

Original Research Article

Factors associated with psychoactive substance use among youth in urban and rural local government areas of Kano State, Nigeria: a comparative cross-sectional study

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Received: 19 June 2026

Revised: 14 July 2026

Accepted: 20 July 2026

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ABSTRACT

Background: Substance use among youth remains a major public health challenge in Nigeria, with limited community-based data from northern regions. This study assessed the prevalence, types, and factors associated with psychoactive substance use among youth in urban and rural local government areas (LGAs) of Kano State, Nigeria.

Methods: A comparative cross-sectional study was conducted from December 2021 to March 2022 among 392 youth aged 15-24 years recruited from congregate settings in one urban and one rural LGA. Multistage sampling was used. Interviewer-administered questionnaires assessed socio-demographics and substance use. Data were analysed using SPSS version 20. Multivariable logistic regression identified factors associated with substance use, with significance set at $p < 0.05$.

Results: The prevalence of psychoactive substance use was 77.8% overall (urban: 88.7%; rural: 67.0%). Commonly used substances included tobacco products (urban: 87.2%; rural: 65.5%), cannabis (urban: 86.2%; rural: 60.9%), tramadol (urban: 83.6%; rural: 66.5%), and alcohol (urban: 59.5%; rural: 56.3%). In urban LGA, independent factors associated with substance use were lower income ($< \text{₦} 50,000$: aOR=20.41, 95% CI: 6.33-66.60, $p=0.001$), and earlier age at initiation (≤ 16 years: aOR=2.72, 95% CI: 1.34-5.52, $p=0.005$; 17-20 years: aOR=2.72, 95% CI: 2.00-3.71, $p=0.001$). In rural LGA, associated factors included no formal education (aOR=2.31, 95% CI: 1.11-4.83, $p=0.026$), student status (aOR=4.13, 95% CI: 1.68-10.19, $p=0.002$), and lower income (aOR=2.11, 95% CI: 1.43-3.11, $p=0.001$).

Conclusions: Prevalence of psychoactive substance use is high, particularly in urban areas. Strengthening substance use prevention programs, improving educational access, economic empowerment, and youth engagement initiatives may reduce substance use among at-risk youth.

Keywords: Psychoactive substances, Substance use, Youth, Associated factors, Urban-rural, Nigeria

INTRODUCTION

Since ancient times, herbs, leaves, and plants have been used to treat diseases. The use of drugs is not inherently dangerous; rather, harm depends on the pattern of use. When used correctly, drugs provide tremendous therapeutic benefits. However, substance misuse can cause serious, sometimes irreversible damage to a youth's physical and psychological development.¹

Substance use is a major public health concern globally and is particularly common among youth and adolescents, leading to physical and mental health complications.²⁻⁴ High levels of peer influence, risk-taking behaviour, and experimentation with substances are normal developmental features of adolescence. Globally, substance use, including alcohol, tobacco, and khat has been associated with socioeconomic problems.⁵ These substances contribute to approximately 2.5 million deaths annually worldwide. Alcohol alone accounts for nearly 4% of all deaths, with 6.2% of male deaths related to alcohol compared to 1.1% of female deaths.⁶ Annually, 320,000 young people aged 15-29 years die from alcohol-related causes, representing 9% of all deaths in that age group. Early drinking onset increases risks of alcohol-related injuries, motor vehicle crashes, unprotected intercourse, and interpersonal violence.⁷

Research from high-income countries suggests substance use is a potentially modifiable risk factor for suicide.^{8,9} Suicide is the 15th leading cause of death worldwide, with over 800,000 deaths annually. Seventy-five per cent of suicides occur in low- and middle-income countries (LMICs).⁹

Studies indicate that substance use has dramatically increased in developing countries, with strong links to criminal behaviour.¹⁰ These substances are widely used among African youth, posing serious social and public health problems. Abused substances produce intoxication that alters judgment, perception, attention, and physical control. Youth involvement in substance use significantly impacts the workforce, slowing economic activity and social progress in many countries.¹¹

A study among Nigerian high school students in an urban setting reported a lifetime prevalence of substance use of 87.3%, with current use at 69.2% and multiple substance use at 57.4%.¹² These substances are associated with decreased academic performance, increased risk of HIV and other STDs, reduced work productivity, accidents, absenteeism, violent crime, theft, and psychiatric disorders, including lethargy, hopelessness, and insomnia.¹²⁻¹⁴

Evidence suggests many antisocial behaviours occur under the influence of habit-forming substances such as alcohol, cannabis, cocaine, and heroin.¹⁵ This may partly explain increasing rates of armed robbery, kidnapping, rape, and insurgency in Nigeria. Substance use occurs across all

societal segments, especially among youth in both urban and rural communities.¹⁶ Youth aged 10-30 years constitute approximately 49% of Nigeria's population. The National Drug Law Enforcement Agency (NDLEA) reports that over 38% of Nigerian youth use substances.¹⁷ Many substance users in Nigeria and Africa lack access to quality healthcare, worsening their social and health conditions and leading to long-term health risks such as weakened immune systems, cancer, mental disorders, and cardiovascular disease.¹⁸ Sustainable development goal 3, target 5 aims to strengthen prevention and treatment of substance abuse, including narcotic drug abuse and harmful alcohol use.

Given the high levels of substance use among youth in Kano State and identified research gaps, this study determined the prevalence, types, and factors associated with psychoactive substance use among youth in urban and rural communities of Kano State, Northwestern Nigeria.

METHODS

Study area

Kano State has 44 LGAs, comprising 8 urban and 36 rural LGAs. The study was conducted in two LGAs: Gwale (urban) and Kura (rural), selected by simple random sampling (balloting) from the list of urban and rural LGAs.²⁰ Sites where youths congregate like youth clubs, mechanic workshops, youth-friendly centres, football pitches, marketplaces were used for the study. Data were collected from December 2021 to March 2022 using a structured, interviewer-administered questionnaire adapted from previous substance use studies.¹²

Study design

A comparative cross-sectional study design was employed.

Study population

Youths (adolescents and young persons) aged 15-24 years who had resided in the study areas for at least one year were eligible. Youths with speech, hearing, mental disabilities, or other conditions preventing informed participation were excluded.

Sample size determination

The minimum sample size was calculated using the formula for comparing two proportions:²¹

$$n = (Z\alpha + Z\beta)^2 [P_1(1-P_1) + P_2(1-P_2)] / (P_1 - P_2)^2$$

Where:

$Z\alpha = 1.96$ (5% significance level)

$Z\beta = 1.28$ (80% power)

$P_1=17.0\%$ (prevalence in urban area from previous study)¹⁶

$P_2=6.5\%$ (prevalence in rural area from previous study)¹⁶

Calculation

$$P_1(1-P_1)=0.17 \times 0.83=0.1411$$

$$P_2(1-P_2)=0.065 \times 0.935=0.0608$$

$$(P_1 - P_2)^2=(0.105)^2=0.011025$$

$$n=(1.96+1.28)^2 \times (0.1411+0.0608)/0.011025$$

$$n=192 \text{ per group}$$

Adjusting for 10% non-response (anticipated 90% response rate), the target sample was 211 per group, totalling 422 participants.

Sampling technique

A multistage sampling approach was used:

Stage 1 (Selection of study LGAs)

From the list of 44 LGAs (8 urban, 36 rural), Gwale was randomly selected from urban LGAs and Kura from rural LGAs using balloting.

Stage 2 (Selection of wards)

From each selected LGA, 25% of the 10 political wards were selected by balloting, yielding 3 wards per LGA: Dandano, Galadanci, and Gwale ward (Gwale LGA); Dalili, G/Dutse, and Tanawa (Kura LGA).

Stage 3 (Selection of congregate sites)

Sites where youth congregate (youth clubs, mechanic workshops, youth-friendly centres, football pitches, marketplaces) were mapped. Using balloting, 5 sites were selected from each ward, totalling 15 sites per LGA and 30 sites overall.

Stage 4 (Selection of youth)

Due to the mobile nature of the population and the inability to ascertain exact population numbers, trained research assistants administered questionnaires to eligible youth at selected sites until the target sample was achieved. This final stage employed convenience sampling.

Data collection

The questionnaire was translated into Hausa by a professional translator and back-translated to English by

an independent translator to ensure consistency. The Hausa version was administered to all participants.

The questionnaire was pretested among youth in Kumbotso LGA (outside the study area) to assess validity, cultural acceptability, and appropriateness. The tool comprised three sections: socio-demographic characteristics, prevalence and types of substance use, and factors associated with substance use.

Substance use was defined as any use of psychoactive substances (including tobacco, cannabis, tramadol, codeine, alcohol, inhalants, and other non-medical use of prescription drugs) within the 12 months preceding the survey, without a physician's prescription. Lifetime use was not distinguished from current use due to study objectives focused on recent use patterns.

Ethical considerations

Ethical approval was obtained from the Health Research Ethics Committee of the Kano State Ministry of LGAs (Approval No.: NHREC/17/03/2018). Informed consent was obtained from all participants aged 18 years and above. For adolescents aged 15-17 years, parental consent and participant assent were obtained. Participants were informed that participation was voluntary, they could decline to answer any question, and all data would be kept confidential. No invasive procedures were performed.

Statistical analysis

Data were entered and analysed using IBM SPSS Statistics version 20. Categorical variables were summarised as frequencies and percentages. Comparisons between urban and rural groups were made using the chi-square test. Multivariable logistic regression was used to identify factors independently associated with substance use, adjusting for potential confounders. Variables with $p<0.20$ in bivariate analysis were entered into the multivariable model. Adjusted odds ratios (aOR) with 95% confidence intervals (CI) were reported. Statistical significance was set at $p<0.05$.

RESULTS

Of 422 questionnaires administered, 195 were completed and returned from the urban LGA (92.4% response rate) and 197 from the rural LGA (93.4% response rate), giving 392 valid responses for analysis.

Socio-demographic characteristics

Respondents' ages ranged from 15 to 24 years. Urban respondents (mean 18.9 ± 2.96 years) were younger than rural respondents (mean 22.4 ± 2.28 years). Fewer rural respondents (25.9%) had attained a tertiary education than urban respondents (44.6%). More urban respondents were engaged in business (46.2%) than rural respondents (30.5%). Higher proportion of urban respondents-initiated

substance use at age ≤ 16 years (24.6% vs. 11.2% rural). All differences statistically significant ($p < 0.05$) (Table 1).

Prevalence of psychoactive Substance Use

The overall prevalence of substance use was 77.8% (305/392). Urban youth had a significantly higher prevalence (173/195, 88.7%) than rural youth (132/197, 67.0%) ($\chi^2 = 27.14$, $p < 0.001$) (Figure 1).

Types of psychoactive substances used

In both LGAs, the most commonly used substances were tobacco products, cannabis, tramadol, alcohol, and codeine. Urban youth reported higher use of all substance categories compared to rural youth, except for injection drug use (IDU), which was more common in rural areas (48.2% vs. 23.6%). Non-conventional substances (e.g., gutter, rubber, lizard dung) were reported but not systematically quantified (Table 2).

Factors associated with substance use

In urban LGA, the independent factors associated with substance use following multivariable logistic regression analysis were Hausa/Fulani ethnicity (aOR=2.06, 95% CI: 1.27-3.36, $p = 0.004$); no formal education (aOR=3.02, 95% CI: 1.46-6.26, $p = 0.003$); monthly income $< \text{₦} 50,000$ (aOR=20.41, 95% CI: 6.33-66.60, $p = 0.001$); age at initiation ≤ 16 years (aOR=2.72, 95% CI: 1.34-5.52,

$p = 0.005$); and age at initiation 17-20 years (aOR=2.72, 95% CI: 2.00-3.71, $p = 0.001$) (Table 3).

In rural LGA, the independent factors associated with substance use following multivariable logistic regression analysis were Hausa/Fulani ethnicity (aOR=2.10, 95% CI: 1.16-3.69, $p = 0.013$); no formal education (aOR=2.31, 95% CI: 1.11-4.83, $p = 0.026$); being a student (aOR=4.13, 95% CI: 1.68-10.19, $p = 0.002$); monthly income $< \text{₦} 50,000$ (aOR=2.11, 95% CI: 1.43-3.11, $p = 0.001$); and parental income $< \text{₦} 50,000$ (aOR=2.39, 95% CI: 1.14-5.03, $p = 0.022$) (Table 4).

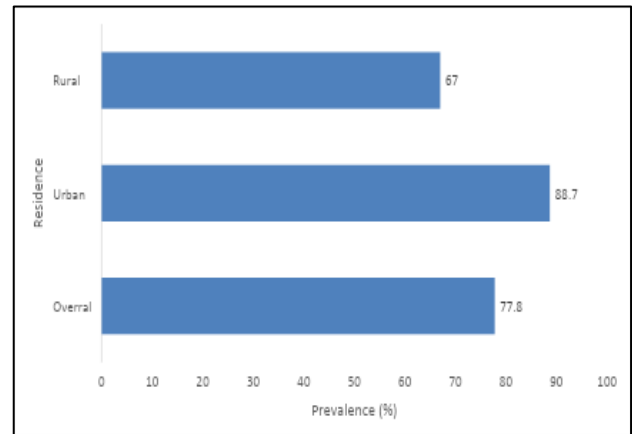


Figure 1: Prevalence of psychoactive substance use by location.

Table 1: Sociodemographic characteristics of youth by residence.

Characteristics	Urban, (n=195) (%)	Rural, (n=197) (%)	χ²	P value
Age (in years)				
15-19	127 (65.1)	34 (17.3)	92.78	<0.001
20-24	68 (34.9)	163 (82.7)		
Ethnicity				
Hausa/Fulani	157 (80.5)	102 (51.8)	36.10	<0.001
Others	38 (19.5)	95 (48.2)		
Religion				
20.15	<0.001	20.15	<0.001	20.15
Christianity	17 (8.7)	51 (25.9)		
Education				
None	0 (0.0)	12 (6.1)	35.82	<0.001
Primary	20 (10.3)	52 (26.4)		
Secondary	88 (45.1)	82 (41.6)		
Tertiary	87 (44.6)	51 (25.9)		
Occupation				
Student	48 (24.6)	46 (23.4)	15.35	0.002
Business	90 (46.2)	60 (30.5)		
Unemployed	24 (12.3)	48 (24.4)		
Employed	33 (16.9)	43 (21.8)		
Marital status				
Single	58 (29.7)	27 (13.7)	41.43	<0.001
Married	82 (42.1)	146 (74.1)		
Divorced	55 (28.2)	24 (12.2)		
Income (₦)				
<50,000	180 (92.3)	144 (73.1)	25.23	<0.001

Continued.

Characteristics	Urban, (n=195) (%)	Rural, (n=197) (%)	χ^2	P value
≥50,000	15 (7.7)	53 (26.9)		
Parent’s income (₦)				
<50,000	136 (69.7)	120 (60.9)	7.47	0.024
50,000-100,000	28 (14.4)	50 (25.4)		
>100,000	31 (15.9)	27 (13.7)		
Age at initiation of substance use (in years)				
≤16	48 (24.6)	22 (11.2)	39.81	<0.001
17-20	132 (67.7)	113 (57.4)		
21-24	15 (7.7)	62 (31.5)		

Table 2: Type of substance use among youth in urban and rural communities.

Substance types	Urban, (n=195) (%)	Rural, (n=197) (%)
Tobacco products	170 (87.2)	129 (65.5)
Cannabis	168 (86.2)	120 (60.9)
Alcohol	116 (59.5)	111 (56.3)
Tramadol	163 (83.6)	131 (66.5)
Codeine	153 (78.5)	130 (65.9)
Injection drug use (IDU)	46 (23.6)	95 (48.2)
CNS stimulants	61 (31.3)	59 (29.9)
Hypnotics and sedatives	64 (32.8)	59 (29.9)
Hallucinogens	69 (35.4)	80 (40.6)
Volatile inhalants	165 (84.6)	109 (55.3)
Any substance use (past 12 months)	173 (88.7)	132 (67.0)

Table 3: Multivariable logistic regression for factors associated with substance use among youth in urban LGA.

Characteristics	aOR	95% CI	P value
Age (in years)			
15-19	0.69	0.42-1.11	0.123
20-24	1.00	Reference	
Ethnicity			
Hausa/Fulani	2.06	1.27-3.36	0.004
Others	1.00	Reference	
Education			
None	3.02	1.46-6.26	0.003
Primary	1.45	0.76-2.75	0.304
Secondary	1.61	0.86-3.00	0.157
Tertiary	1.00	Reference	
Occupation			
Student	0.43	0.08-2.29	0.322
Business	1.68	0.60-4.74	0.325
Unemployed	1.11	0.43-2.84	0.830
Employed	1.00	Reference	
Income (₦)			
<50,000	20.41	6.33-66.60	0.001
≥50,000	1.00	Reference	
Parent's income (₦)			
<50,000	2.70	0.76-9.58	0.123
50,000-100,000	1.55	0.42-5.72	0.512
>100,000	1.00	Reference	
Age at initiation (in years)			
≤16	2.72	1.34-5.52	0.005
17-20	2.72	2.00-3.71	0.001
21-24	1.00	Reference	

Table 4: Multivariable logistic regression for factors associated with substance use among youth in rural LGA.

Characteristics	aOR	95% CI	P value
Age (in years)			
15-19	0.61	0.36-5.87	0.448
20-24	1.00	Reference	
Ethnicity			
Hausa/Fulani	2.10	1.16-3.69	0.013
Others	1.00	Reference	
Education			
None	2.31	1.11-4.83	0.026
Primary	1.42	0.73-2.76	0.305
Secondary	1.58	0.84-3.00	0.158
Tertiary	1.00	Reference	
Occupation			
Student	4.13	1.68-10.19	0.002
Business	0.73	0.29-1.85	0.503
Unemployed	1.32	0.53-3.31	0.551
Employed	1.00	Reference	
Income (₦)			
<50,000	2.11	1.43-3.11	0.001
≥50,000	1.00	Reference	
Parent's income (₦)			
<50,000	2.39	1.14-5.03	0.022
50,000-100,000	0.23	0.09-0.62	0.004
>100,000	1.00	Reference	
Age at initiation (in years)			
≤16	3.59	0.48-27.12	0.215
17-20	2.39	0.62-9.18	0.206
21-24	1.00	Reference	

DISCUSSION

This study examined psychoactive substance use among youth recruited from congregate settings in urban and rural LGAs of Kano State. The findings demonstrate a high prevalence of substance use, particularly in urban areas, with multiple substances commonly used. The overall prevalence of substance use (77.8%) is substantially higher than the NDLEA national estimate of 38% among Nigerian youth.¹⁷ This discrepancy is likely explained by differences in study populations: our study specifically recruited youth from congregate settings (mechanic workshops, football pitches, markets) where higher-risk individuals are overrepresented, whereas national estimates include general population youth. Our findings are comparable to studies using similar high-risk sampling strategies, including 81.1% among commercial bus drivers in Kano and 88.0% among incarcerated delinquents in Kaduna.^{22,23} However, our prevalence exceeds that of general population studies, such as 27.5% among university students in Uyo.²⁴

Urban youth had significantly higher substance use (88.7%) than rural youth (67.0%). This urban-rural gradient may reflect greater availability of substances, higher population density facilitating peer influence, and relative anonymity in urban settings. Similar patterns have

been reported in Southwestern Nigeria.¹⁶ The most commonly used substances-tobacco, cannabis, tramadol, alcohol, and codeine are consistent with previous Nigerian studies.^{25,26} of concern is the high prevalence of injection drug use in rural areas (48.2%), which exceeds urban rates (23.6%). This unexpected finding warrants further investigation, as rural IDU may represent an underrecognized risk for blood-borne virus transmission.

For factors associated with substance use showed that youth with no formal education had approximately 2-3 times higher odds of substance use compared to those with tertiary education, consistent with studies showing education as a protective factor.²⁷ Education may provide knowledge about substance harms, delay initiation, and improve employment prospects. Low income (<₦50,000/month) was strongly associated with substance use in both settings, though the magnitude was dramatically larger in urban areas (aOR=20.41). This may reflect urban youth using substances as coping mechanisms for financial stress, or the high cost of substances making them less accessible to higher-income youth. The reverse pattern in rural areas (lower magnitude) may indicate different socioeconomic dynamics.

Hausa/Fulani ethnicity was associated with higher substance use in both LGAs. This may reflect cultural

norms, differential enforcement of substance laws, or underlying socioeconomic differences rather than ethnic predisposition per se. Confounding by residence (Hausa/Fulani predominance in urban areas) was partially adjusted for in multivariable analysis. Early initiation (≤ 16 years) was strongly associated with substance use in urban areas, consistent with evidence that earlier exposure increases risk of problematic use.²⁸ The lack of significant association in rural areas may reflect a smaller sample size or different patterns of initiation. Rural students had 4-fold higher odds of substance use compared to employed youth. This may indicate peer influence in school settings, academic stress, or leisure-time boredom in rural environments with fewer recreational alternatives.

The study has some strengths. It provides comparative urban-rural data on substance use among hard-to-reach youth in an understudied region of Nigeria. The use of interviewer-administered questionnaires in the local language (Hausa) enhanced comprehension and response rates. However, the study is not without some limitations. Recruitment from congregate sites (mechanic workshops, football pitches, markets) overrepresents youth who frequent public spaces and underrepresents homebound, employed in formal settings, or studying youth. Findings are not generalizable to all youth in Kano State. This shows some selection bias. Self-reported substance use, shows social desirability bias, may be underreported due to stigma and legal consequences, potentially underestimating true prevalence. Inaccuracies may be introduced due to recall bias where participants were asked about events up to 12 months prior. Self-report was not verified by urine or saliva testing, thus, no biochemical validation. And convenience sampling at the final stage may limit the statistical generalizability of findings.

Nevertheless, the study is not without implications for policy and practice. The high prevalence of substance use among youth in congregate settings suggests targeted interventions at these venues may be efficient. Recommended strategies include strengthening enforcement of substance control laws, particularly regarding tramadol and codeine; integrating substance use education into school curricula and vocational training programs; establishing youth-friendly substance use screening and brief intervention services at congregate sites; implementing economic empowerment programs for out-of-school and unemployed youth; conducting community-based awareness campaigns in local languages addressing substance harms; and further research to understand the high rural IDU prevalence and develop harm reduction interventions

CONCLUSION

Psychoactive substance use is highly prevalent among youth recruited from congregate settings in Kano State, particularly in urban areas. Substances commonly used include tobacco, cannabis, tramadol, and alcohol. Low education, low income, Hausa/Fulani ethnicity, early

initiation (urban), and student status (rural) were independently associated with substance use. These findings support the need for targeted, evidence-based interventions addressing modifiable risk factors, including educational support, economic empowerment, and youth engagement programs.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee Kano State Ministry of Local Government Affairs (NHREC/17/03/2018).

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Cite this article as: Iliyasu U, Musa Z, Adeyemo QE, Shehu AI, Mohammed N, Hussain AR, Kurba II, et al. Factors associated with psychoactive substance use among youth in urban and rural local government areas of Kano State, Nigeria: a comparative cross-sectional study. *Int J Res Med Sci* 2026;14:3212-9.