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: Thestudy assessedthe 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 SouthLocal GovernmentfromNovember 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'sdemographics and socioeconomic characteristics, anthropometrics characteristics were assessed using a standardized method by trained anthropometrists, and the dietary intake of the respondentswas 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 witha mean age of 38.7±0.49years.The mean height and weight of the respondents were 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 underweight.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 micronutrient 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 them to the challenges of 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 them o inadequate dietary intake or excess consumption of unhealthy diets [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, the 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 a 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 matter 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 Abeokuta south and north with tertiary, secondary, and 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, and 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 65years. 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:

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

Where N = desired minimum sample size when the sample frame is more than 10,000
Z^2 = table value for standard normal deviation 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:

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

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

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 technique 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, and 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 questionnairewere 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 analog 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 ratiowere calculated from the measurements and classified according to WHO standards[10].

BMI was calculated using the formula.

BMI= Weight (kg)

Height (m2)

2.7.3 Nutrient Intake and Adequacy

The food intake was assessed using a 24-hour dietary recall questionnaire [11-12]. The data was collected during the weekdays and the respondents were probed for snacks, in between meals, supplements, and drug use. The data obtained are converted into grams and entered into total dietary analysis software to analyze the nutrient intake of the respondents andthe 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, and standard deviation, and inferential statistics such as Fischer's exact and Chi's square analysis were used to test for relationships 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 a 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 were 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 underweight. The result shows that less than one-third (29.7%) of the respondents had a waist-to-hip ratio that indicates abdominal obesity.

3.1.3 Percentage fulfillment of the Recommended dietary allowance by the Respondents

Table 3 described the mean energy and nutrient intake and percentage fulfillment 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 fulfillment 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 Nutrient adequacy of foods consumed by the respondents.

Table 4 showed the nutrient adequacy of foods consumed by the respondents. The 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 in Table 5, the relationship between macronutrient adequacy and body mass index of the respondents. There is no significant difference between the 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's workforce plays an important role in economic growth ensuring the efficient and safe movement of people and good. As a result of their demanding work schedule, they indulge in poor dietary practices including snacking and skipping 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 commercial drivers in Abeokuta South Local Government. The results revealed that all the respondents were male, within 18-65 years, the majority were Christians, married, and had primary education. 40.3% were malnourished and there is substantial inadequate micronutrient intake among the respondents.

The majority of the respondents in this study were between ages31-50 years with a mean age of 38.7±0.49years, this shows that most of the commercial motorists were of activeages. Some other studies carried out among commercial motorists have shown the same trend where a higher percentage of commercial drivers were between the ages of 31-50 years[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. A similar study among commercial drivers in Akure reported primary school education as the highest level of education among the respondents [16]. This suggests that there is a low literacy level among the respondents. Personal income and food prices have been identified as key drivers of dietary choices and consumption patterns[17]. 93.4% of the respondents earned below #5,000 daily. A similar study by Edo and Nwosu [18] among commercial drivers in Ogun state reported that the 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 they cannot support their families.

A 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 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 are prevalent among workers in the transportation industry [22-23]. The result of this study aligns 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, the prevention of diseases, and the promotion of life and productivity [26]. Inadequate diet and negative occupational factors have adverse effects on the health of commercial drivers [25,27]. This study showed there is considerable micronutrient (Vitamin C, Vitamin B1, Vitamin B6, Calcium, Zinc, and Magnesium) inadequacy among the commercial drivers. Several other studies have established poor eating habits 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 rivers is high in Carbohydrates from Cereals and roots and tubers and the intake of Vitamin B3, Calcium, and potassium was 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*

Table 3: Percentage fulfillment of the Recommended Dietary Allowance by theRespondents

Nutrient	Mean Intake	Minimum	Maximum	RDA	% RDA fulfillment
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 (<60% of RDA)	Adequate (60-80% of RDA)	Excess (>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 nutrient adequacy of commercial drivers be organized. Further studies should be carried out to evaluate the relationship between Vitamin D adequacy and long driving hours among commercial drivers.

CONSENT

All authors declare that “written informed consent” was obtained from the respondentsby asking them to sign after introducing and explaining the study and its objectivesbefore 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

Before 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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