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# The Impact of Alcohol and Herbal Consumption on the Cardiovascular Health Status of Commercial Automobile Drivers in Ibadan

Adedamope Olajumoke Adediran*, Paul Olaiya Abiodun
*Department of Public Health, Texila American University, Guyana*

***Abstract***

*Cardiovascular diseases are a group of non-communicable diseases with a rising burden in Nigeria. Commercial automobile driving is an occupation with associated risks that may worsen the burden among the population concerned. A cross-sectional survey of 1713 automobile drivers across Ibadan showed a predominantly male population with more than half in the 36–49 years age bracket, and 74.6% with at least secondary level of education. 44.7% of them have been working for 5-10 years, mostly working for 9-16 hours a day (96.3%) and 6-7 days in a week (96.2%). The long hours of work, prevalence of alcohol consumption (44.4%), and prevalence of herbal consumption (87.7%) may have contributed to the difference in the proportion of the population with previously diagnosed hypertension (2.3%) and the proportion observed to be hypertensive during the study (13.3%). A significant association between alcohol consumption and the prevalence of hypertension, pedal oedema and other diagnosed chronic illnesses were also observed. In contrast, no significant association was noted between herbal consumption and the parameters of the cardiovascular health status observed. It is concluded that although the prevalence of hypertension in this population was lower than previously reported in mixed community samples, the significant association between alcohol use and elevated blood pressure underscores the vulnerability of this occupational group.*

***Keywords:*** *Alcohol, Blood Pressure, Cardiovascular Diseases, Commercial Drivers, Herbs.*

## Introduction

The burden of cardiovascular diseases is rising in low- and middle-income countries like Nigeria, yet insufficient attention is being given to addressing this emerging public health crisis [1]. Cardiovascular diseases (CVDs) account for approximately 11% of the 29% of all deaths in Nigeria attributed to noncommunicable diseases (NCDs), and there are almost no significant efforts in motion to stem the tide by the health agencies concerned [2]. This challenge is worsened by the relatively poor health seeking behaviour of the population [3]. This poor health seeking habit has been found out to be more pronounced among the population with lower level of education and socioeconomic status such as artisans including commercial automobile drivers [3, 4].

Cardiovascular diseases are increasingly recognized as a major occupational health concern, particularly among populations engaged in physically and mentally demanding jobs such as commercial driving. Drivers often face prolonged exposure to stress, irregular dietary habits, and limited opportunities for physical activity, all of which contribute to elevated cardiovascular risk. Commercial automobile drivers are also known to engage in substantial alcohol use, as well as the consumption of herbal drinks, often driven by fatigue from long working hours and sociocultural beliefs, including the

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****Corresponding Author: damopeadediran@gmail.com***

use of herbal and alcohol concoctions as alternative medicine [2]. Globally, the prevalence of hypertension among commercial transport workers is reported to be about 27.7%, a rate linked to population growth, aging, and behavioural risk factors including smoking, physical inactivity, excessive alcohol consumption, stress, and poor diet [1].

However, the prevention of modifiable risk factors is widely recognized as a crucial step in reducing the burden of cardiovascular diseases (CVDs), and alcohol consumption has been highlighted as a significant contributor to cardiovascular health outcomes. In a country like Nigeria, with a currently low life expectancy of 62.6 years ranking 167th globally [1], it is therefore important to identify high-risk individuals and factors that may influence and worsen the public health of commercial automobile drivers. The transportation sector plays an important role in national development and often considered a proxy for measuring urbanization and industrialisation, hence it would be of great advantage to understand the cardiovascular health pattern of commercial automobile drivers with a view to improving it [2]. Understanding these dynamics is essential not only for improving the health of drivers but also for enhancing road safety and productivity in the transport sector.

While there are several studies on the prevalence of alcohol and substance abuse in this region, fewer studies have examined the population of interest, and much more fewer studies have focused on the consumption of herbal drinks among them. There is also a paucity of data on the cardiovascular health status of this population, especially with respect to the consumption of alcohol and herbal drinks. Therefore, the study aimed to assess the cardiovascular health status of commercial automobile drivers in Ibadan and how it is being impacted by the current burden of alcohol and herbal drink consumption. We hypothesised that the consumption of alcohol and herbal drinks among commercial automobile drivers in Ibadan has a significant negative impact on their cardiovascular health status.

## Materials and Methods

A total of 1713 commercial automobile drivers within Ibadan metropolis participated in this study. Ethical approval was obtained from the Oyo State Ethical Review Board with reference number AD/13/479/062. The study also adhered to the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) guidelines. Ten (10) local government areas (LGAs) each with 171 -174 respondents were administered questionnaire after their consent to participate in the study.

The Questionnaire used for this study was interviewer-administered and is a composite derived from other assessment tools with established reliability and validity and further validated via a pilot study to assess the content validity and face validity.

To assess the cardiovascular impact of alcohol and herbal drinks, some non-invasive parameters were measured namely: Blood pressure, Pulse rate, and Body mass index (BMI). This data was collected by trained research assistants using a calibrated digital sphygmomanometer (Omron® Basic-2) for the blood pressure and pulse rate. A portable clinical weighing scale and meter rule were used to obtain the BMI-related parameters (weight and height). The BMI in $kg/m^2$ is obtained thus: Weight (in kilogrammes)/Height$^2$ (in metres). Each of these devices were calibrated by comparing values obtained with that obtained with other standardised devices and consistency was ensured.

This research employed various data management and analysis tools to ensure efficient handling and rigorous analysis of the collected data. Data were obtained using a

structured questionnaire and with the help of trained research assistants. The quantitative data obtained were analysed using the Statistical Package for Social Sciences (SPSS) by the International Business Machines (IBM) Corporation, version 25.

## Results

The study population consists of 1,713 participants and is characterized by a nearly exclusive male presence and a predominantly middle-aged demographic (Table 1). The sample is overwhelmingly male, accounting for 99.5% (n=1,705) of the participants, more than half (51.0%) in the 36–49 years age bracket, a vast majority are married (89.4%), and most participants live in a nuclear family structure. Many participants (74.6%) have at least secondary level of education.

**Table 1.** Social Demographics of Commercial Automobile Drivers in Ibadan

| | **n** | **%** |
|---|---|---|
| **Sex** | | |
| Male | 1705 | 99.5 |
| Female | 8 | 0.5 |
| **Age group** | | |
| 18 - 24 years | 32 | 1.9 |
| 25 - 35 years | 389 | 22.7 |
| 36 - 49 years | 873 | 51 |
| 50 - 64 years | 363 | 21.2 |
| ≥ 65 years | 56 | 3.3 |
| **Marital Status** | | |
| Divorced | 29 | 1.7 |
| Married | 1532 | 89.4 |
| Single | 139 | 8.1 |
| Widow/Widower | 13 | 0.8 |
| **Family Structure** | | |
| Extended | 63 | 3.7 |
| Nuclear - Monogamy | 1030 | 60.1 |
| Nuclear - Polygamy | 620 | 36.2 |
| **Level of Education** | | |
| Nil education | 1 | 0.1 |
| Primary | 331 | 19.3 |
| Secondary | 1278 | 74.6 |
| Tertiary | 103 | 6 |

The proportion of the respondents engaging in motorcycling were slightly more (Table 2) with an occupational profile of more with a working experience of 5-10 years (44.7% of the respondents), mostly working for 9-16 hours a day (96.3%) and 6-7 days in a week (96.2%).

**Table 2.** Occupational Demographics of Commercial Automobile Drivers in Ibadan

| | **n** | **%** |
|---|---|---|
| **Occupation** | | |
| Bus driver | 175 | 10.2 |

| | | |
|---|---|---|
| Cab driver | 415 | 24.2 |
| Motorcycle rider | 644 | 37.6 |
| Tricycle rider | 479 | 28 |
| **Occupational experience** | | |
| < 5 years | 141 | 8.2 |
| 5 - 10 years | 766 | 44.7 |
| 11 - 20 years | 689 | 40.2 |
| > 20 years | 117 | 6.8 |
| **Work hours/day** | | |
| < 8 hours | 39 | 2.3 |
| 9 - 16 hours | 1649 | 96.3 |
| > 16 hours | 25 | 1.5 |
| **Workdays/week** | | |
| 1 - 3 days | 3 | 2 |
| 4 - 5 days | 62 | 3.6 |
| 6 - 7 days | 1648 | 96.2 |

Alcohol consumption among Ibadan commercial automobile drivers shows varying relationship with the cardiovascular parameters. Alcohol consumption was prevalent with 44.4% reporting current use and 59.1% having consumed it at some point in their lives. Herbal drinks, however, were far more widespread, embraced by 87.7% of individuals (Table 3). Water-based herbal preparations were the most common, used by 84.1%, while alcohol-based herbal drinks were less frequent at 40.8%. Only a small fraction, 14.6%, reported combining both water- and alcohol-based herbal consumption.

**Table 3.** Prevalences Obtained among Commercial Automobile Drivers in Ibadan

| | **%** |
|---|---|
| Point prevalence of alcohol consumption | 44.4 |
| Lifetime prevalence of alcohol consumption | 59.1 |
| Prevalence of herbal consumption | 87.7 |
| Water-based herbal consumption | 84.1 |
| Alcohol-based herbal consumption | 40.8 |
| Concurrent intake of water- and alcohol-based consumption | 14.6 |

A majority of the respondents (78.1%) had not checked their blood pressure recently, and 13.3% of them had their systolic blood pressure ≥ 140 mmHg (Table 4). This was in sharp contrast to the proportion of commercial drivers who knew their blood pressure status, that is, already diagnosed of hypertension (2.3%). Asides hypertension, obesity was reported in 45.1%, palpitations in 5.6%, abnormal pulse rates such as bradycardia or tachycardia in 2.3%, and pedal oedema in 0.8% (Table 5). There is a significant association between alcohol consumption and the prevalence of hypertension, pedal oedema and chronic illnesses (Table 6). Herbal consumption however does not have any significant association with any of the cardiovascular parameters assessed (Table 7).

**Table 4.** Blood Pressure Profile of Commercial Automobile Drivers in Ibadan

| | n | % |
|---|---|---|
| **Recent blood pressure check** | | |
| Yes | 375 | 21.9 |
| No | 1338 | 78.1 |
| **Systolic blood pressure range (mmHg)** | | |
| Normal (90 – 119) | 340 | 19.9 |
| Elevated (120 – 129) | 633 | 37 |
| Stage 1 Hypertension (130 – 139) | 512 | 29.9 |
| Stage 2 Hypertension (≥ 140) | 216 | 12.6 |
| Hypertensive crisis (≥ 180) | 11 | 0.6 |
| **Diastolic blood pressure range (mmHg)** | | |
| Normal (< 80) | 700 | 41 |
| Hypertension (80 – 119) | 1005 | 58.8 |
| Hypertensive crisis (> 120) | 3 | 0.2 |

**Table 5.** Cardiovascular Profile of Commercial Automobile Drivers in Ibadan

| | n | % |
|---|---|---|
| Obesity | 76 | 45.1 |
| Diagnosed hypertension | 39 | 2.3 |
| Cardiovascular diseases | 126 | 7.4 |
| **Other cardiovascular symptoms** | | |
| Palpitations | 96 | 5.6 |
| Abnormal pulse rate (brady-/tachy-cardia) | 40 | 2.3 |
| Pedal oedema | 14 | 0.8 |

**Table 6.** Relationship between Alcohol Consumption and Cardiovascular Health Status among Commercial Automobile Drivers in Ibadan

| **Cardiovascular health status** | **Alcohol consumption** | | **$X^2$** | **p-value** |
|---|---|---|---|---|
| | **Yes** | **No** | | |
| **Hypertension** | | | | |
| Yes | 134 | 92 | 23.174 | < 0.001 |
| No | 626 | 855 | | |
| **Obesity** | | | | |
| Yes | 41 | 35 | 3.058 | 0.217 |
| No | 718 | 908 | | |
| **Pedal oedema** | | | | |
| Yes | 8 | 6 | 0.003 | < 0.001 |
| No | 751 | 942 | | |
| **Palpitations** | | | | |
| Yes | 48 | 48 | 2.51 | 0.285 |
| No | 711 | 900 | | |
| **Chronic illness** | | | | |
| Yes | 9 | 3 | 0.003 | < 0.001 |
| No | 751 | 945 | | |

**Table 7.** Relationship between Herbal Consumption and Cardiovascular Health Status among Commercial Automobile Drivers in Ibadan

| Cardiovascular health status | Herbal consumption | | $X^2$ | p-value |
|---|---|---|---|---|
| | Yes | No | | |
| **Hypertension** | | | | |
| Yes | 199 | 28 | 0 | 0.996 |
| No | 1302 | 183 | | |
| **Obesity** | | | | |
| Yes | 62 | 14 | 2.76 | 0.107 |
| No | 1435 | 196 | | |
| **Pedal oedema** | | | | |
| Yes | 14 | 0 | 2.126 | 0.345 |
| No | 1487 | 211 | | |
| **Palpitations** | | | | |
| Yes | 91 | 5 | 4.909 | 0.086 |
| No | 1410 | 206 | | |
| **Chronic illness** | | | | |
| Yes | 10 | 2 | 0.212 | 0.651 |
| No | 1492 | 209 | | |

## Discussion

Numerous studies have revealed the complex relationship between alcohol use and cardiovascular conditions such as hypertension, coronary heart disease, stroke, peripheral arterial disease and cardiomyopathy [5]. Until recently, alcohol consumption was considered to have a double-edged sword, that is, low to moderate intake of alcohol was cardioprotective, while chronic and excessive intake alcohol could have adverse cardiovascular effects. The current trend with alcohol use is that no level of alcohol consumption was safe [6, 7]. Following several reviews which have failed to show the protective effects of alcohol, the latest consensus is that no safe amount of alcohol consumption can be established [6]. Unfortunately, not many populations may be aware of this latest development and as such still consume alcohol with minimal consideration for its cardiovascular and other health implications.

The transport sector of most economies, as it was reflected in this study is predominated by the males (99.5%), a gender posited by several researches to be in favour of alcohol and substance abuse [8-11]. Although there have been discrepancies on gender-based epidemiology of cardiovascular diseases, many studies posit that while there is a greater incidence of cardiovascular diseases among females, many men are more likely to develop it at an earlier age or suffer mortality from it. This has led further studies which have outlined the factors which predispose men to the development of cardiovascular diseases [12, 13]. Risk factors in this population which have also been alluded to in other studies are consumption of alcohol, socioeconomic factors, smoking, and long exposure to chronic stress [12]. Commercial automobile drivers, as also shown from this study, are sometimes subjected to long hours of work (9-16 hours for most parts of the week) and when combined with risky behaviours such as alcohol consumption, their cardiovascular

health status suffers a negative impact [14]. The significant association between alcohol consumption and the presence of hypertension and other chronic illnesses in our study may be attestation to this negative impact.

In this study, the prevalence of respondents with hypertension (with blood pressure ≥ 140/90 mmHg) is 13.3%. This is much lower than the prevalence found out by Akinpeloye et al, who conducted a study in about the same area recently. In their study, they reported a prevalence of 33.3%, despite the same cut-off point ≥ 140/90 mmHg [2]. Possible reasons for this may have included the fact that they studied a mixed population in the area – both transporters and non-transporters. Also, their sample population was about one-third of this study, and this may have accounted for the relatively significant difference. However, this significant finding suggests that commercial automobile drivers may not be a major contributor to the burden of hypertension in Ibadan. As more recent studies align with the updated cut-off for hypertension adopted by many international organisations, the epidemiology of cardiovascular diseases may be altered among this population. The 2025 revised guideline of the AHA/ACC (American Heart Association/American College of Cardiology) now sets the threshold for hypertension at a systolic blood pressure of > 130 mmHg [15]. Other reasons that may have contributed to the current prevalence of alcohol and herbal consumption and the concomitant cardiovascular health status are the socioeconomic status and level of education of this population. Most of the respondents, as is commonly noted in similar population in other regions have a secondary level of education. This coupled with their financial status influence their health seeking behaviour and in turn influence their cardiovascular health status [4].

Some of the concerns raised about herbal preparation include the uncertainty about dosage, hygiene of preparations and its possible toxicity profile [16]. With the rising utilization of herbal medicine is the concern on the current knowledge available as regards the safety profile [17]. Many of the herbal preparations have been implicated in cardiovascular diseases. Other systems often affected are the gastrointestinal system, renal system and haematologic system [18]. Woo et. al. noted that Liquorice root, Ginseng and Saw palmentto could cause hypertension. Also, cardiovascular adverse effects could arise from interaction with other orthodox medicine that an individual may be co-administering, for example, Ginkgo biloba when used with a thiazide diuretic would result in increased blood pressure [19]. From this study, while 13.3% of the respondents consuming herbal preparations are hypertensive, there was however no significant association between herbal consumption and the presence of cardiovascular parameters or any known chronic illnesses. Despite this study's limitation to establish a significant association between the consumption of herbs and cardiovascular health parameters, other studies have highlighted the almost nil effect, and more likely, the cardiotoxic effect of most unrefined herbs consumed. In a review by Gavanji, scientific data regarding cardiotoxicity showed that 16 herbs from 11 families may increase cardiac toxicity. Therefore, it's important to use herbal medicines and natural products under the guidance of medical professionals [20].

On the basis of above findings, leaders of public health advocacy can increase health promotion activities geared towards avoiding a cardiovascular health crisis in this population. The difference noted in the number of persons previously diagnosed of hypertension and that observed during this study (2.3% versus 13.3% respectively)

reflects the need for regular screening. Incorporating cardiovascular risk screening and education during opportune encounters is regarded as a logical, efficient and financially prudent means of caring for the health of this category of workers [4].

This study is not without some limitations. First, its cross-sectional design precludes causal inference between alcohol/herbal consumption and cardiovascular outcomes. Second, reliance on self-reported data may introduce recall and social desirability bias, particularly regarding substance use. Third, the heterogeneity of herbal preparations consumed makes it difficult to assess specific cardiovascular effects. Future longitudinal studies with biochemical assays of herbal concoctions would provide more definitive evidence.

## Conclusion

Although the prevalence of hypertension in this population was lower than previously reported in mixed community samples, the significant association between alcohol use and elevated blood pressure underscores the vulnerability of this occupational group.

## Conflict of Interest

The authors declare no conflict of interest. This study was conducted independently, and no author received financial or material incentives that could bias the outcomes of this research.

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## Ethical Approval

Ethical approval was obtained from The Oyo State Ethical Review Board prior commencement of the research. All participants provided informed consent, and confidentiality was strictly maintained throughout the research process.

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## Data Availability

The authors confirm that the raw data supporting the findings are available from the corresponding author upon request.

## Author Contributions

- **Adediran A.O.:** Conceptualization, methodology, data analysis, manuscript drafting, final approval
- **Prof. Olaiya Abiodun:** Technical guidance, conceptual oversight, editing, and academic supervision
- **District and Facility Contributors:** Field data collection, validation, and logistics support

All authors reviewed and approved the final manuscript.

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