	126	72.8	(68.7, 76.9)
Menthylated Spirit	78	45.1	(39.9, 50.3)
Gadagi*	162	93.6	(92.43, 94.8)
Kolanut*	134	77.2	(74.9, 79.52)
Madaran Sukudie (Formalin)	133	76.9	(74.9, 78.8)
Dan Kamaru*	62	35.8	(32.07, 39.53)
Kokino*	28	16.2	(12.05, 20.35)

Note:
CI =95% confidence intervals
* These are locally improvised intoxicants/drugs
Gadagi is a stimulant tea of highland brand boiled in water with some plants such as African mahogany (Khaya senegalensis), lemon grass (Cymbopogon citrates), mint plant (Mentha palustris), and garlic (Allium sativum); Kola nut is a caffeine-containing nut chewed in many West African cultures; *Madran sukudie* is a chemical used in preserving biological specimens, and embalming corpses; *Dan kamaru* is a stimulant root of a bitter plant imported from Cameroun; *Kokino* is an indigenous distilled spirit.

Qualitative Results

The responses of the members of the gang who participated in the oral interview were tape-recorded on a digital voice recorder for easy transcription. The transcripts were later read through and three major themes were identified (i.e., zeal for identity formation, peer pressure, and relationships with politicians) to explain the probable risk factors related to alcohol and other substances of abuse by the participants.

Table 3: Chi square analysis of patterns of multiple drug use across demographic characteristics of the participants

Age Group	One Drug User	Two Drug User	Three Drug User	More than three Drug User	X^2	p
15-20	08	19	12	11	2.84	0.092[ns]
21-26	09	32	09	13		
27- above	11	26	11	12		
Duration of Gang membership						
0-3years	28	31	23	02	17.12	0.001*
4-6years	07	10	12	09		
More than 6years	13	21	10	07		

Ns=not significant < 0.05; * significant >0.05
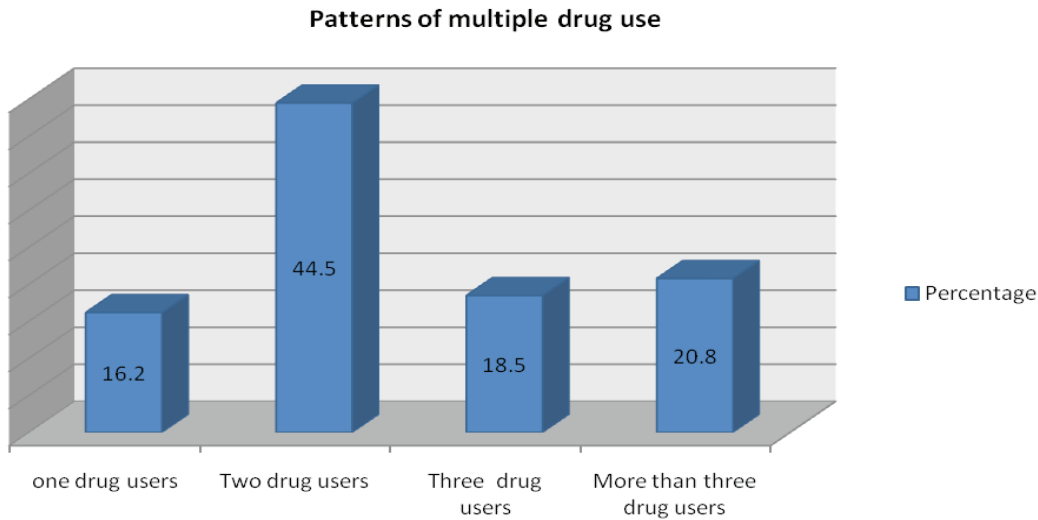
Figure 1: Multiple drug use among Yandaba gang members

DISCUSSION

The computed outcomes from the current study suggest that the members of yandaba do engage with a high prevalence in the cheap, widely available psychoactive substances; notably, cannabis, tobacco (nicotine), rophynol, codeine, alcohol, volatiles solvents and other unconventional intoxicants. This finding is partly in line with other studies, in which street children and youth gangs admitted to taking cheap, readily available drugs that can induce a sense of intoxication and euphoria in them (for a review, see Abdulmalik, Omigbodun, Beida & Adedokun, 2009; Aidan, 1997; Ayaya & Esamai, 2001; Forster, Tannhauser, & Barros 1996; Inciardi & Surrat, 1998; Kaime-Atterhog & Ahlberg, 2008; Morakinyo & Odejide, 2003; Olley, 2006; Salaam & Brown, 2010; Srivastava, 1995; UNODC, 2006; WHO, 1993). Nonetheless, the use of cheap and readily available drugs by participants in

Table 4: Qualitative Responses for Category Formation

Theme	Sample Quote
1. Strategic intoxication	*"Drugs and alcohol use facilitates our membership and help us to operate as a successful member of yandaba"*
	"While on drugs, we can do anything. Taking drugs and alcohol do make us tough and fearless!"
	"Taking drugs or alcohol is part of our lives. It calms you down and makes you strong."
	"If you don't take these things, people will not respect you......."
	"Taking drugs and alcohol embolden us to do anything"
	"It is only through "wannan harkar" (drugs and alcohol use) that certain things are done!"
	"It makes you bold and be ready to take on anyone........."
2. Sense of belonging	*"We do enjoy hanging out together and having fun. It's like a second family, the boys are always there for you. If you need any help, they will be there. If you need something to make you high (drug), they are always there for you."*
	"My initial benefit was sharing cigarettes and hard drinks with other boys at the petrol station. I also enjoyed their jokes. Somewhere along the line, I realised that my friends do it, why not me? ……"
	"I used to join other boys at junction where they take drugs. One day, I was told by the group that I would not be allowed to go if I didn't take drugs with them. I agreed so as to save my neck. "Da sun hallaka ni" (they could have killed me). I took it in excess."
3. Relationships with politicians	*"During political campaigns, politicians do use us. They do recruit boys at various junctions to foment trouble. Some of them (the politicians) don't always provide drugs but we know where and how to get them after paying for the service. We need to take drugs to get charged!"*
	"During elections, they do call on us; they do give us campaign vests, money and wee wee (cannabis). The moment you take the drug, your brain will turn off. They do put us on their campaign bus as part of the convoy. We do serve as guards or provide security for them. We go with weapons to protect them and to defend ourselves"
	"I was not enrolled in school due to financial difficulties and had nothing to do. There was a time when some politicians approached us with a job, I was left out because I didn't take drugs. My friends got the money. Before the next job, I got myself into the sytem!"
	"My initial involvement with "kwayoyi" (drugs) has to do with politicians. I was given the substance by a politician before a political rally. It influenced me to be reckless and to do certain things without second thought".

the current study is not to suggest that a few members of the yandaba may not struggle to finance access to other expensive drugs. In fact, the descriptive analysis of the patterns of illicit drug use by the participants suggests that few members of the yandaba had ever used or were currently using expensive illicit drugs, such as cocaine and heroin. What is unclear is how they manage to finance their expensive drug use, given that the majority of the yandaba are from an economically disadvantaged background.

The findings on the high levels of alcohol and other illicit drug use by the participants, despite their Muslim background (being previously enrolled through the process of *almajiri* education), should be highlighted. This finding is at variance with other studies on Northern Nigeria, where an extremely low rate of alcohol use among the participants was reported (e.g., see Abdulmalik, Omigbodun, Beida & Adedokun, 2009; Obot & Olaniyi, 1991). For instance, reports of street children in Maiduguri (Nigeria) by Abdulmalik, Omigbodun, Beida and Adedokun, (2009) revealed that this group contained extremely low alcohol users. The strong Islamic religious teaching on the prohibition of alcohol may have resulted in the low prevalence of alcohol use among Abdulmalik and colleague groups because the samples were still at Quranic School when they participated in the study. Another probable reason for the disparity between the results of this study and previous studies might be due to the fact that large numbers of yandaba who participated in the present study operated in culturally mixed (e.g., Doraye, Tudun Wada, and Sabon Gari) whose populations are with mainly southern non Muslims, and thus the activities of the Task Force on Islamic Law Implementation (*Hisbah*) are rarely felt among the non Muslim residents.

On the patterns of relationships between drug use and the participants' duration as a gang member, the chi square analysis suggests that there was a statistically significant relationship. This finding is unsurprising because extended group membership could expose them to a street reputation for illicit drug use. Substance abuse or illicit drug use among youth gangs often entails congregations and is often viewed as a common type of activity that is integrated into their subculture. It therefore follows that engagement in illicit drug and alcohol misuse could be escalated through group solidarity in "supporting a normalised environment".

Regarding the relationships that exist between the patterns of drug use and the age group of the participants, no statistically significant relationship was observed. The reason for the lack of a significant relationship between age group and patterns of multiple drug use is not immediately clear, but it may be anticipated that the age of the participants may not necessarily affect their patterns of psychoactive substance misuse, since gang members operate in groups (whether young or old), irrespective of age differences or age gaps.

Now, considering the probable risk factors for the initiation into alcohol and other psychoactive substance use among yandaba, three prominent risk factors emerged from the qualitative data. These are: strategic intoxication to demonstrate their toughness, sense of belonging, and relationships with politicians. The participants maintained that the use of drugs and alcohol gives them the necessary courage to engage in violent behaviour and to instil fear in people. According to them, engaging in violent or other criminal behaviour may not be easy without being influenced by alcohol or drug intake. In particular, one of the respondents mentioned that the use of drugs and alcohol facilitates their membership and gives them the courage to operate as successful members of the yandaba. The question that is raised by this response is what makes an average gang member a successful member of the yandaba. While there was no specific answer to this, becoming a yandaba member epitomises masculinity and excessive drug and alcohol use may enhance this.

The other frequent route to drug and alcohol use among the yandaba, as revealed in the current study, was to demonstrate a sense of belonging and/or to function as a family. Although the use of illicit drugs and alcohol is not necessarily a condition for street children or youth gang membership, the respondents in the current study admitted that they had tried drugs for the first time in order to demonstrate a sense of feeling bound to conform, and thus "fit in" with their peers. While various explanations may be given to buttress this, it is plausible to presume that their peers often spend time doing common activities together, and, through interactions with their peers, they tend to acquire values and beliefs that relate to what is accepted as normalised activity within the

gang, in which substance misuse is prominent. As reiterated earlier, drug and alcohol use appears to be a normalised activity within the gang in order to establish a street reputation and as a symbolic statement of belonging.

The participants also rationalised their initial drug and alcohol use by blaming it on their relationships with politicians. While their responses are treated with extreme caution, it is common knowledge that the majority of yandaba earnings come from politically motivated thuggery (Dan-Asabe, 1991; Dawah, 1996; International Crisis Africa Report, 2007; Kushee, 2008; Matusitz & Repass, 2009). Besides monetary compensation for engaging in political thuggery, the yandaba members are mostly introduced to drugs and alcohol by their benefactors. While under the influence of drugs/alcohol, they freely wield and scrape weapons along the road, frightening or intimidating innocent victims who might be perceived as the 'political enemy' of their benefactor. Although an ordinary member of the gang is perceived as being violent and aggressive, the use of drug could escalate their aggressive and violent tendencies.

While the identified risk factors may be treated independently, it should be highlighted that young people who engage in one form of health-compromising behaviour are often engaged in other problem behaviours (Mackenzie, Hunt, & Joe-Laidler, 2006). In fact, some of the probable risk factors for yandaba gang membership and subsequent drug use are interrelated and additive. For instance, relationships with politicians predate illicit drug and other substance abuse by the gang members. Whether they are being approached by politicians or not, an average member of the yandaba is engaged in excessive drug and alcohol use, either to show solidarity for identity formation or to demonstrate toughness. From the foregoing, it can be deduced that drug and alcohol use by prospective members of the yandaba is a shared group activity which constitutes an integral part of their everyday life, primarily to demonstrate their masculinity and toughness, and could be further enhanced by other risk factors, such as the perceived need to "fit in" with peers, and relationships with politicians necessitated by economic hardship.

As a last word, it is recognised that the study reported in the current paper is constrained by some major limitations that need to be addressed because of their implications for the interpretation of the data presented. These include the difficulty in estimating the exact universe of the street gang, the uncorroborated self report method of data collection and its attendant social biases, the adoption of descriptive and cross-sectional design and its effect on actual cause and effects connection, the simplicity of the instrument used for data collection, the relatively small number of participants recruited for the qualitative interviews and its effect on the generalising the findings. Based on the aforementioned weaknesses, it is clear that future research should seek to utilise a more sophisticated instrument for data collection, with large, randomly selected members of the yandaba, and that experimental designs or the use of more complex statistics such as structural equations would help to present a more detailed useful picture of yandaba substance misuse behaviour.

Policy Implications

Notwithstanding some of the major limitations highlighted above, several important implications are suggested by the results of the present study. Firstly, the use of yandaba gang members as political thugs and their consequent involvement in alcohol and drug intake, that was highlighted in the present study, has important implications with regard to the need for Nigerian politicians to collaborate and support those in government to address the problem of the excruciating poverty arising from unemployment, and the increasing decay of our educational system, which is the potential motivation for gang membership and consequent involvement in antisocial activities in Nigeria. It is also important that the National Agency for Food and Drug Administration and Control (NAFDAC) should forge a meaningful partnership with the National Drug Law Enforcement Agency (NDLEA) in Nigeria to manage and control the problem of substance

misuse among vulnerable and other addicts in the country. The continuing availability of prescription drugs on the street (through street hawking) and hypnosedatives, such as diazepam, nitrazepam, and rohypnol, requires urgent, serious attention from both agencies. On the last note, the adoption of an outreach service could serve as a necessary intervention by bringing information, education and reformatory services to the members of the group in their milieu, as they are unlikely to seek help unprompted. Such an outreach programme will play a significant role in identifying and referring most at-risk young people to static services where professionals will be available to manage their substance misuse behaviour and the risks associated with their gang membership.

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