

Pattern, motivation and risks of substance use among commercial road transport workers in Ile-Ife, Southwestern Nigeria

Authors

Ayodapo Oluwadare Jegede¹, *Oladayo Nifemi Babalola¹, Glory Olalekan Adebajo¹, John Oluwadara Adedeji¹, Taofikat Adebukola Akande¹, Oluwafemi Enoch Awotimiro¹, Dolapo Ebunoluwa Bolade¹, Muhyideen Adekunle Abioye¹, Anthony Afolabi Toluwalase¹, Timothy Temiloluwa Orimolade¹ & Jeremiah Oluwamayowa Omojuyigbe¹

Affiliation

1. Obafemi Awolowo University, Ile-Ife, Osun, Nigeria.

Corresponding author

*Oladayo Nifemi Babalola¹

E-mail: oladayobb@gmail.com

Date submitted: 24th February 2026

Date published: 30th June 2026

ABSTRACT

Psychoactive substance use by commercial drivers has emerged as both a public health and road safety issue in low- and middle-income countries. In Nigeria, drivers face working conditions that may promote psychoactive substance use both as a coping mechanism and as a means of enhancing work performance. However, local evidence in relation to psychoactive substance use from this population in recent years is limited. Hence, this study aimed to determine the prevalence, pattern and motivation for use, and level of substance abuse risk among commercial road transport workers in Ile-ife, and examine factors associated with driving under the influence of alcohol/drugs and high abuse risk. A cross-sectional survey was conducted among 316 commercial transport workers recruited from major motor parks in Ile-Ife using a semi-structured questionnaire with validated substance use screening questions. Descriptive statistics and inferential statistical tests were conducted. Alcohol and energy drinks were the most commonly reported substances, with 51.6% and 52.2% of participants reporting current use, respectively. High use of kolanut/bitter kola and herbal mixtures was also reported, whereas use of cannabis, opioids, cocaine, and sedatives was relatively low. Similarly, 18.4% of participants were classified with high substance abuse risk, and among users, 21.8% reported ever driving under the influence of alcohol/

drugs. Reduction of stress, pleasure, and improvement of work performance were the most common reasons given for substance use. Increasing age was independently associated with lower odds of driving under the influence of alcohol/drugs and high abuse risk. However, increased motivation score was associated with higher odds of both outcomes. Overall, substance use appears to be heavily influenced by occupational and psychosocial factors among this population. Indicating the need for combining routine screening for substance use with counselling for stress management and motor-park-based road safety education.

Keywords: *Substance use, psychoactive substances, road safety, commercial drivers, occupational stress, Nigeria*

INTRODUCTION

Psychoactive substances are chemical compounds that affect the central nervous system, altering perception, cognition, mood, and behaviour. Although many psychoactive substances have been accepted for medical or social uses, harmful or hazardous use of these substances is linked to poor health, antisocial behaviour, and personal safety consequences. According to the World Health Organization, substance abuse is a pattern of harmful or hazardous use of psychoactive substances, including alcohol and illicit drugs (World Health Organization [WHO], 2025).

Substance use continues to be a significant public health concern worldwide and in sub-Saharan Africa due to its association with mental health disorders and physical morbidity, injury, and socioeconomic consequences (Abio et al., 2020; Ajayi & Somefun, 2020; Onaolapo et al., 2022). A national drug-use survey in Nigeria conducted in 2018 estimated that 14.4% of people aged 15-64 years (approximately 14.3 million people) had used drugs in the previous year (United Nations Office on Drugs and Crime [UNODC], 2019). The survey also found that substance use was more prevalent among males compared to females, which is relevant to occupational groups that are predominantly male, like commercial road transport workers. Road traffic injury is also another substantial public health challenge. On average, approximately 1.19 million people die each year as a result of road traffic crashes, with an additional 20-50 million people suffering non-fatal injuries (WHO, 2026). Low and middle-income countries disproportionately experience road traffic fatalities due to factors such as limitations in road infrastructure, weak traffic law enforcement, limited emergency care, and high exposure of vulnerable road users (Jadaan et al., 2018; WHO, 2023, 2026). Nigeria is not an exception to this trend, as road crashes continue to account for significant mortality and morbidity in the country, and driver-related risk factors represent a key area for prevention (Federal Road Safety Corps [FRSC], 2020).

Commercial road transport workers, including bus drivers, taxi drivers, motorcyclists, tricyclists, and truck drivers, are at heightened risk because they spend long hours operating

vehicles on roads and under challenging conditions. Long work hours, poor schedules, economic pressure, fatigue, and stressful traffic conditions may incentivize commercial drivers to consume alcohol, stimulants, energy drinks, or substances available within their environment to stay awake, relieve stress, or maximize perceived work performance (Cardoso et al., 2019; Giroto et al., 2014; Leyton et al., 2019).

Research in Nigeria has reported high prevalence of psychoactive substance use among commercial drivers, and alcohol is often cited as the most commonly used substance (Akande et al., 2023; Eneh et al., 2023; Leyton et al., 2019). Other studies have attributed use to occupational stressors including fatigue, peer influence, availability of substances around motor parks, and perceived improvement in alertness and driving ability (Alti- Muazu & Aliyu, 2008; Sowunmi & Akinmuleya, 2023; Yunusa et al., 2017). Risk to road safety is highest when psychoactive substances are used before or during driving because substance-related impairment impacts judgement, reaction time, and coordination (Kiwango et al., 2021).

A limitation of existing evidence on psychoactive substance use among commercial road drivers in Nigeria is that much of it is outdated or was conducted outside of Ile-Ife. Population movement has contributed to change in the commercial transport landscape of Ile-Ife over time, and long-distance transport is no longer the predominant livelihood among transport workers. Intra-city transportation has expanded due to urbanization and increasing economic pressure. Patterns of substance availability have also evolved over time. Given these changes, there is a need to establish current, setting-specific evidence on psychoactive substances that are used among transport workers in Ile-Ife, reasons that drive substance use, and how substance use behaviours such as driving under the influence of substances and risk of substance abuse occur. Without establishing this evidence, prevention programmes would likely miss critical details about the occupational context and motor-park environment that influence drivers' daily decisions about substance use.

Thus, this study aimed to assess psychoactive substance use among commercial road transport workers in Ile-Ife, Osun State, Nigeria. The study had four specific objectives: (1) determine the prevalence and pattern of psychoactive substance use, (2) identify factors that influence psychoactive substance use among commercial drivers, (3) assess substance use-related behavioral risks, and (4) identify factors associated with driving under the influence of substances and high risk of substance abuse.

METHODOLOGY

This study investigated psychoactive substance use among commercial road transport workers in Ile-Ife metropolis, Osun State, Nigeria. Information was obtained using a semi-structured questionnaire incorporating validated alcohol- and drug-screening items. The

study also explored factors associated with driving under the influence of alcohol/drugs and high substance abuse risk.

Study design and setting

The study employed a cross-sectional survey design and was conducted among commercial road transport workers (CRTWs) operating in Ile-Ife. Ilé-Ifè is a semi-urban city located in Osun State, southwest Nigeria. Ilé-Ifè serves as an educational centre, hosting Obafemi Awolowo University, one of the premier universities in Nigeria, and many markets in the area, leading to a very large population movement and thereby increasing transport demand (Osun State Government, n.d.). In Ilé-Ifè, commercial motor transport activities thrived along motor parks and motor transport stations such as Mayfair, Lagere, and Ilesa Garage, which facilitated intra-city and inter-city transportation operations. These places served as major terminals for transporting passengers using mainly minibuses, taxis, tricycles and motorcycle commercial road transport services (Oladeji & Agbabiaka, 2021). RTCs have been a major public health problem that needed to be addressed in Osun State. According to the FRSC annual report in 2021, there were 404 RTCs recorded in the state that claimed the lives of 240 people, while 1,193 others were injured (FRSC, 2022).

Participants, sampling and sample size determination

To be included, commercial road transport drivers aged 18 and above who worked out of the six main motor parks in the two Ile-Ife local government areas and who gave their informed consent were eligible. Ineligible drivers were those who did not meet the inclusion criteria. Also, questionnaires with unanswered items for key outcome variables were excluded from final analysis.

Drivers were recruited with assistance from transport union leaders in the study area. Researchers approached eligible drivers during rest periods and invited them to participate in the study. Using the transport unions' structure and study flow logistics, a convenience sample frame was employed, consisting of drivers who were eligible and available when data collection was conducted at the motor parks.

Sample size was calculated using Fisher's formula for a single population proportion at 95% Confidence Interval (CI), Margin of error of 5% and $p = .50$ for a finite population. The generated sample size was 384, the minimum required at the 95% Confidence Level with no prior knowledge of the prevalence. Prevalence was unknown; therefore, p was set to its maximum value (.50) to obtain the largest sample size of 384. The sample size was adjusted using the finite population correction formula, based on an estimated population of 1,300, comprising all active commercial transport workers across the six motor parks where the study was conducted. The number 1300 was arrived at by conducting an enumeration pre-

test in collaboration with leaders of transport unions and motor-park authorities who knew the approximate number of active registered drivers working from each park. The adjusted minimum sample size with finite correction was 296. With 10% non-response rate allowed, the final sample size was 326 participants.

Data Collection Instrument

The data collection involved a semi-structured, pre-tested questionnaire designed to capture information on socio-demographic profiles, employment aspects, awareness and perceived availability of psychoactive substances, substance consumption habits, motivations driving usage, and road-safety-related conduct. Questionnaire items related to alcohol and drug use were derived from previously validated screening tools (Alcohol Use Disorders Identification Test (AUDIT; Saunders et al., 1993); Drug Abuse Screening Test (DAST-10; Skinner, 2001)). The questionnaire was piloted for feasibility and clarity with 30 transport workers from a neighboring city. Minor amendments were made to the wording of some questions.

Composite scale construction

The substance-awareness scores were compiled by summing the binary answers to the various awareness items. Behavioral risk scores were created by summing subscales of dichotomous indicators for substance-use items, timing-of-use items, and driving-under-the-influence risk items. Scale reliability was assessed using Cronbach's alpha. Timing-of-use subscales were included in the abuse risk composite score (as described below) using weighted scores to account for differences in behavioral risk associated with the time of last substance used. Item responses were dichotomized (Yes =1, No=0). Individual substance-use and driving-under-the-influence risk items were given equal weight within each respective subscale. Timing-of-use responses were weighted to account for differences in behavioral risk based on time of day, substance used, and likelihood of driving and cognitive impairment. We assigned the following weights based on time-of-day substance used: morning = 3, midday = 2, afternoon/evening =1, and late night = 2. Weighted, standardized subscale scores were summed to create a Composite Abuse Risk Score. The composite score was used in its continuous form for descriptive statistics and then dichotomized into "High Risk" versus "Low/Moderate Risk" behaviours for regression analysis. A complete list of the items used to create each scale is provided in Supplemental Table S4.

Data analysis

Three hundred forty-two questionnaires were distributed. Non-complete responses were dropped (n = 26), resulting in 316 participant responses used for final analysis. Analyses were completed using descriptive and inferential statistical procedures as appropriate to the

study aims. Frequencies, percentages, means, standard deviations, medians, inter-quartile ranges, and 95% confidence intervals were calculated to describe sociodemographic information, prevalence and patterns of substance use, reasons for substance use, and road-safety-related behaviours. Pearson's chi-square or Fisher's exact tests and independent-samples t-tests were used, where appropriate, to determine bivariate associations between explanatory variables and the two study outcomes (driving under the influence and high risk for substance abuse). Two multivariable binary logistic regression models were fitted to determine predictors of driving under the influence and high substance abuse risk. Covariates included in the models were selected based on theoretical importance and bivariate analyses. Adjusted odds ratios (ORs), 95% confidence intervals (CI) and p-values were reported. Hosmer-Lemeshow goodness-of-fit statistics were used to determine model fit. Statistical significance was considered at $p < .05$.

Ethical considerations

Ethical clearance for the study was granted by the Health Research Ethics Committee, Institute of Public Health, Obafemi Awolowo University, Ile-Ife, HREC: IPH/OAU/12/2143. Approval was also sought from the transport union authority at each motor park. Written informed consent was obtained from respondents after they were informed about the study, prior to the administration of the questionnaires. Confidentiality was assured by informing respondents that their responses would not be linked to them at any point in the study.

RESULTS

Participant characteristics

The study included 316 commercial road transport workers, who comprised the valid respondents and constituted 96.9% of our targeted sample. Participants had a mean age of 42.6 ± 10.7 years, and 64.6% were in the 30–49-year age group. Most of them had at least a secondary school education (79.4%), including one-quarter with post-secondary education. The majority of participants were married in monogamous unions (74.7%). Most respondents were Christians (65.8%), while 32.6% were Muslims.

Most commercial drivers operated motorcycles (45.8%) or buses/vans (43.0%). Most commercial drivers owned their vehicles (71.5%), whereas approximately one-quarter of vehicles were operating under the commercial hire category. Mean driving experience was 14.3 ± 10.8 years. Socio-demographic and occupational characteristics were included in multivariable models because prior research had identified these factors as possible predictors of substance use and driving-related risk among commercial drivers (Akande et al., 2023; Giroto et al., 2014; Sowunmi & Akinmuleya, 2023). This information is summarized in Table 1

Table 1***Socio-demographic and occupational characteristics of participants (N = 316)***

Characteristic	n (%) or Mean \pm SD
Age (years)	42.64 \pm 10.66
Age group (years)	
<30	21 (6.6)
30-39	103 (32.6)
40-49	101 (32.0)
\geq 50	91 (28.8)
Highest education level attained	
None/Primary Uncompleted	2 (0.6)
Primary Completed	63 (19.9)
Secondary Completed	172 (54.4)
Post-secondary	79 (25.0)
Marital status	
Single	18 (5.7)
Married (Monogamous)	236 (74.7)
Married (Polygamous)	55 (17.4)
Divorced/Widowed/Separated	7 (2.2)
Religion	
Christianity	208 (65.8)
Islam	103 (32.6)
Traditional Worship	4 (1.3)
Others	1 (0.3)
Daily income category ^a (n = 311)	
Low Income	103 (32.6)
Lower-Middle	79 (25.0)
Upper-Middle	54 (17.1)
High Income	75 (23.7)

^a Daily income categories were defined as follows: Low income (< ₦5,000), Lower-middle income (₦5,000–₦9,999), Upper-middle income (₦10,000–₦19,999), and High income (\geq ₦20,000).

Prevalence and patterns of psychoactive substance use

The prevalence of lifetime psychoactive substance use among participants is presented in Table 2. A significant portion of participants, specifically 51.6%, reported using alcohol in the period under review. Current use of energy drinks was nearly as common (52.2%; 95% CI: 46.7-57.7). Use of kolanut/bitter kola (35.1%) and of herbal mixture (including drinks such as paraga or bitters) (35.4%) was also reported frequently. Tobacco use was reported by 12.0% of participants. Cannabis (7.9%), opiates (4.1%), cocaine (2.5%), and sedatives (1.9%) were among the less commonly used drugs included in our assessment. Overall, 75.6% reported the use of one or more drugs other than alcohol, and 81.3% reported using alcohol or any other drug. As such, we find that drug use within our study population is characterized by alcohol, energy drinks, kolanut/bitter kola, and herbal mixtures rather than illicit substances. This information is captured in Table 2. Detailed data on knowledge of and perceived accessibility of psychoactive substances are presented in Supplementary Tables S1 and S2 respectively.

Table 2***Prevalence of substance use among participants (N = 316)***

Variable	n (%)	95% CI (%)
Alcohol use	163 (51.6)	46.1–57.1
Tobacco use	38 (12.0)	8.4–15.6
Kolanut/bitter kola ^a use	111 (35.1)	29.9–40.4
Herbal mixtures (paraga ^b /bitters) use	112 (35.4)	30.1–40.7
Stimulants (coffee/amphetamines) use	55 (17.4)	13.2–21.6
Cocaine use	8 (2.5)	0.8–4.3
Cannabis use	25 (7.9)	4.9–10.9
Opiate use	13 (4.1)	1.9–6.3
Sedative use	6 (1.9)	0.4–3.4
Energy drink use	165 (52.2)	46.7–57.7
Any drug use ^c	239 (75.6)	70.9–80.3
Any substance use ^d	257 (81.3)	77.0–85.6
Ever driven under the influence (DUI; n = 257)	56 (21.8)	16.8–26.8
Ever arrested/penalized for DUI	6 (1.9)	0.4–3.4

^a Any drug use includes tobacco, kolanut/bitter kola, herbal mixtures, energy drinks, stimulants, cannabis, cocaine/heroin, opiates, and sedatives. ^b Any substance use includes alcohol or any drug.

Table 3 outlines the usage trends observed among participants. A significant portion of participants, 48.4%, stated they had not used alcohol, while 20.3% consumed it on a daily basis. Of those who drank alcohol, the most frequent time of consumption was in the evening (50.9%), followed by late-night drinking (32.5%). Over one-third of alcohol drinkers also endorsed using alcohol in the morning. Of participants who provided spending data for alcohol, the median monthly spend was ₦3,200 (IQR: ₦1,500–₦10,000). Just over one-quarter (24.4%) of participants reported never using drugs, while 20.9% reported using drugs daily and 17.1% used drugs two to three times per day. Drugs were most commonly reported to be used in the morning, followed by evening and late night. Of participants who provided spending data for drugs, the median monthly spend was ₦2,000 (IQR: ₦1,000–₦5,000). Full frequency distribution can be found in Supplementary Table S3.

Table 3
Patterns of substance use among participants (N = 316)

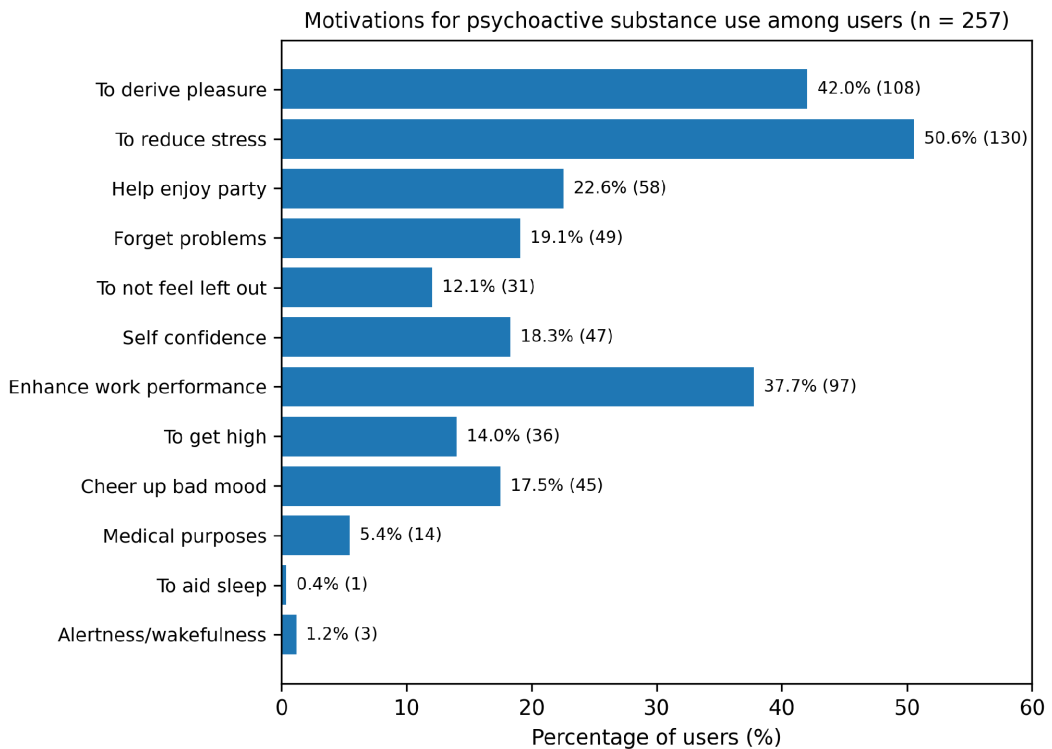
Variable	n (%) or Median (IQR)
Frequency of alcohol use	
Never	153 (48.4)
Monthly	21 (6.6)
Weekly	23 (7.3)
2-5 times weekly	55 (17.4)
Daily	64 (20.3)
Timing of alcohol use (n = 163)	
Morning	61 (37.4)
Mid-day	19 (11.7)
Afternoon	22 (13.5)
Evening	83 (50.9)
Late night	53 (32.5)
Frequency of drug use	
Never	77 (24.4)
Monthly	48 (15.2)
Weekly	47 (14.9)
2-5 times weekly	24 (7.6)
Daily	66 (20.9)
2-3 times daily	54 (17.1)
Timing of drug use (n = 239)	
Morning	52 (21.8)
Mid-day	14 (5.9)
Afternoon	24 (10.0)
Evening	42 (17.6)
Late night	42 (17.6)
Typical daily alcohol intake (n = 150)	
1-2 bottles	26 (17.3)
3-4 bottles	12 (8.0)
5-6 bottles	5 (3.3)
> 6 bottles	5 (3.3)
Non-daily drinkers	102 (68.0)
Monthly expenditure on alcohol (Naira, n = 149)	3200 (1500–10000)
Monthly expenditure on drugs (Naira, n = 84)	2000 (1000–5000)

Motivation for substance use

The second objective sought to identify factors that influence psychoactive substance use among commercial drivers. Figure 1 shows that motivations were largely occupational and psychosocial. The most reported reasons were stress reduction (50.6%), pleasure seeking (42.0%), and work performance enhancement (37.7%). Social motivations, including enjoying parties and avoiding social exclusion, were also reported, but intoxication, mood enhancement, medical reasons, and sleep- or alertness-related motivations were less common, as shown in Figure 1.

Figure 1

Distribution of self-reported motivations for psychoactive substance use among users (n = 257)



Substance-related behavioral risks

The third objective focused on evaluating risks associated with substance use behaviours. Of respondents that endorsed use of any substances, prevalence of lifetime drunk or drugged driving was reported by 21.8% (95% CI: 16.8-26.8). A low percentage of respondents (1.9%) endorsed a history of arrest/penalty for driving under the influence of alcohol/drugs. Despite risky self-reported driving behaviour, low lifetime penalty frequencies may indicate low exposure to enforcement action. Regarding composite risk classification, 39.6% of

participants were low risk, 42.1% moderate risk, and 18.4% high risk for problem substance use. Overall, one in five study participants was determined to have an abuse risk score indicative of high-risk substance behaviours. See Supplementary Table S4 for details on composite scale weighting and reliability.

Factors associated with driving Under the influence of alcohol/drugs and elevated Substance abuse risk

Objective 4 explored associations with driving under the influence and elevated risk for substance abuse. Using bivariate analysis, age was significantly associated with driving under the influence ($t = 2.63, p = .009$) and elevated abuse risk ($t = 3.33, p < .001$). Religion was also significantly associated with both outcomes. Having a vehicle was significantly associated with increased abuse risk, but not driving under the influence. Having consumed alcohol was significantly associated with driving under the influence (Fisher's exact test, $p < .001$). A higher motivation score was significantly associated with driving under the influence and elevated abuse risk. No other socio-demographic or occupational variables were associated with driving under the influence of or increased risk for substance abuse. Supplementary Table S5 includes all bivariate results for objective 4, including variables that were not significant.

Table 4***Bivariate associations between participant characteristics and study outcomes***

Predictor	DUI: Test statistic	DUI p-value	Elevated abuse risk: Test statistic	Abuse risk p-value
Age (Years)	t = 2.63	0.009*	t = 3.33	< 0.001*
Education level	$\chi^2(3) = 0.66$	0.883	$\chi^2(3) = 7.71$	0.052
Marital status	$\chi^2(3) = 2.28$	0.516	$\chi^2(3) = 3.44$	0.329
Daily income category	$\chi^2(3) = 0.68$	0.877	$\chi^2(3) = 0.75$	0.861
Religion	$\chi^2(3) = 10.51$	0.015*	$\chi^2(3) = 10.01$	0.018*
Vehicle type	$\chi^2(3) = 3.35$	0.341	$\chi^2(3) = 6.27$	0.099
Vehicle ownership	$\chi^2(3) = 1.64$	0.651	$\chi^2(3) = 13.40$	0.004*
Years of driving experience	t = 0.81	0.418	t = -1.49	0.137
Alcohol consumption	Fisher's exact test	< 0.001*	-	-
Any drug use	Fisher's exact test	0.771	-	-
Motivation score	t = -5.6	< 0.001*	t = -7.326	< 0.001*

As shown in Table 5, the multivariable logistic regression model indicated that age and motivation score independently forecast both outcomes. Higher age was significantly associated with decreased odds of driving under the influence (adjusted OR = 0.97, 95% CI: 0.93-1.00, $p = .049$) and decreased odds of high abuse risk (adjusted OR = 0.97, 95% CI: 0.94-0.99, $p = .017$). A higher motivation score was significantly associated with increased odds of driving under the influence (adjusted OR = 1.28, 95% CI: 1.09-1.52, $p = .003$) and higher abuse risk (adjusted OR = 1.55, 95% CI: 1.33-1.81, $p < .001$). Model diagnostics showed both models had a good fit ($p > .05$ on Hosmer-Lemeshow tests). Full multivariable model outputs are presented in Supplementary Table S6.

Table 5***Multivariable logistic regression predicting driving under the influence***

Predictor	Adjusted OR (Exp(B))	95% CI	p-value
Age (years)	0.97	0.93–1.00	0.049*
Motivation score	1.28	1.09–1.52	0.003*

Note. Model fit: Hosmer-Lemeshow chi-square (8) = 8.09, $p = .425$. Model adjusted for age, motivation score, education level, daily income category, vehicle type, alcohol consumption, and drug use. Only predictors retained in the final model are presented. * $p < .05$.

Table 6***Multivariable logistic regression predicting elevated substance abuse risk***

Predictor	Adjusted OR (Exp(B))	95% CI	p-value
Age (years)	0.97	0.94–0.99	0.017*
Motivation score	1.55	1.33–1.81	< 0.001*

Note. Model fit: Hosmer-Lemeshow chi-square (8) = 7.24, $p = .511$. Model adjusted for age, motivation score, education level, daily income category, and vehicle type. Only predictors retained in the final model are presented. * $p < .05$.

DISCUSSION

This research aimed to understand the prevalence, drivers, behavioral dangers, and related elements of psychoactive substance consumption among commercial drivers in Ile-Ife, Nigeria. Results from this study indicate that psychoactive substance use among commercial transport workers is prevalent, highly patterned, and primarily focused on alcohol, energy drinks, kolanut/ bitter kola and herbal mixture. Relative to other substances, cannabis, cocaine, opiates, and sedatives were less prevalent. These findings are important because they suggest that interventions targeting substance use and road safety around motor parks should focus beyond illicit drugs and target socially acceptable substances that are likely to be easily accessible around these locations.

The continued prominence of alcohol as a substance of choice among study participants, wherein just over half (54.8%) of participants were current alcohol users, highlights an important trend consistent with previous research among commercial drivers in Nigeria. In fact, an earlier study among transport workers in the Ile-Ife community also reported

a significant proportion of alcohol users among commercial drivers (Abiona et al., 2006). This continued prevalence of alcohol use within the same broad geographic setting suggests the practice may be common and ingrained within this occupational environment beyond general public health education messaging. Additional studies in other Nigerian settings have come to similar conclusions (Akande et al., 2023; Okafor et al., 2016; Yunusa et al., 2017).

Equally important was the reported high prevalence of energy drink use among participants in this study. Energy drink use was nearly equal to alcohol use within this sample, suggesting that stimulant-like products are now ingrained into the substance-use habits among commercial drivers. Prior studies among Nigerian commercial drivers did not uniformly assess energy drinks, making comparisons across studies difficult. However, preliminary evidence from Ghana suggests that this may be an emerging issue among commercial drivers in this region (Saku et al., 2020).

Participants' motivations were primarily coping with stress, enjoyment, and improved work performance. The desire to cope with stressors of the job (long hours, inadequate income, fatigue, staying awake while driving) was similar to reasons given in prior studies where drivers used substances to help cope with stress and anxiety of the job, suppress fatigue, and allow them to work harder (Alti- Muazu & Aliyu, 2008; Okpataku, 2015; Yunusa et al., 2017). Again, these findings suggest that drivers use substances for functional reasons in addition to recreational reasons.

Road-safety-wise, there were clear indications that substance use could adversely affect the roadworthiness of these workers. Over one-fifth of participants who used substances reported driving under the influence of alcohol or another substance at some point. However, few drivers reported being arrested or penalized for driving under the influence. If penalties are unlikely to be imposed after being caught, individuals will be less deterred from engaging in this risky behaviour. Additionally, almost one in five participants had a high risk for substance abuse, suggesting that there may be a role for screening, counselling, and referral services for transport workers at motor parks.

Multivariate analysis revealed that the 'motivation score' was an independent predictor of driving under the influence of alcohol and other substances, as well as a high risk for substance abuse. This indicates that the more reasons drivers have for using substances, the more likely they are to engage in risky road safety behaviour and have a high risk for substance abuse. Interventions should address reasons why drivers think using substances will help them better cope with stressors of the job, have fun, and work longer hours. Interventions could provide alternative means for drivers to reduce fatigue and cope with job stress without putting themselves or the public at risk. Age was inversely associated with both outcomes, suggesting that older drivers were at lower risk. This may be due to several

factors, including, but not limited to, more experience, less risk-taking as drivers get older, or older drivers developing health conditions or taking on increased family responsibilities. Vehicle ownership was significantly associated with higher substance abuse risk in bivariate analysis, though this association was not retained after adjustment for other variables in the multivariable model. This suggests that the observed relationship may have been influenced by confounding factors such as age and income category rather than vehicle ownership itself. Future longitudinal studies are needed to evaluate these relationships.

CONCLUSION

Psychoactive substance use among commercial road transport workers was common in Ile-Ife, Nigeria. Alcohol and energy drinks were the most used substances, followed by kolanut/bitter kola and herbal mixture. Driving while intoxicated and high-risk substance abuse were positively associated with strong motivation to use substances to cope with stress, obtain pleasure and work-related perceived beneficial effects.

It is recommended that prevention programmes should be strengthened beyond existing awareness campaigns to include screening and early identification of drivers who need support in managing stress, targeted counselling programmes that address the perceived benefits of psychoactive substance use, and enforcement of context-sensitive road safety interventions in motor parks, while longitudinal research should explore causal pathways. Given the inverse association between age and both driving under the influence and high abuse risk, prevention efforts should give particular attention to younger drivers, who this study identifies as carrying greater odds of hazardous substance-related behaviour. Future studies should also broaden substance use assessments to include energy drinks and other non-illicit stimulants, which this study identifies as a prominent but underexplored category in the Nigerian transport context.

This study was limited by its cross-sectional design. As such, causal relationships cannot be determined. Self-reported substance use is also subject to recall bias, and participants may under-report use of substances that may carry negative social stigma or legal consequences. The sampling technique was also limited to convenience sampling, which may limit the generalizability of findings to other motor parks. Despite these limitations, this study provides recent and setting-specific data on substance-use patterns, motives for use, and behavioral risks associated with psychoactive substance use among commercial transport workers in Ile-Ife, Nigeria.

REFERENCES

- Abegaz, T., & Gebremedhin, S. (2019). Magnitude of road traffic accident related injuries and fatalities in Ethiopia. *PLOS ONE*, 14(1), e0202240. <https://doi.org/10.1371/journal.pone.0202240>
- Abio, A., Sezirahiga, J., Davis, L. E., & Wilson, M. L. (2020). Substance use and sociodemographic correlates among adolescents in a low-income sub-Saharan setting. *Journal of Injury and Violence Research*, 12(1), 21-33. <https://doi.org/10.5249/jivr.v12i1.1195>
- Abiona, T. C., Aloba, O. O., & Fatoye, F. O. (2006). Pattern of alcohol consumption among commercial road transport workers in a semi-urban community in southwestern Nigeria. *East African Medical Journal*, 83(9), 494-499.
- Adejoke, A. A., Qudus, A. O., Chinweike, A. U., Modinat, A. A., Kehinde, A. A., Mutiat, O. A. A., & Ayodele, O. A. (2020). Kolanut consumption, its benefits and side effects. *World Journal of Advanced Research and Reviews*, 8(3), 356-362. <https://doi.org/10.30574/wjarr.2020.8.3.0483>
- Ajayi, A. I., & Somefun, O. D. (2020). Recreational drug use among Nigerian university students: Prevalence, correlates and frequency of use. *PLOS ONE*, 15(5), e0232964. <https://doi.org/10.1371/journal.pone.0232964>
- Akande, R. O., Akande, J. O., Babatunde, O. A., Ajayi, A. O., Ajayi, A. A., Ige, R. O., & Olatunji, M. B. (2023). Psychoactive substance abuse among commercial bus drivers in Umuahia, Abia State, South-Eastern Nigeria: An uncontrolled epidemic with attendant road traffic crashes. *BMC Public Health*, 23, Article 250. <https://doi.org/10.1186/s12889-023-15039-6>
- Alti-Muazu, M., & Aliyu, A. A. (2008). Prevalence of psychoactive substance use among commercial motorcyclists and its health and social consequences in Zaria, Nigeria. *Annals of African Medicine*, 7(2), 67-71. <https://doi.org/10.4103/1596-3519.55678>
- Cardoso, M., Fulton, F., Callaghan, J. P., Johnson, M., & Albert, W. J. (2019). A pre/post evaluation of fatigue, stress and vigilance amongst commercially licensed truck drivers performing a prolonged driving task. *International Journal of Occupational Safety and Ergonomics*, 25(3), 344-354. <https://doi.org/10.1080/10803548.2018.1491666>
- Eneh, O. C., Okosun, A., Egbenta, I. R., Obi, N. I., Oloto, M. C., Ubani, O., & Eneonwo, C. I. (2023). A comparative analysis of road and vehicle qualities as factors of road traffic carnage in Nigeria. *BMC Public Health*, 23, Article 2173. <https://doi.org/10.1186/s12889-023-17089-2>

Federal Road Safety Corps. (2020). United Nations Decade of Action for Road Safety (2011-2020): Status report. https://frsc.gov.ng/wp-content/uploads/2021/01/STATUS_REPORT_OF_THE_UN_DECADE_OF_ACTION_2011-2020-2_compressed.pdf

Federal Road Safety Corps. (2022). Federal Road Safety Corps 2021 annual report. <https://frsc.gov.ng/wp-content/uploads/2022/11/2021-ANNUAL-REPORT-1.pdf>

Giroto, E., Mesas, A. E., De Andrade, S. M., & Birolim, M. M. (2014). Psychoactive substance uses by truck drivers: A systematic review. *Occupational and Environmental Medicine*, 71(1), 71-76. <https://doi.org/10.1136/oemed-2013-101452>

Idowu, A., Funmilayo, D., Oyindamola, A., Halima, N., & Kolawole, D. (2022). Herbal high mixture as an emerging psychoactive substance prevalence among commercial drivers in Lagos, Nigeria. *Annals of Anatomy Research*, 1(1), Article 1005.

Jadaan, K., Al-Braizat, E., Al-Rafayah, S., Gammoh, H., & Abukahlil, Y. (2018). Traffic safety in developed and developing countries: A comparative analysis. *Journal of Traffic and Logistics Engineering*, 6(1), 157-161.

Kehinde, O. S., & Olusegun, F. F. (2012). Taking alcohol by deception II: Paraga (alcoholic herbal mixture) use among commercial motor drivers in a southwestern Nigerian city. *BMC Research Notes*, 5, Article 301. <https://doi.org/10.1186/1756-0500-5-301>

Kiwango, G., Francis, F., Moshiro, C., Möller, J., & Hasselberg, M. (2021). Association between alcohol consumption, marijuana use and road traffic injuries among commercial motorcycle riders: A population-based case-control study in Dar es Salaam, Tanzania. *Accident Analysis & Prevention*, 160, Article 106325. <https://doi.org/10.1016/j.aap.2021.106325>

Lasebikan, V. O., & Ayinde, O. (2012). Rapid situation assessments of alcohol and substance use among commercial vehicle drivers in Nigeria. *East African Medical Journal*, 89(11), 363-371.

Leyton, V., Bombana, H. S., Magalhães, J. G., Panizza, H. N., Sinagawa, D. M., Takitane, J., & Muñoz, D. R. (2019). Trends in the use of psychoactive substances by truck drivers in São Paulo State, Brazil: A time-series cross-sectional roadside survey (2009-2016). *Traffic Injury Prevention*, 20(2), 122-127. <https://doi.org/10.1080/15389588.2018.1552786>

Okafor, C., Udofia, O., & Onyuku, T. (2016). Pattern of psychoactive substance use among long-distance commercial drivers in Calabar, Nigeria. *International Neuropsychiatric Disease Journal*, 8(3), 1-9.

Okpataku, C. I. (2015). Pattern and reasons for substance use among long-distance commercial drivers in a Nigerian city. *Indian Journal of Public Health*, 59(4), 259-263.

Okpataku, C. I. (2016). Sociodemographic correlates of substance use among long-distance commercial vehicle drivers. *Journal of Medicine in the Tropics*, 18(1), 6-11. <https://doi.org/10.4103/2276-7096.176053>

Oladeji, P. B., & Agbabiaka, H. I. (2021). Intra-urban mobility: The place of para-transit operations in the ancient town of Ile-Ife, Nigeria. *Scientific Journal of Silesian University of Technology. Series Transport*, 111, 109-118.

Onaolapo, O. J., Olofinnade, A. T., Ojo, F. O., Adeleye, O., Falade, J., & Onaolapo, A. Y. (2022). Substance use and substance use disorders in Africa: An epidemiological approach to the review of existing literature. *World Journal of Psychiatry*, 12(10), 1268-1286. <https://doi.org/10.5498/wjpv12.i10.1268>

Osun State Government. (n.d.). Ilé-Ifè. Retrieved April 10, 2026, from <https://www.osunstate.gov.ng/ile-ife/>

Saku, E. Y., Nuro-Ameyaw, P., Amenya, P. C., Kpodo, F. M., Esua-Amofo, P., & Kortei, N. K. (2020). Energy drink consumption prevalence and awareness of potential health implications among commercial drivers in the Ho municipality of Ghana. *BMC Public Health*, 20, Article 1304.

Saunders, J. B., Aasland, O. G., Babor, T. F., De la Fuente, J. R., & Grant, M. (1993). Development of the Alcohol Use Disorders Identification Test (AUDIT): WHO collaborative project on early detection of persons with harmful alcohol consumption-II. *Addiction*, 88(6), 791-804. <https://doi.org/10.1111/j.1360-0443.1993.tb02093.x>

Schifano, F., Catalani, V., Sharif, S., Napoletano, F., Corkery, J. M., Arillotta, D., & Guirguis, A. (2022). Benefits and harms of smart drugs (nootropics) in healthy individuals. *Drugs*, 82(6), 633-647. <https://doi.org/10.1007/s40265-022-01716-0>

Skinner, H. A. (2001). Assessment of substance abuse: Drug Abuse Screening Test (DAST). In *Encyclopedia of Drugs, Alcohol, and Addictive Behaviors* (2nd ed.).

Sowunmi, F., & Akinmuleya, A. S. A. (2023). Market concentration and demand for alcoholic beverages in major motor parks within Ibadan metropolis, Oyo State, Nigeria. *Applied Studies in Agribusiness and Commerce*, 17(2). <https://doi.org/10.19041/APSTRACT/2023/2/3>

Turner, C., & McClure, R. (2003). Age and gender differences in risk-taking behaviour as an explanation for high incidence of motor vehicle crashes as a driver in young males. *Injury Control and Safety Promotion*, 10(3), 123-130. <https://doi.org/10.1076/icsp.10.3.123.14560>

United Nations Office on Drugs and Crime. (2019). Drug use in Nigeria 2018. https://www.unodc.org/documents/data-and-analysis/statistics/Drugs/Drug_Use_Survey_Nigeria_2019_BOOK.pdf

World Health Organization. (n.d.). Substance abuse. WHO Regional Office for Africa. Retrieved May 30, 2026, from <https://www.afro.who.int/health-topics/substance-abuse>

World Health Organization. (2023). Global status report on road safety 2023. <https://www.who.int/publications/i/item/9789240086517>

World Health Organization. (2026, May 1). Road traffic injuries. <https://www.who.int/news-room/fact-sheets/detail/road-traffic-injuries>

Yakubu, M. T., & Quadri, A. L. (2012). Garcinia kola seeds: Is the aqueous extract a true aphrodisiac in male Wistar rats? *African Journal of Traditional, Complementary and Alternative Medicines*, 9(4), 530-535. <https://doi.org/10.4314/ajtcam.v9i4.9>

Yosef, T., Getachew, D., Bogale, B., Wondimu, W., Shifera, N., Negesse, Y., & Gerense, H. (2021). Psychoactive substance use and its associated factors among truck drivers in Ethiopia. *BioMed Research International*, 2021, Article 1604245. <https://doi.org/10.1155/2021/1604245>

Yunusa, U., Bello, U. L., Idris, M., Haddad, M. M., & Adamu, D. (2017). Determinants of substance abuse among commercial bus drivers in Kano metropolis, Kano State, Nigeria. *American Journal of Nursing Science*, 6(2), 125-130.

Supplementary Table S1***Knowledge of psychoactive substances (N = 316)***

Substance	Know n (%)
Alcohol	284 (89.9)
Tobacco (Cigarettes/Snuff)	256 (81.0)
Kola Nut/Bitter Kola	272 (86.1)
Herbal mixtures (paraga/bitters)	265 (83.9)
Energy Drinks	286 (90.5)
Stimulants (coffee/amphetamines)	197 (62.3)
Cocaine or heroin	131 (41.5)
Cannabis (marijuana)	174 (55.1)
Opiates (Codeine/Morphine/Tramadol)	142 (44.9)
Sedatives (Valium/Lexotan)	71 (22.5)

Supplementary Table S2

Perceived accessibility of psychoactive substances

Substance	Impossible	Very difficult	Fairly difficult	Fairly easy	Very easy	Don't know	Missing
Alcohol	23 (7.3)	4 (1.3)	12 (3.8)	12 (3.8)	234 (74.1)	31 (9.8)	-
Tobacco (Cigarettes/Snuff)	7 (2.2)	5 (1.6)	7 (2.2)	10 (3.2)	195 (61.7)	32 (10.1)	60 (19.0)
Kola Nut/Bitter Kola	6 (1.9)	2 (0.6)	4 (1.3)	16 (5.1)	219 (69.3)	25 (7.9)	44 (13.9)
Herbal mixtures (paraga/bitters)	10 (3.2)	2 (0.6)	7 (2.2)	18 (5.7)	203 (64.2)	25 (7.9)	51 (16.1)
Energy Drinks	18 (5.7)	8 (2.5)	6 (1.9)	12 (3.8)	175 (55.4)	67 (21.2)	30 (9.5)
Stimulants (coffee/ amphetamines)	7 (2.2)	4 (1.3)	2 (0.6)	21 (6.6)	121 (38.3)	42 (13.3)	119 (37.7)
Cocaine or heroin	16 (5.1)	40 (12.7)	15 (4.7)	3 (0.9)	15 (4.7)	42 (13.3)	185 (58.5)
Cannabis (marijuana)	8 (2.5)	28 (8.9)	28 (8.9)	25 (7.9)	42 (13.3)	43 (13.6)	142 (44.9)
Opiates (Codeine/Morphine/ Tramadol)	9 (2.8)	33 (10.4)	16 (5.1)	15 (4.7)	25 (7.9)	44 (13.9)	174 (55.1)
Sedatives (Valium/Lexotan)	7 (2.2)	21 (6.6)	7 (2.2)	2 (0.6)	13 (4.1)	21 (6.6)	245 (77.5)

Supplementary Table S3*Detailed frequency distributions of substance use patterns (N = 316)*

Substance	Never	Monthly	Weekly	2-5 times weekly	Daily	2-3 times daily
Alcohol	153 (48.4)	21 (6.6)	23 (7.3)	55 (17.4)	64 (20.3)	0 (0.0)
Tobacco (Cigarettes/Snuff)	278 (88.0)	1 (0.3)	7 (2.2)	4 (1.3)	14 (4.4)	12 (3.8)
Kola Nut/Bitter Kola	205 (64.9)	41 (13.0)	22 (7.0)	13 (4.1)	22 (7.0)	13 (4.1)
Herbal mixtures (paraga/bitters)	204 (64.6)	23 (7.3)	27 (8.5)	8 (2.5)	33 (10.4)	21 (6.6)
Energy Drinks	151 (47.8)	42 (13.3)	44 (13.9)	26 (8.2)	34 (10.8)	19 (6.0)
Stimulants (coffee/amphetamines)	261 (82.6)	28 (8.9)	10 (3.2)	5 (1.6)	7 (2.2)	5 (1.6)
Cocaine or Heroin	308 (97.5)	2 (0.6)	3 (0.9)	0 (0.0)	1 (0.3)	2 (0.6)
Cannabis (Marijuana)	291 (92.1)	7 (2.2)	5 (1.6)	2 (0.6)	6 (1.9)	5 (1.6)
Opiates (Codeine/Morphine/ Tramadol)	303 (95.9)	5 (1.6)	2 (0.6)	1 (0.3)	4 (1.3)	1 (0.3)
Sedatives (Valium/Lexotan)	310 (98.1)	4 (1.3)	1 (0.3)	0 (0.0)	1 (0.3)	0 (0.0)

Supplementary Table S4

Item composition and reliability of composite scales

Scale	Items Included	Cronbach's α
Substance use risk subscale	Alcohol use, Tobacco use, Kola nut use, Herbal mixture use, Amphetamine use, Cocaine use, Cannabis use, Opiate use, Sedative use, Energy drink use	0.679
Timing Risk Subscale (Alcohol)	Alcohol use in the morning, Alcohol use at midday, Alcohol use in the afternoon, Alcohol use in the evening, Alcohol use late at night	0.408 ^a
Timing Risk Subscale (Drugs)	Drug use in the morning, Drug use at midday, Drug use in the afternoon, Drug use in the evening, Drug use late at night	0.453 ^a
DUI risk subscale	DUI Experience: Felt Overconfident, DUI Experience: Loss of Coordination, DUI Experience: Impaired/Blurred Vision, DUI Experience: Carelessness or Speeding	0.668
Motivation subscale	To experience pleasure, To relieve stress, For parties or social events, To forget problems, To feel a sense of belonging, To gain confidence, To work better or longer, To feel "high", To improve mood, For medical or health reasons, To help with sleep, To stay awake or alert	0.740

^a Timing-of-use subscales showed lower internal consistency but were retained due to conceptual importance in capturing temporal risk patterns of substance use in relation to driving.

Supplementary Table S5**Full bivariate association table**

Predictor	DUI n (%) or Mean \pm SD	No DUI n (%) or Mean \pm SD	Test statistic	p-value
Driving under the influence (DUI)				
Age (Years)	43.0 \pm 10.7	38.8 \pm 10.8	t = 2.63	0.009*
Education level			$\chi^2(3) = 0.66$	0.883
None/Primary Uncompleted	0 (0.0)	1 (100.0)		
Primary Completed	13 (25.0)	39 (75.0)		
Secondary Completed	31 (20.9)	117 (79.1)		
Post-secondary	12 (21.4)	44 (78.6)		
Marital status			$\chi^2(3) = 2.28$	0.516
Single	2 (11.8)	15 (88.2)		
Married (Monogamous)	40 (21.4)	147 (78.6)		
Polygamous	12 (25.0)	36 (75.0)		
Divorced/Widowed/Separated	2 (40.0)	3 (60.0)		
Daily income category			$\chi^2(3) = 0.68$	0.877
Low Income	20 (24.7)	61 (75.3)		
Lower-Middle	14 (20.0)	56 (80.0)		
Upper-Middle	10 (23.3)	33 (76.7)		
High Income	12 (20.0)	48 (80.0)		
Religion			$\chi^2(3) = 10.51$	0.015*
Christianity	33 (20.1)	131 (79.9)		
Islam	19 (21.6)	69 (78.4)		
Traditional worship	3 (75.0)	1 (25.0)		
Others	1 (100.0)	0 (0.0)		
Vehicle type			$\chi^2(3) = 3.35$	0.341
Motorcycle	27 (22.9)	91 (77.1)		

Tricycle	0 (0.0)	9 (100.0)		
Taxi Cab	3 (15.0)	17 (85.0)		
Bus	26 (23.6)	84 (76.4)		
Vehicle ownership			$\chi^2(3) = 1.64$	0.651
Self-Owned	37 (20.9)	140 (79.1)		
Third-Party (Friend)	1 (10.0)	9 (90.0)		
Third-Party (Family)	1 (33.3)	2 (66.7)		
Commercial Hire	17 (25.4)	50 (74.6)		
Years of driving experience	13.7 ± 10.5	15.0 ± 11.5	t = 0.81	0.418
Alcohol consumption			Fisher's exact test	< 0.001*
Yes	48 (29.4)	115 (70.6)		
No	8 (8.5)	86 (91.5)		
Any drug use			Fisher's exact test	0.771
Yes	53 (22.2)	186 (77.8)		
No	3 (16.7)	15 (83.3)		
Motivation score	3.8 ± 2.3	2.0 ± 2.0	t = -5.6	< 0.001*
Elevated abuse risk				
Age (Years)	44.06 ± 10.19	39.92 ± 11.06	t = 3.33	< 0.001*
Education level			$\chi^2(3) = 7.71$	0.052
None/Primary Uncompleted	2 (100.0)	0 (0.0)		
Primary Completed	37 (58.7)	26 (41.3)		
Secondary Completed	108 (62.8)	64 (37.2)		
Post-secondary	61 (77.2)	18 (22.8)		
Marital status			$\chi^2(3) = 3.44$	0.329
Single	11 (61.1)	7 (38.9)		
Married (Monogamous)	162 (68.6)	74 (31.4)	uh	
Polygamous	31 (56.4)	24 (43.6)		

Divorced/Widowed/Sep- arated	4 (57.1)	3 (42.9)		
Daily income category			$\chi^2(3) = 0.75$	0.861
Low Income	66 (64.1)	37 (35.9)		
Lower-Middle	50 (63.3)	29 (36.7)		
Upper-Middle	35 (64.8)	19 (35.2)		
High Income	52 (69.3)	23 (30.7)		
Religion			$\chi^2(3) = 10.01$	0.018*
Christianity	141 (67.8)	67 (32.2)		
Islam	67 (65.0)	36 (35.0)		
Traditional worship	0 (0.0)	4 (100.0)		
Others	0 (0.0)	1 (100.0)		
Vehicle type			$\chi^2(3) = 6.27$	0.099
Motorcycle	98 (66.2)	50 (33.8)		
Tricycle	11 (100.0)	0 (0.0)		
Taxi Cab	13 (61.9)	8 (38.1)		
Bus	86 (63.2)	50 (36.8)		
Vehicle ownership			$\chi^2(3) = 13.40$	0.004*
Self-Owned	162 (71.7)	64 (28.3)		
Third-Party (Friend)	7 (63.6)	4 (36.4)		
Third-Party (Family)	2 (66.7)	1 (33.3)		
Commercial Hire	37 (48.7)	39 (51.3)		
Years of driving experience	13.64 ± 10.54	15.56 ± 11.31	t = -1.49	0.137
Motivation score	1.65 ± 1.83	3.47 ± 2.14	t = -7.33	< 0.001*

χ^2 = Pearson Chi-square; t = independent samples t-test. * $p < 0.05$.

Supplementary Table S6***Full multivariable regression outputs***

Predictor	B	S.E.	Adjusted OR (Exp(B))	95% CI	p-value
Logistic regression predicting driving under the influence (DUI)					
Age	-0.04	0.02	0.97	0.93–1.00	0.049*
Motivation score	0.25	0.09	1.28	1.09–1.52	0.003*
Education level					
None/Primary Uncompleted vs Post-secondary	-0.65	42513.20	0.52	0.00–0.00	1.000
Primary Completed vs Post-secondary	0.26	0.54	1.30	0.45–3.77	0.624
Secondary Completed vs Post-secondary	-0.28	0.44	0.76	0.32–1.78	0.520
Daily income category					
Low Income vs High Income	0.41	0.48	1.51	0.59–3.87	0.396
Lower-Middle vs High Income	0.06	0.49	1.06	0.41–2.78	0.899
Upper-Middle vs High Income	0.21	0.55	1.24	0.42–3.61	0.700
Vehicle type					
Motorcycle vs Bus	-0.07	0.40	0.94	0.43–2.06	0.868
Tricycle vs Bus	-19.92	13852.71	0.00	0.00–0.00	0.999
Taxi Cab vs Bus	-0.39	0.76	0.67	0.15–3.00	0.604
Alcohol consumption					
No vs Yes	-0.90	0.47	0.41	0.16–1.02	0.054
Any drug use					
No vs Yes	-0.03	0.74	0.97	0.23–4.13	0.972
Model fit: Hosmer-Lemeshow $\chi^2(8) = 8.09, p = 0.425$					

Logistic regression predicting elevated abuse risk

Age	-0.04	0.02	0.97	0.94–0.99	0.017*
Motivation score	0.44	0.08	1.55	1.33–1.81	< 0.001*
Education level					
None/Primary Uncompleted vs Post-secondary	-0.04	42491.23	0.96	0.00–0.00	1.000
Primary Completed vs Post-secondary	1.02	0.50	2.79	1.06–7.34	0.039*
Secondary Completed vs Post-secondary	0.36	0.39	1.43	0.67–3.06	0.353
Daily income category					
Low Income vs High Income	0.63	0.44	1.89	0.80–4.44	0.147
Lower-Middle vs High Income	0.25	0.43	1.28	0.55–2.98	0.564
Upper-Middle vs High Income	0.16	0.48	1.17	0.46–2.98	0.737
Vehicle type					
Motorcycle vs Bus	-0.15	0.36	0.86	0.43–1.74	0.684
Tricycle vs Bus	-21.09	13785.14	0.00	0.00–0.00	0.999
Taxi Cab vs Bus	0.15	0.57	1.17	0.38–3.54	0.787

Model fit: Hosmer-Lemeshow $\chi^2(8) = 7.24, p = 0.511$

Reference categories: Post-secondary education, High income, Bus vehicle type, Alcohol use = Yes, Drug use = Yes.