

Original Research Article
**NUTRITIONAL STATUS AND NUTRIENT
ADEQUACY OF FOOD CONSUMED BY
COMMERCIAL DRIVERS IN ABEOKUTA SOUTH
LOCAL GOVT AREA, OGUN STATE**

ABSTRACT

Introduction: The nutritional status and adequacy of nutrients in the food consumed by commercial drivers have significant implications for their overall health, well-being and job performance.

Aims: The study assessed the nutritional status and nutrient adequacy of food consumed by commercial drivers in Abeokuta south local govt area, Ogun State.

Study Design: A descriptive cross-sectional design was used to carry out this study.

Place and Duration of Study: The study was carried out in the Major Parks of Abeokuta south Local Government within the period of November 2019 to February 2020.

Methodology: The data was obtained from randomly selected three hundred (300) commercial drivers in the major parks (Asero, Ijaiye, Kuti and Sapon) of Abeokuta South Local Government. A structured-interviewer-administered questionnaire was used to obtain data on the respondent's demographics and socioeconomic characteristics, anthropometrics characteristics were assessed using a standardized method by trained anthropometrists and dietary intake of the respondents was obtained using a validated 24-hour recall questionnaire. Data were analyzed and presented using descriptive and inferential statistics.

Results: All (100%) of the respondents were males with mean age of 38.7 ± 0.49 years. The mean height and weight of the respondents was found to be 1.68 ± 0.86 m and 68.50 ± 8.47 kg respectively. More than half (59.7%) of the respondents had a normal BMI, 34.3% and 0.3% were overweight and obese respectively and only a few (5.7%) were under-weight. The nutrient adequacy results revealed inadequacies of Vitamin C (83.3%), Vitamin B1 (66.7%), Vitamin B6 (79.3%), Calcium (89.3%), Zinc (53.3%) and Magnesium (70.7%).

Conclusion: It is concluded that overweight, obesity and micronutrients inadequacy is prevalent among commercial drivers. Malnutrition and Micronutrients inadequacy among commercial drivers should be recognized as a public health problem and strategies to improve their status and nutrient intake should be implemented.

Keywords: Nutritional Status, Nutrient Adequacy, Micronutrient, Commercial Drivers

1.0 INTRODUCTION

The nutritional status and adequacy of nutrients in the food consumed by commercial drivers have significant implications for their overall health and well-being [1]. Commercial drivers play a vital role in transportation and logistics, ensuring the efficient movement of goods and people. Their demanding schedules and long hours on the road can predispose to the challenges in accessing and consuming balanced and nutritious meals due to their work demands and limited food options while on the road [1, 2]. However, these significantly impact their nutritional status and dietary patterns, which tends to predispose to inadequate dietary intake or excess consumption of unhealthy diet [3]. Hence, it is crucial to provide the human body with proper nutrition through a well-balanced diet to meet its needs and support essential bodily functions [4]. Over-nutrition poses a significant risk, contributing to weight gain and the development of various non-communicable diseases [5]. Conversely, undernutrition, resulting from inadequate energy and nutrient intake, presents a serious health challenge, particularly in economically disadvantaged, developing countries like Nigeria [6]. Adequate nutrition is essential for their overall health, well-being, and job performance [2].

Several studies have explored the nutritional status of commercial drivers, shedding light on their dietary patterns and nutrient intake. For instance, study by Oyebode et al [1], conducted in Nigeria found that commercial drivers had a high prevalence of overweight and obesity, indicating an excess intake of calories and poor dietary choices. This is consistent with the findings of a study by Ogundele et al. [2], which reported a high consumption of energy-dense foods and low intake of fruits and vegetables among commercial drivers. However, a study conducted by Adebisi et al. [4] in Nigeria found that the diets of commercial drivers were deficient in essential micronutrients such as vitamins A, C, and E, as well as minerals like iron and zinc. Hence, Ajayi et al. [5] conducted a study in Nigeria and reported a higher prevalence of chronic diseases among commercial drivers. Furthermore, the nutrient deficiencies observed in their diet can compromise their immune function, leading to increased susceptibility to infections and impaired wound healing [7]. The occupation of commercial driving involves long hours on the road and limited access to nutritious food options, little is known about the specific nutritional challenges faced by these commercial drivers in the local context. Hence, more research into the subject matters is important.

This study highlighted the need for interventions to improve the dietary practices of commercial drivers and enhance their nutritional status. One potential approach is the implementation of nutrition education programs to improve their knowledge and awareness of healthy eating practices. Additionally, initiatives to increase the availability of nutritious food options at transportation hubs and rest stops can also have a positive impact on their dietary choices.

To improve the nutritional status and adequacy of nutrients among the study population, it is important to know the nutritional and nutrient adequacy status of the commercial drivers. This study therefore assessed the nutritional status and nutrient adequacy of food consumed by commercial drivers in Abeokuta South Local Govt Area, Ogun State.

2. METHODOLOGY

2.1 Study Area

Abeokuta is the capital of Ogun state, southwestern Nigeria. It is situated on the east bank of the Ogun River, around a group of rocky outcroppings that rise above the surrounding wooded savanna. It comprises of Abeokuta south and north with tertiary, secondary, primary health care centers and both public and private primary, secondary schools and tertiary institutions respectively. Abeokuta South Local Government has four (4) major commercial motor-parks located in four (4) different wards namely (Asero, Ijaye, Kuto, Sapon) out of the 15 wards in the Local Government.

2.2 Study Design

A descriptive cross-sectional design was used to carry out this study among commercial drivers in Abeokuta South Local Government Area, Ogun State.

2.3 Study Respondents

The study respondents were commercial drivers between the ages of 18 to 65 years. The student respondents include; Commercial Bus drivers and Taxi/Cab drivers working at the motor-parks.

2.4 Sample Size Determination

The sample size was based on the prevalence of malnutrition (Over-nutrition) among commercial drivers which is 26.8% as described by Adepoju et al., [8]

The sample size was calculated using the formula:

$$N = \frac{Z^2 P (1-P)}{D^2} \quad [9]$$

Where N = desired minimum sample size when sample frame is more than 10,000

Z^2 = table value for standard normal deviate corresponding to 95% significance level (1.96).

P = Prevalence of malnutrition which is (26.8% = 0.268)

D = Margin error, (5%) set at +0.05

Substituting the values in the above formula, the sample size equals:

$$N = \frac{(1.96)^2 \times 0.268 (1-0.268)}{(0.05)^2} \quad N = 301$$

The sample size (N) for the study was increased to three hundred and seventeen (317) respondents to cater for attrition and possible drop out.

2.5 Sampling Technique

A multistage sampling technique was used in selecting 317 respondents in the major motor parks of Abeokuta South Local Government, Abeokuta. An exhaustive or total sampling techniques was used to assess all the major motor parks in Abeokuta South Local Government and a simple random sampling technique was used in selecting respondents from each of the motor parks until the minimum sample size is achieved.

2.6 Eligibility criteria

2.6.1 Inclusion Criteria

This study includes only commercial bus drivers and cab drivers between the ages of 18 to 65 years working at the motor parks who were in unions - National Union of Road Transport Workers (NURTW) and Road Transport Employee's Association of Nigeria (RTEAN) and commercial drivers.

2.6.2 Exclusion Criteria

All unregistered and unwilling commercial drivers, drivers with health issues, commercial drivers below and above the age categories of 18-65 years were excluded from this study.

2.7 Method of Data Collection

An interviewer-administered questionnaire, standard anthropometric assessment method and validated 24-hour dietary recall questionnaire was used to obtain data from the respondents.

2.7.1 Characteristics Assessment

A well-structured and validated questionnaire was used to collect information on the socio-demographic and personal characteristics of the respondents. Data such as Age, Marital status, Educational Status, Average daily income etc., were obtained

2.7.2 Anthropometric Measurement

The anthropometric measurements of the respondents were taken following the WHO standard. Weight measurement was taken using a portable well-calibrated analogue weighing scale and the respondents were told to remove items that could over-estimate their weights before weighing. The height measurement was taken using a wooden height meter which was graduated appropriately, and the respondents were told to stand with their scapula, buttocks and heels touching the wall with the head adjusted to be in its natural non-stretched position. A stretched non-elastic measuring tape was used to measure the waist circumference and hip circumference. The waist circumference was measured at the midway between the iliac crest and lower rib while the hip circumference was measured on the widest part of the hip. Body mass index and waist-hip-ratio was calculated from the measurements and classified according to WHO standard [10].

BMI was calculated using the formula.

BMI= $\frac{\text{Weight (kg)}}{\text{Height (m)}^2}$

Height (m²)

2.7.3 Nutrient Intake and Adequacy

The food intake was assessed using 24-hour dietary recall questionnaire [11-12]. The data was collected during the weekdays and the respondents were probed for snacks, in between meals, supplement and drug used. The data obtained are converted into grams and entered into total dietary analysis software to analyze the nutrient intake of the respondents; and nutrient adequacy was estimated using the Nutrient Adequacy Ratio (NAR).

2.8 Data Analysis

After the data collection, three hundred (300) questionnaires were retrieved (95% recovery rate). The data were sorted, cleaned and coded using Microsoft Excel and imported into Statistical Package for Social Science (SPSS) windows software version 28.0. Descriptive statistics such as tables, means, median, percentage, frequencies, standard deviation and inferential statistics such as Fischer's exact and Chi's square analysis were used to test for relationship among variables.

3. RESULTS AND DISCUSSION

3.1 Results

3.1.1 Demographic and Socioeconomic Characteristics of the Respondent

Table 1 shows the socio-demographic characteristics of the respondents. All (100%) of the respondents were males with ages ranging from 18 to 65 years and mean age of 38.7±0.49years. More than half (70.3%) of the respondents were Christians, most (88.3%) of the respondents were married and 55% had only primary school education. More than half (60.3%) of the respondents have a family size ranging from 1-5 and 53% earned a low income of about ₦2000 - ₦4000 daily.

3.1.2 Anthropometric Characteristics of the Respondents

Table 2 described the anthropometric characteristics of the respondents. The mean height and weight of the respondents was found to be 1.68±0.86m and 68.50±8.47kg respectively. More than half (59.7%) of

the respondents had a normal BMI, (34.3%) and (0.3%) were overweight and obese respectively and only a few (5.7%) were under-weight. The result shows that less than one-third (29.7%) of the respondents had waist to hip ratio that indicates abdominal obesity.

3.1.3 Percentage fulfilment of the Recommended dietary allowance by the Respondents

Table 3 described the mean energy and nutrient intake and percentage fulfilment of the recommended dietary allowance by the respondents. The respondents' mean macronutrients intake was Calorie (1480.43kcal), Carbohydrate (259.24g), protein (53.09g), fat (30.51g) and mean micronutrients intake was Vitamin C (22.42), Vitamin B1 (0.77), Vitamin B6 (0.78), Vitamin B12 (644.57), Calcium (247.55), Zinc (82.02), Iron (87.81) and Magnesium (195.42). The percentage fulfilment of the recommended dietary allowance by the respondents revealed that carbohydrate, vitamin B12 and Iron intake are more than the percentage recommended dietary allowance whereas, Vitamin C, Vitamin B1, Vitamin B6, Calcium and Magnesium are below half (50%) of the recommended dietary allowance.

3.1.4 Nutrients adequacy of foods consumed by the respondents.

Table 4 showed the nutrients adequacy of foods consumed by the respondents. Majority (83.3%, 66.7%, 79.3%, 89.3%, 53.3% and 70.7%) of the respondents had inadequate intake of Vitamin C, Vitamin B1, Vitamin B6, Calcium, Zinc and Magnesium respectively. 62%, 97%, 60.7% and 78.7% had excess intake of protein, carbohydrate, Vitamin B12, and Iron respectively. Only a few (19%, 1.3%, 4.3%, 14%, 15%, 7.3%, 16.3%, 13.3%) had adequate intake of Protein, Carbohydrate, Vitamin C, Vitamin B1, Vitamin B6, Calcium, Zinc and Iron respectively.

3.1.5 Relationship between Nutrient Adequacy and Nutritional Status of the Respondents

As shown on Table 5, the relationship between macronutrients adequacy and body mass index of the respondents. There is no significant different between energy and body mass index of the respondents ($P=.70$), carbohydrate and body mass index ($P=.98$), Protein and body mass index ($P=.61$) and also fat and body mass index of the respondents ($P=.25$).

3.2 Discussion

Adequate nutrition is essential for overall health, well-being, and job performance. Commercial drivers as part of the Nation workforce plays important role in economic growth ensuring efficient and safe movement people and good. As a result of their demanding work schedule, they indulge in poor dietary practices including snacking and skipping of meals, and substituting alcohol for foods, hence affecting their health and nutritional status. However, little attention is given to the nutritional status and adequacy of food consumed by these commercial drivers. This study therefore assessed the nutritional status and nutrient adequacy of food consumed by of commercial drivers in Abeokuta South Local Government. The results revealed that all the respondents were male, within 18-65years, majority were Christians, married and had primary education. 40.3% were malnourished and there is substantial inadequate micronutrients intake among the respondents.

Majority of the respondents in this study were between age 31-50years with a mean age of 38.7 ± 0.49 years, this shows that most of the commercial motorists were of active ages. Some other studies carried out among commercial motorists have shown the same trend where a higher percentage of the commercial drivers were in the ages of 31-50years [13-14]. Higher education attainment education does not only favor the operational capabilities of commercial drivers but also their food choice and consumption pattern [15]. The highest level of education of the drivers in this study was primary education. Similar study among commercial drivers in Akure reported primary school education as the highest level of education among the respondents [16]. This suggest that there is low literacy level among the respondents. Personal income and food prices have been identified as key drivers of dietary choices and consumption pattern [17]. 93.4% of the respondents earned below #5,000 on daily basis. A similar study by Edo and Nwosu [18] among commercial drivers in Ogun state reported that majority (44%) of the respondents earned below #5000 daily. This agreed with Ipingbemi [19] who opined that commercial

drivers are low income earners owing to the fact the income that is left for commercial drivers after vehicle maintenance is so meager that it cannot support their families.

Previous study has shown that work productivity is influenced by nutritional status [20-21]. Berha et al [22] opined that improving nutritional status can contribute to the labor and economic productivity as being overweight and obese are characterized by high rates of mortality, morbidity and absenteeism. Studies have demonstrated that overweight and obesity is prevalent among workers in the transportation industry [22-23]. The result of this study is in consonance with the previous research as the prevalence of Overweight and Obesity is high among the respondents. This high prevalence could be associated with poor diets, sedentary lifestyles, and short sleep duration which were also perceived as risks of overweight and obesity by other researchers [24-25].

An adequate nutritional intake is essential for human development, prevention of diseases and promotion of life and productivity [26]. Inadequate diet and negative occupational factors have adverse effect on the health of commercial drivers [25,27]. This study showed there is considerable micronutrients (Vitamin C, Vitamin B1, Vitamin B6, Calcium, Zinc and Magnesium) inadequacy among the commercial drivers. Several other studies have established poor eating habit and consumption patterns of drivers. Balieiro et al, [27] in a study among bus drivers in Brazil reported that none of the respondents met the recommended value of fruits and vegetables but an eating habit comprising of increased intakes of fatty and fast foods, decreased fiber rich foods and continuous patronage of restaurants. Edo and Nwosu [18] in a study among commercial drivers in Ogun state also reported that the food intake of commercial drivers is high in Carbohydrate from Cereals and root and tubers and the intake of Vitamin B3, Calcium and potassium were below the recommended dietary allowance. There is no significant difference between the nutritional status and macronutrient adequacy of the respondents ($P > .05$). This cross-sectional descriptive study does not assess the factors influencing the nutritional status and nutrient adequacy of the respondents, all factors highlighted are as identified by existing studies. This limitation is of importance in the interpretation of the result of this study.

Table 1: Demographic and Socioeconomic Characteristics of the Respondents

| Variables | Frequency (N=300) | Percentage (%) |
|-----------------------------|-------------------|-----------------|
| Age Category | | |
| Mean age | | 38.75±0.49years |
| 18-30 | 24 | 8 |
| 31-50 | 224 | 74.7 |
| 51-65 | 52 | 17.3 |
| Marital Status | | |
| Married | 265 | 88.3 |
| Not married | 21 | 7 |
| Divorced | 11 | 3.7 |
| Widowed | 3 | 1 |
| Educational Status | | |
| Primary | 165 | 55 |
| Secondary | 114 | 38 |
| Tertiary | 15 | 5 |
| No formal education | 6 | 2 |
| Religion | | |
| Islam | 88 | 29.3 |
| Christianity | 211 | 70.3 |
| Traditional | 1 | 0.4 |
| Ethnicity | | |
| Yoruba | 293 | 97.7 |
| Igbo | 5 | 1.7 |
| Hausa | 2 | 0.7 |
| Household size | | |
| 1-5 | 181 | 60.3 |
| 6-10 | 119 | 39.7 |
| Average daily Income | | |
| #1000 - #1999 | 110 | 36.7 |
| #2000 - #3999 | 159 | 53.0 |
| #4000 - #5000 | 11 | 3.7 |
| Above #5000 | 20 | 6.7 |

Table 2: Anthropometric Characteristics of the Respondents

| Variables | Frequency (N) | Percentage (%) |
|---------------------------------------|---------------|----------------|
| BMI category | | |
| <18.5kg/m ² (Underweight) | 17 | 5.7 |
| 18.5-24.9kg/m ² (Normal) | 179 | 59.7 |
| 25-29.9kg/m ² (Overweight) | 103 | 34.3 |
| >30kg/m ² (Obese) | 1 | 0.3 |
| WHR category | | |
| < 0.9 (Normal) | 211 | 70.3 |
| > 0.9 (At risk) | 89 | 29.7 |

*WHR – Waist to Hip ratio

UNDER PEER REVIEW

Table 3: Percentage fulfilment of the Recommended Dietary Allowance by the Respondents

| Nutrient | Mean Intake | Minimum | Maximum | RDA | % RDA fulfilment |
|------------------|--------------------|----------------|----------------|------------|-------------------------|
| Energy (Kcal) | 1480.43±601.58 | 119.26 | 3428.46 | 2300 | 62.6 |
| Carbohydrate (g) | 259.24±107.64 | 47.77 | 634.91 | 130 | 188.7 |
| Protein (g) | 53.09±23.41 | 10.04 | 134.33 | 56 | 92.8 |
| Fat (g) | 30.51±20.76 | 3.32 | 123.05 | 35 | 71.7 |
| Vitamin C (mg) | 22.42±55.47 | 0.00 | 325.93 | 60 | 2.61 |
| Vitamin B1 (mg) | 0.77±0.55 | 0.02 | 3.27 | 1.5 | 46 |
| Vitamin B3 (mg) | 13.32±9.22 | 0.73 | 54.65 | 19 | 61.1 |
| Vitamin B6 (mg) | 0.79±0.63 | 0.00 | 7.50 | 2 | 38 |
| Vitamin B12 (mg) | 644.57±1438.04 | 0.00 | 9458.07 | 2 | 205 |
| Vitamin B9 (mg) | 189.66±156.64 | 1.11 | 726.82 | 200 | 70.2 |
| Calcium (mg) | 247.55±161.91 | 1.11 | 726.82 | 800 | 29.2 |
| Phosphorus (mg) | 503.74±250.99 | 1.11 | 1263.72 | 800 | 60.6 |
| Zinc (mg) | 82.02±165.67 | 1.11 | 726.82 | 15 | 58.2 |
| Iron (mg) | 87.81±163.38 | 1.11 | 726.82 | 10 | 155.7 |
| Magnesium (mg) | 195.42±139.96 | 1.11 | 726.82 | 350 | 45.44 |

*RDA source: 2015-2020 Recommended Dietary Guidelines

Table 4: Nutrients adequacy of foods consumed by the respondents

| Nutrients | RDA | Inadequate | Adequate | Excess |
|-----------------|------|---------------|-----------------|---------------|
| | | (<60% of RDA) | (60-80% of RDA) | (>80% of RDA) |
| | | N (%) | N (%) | N (%) |
| Energy (kcal) | 2300 | 133(44.3) | 97(32.3) | 70(23.4) |
| Protein(g) | 56 | 57(19) | 57(19) | 186(62) |
| Carbohydrate(g) | 130 | 5(1.7) | 4(1.3) | 291(97) |
| Fat(g) | 35 | 122(40.7) | 50(16.7) | 128(42.7) |
| Vitamin C(mg) | 60 | 250(83.3) | 13(4.3) | 37(12.4) |
| Vitamin B1(mg) | 1.5 | 200(66.7) | 42(14) | 58(19.3) |
| Vitamin B3(mg) | 19 | 145(48.3) | 24(8) | 131(43.7) |
| Vitamin B6(mg) | 2 | 238(79.3) | 45(15) | 17(5.7) |
| VitaminB12(mg) | 2 | 109(36.3) | 9(3) | 182(60.7) |
| Vitamin B9(mg) | 200 | 125(41.7) | 37(12.3) | 138(46) |
| Calcium(mg) | 800 | 268(89.3) | 22(7.3) | 10(3.4) |
| Phosphorus(mg) | 800 | 147(49) | 70(23.3) | 83(27.7) |
| Zinc(mg) | 15 | 160(53.3) | 49(16.3) | 91(30.3) |
| Magnesium(mg) | 350 | 212(70.7) | 41(13.7) | 47(15.7) |
| Iron(mg) | 10 | 24(8) | 40(13.3) | 236(78.7) |

*RDA source: 2015-2020 Recommended Dietary Guidelines

Table 5: Relationship between Body Mass Index and Macronutrients Adequacy of the respondents

| Energy intake | Under weight N (%) | Normal weight N (%) | Overweight N (%) | Obese N (%) | Total N (%) | Fisher's exact | P value |
|----------------------|-------------------------------|--------------------------------|-----------------------------|------------------------|------------------------|-----------------------|----------------|
| Calorie | | | | | | 3.604 | .70 |
| Inadequate | 9(6.8) | 80(60.2) | 44(33.1) | 0(0) | 133(100) | | |
| Adequate | 5(5.2) | 60(61.9) | 31(32) | 1(1) | 97(100) | | |
| Excess | 3(4.3) | 39(55.7) | 28(40) | 0(0) | 70(100) | | |
| Total | 17(5.7) | 179(59.7) | 103(34.3) | 1(0.3) | 300(100) | | |
| Carbohydrate | | | | | | 5.912 | .98 |
| Inadequate | 0(0) | 3(60) | 2(40) | 0(0) | 5(100) | | |
| Adequate | 0(0) | 2(50) | 2(50) | 0(0) | 4(100) | | |
| Excess | 17(5.8) | 174(59.8) | 99(34) | 1(0.3) | 291(100) | | |
| Total | 17(5.7) | 179(59.7) | 103(34.3) | 1(0.3) | 300(100) | | |
| Protein | | | | | | 4.856 | .61 |
| Inadequate | 6(10.5) | 30(52.6) | 21(36.8) | 0(0) | 57(100) | | |
| Adequate | 3(5.3) | 36(63.2) | 18(31.6) | 0(0) | 57(100) | | |
| Excess | 8(4.3) | 113(60.8) | 64(34.4) | 1(0.5) | 186(100) | | |
| Total | 17(5.7) | 179(59.7) | 103(34.3) | 1(0.3) | 300(100) | | |
| Fat | | | | | | 6.152 | .25 |
| Inadequate | 6(4.9) | 73(59.8) | 43(35.2) | 0(0) | 122(100) | | |
| Adequate | 2(4) | 34(68) | 13(26) | 1(2) | 50(100) | | |
| Excess | 9(7) | 72(56.2) | 47(36.7) | 0(0) | 128(100) | | |
| Total | 17(5.7) | 179(59.7) | 103(34.3) | 1(0.3) | 300(100) | | |

4. CONCLUSION

Based on the findings of this study, it is concluded that overweight, obesity and micronutrients inadequacy is prevalent among commercial drivers. It is therefore recommended that micronutrient inadequacies among commercial drivers should be recognized as of public health importance and nutrition education tailored towards improving the nutritional status and nutrients adequacy of commercial drivers be organized.

CONSENT

All authors declare that "written informed consent" was obtained from the respondents' by asking them to sign after introducing and explaining the study and its objectives prior data collection. Respondents whose consent cannot be ascertained were excluded from the study. The copies of the written consent are available for review by the Editorial office/Chief Editor/Editorial Board members of this journal.

ETHICAL APPROVAL

Prior to the study, permission to embark on the study was obtained from the Department of Nutrition and Dietetics, Federal University of Agriculture, Abeokuta which was communicated to the Authority of the Union and permission was obtained from the respective commercial driver Unions before the commencement of Data collection.

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