



## **LONG DISTANCE DRIVERS' PERCEPTION OF KOLA NUT USE AND RISK OF ROAD TRAFFIC ACCIDENTS**

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### **Abstract**

*This study has two goals. First was to describe the prevalence of use of kola nut among long distance drivers, and second was to investigate long distance drivers' perception of kola nut use and risk of road traffic accidents. The study adopted a mixed-method design. Study 1 used the quantitative method to examine prevalence of kola nut use in the sample. Participants were 104 all-men, long distance drivers of commercial 18-seater mini-buses (age range = 25 - 54 years; mean age = 37.04 years; SD = 4.68). The drivers completed adapted variant of Psychoactive Substance Abuse Questionnaire (PSAQ). Descriptive analysis of data showed a high prevalence of kola nut use among long distance drivers, 84.62% of the sample use kola nut. Study 2 used qualitative method (in-depth interview) to investigate long distance drivers' perception of kola nut use and risk of road traffic accidents. Participants for this study (N = 43) were interviewed at seven small motor parks at two locations in Enugu state, south-east Nigeria. Analysis of qualitative data showed that long distance drivers showed positive perception towards kola nut use and its influence on road traffic accidents. These findings were discussed, and the authors recommended that kola nut be carefully considered as an effective strategy for road safety.*

*Key words: Caffeine; Kola nut; Long distance drivers; Principles of reinforcement; Road traffic accidents.*



## Introduction

The number of people who die in road traffic accidents on Nigerian roads is too many that if an individual is told about the death of another, the spontaneous question asked is: “is it through accident?” The bulk of road crashes on the Nigerian highways involve long distance drivers of commercial motor vehicles, such as trailers, luxurious buses, trucks and fuel tankers. But long distance drivers that have not received much attention in research are drivers of 18-seater commercial mini-buses. This group of drivers constitute the highest road offenders (Juillard, Labinjo, Kobusingye, & Hyder, 2010); according to the International Transport Forum (ITF, 2017), 63% of fatal crashes in Nigeria involve operators of commercial mini-buses, which ply distances of between 700 and 900 kilometers or more. Those mini-bus drivers like all other long distance drivers, routinely experience monotonous and extended driving periods in sedentary position and this condition often culminates in lapses of vigilance in relation to the task of driving. Studies (e.g., Asogwa, 1978; Logan, 2002; Mefoh, Ugwu, & Eze, 2018), which examined the use of psychoactive substances in commercial drivers observed that many commercial drivers use psychotropic substances to maintain alertness. However, there seems to be little knowledge about the use of caffeine or caffeinated substances, such as kola nut in long distance drivers.

Caffeine is an alkaloid occurring naturally in some 60 plant species, of which kola nut is the most well known (Addicott, 2014). The kola nut is the fruit of the evergreen tropical rainforest kola nut tree, called “*cola acuminata*”. The kola nut production capacity of Nigeria is 52.4 percent of the worldwide kola nut production (ITC, 2013). Kola nut is found in clusters. One cluster has five, six, or more individual nuts. Each single kola nut contains micronutrients of about 2-3 percent caffeine and 1–2 percent theobromine, both of which act as stimulants when consumed (Dewole, Dewumi, Alabi, and Adegoke, 2013). One single nut can be separated into two, three, five or eight sections or lobes. Many drivers believe that kola nut helps drivers to stay alert, but they have no idea how this happens. The reinforcement principles by Skinner (1938) seem to explain the probable motivation for use



of kola nut in long distance drivers. The model proposes that reinforcement increases the probability that behaviour would recur. Since the drivers believe that kola nut postpones sleep, the behaviour to use kola nut when on duty also increases. Studies (e.g., Asogwa, 1978; De Valck & Cluydts, 2001) have now shown that it is the caffeine inside the kola nut that mediates the psychotropic effects seen in behaviour of kola nut users. Asogwa (1978) points to this fact when he wrote: “in view of the fact that kola nut produces its effects mainly due to its caffeine content, it should be classified as a drug and studied in order to establish, as with alcohol, the quantity compatible with safety on the road” (p.1228).

Caffeine is a central nervous system stimulant. Like all other psychotropic drugs, caffeine increases arousal levels of users by altering brains normal activity. Fredholm, Battig, Holmen, Nehig, and Zvartau (1999) describe caffeine as a psycho-stimulant, which works by suppressing the innate adenosine mediated drive to sleep while activating arousal. Caffeine occurs naturally in plants. It is unregulated in nearly all parts of the world, including Nigeria. It is therefore one of the world’s most widely consumed psychoactive drugs (Sharwood, Elkington, Meuleners, Ivers, Boufous, & Stevenson, 2013), and one of the least studied. Caffeine’s major psychological effects when taken in moderate dosages include a decrease in fatigue and drowsiness, an increase in speed and efficiency, and reduction in the number of errors, especially in routinely monotonous tasks like long distance driving. While caffeine seems to promote feeling of alertness and energy, it can also cause a number of unpleasant side effects. Large dosage of caffeine causes insomnia, tremor, restlessness, increased heart rate and anxiety. There is also evidence of caffeine dependence (De Valck & Cluydts, 2001). Withdrawal from any addictive substance, including caffeine, can present itself in the form of shakiness. Caffeine induced withdrawal symptoms include headache, drowsiness, impaired concentration, anxiety, irritability, nausea, stiffness, muscle aches and vomiting.

Previous studies (e.g., Asogwa, 1978; Logan, 2002; Mefoh et al. 2018) show that drivers who take psychoactive substances, including caffeinated substance such as kola nut, are more likely to suffer performance deficit on complex psycho-motor tasks due to the effects of



drugs on the central nervous system. Asogwa, (1978) and Bekibele et al. (2007) observed that extensive use of kola nut is a significant factor in road traffic accidents in Nigeria. The studies argue that after ingesting kola nut, long distance drivers' drive for hours without rest and food until fatigue inevitably sets in. Asogwa (1978) reports that in a study that examined the mental state of 555 drivers involved in road accidents in Nigeria showed that 12.25% reported that they have eaten kola nut. Other studies (Afolabi & Kolawole, 2017; Ilechukwu, 1985; Onyemaechi & Ofoma, 2017) have also found that kola nut debilitates driving performance. In contrast, Sharwood et al. (2013) reported that long distance drivers who consume caffeinated substances were far less likely to be involved in road traffic accidents than other drivers who did not use the substance. The study observed that long distance truck drivers who consumed caffeine were involved in just 116 of the 530 road crashes by truck drivers.

None of the previous studies sought long distance drivers' opinions about the use of caffeine or caffeinated substances, such as kola nut, and how use would influence road safety or road accidents. The present study bridges this lacuna in literature by quizzing long distance drivers about this concern. The study adopts a mixed-method design to investigate two objectives. First was to describe the prevalence of kola nut use in long distance drivers of 18-seater mini-buses; and the second was to examine the drivers' perceptions on kola nut use and associated risk to road traffic accidents.

## **Method**

### ***Study 1***

#### ***Participants***

Participants for this study were 104 long distance commercial drivers of 18-seater mini-buses, who plied the Nigerian highways from the Northern region of the country into the Southern region, and vice versa. All the long distance commercial drivers were male. Their



ages range between 25 and 54 years, with a mean age of 37.04 years and a standard deviation of 4.68. Of the 104 long distance drivers, 73 (70.19%) were married, while the remaining 31 (29.81%) were single; none was divorced. With regard to their educational attainment, 11 (10.58%) of the drivers completed tertiary education; 57 (54.81%) completed secondary school education, while 9 (8.65%) of them quitted schooling at that level of education. The rest 27 (25.96%) long distance drivers completed primary school education, but did not proceed any further. All the participants have 3 years of driving experience or more; the average years of the long distance drivers driving experience was 5.31 years. The sampling technique adopted in recruiting participants for the study was availability sampling method.

### ***Instrument***

The questionnaire form used in this study consisted of two sections: sections A and B. Section A elicited information about a long distance driver's demographic characteristics, like age, educational attainment, marital status, etc, while Section B assesses the frequency of kola nut use in long distance commercial drivers of 18-seater mini-bus. The measure was adapted from the Psychoactive Substance Abuse Questionnaire (PSAQ) (Eze, 2006). The PSAQ is a 5-item measure, which is used to assess frequency of psychoactive substance abuse. The validation of the instrument shows that the measure has a content validity and test-retest reliability index of 0.61 (N = 55). The adaptation involves substituting the psychoactive substances on the PSAQ with kola nut. The original instruction remained unchanged. The instruction requires a participant to give a rating of between 0 and 4 to each of the following 5 statements: "never used it" (scored 0), "have not used it more than 2 times" (scored 1), "uses it less than 3 times in one week" (scored 2), "uses it more than 3 times in one week" (scored 3), and "used it frequently in the past but has stopped" (scored 4). The revalidation of the instrument in healthy Nigerian adults showed a content validity of 86% (by 3 judges) and an internal consistency reliability index of 0.67 (Chukwu, Okonkwo, & Mefoh, 2019).



### ***Procedure, design and data analysis***

Data were collected from long distance commercial drivers at several motor parks in Obollo-Afor (near Nsukka). Prior to the collection of data, the drivers were informed that participation in the study was voluntary and that agreeing to participate in the study implied consent. The design of the study was cross-sectional, as data were collected across groups of long distance drivers once and on the spot. Descriptive statistics (frequency distribution) was the statistic used to describe the prevalence of kola nut use among long distance commercial drivers of 18-seater mini-buses.

### ***Ethical standard***

Approval for this study was sought and obtained from the institutional review board (IRB) of the Faculty of the Social Sciences, University of Nigeria, Nsukka. The study was therefore performed in accordance with the ethical standards laid down in the American Psychological Association ethical principles of psychologists and code of conduct (APA, 2010).

### ***Study 2***

#### ***The study setting***

The study was conducted across Obollo-Afor and 9<sup>th</sup> Mile Corner areas in Enugu state. Obollo-Afor is a semi-rural community in Udenu Local Government Area in Enugu state, south-eastern, Nigeria. Obollo-Afor (near Nsukka) is popular for being a gateway town into most parts of the south from the north, or a point of departure towards the north from the East. Because of this, the town holds a great significance for both transporters and small businesses. Several small and busy motor parks litter along the highway across the town, stretching about a distance of about 2 kilometers. A lot of commercial activities thrive on both sides of the road that that part of the town usually bubbles with activities 24/7, seven days a week. Qualitative data for this study were obtained from long distance commercial



drivers in some of those small motor-parks at Obollo-Afor. Also, some interviews were conducted at the 9<sup>th</sup> Mile Corner, just about 25 kilometers away from Obollo-Afor, The 9<sup>th</sup> Mile Corner is a much more busy area than Obollo-Afor for two major reasons. The first is that 9<sup>th</sup> Mile Corner is home to two prominent brewery plants - the Nigerian Bottling Company and the Nigerian Breweries PLC. Another reason why the 9<sup>th</sup> Mile Corner is a beehive of activities is that 9<sup>th</sup> Mile Corner is an area where many drivers stop to allow passengers buy things or eat before continuing on their journey. The 9<sup>th</sup> Mile Corner has several motor parks, with some long distance drivers actually terminating and/or beginning their journey at the 9<sup>th</sup> Mile Corner.

### ***Participants and interviews***

Qualitative data for this study were collected by using an open-ended in-depth interview. The participants for the study (N = 43) were long distance commercial drivers of 18-seater mini-bus. All the participants were male drivers between the age of 32 - 55 years (Mean age = 39.62 years; SD = 3.58). In the sample, 26 (60.67%) were married, 15 (34.88%) were single, and 2 (4.65%) were divorced or separated. The average age of driving experience was 6.02 years. The in-depth interview was conducted one-by-one (i.e., individually), over a period of three weeks. The duration of each interview was eight minutes or less; this suited the drivers, owing to their on-the-go nature. The drivers were asked about their views regarding kola nut use and risk of road traffic accidents. The researchers identified and recruited only long distance drivers who have stayed in the business of driving long distances for five years or more. That was the inclusion criterion; any long distance driver who has less than five years of driving experience was not interviewed or included in the study. The procedure for the interview was to explain the purpose of the study to a participant, and then request the individual's voluntary participation in the study. The driver then gives a verbal consent to participate in the study. Interviews were conducted in English and recorded with a digital device with the consent of the each interviewee.



Recorded interview were transcribed, analyzed, and summarized to illustrate long distance drivers' perceptions on the use of kola nut and risk of road traffic accidents.

### ***Data analysis***

The transcripts were subjected to thematic coding and analysis. However, the thematic codes used in the analysis were based on prior themes reflected in the interview guide. The interview guide was developed to access long distance commercial drivers' perception of kola nut use in long distance drivers' and the associated risk of road traffic accidents.

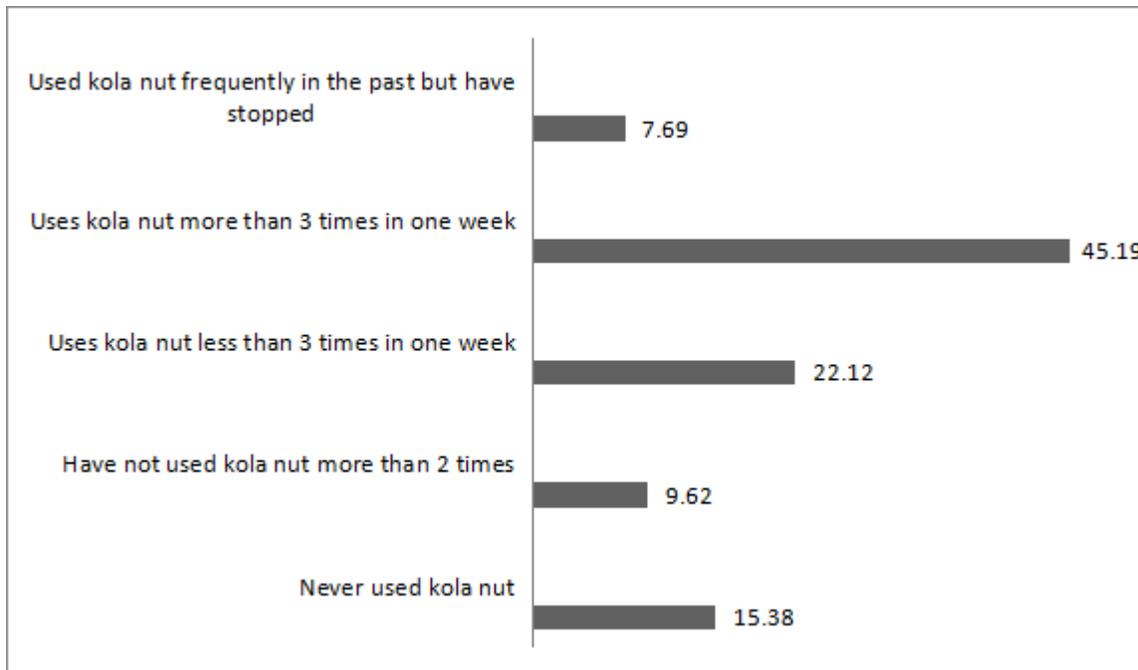
## **Results**

### **Study 1**

The frequency or prevalence of use of kola nut by long distance drivers is shown in Figure 1. The finding revealed that the use of kola nut in long distance drivers is pervasive; many long distance drivers commonly use kola nut. Out of the 104 long distance drivers examined, only 16, representing 15.38% of the sample indicated that they had never used kola nut. The remaining 88 (84.62%) of the sample reported that they have either used kola nut in the past or are still using the substance. The breakdown of the category of usage are as follows: 10 long distance drivers indicated that they have not used kola nut more than two times; 23 long distance drivers stated that they use kola nut less than three times in one week; 47 long distance drivers disclosed that they use the substance more than three times in one week; and the remaining 8 drivers reported that they have used kola nut frequently in the past but have stopped.

### Figure 1

A bar chart displaying schematic illustration of the percentage use of kola nut in long distance commercial mini-bus drivers



## Study 2

### Kola nut use in long distance commercial drivers

Data obtained from the interviewees show that the use of kola nut is common among long distance drivers. This finding is independent of the earlier finding in Study 1. Out of the 43 long distance drivers who were interviewed in this later study, 28 (65.12%) of them reported that they have personally used the substance (kola nut) when driving long distances. Amongst the interviewees, 15 (34.88%) long distance drivers disclosed that they had never used kola nut. When asked to provide a rough estimate of the proportion (in percent) of long distance drivers they believe use kola nut when driving, they provided scores that can be described as relatively high. The mean score of their rating was 72.09%. One driver, whose age was 49 years and whose year of driving experience was 7 years stated that:

“Anyone who has driven long distances would have noticed that all drivers take something to maintain alertness while driving on a journey. But it is not only kola nut



that drivers use. Some eat kola nut, but others use alcohol – beer, ‘*ogogoro*’ (i.e., distilled gin), *agbo* (i.e., prepared herbal remedy soaked in alcohol), energy drinks or other substances not freely sold in the motor park.”

Another 37 year old driver with 6 years driving experience argued that:

“There is no need to ask whether long distance drivers use kola nut or not? They do. If you check any motor park in the country, you will observe that kola nut is one of the commonest commodity sold to drivers. I don’t like kola nut myself because of its taste, but I manage to eat one before beginning any journey.”

The above comment suggests that kola nut is not a scarce commodity in motor parks and that it is readily available for anyone needing it. Some long distance drivers recognized that the use of kola nut is widespread among drivers. However, many drivers are recently going for alternative substances. Asked why that is so, they pointed out that health is one of the major reason. As one 53 year old driver, with 5 years driving experience puts it:

“When my doctor discovered that I have high blood pressure, he told me to stop using kola nut. I told him I will stop, but I didn’t. What I did was to reduce the quantity of kola nut I consume. I used to eat three to four lobes on a journey before, but now, I eat only one kola nut per journey, and abstain whenever am not booked to travel”

Another 41 year old long distance driver, with a driving experience of 7 years, said:

“Kola nut is commonly used by drivers because drivers trust it to fight sleep. But it is not correct to assume that all long distance drivers use it. I personally have not used kola nut in 6 months. I now use ‘*agbo*’ and tobacco. Any time I am done using these substances, my head and eyes would clear and I would drive better and more cautiously.”



## Kola nut use and risk of road traffic accident

Majority of the interviewees showed positive perception of kola nut use and they argue that kola nut serves a good purpose for long distance driving: it keeps sleep away from working drivers. These participants acknowledged that driving for long period without stopping, somehow makes a driver to feel drowsy and ultimately lose concentration and/or control. According to this view, the lure to fall asleep on the wheel is a recipe for road traffic accidents. One 51 year old driver, who has 6 years driving experience, mentioned that:

“Driving long hours on the road without stopping naturally have a way of making the driver to fall asleep. So as a driver, you have a duty to fight the condition, otherwise you’re bound to crash. Although there are several substances that drivers can use to stay awake, kola nut is the commonest one and the most trusted.”

Another driver who reported that he has driven for 9 years; he was 46 years old stated that:

“All commercial drivers use one substance or another to fight sleeping on the wheel. No one who drives long distances would deny that he has never felt drowsy while driving his motor. As for me, I eat kola nut to prevent sleep and it works for me!”

The sedentary nature of driving, especially in this modern time when vehicles are fitted with automatic gear system, has made driving less stressful for long distance drivers. Drivers no longer have to suppress a clutch to engage the gear, which used to be a kind of small exercise for drivers, and which helps to keep them active on the steering. In the present time, all that the driver need to do is just to control the steering wheel, which in itself is a monotonous task. Because the human body deprived of sufficient physical exercise is usually sluggish, tired, and fatigued, long distance drivers are prone to dosing off when they drive. Driver fatigue and drowsy driving are important factors that have kept accident rates high. Finding of a meta-analytic research (Biolac, Franchi, Arnaud, Sagaspe, Moore, Salvo & Philip, 2007) show that driving while feeling sleepy was associated with motor vehicle



collision. To avoid drowsiness and fatigue therefore, many long distance drivers use a whole range of substances to make them stay at alert. A 44year old long distance driver, with 7 years driving experience, said:

“Kola nut helps to prevent sleepiness in long distance drivers. Observations show that kola nut and sleep are strange bedfellows, which explains the incessant use of the substance by commercial drivers. Although, I can’t stand the bitter taste of kola nut, but I do use it occasionally to stay alert.”

Long distance drivers use other substance like tobacco, energy drink, prepared herbal remedies; cannabis and/or cocaine soaked in local gin to remain at alert when driving, but these substances sometimes make long distance drivers prone to road traffic accidents. One 39 year old driver, with 5 years of driving experience stated that:

“Aside kola nut, many of the other substances that drivers take often has unwholesome side effects. Drinking alcohol or its other variants makes a driver bold and daring, causing them to drive beyond the maximum speed limits and/or undertake dangerous maneuvers in unauthorized places, which frequently results in carnage. But kola nut do not have such tendencies, its major problem is that kola nut can postpone sleep when one wants to sleep.”

Another 51 year old driver, with 6 years driving experience also said:

“Some drivers do not eat kola nut at all. Not because it doesn’t work, but because it does not taste good. I remembered asking Amadi (we used to ply the same route before) to use kola nut after he complained that he nearly dozed off on the steering. But he refused. Amadi once said to me that, ‘kola nut is too bitter and does not taste good as other seeds.’ He continued to use other substances, but not long afterwards, he had an accident that incapacitated him”



## Discussion

The present research has two objectives. The first goal investigated the prevalence of kola nut use in long distance drivers of commercial 18-seater mini-buses. Analysis of participants' responses on the scale that assessed the degree of kola nut use in long distance drivers indicated that a large number of long distance drivers use the caffeine-based substance – kola nut. The study revealed that over three quarters of the sample of long distance drivers examined reported that they still use kola nut or that they have used it in the past. The finding is consistent with previous literature (Asogwa, 1978; Bekibele et al. 2007; Ilechukwu, 1985; Onyemaechi & Ofoma, 2017), which observed that commercial drivers commonly use kola nut. Kola nut possesses a somewhat bitter taste. Therefore, simply speculating that long distance drivers use kola nut because they crave for it is a weak argument. A more tenable explanation of why long distance drivers use kola nut is that kola nut serve important function for the drivers. This line of thought explains that the long distance drivers motivation to use kola nut is predicated on the principles of reinforcement (Skinner, 1938), which posits that positive reinforcement increases the probability that behaviour will occur.

The second goal of the study was to examine long distance drivers' perceptions of kola nut use and risk of road traffic accidents. This objective was examined in a qualitative research, which generated responses that were summarized under two themes. The first theme reiterated the finding observed in Study 1, that the bulk of long distance drivers use kola nut. Interviewees reported that more than half of all long distance drivers use kola nut. The finding is consistent with previous related literature (Asogwa, 1978; Bekibele et al. 2007). The other theme describes the perception of long distance driver on the relationship of kola nut use and risk of road traffic accidents. The analysis of respondents responses suggested that kola nut use is associated with reduced risk of road traffic accidents in long distance drivers. This finding is in correspondence with the study of Sharwood et al. (2013).



Sharwood et al. observed that using caffeine-based substances does really help long distance drivers avoid traffic crashes.

Most previous studies conducted in Nigeria (Asogwa, 1978; Bekibele et al. 2007; Onyemaechi & Ofoma, 2017) seem to suggest that kola nut use is a significant factor in road traffic accidents. The observation is a contrast to the present finding, but they did not really contradicted it. If the findings obtain in those other studies are turned around, one would observe that the findings indeed revealed that automobile drivers who consume caffeine-based substances, like kola nut, were far less likely to be involved in road traffic accidents than drivers who do not use the substance. As an example, Asogwa (1978) observed that only 12.25% of the 555 drivers who were involved in road traffic accidents were found to have eaten kola nut. What this meant then was that the bulk of drivers who were involved in road traffic accidents were drivers who did not eat kola nut. Despite the consistency seen in both earlier and later studies, it is important that the present finding be explained with caution. Too much kola nut taken too close to bedtime can harm the quality of sleep and fitful sleep may lead to fatigue before a journey, which may lead to traffic crashes. Asogwa (1978) puts it this way: “fatigue induced by the insomnia following kola nut ingestion may have contributed too high accident rates” (p. 1228).

### **Limitation and suggestion for future research**

Although our findings converge with previous related studies (Asogwa, 1978; Bekibele et al. 2007; Sharwood et al. 2013), the smallness of our sample limits the confidence in our results. Our difficulty in taking more participants was because normal social activities has not fully returned to the country following the COVID-19 pandemic and its attendant lockdown. But as normal activities are generally returning, we enjoin future researchers to use larger sample size to enhance the generalizability of their findings.



## **Conclusion**

The purpose of the present study were to describe the prevalence of kola nut use in long distance drivers of commercial 18-seater mini-buses, and to examine the drivers perception of kola nut use and risk of road traffic accidents amongst the drivers. The findings show that there is high use of kola nut among long distance drivers; also, the drivers perceived drivers who use kola nut to be less likely to be involved in road traffic accidents than long distance drivers who do not use the substance. In other words, the finding suggests that the consumption of caffeinated stimulant substance, such as kola nut, is associated with clearly reduced risk of involvement in road traffic accidents. These findings are revealing and could help to enrich the effectiveness of road safety in Nigeria. Based on the findings, we proposed that since the consumption of kola nut can protect against risk of road traffic accidents in long distance drivers, kola nut can be adopted as an effective strategy to maintain alertness while driving. Also, because kola nut stimulates the central nervous system (CNS) due to its active ingredient - caffeine, we propose that kola nut be classified as a psychoactive substance. This is not a call to control its use (caffeine is not an illegal substance), but one that would create an opportunity for more concerted research to fully understand this caffeine-based substance in terms of the quantity compatible with safety on roads.

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