

PREVALENCE OF MALNUTRITION AND SELECTED RISK FACTORS OF CARDIOVASCULAR DISEASES AMONG PRIMARY HEALTHCARE WORKERS IN TWO LOCAL GOVERNMENT AREAS OF OGUN STATE, NIGERIA

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ABSTRACT

Overnutrition resulting in overweight and obesity increases the risk of developing cardiovascular diseases. This study was carried out to assess the prevalence of malnutrition and some selected risk factors of cardiovascular diseases among primary healthcare workers in two Local Government Areas of Ogun State, Nigeria. An exhaustive sampling method was used, resulting in 220 eligible respondents. Anthropometric measurements were taken while body mass index (BMI) and abdominal obesity were calculated. Blood pressure and glucose level of the subjects were measured. Data were presented using frequency, percentage and Chi-Square tests to establish relationships among variables. Higher percentage (35.5%) of the respondents were of normal BMI category while prevalence of underweight, overweight and obesity were found to be 7.7%, 25.9% and 30.9%, respectively. Abdominal obesity was found among 58.2% of the respondents while high blood pressure was observed in 38.7%. Blood glucose was elevated in 20% of the subjects. Abdominal obesity, systolic and diastolic blood pressure of the respondents were found to be strongly associated with BMI ($p < 0.05$). This study observed high prevalence of overnutrition (overweight and general obesity), elevated blood glucose, high blood pressure, and high abdominal obesity trend as factors which may expose the respondents to poor health in future.

Keywords: Malnutrition, Cardiovascular diseases, Healthcare Workers.

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INTRODUCTION

Malnutrition sets in as a result of a person engaging in an improper dietary practice which lacks certain nutrients, and where food may be in excess or in the wrong proportions (Kozier, 2008). Malnutrition oc-

curs when the nutrient intake is less than requirements (Undernutrition) or exceeds requirements (Over nutrition). However, both under and over nutrition lead to metabolic changes which have acute and chronic consequences on health (Gibney, 2009). These

changes mostly cause problems of underweight, overweight, general and abdominal obesity, dyslipidemia and insulin resistance. In some cases, it may lead to cardiovascular diseases (Galassi et al., 2006).

An adequate nutrient intake consists of a diet made up of a careful selection of food items from all classes of food groups with recommended quantities. An excess, deficiency, or imbalance of any of these essential components of the food groups can lead to poor nutritional status, and in some cases malnutrition (Lewis et al., 2004). Malnutrition can occur because of prolonged engagement in an inadequate food intake which lacks certain nutrients, and where food may be in excess or in the wrong proportions (Kozier, 2008). A study conducted on hospital workers in Abeokuta Metropolis by Adeleke and Adeleke (2015) reported that 6.2% of the respondents were underweight; 35.8% overweight and 20% obese. Only 38% had normal body mass index (BMI) out of the 260 respondents for the study. This study further showed that majority of the respondents (62%) were malnourished despite being hospital caregivers, a situation that calls for serious attention. Thus, this study aimed to determine the prevalence of malnutrition assessed by underweight, overweight and obesity, and also some selected risk factors of cardiovascular diseases among primary healthcare workers in two Local Government Areas of Ogun State, Nigeria. This is to provide insight to the health condition of the primary healthcare workers to assist in designing strategies to living a nutritional healthy life and put in place necessary plans and awareness to tackle the issues related to cardiovascular disease among these foremost healthcare workers.

MATERIALS AND METHODS

This study employed cross-sectional descriptive and analytical research design approach to determine the prevalence of malnutrition and some selected risk factors of cardiovascular diseases among the primary healthcare workers in Odeda and Abeokuta South Local Government Areas of Ogun State, Nigeria. These two Local Government Areas were purposively selected for this study because of the high prevalence of overweight and obesity reported to be found among the hospital health workers in Abeokuta Metropolis (Adeleke and Adeleke, 2015) which are two key risk factors of cardiovascular diseases.

Odeda Local Government Area has eighteen (18) functional Primary Healthcare Centers with one hundred and thirty-five (135) healthcare workers while Abeokuta South Local Government Area has thirteen (13) functional Primary Healthcare Centers with one hundred and twenty-three (123) healthcare workers giving a total sum of two hundred and fifty-eight (258) primary healthcare workers for the two Local Government Areas as at the time of this study.

Sampling technique and procedure

An exhaustive survey technique was used in which all two hundred and fifty-eight (258) respondents were contacted for the purpose of this study but two hundred and twenty (220) eligible respondents gave consent for the study participation. To contact the participants, visitation was made to each primary healthcare center along with an approval letter of each local government Director for Primary Healthcare. The sampling frame consisted of a list of all Doctors, Registered Nurses, Community Health Extension Workers, Health Educators, Pharmacy Tech-

nicians, Laboratory Scientists, Food Scientist and Health Attendants working within the two Local Governments Primary Healthcare Centers.

The criteria used to recruit respondents are that each participant should be registered primary healthcare worker with license to practice from their respective professional body; he or she must have been deployed to the study area and had worked with the state primary healthcare commission for at least six months prior to the study. Pregnant and lactating female primary healthcare workers as well as healthcare workers on annual/maternal/sick/study leave during the study were excluded.

Method of data collection and procedure

Anthropometric measurements such as weight, height, waist and hip circumference were taken using standard procedures described by Cogill, (2003). Body mass index and abdominal obesity were calculated from the measurements using World Health Organization standards: Underweight ($<18.5\text{kg}/\text{m}^2$), Normal ($18.5\text{kg}/\text{m}^2 - 24.9\text{kg}/\text{m}^2$), Overweight ($25.0\text{kg}/\text{m}^2 - 29.9\text{kg}/\text{m}^2$), Obese I ($30.0\text{kg}/\text{m}^2 - 34.9\text{kg}/\text{m}^2$), Obese II ($35.0\text{kg}/\text{m}^2 - 39.9\text{kg}/\text{m}^2$), Obese III ($\geq 40.0\text{kg}/\text{m}^2$) (WHO, 2000). The following cutoffs were used with regards to metabolic/cardiovascular disease screening: high-risk waist circumference (Visceral Obesity) $\geq 102\text{cm}$ for men and $\geq 88\text{cm}$ for women, high-risk plasma blood glucose level $\geq 110\text{ mg}/\text{dl}$ and high-risk blood pressure $\geq 130/\geq 85\text{ mmHg}$ following the National Cholesterol Education Program for Adult Treatment Panel III guideline (NCEP, 2001).

Statistical analysis

Data collected were examined, entered and processed using Microsoft Excel (Microsoft Office, 2016) and were further subjected to statistical analysis using Statistic Package for Social Sciences version 23.0 for windows® (IBM SPSS, 2015). Errors and inconsistencies were checked to validate the data and presenting it in frequency count, percentage values. Inferential statistics such as Chi-Square was employed to examine the relationship between the selected risk factors of cardiovascular disease and body mass index among the respondent. Tests were performed at $p \leq 0.05$.

RESULTS

Regarding the Body Mass Index (BMI) Classification of the respondents according to WHO (2000) guideline, it was observed that 7.7% of the respondents were underweight, while higher percentage (35.5%) had normal BMI, followed by 25.9% who were overweight, 27.3% were obese I and 3.6% were obese II (Table 1).

Stratifying the body mass index classification according to the respondent's job title/ occupation revealed that the Community Health Extension Workers had the highest percentage of overweight (29.0%), obese I (38.7%) and obese II (6.5%). Among the Nursing Staff, highest percentage were obese I (38.1%), followed by overweight (26.2%), 21.4% had normal BMI, 9.5% were underweight and the least (4.8%) were obese II. Little above 47% of the Health Attendance/ Assistant had normal BMI, about 29% were overweight, 14.3% were obese I, 7.1% were underweight, while the least (2.9%) were obese II. The highest percentage (36.4%) of the Pharmacy Technician were obese I, little

above 27% were overweight while same percentage (18.2%) were underweight and of normal BMI. Majority (77.8%) of the Lab Scientist had normal BMI while 11.1% were overweight. The two (2) Health Educator in the study location had normal BMI. This was similar to the result of the Food Scientist where the four (4) scientists in the study location had normal BMI. A significant association was observed between the BMI classification and Job Title/ Occupation of the respondents having a p-value of 0.001 (Table 1).

Using NCEP ATP III guideline (NCEP, 2001) for the identification of abdominal obesity classification, 58.2% of the respondent's fell within the high-risk waist circumference category (Table 2). For systolic blood pressure measurement, 34.6% of the respondents were at risk of cardiovascular diseases as at the time of the study while 40.9% of the respondents were at risk of cardiovascular diseases using diastolic blood pressure measurement (Table 2).

About 20% of the respondents had high fasting blood glucose placing them at risk of cardiovascular diseases as at the time of this present study (Table 2). The Community Health Extension Workers had the highest percentage of abdominal obesity and high fasting blood glucose of 67.7% and 45.2% respectively. More so, little above average (58.1%) and (54.8%) of the Community

Health Extension Workers were not at risk of high systolic and diastolic blood pressure respectively. The Nurses had the highest percentage of high-risk systolic and diastolic blood pressure having 42.9% and 52.4% respectively. Also, 66.7% of the Nurses had abdominal obesity while just 4.8% had high risk fasting blood glucose. The two (2) Health Educator in the study location were free of abdominal obesity, high blood pressure, and high fasting blood glucose. Little above 27% of the Pharmacy Technician had abdominal obesity, 9.1% had high blood pressure while all the Pharmacy Technician were not at risk of high fasting blood glucose. About 66% of the Health Attendant/ Assistant had abdominal obesity, 37.1% high blood pressure while 17.1% had high fasting blood glucose. Little above 33% of the Lab Scientist had abdominal obesity while just 11.1% had high fasting blood glucose. Among the four (4) Food Scientist in the study location, none had abdominal obesity and high fasting blood glucose while all had high blood pressure (Table 2).

Abdominal obesity, systolic blood pressure and diastolic blood pressure of the respondents was found to be strongly associated with body mass index of the respondents having a p-value of 0.000, 0.000 and 0.001 respectively while fasting blood glucose was not significant with the BMI of the respondents (Table 3).

Table 1: Body Mass Index (BMI) Classification of the Respondents Stratified by Job Title/ Occupation

BMI Classification	Job Title/ Practice										χ ²	P-value		
	Nurse	Community Health Extension Worker	Health Educator	Pharmacy Technician	Health Attendant/ Assistant	Lab Scientist	Food Scientist	Total	F (%)	F (%)			F (%)	
Underweight	4 (9.5)	4 (6.5)	0 (0.0)	4 (18.2)	5 (7.1)	0 (0.0)	0 (0.0)	17 (7.7)	0 (0.0)	0 (0.0)	0 (0.0)	17 (7.7)		
Normal	9 (21.4)	12 (19.4)	2 (100.0)	4 (18.2)	33 (47.1)	14 (77.8)	4 (100.0)	78 (35.5)	4 (100.0)	4 (100.0)	4 (100.0)	78 (35.5)		
Overweight	11 (26.2)	18 (29.0)	0 (0.0)	6 (27.3)	20 (28.6)	2 (11.1)	0 (0.0)	57 (25.9)	2 (11.1)	0 (0.0)	0 (0.0)	57 (25.9)		
Obese I	16 (38.1)	24 (38.7)	0 (0.0)	8 (36.4)	10 (14.3)	2 (11.1)	0 (0.0)	60 (27.3)	2 (11.1)	0 (0.0)	0 (0.0)	60 (27.3)		
Obese II	2 (4.8)	4 (6.5)	0 (0.0)	0 (0.0)	2 (2.9)	0 (0.0)	0 (0.0)	8 (3.6)	0 (0.0)	0 (0.0)	0 (0.0)	8 (3.6)		
Total	42 (100.0)	62 (100.0)	2 (100.0)	22 (100.0)	70 (100.0)	18 (100.0)	4 (100.0)	220 (100.0)	18 (100.0)	4 (100.0)	4 (100.0)	220 (100.0)	52.798	0.001*

*Statistically significant at p≤0.05

Table 2: Classification of Selected Risk Factors for Cardiovascular Diseases among the Respondents Stratified by Job Title

Risk Factors	Job Title							
	Nurse F (%)	Community Health Exten- sion Worker F (%)	Health Educator F (%)	Pharmacy Technician F (%)	Health At- tendant/ Assistant F (%)	Lab Scien- tist F (%)	Food Sci- entist F (%)	Total F (%)
Abdominal Obesity								
At Risk	28 (66.7)	42 (67.7)	0 (0.0)	6 (27.3)	46 (65.7)	6 (33.3)	0 (0.0)	128 (58.2)
Not At Risk	14 (33.3)	20 (32.3)	2 (100.0)	16 (72.7)	24 (34.3)	12 (66.7)	4 (100.0)	92 (41.8)
Total	42 (100.0)	62 (100.0)	2 (100.0)	22 (100.0)	70 (100.0)	18 (100.0)	4 (100.0)	220 (100.0)
Blood Pressure								
High-Risk Systolic BP	18 (42.9)	26 (41.9)	0 (0.0)	2 (9.1)	26 (37.1)	4 (22.2)	4 (100.0)	80 (36.4)
Not At Risk	24 (57.1)	36 (58.1)	2 (100.0)	20 (90.9)	44 (62.9)	14 (77.8)	0 (0.0)	140 (63.6)
Total	42 (100.0)	62 (100.0)	2 (100.0)	22 (100.0)	70 (100.0)	18 (100.0)	4 (100.0)	220 (100.0)
High-Risk Diastolic BP	22 (52.4)	28 (45.2)	0 (0.0)	2 (9.1)	26 (37.1)	8 (44.4)	4 (100.0)	90 (40.9)
Not At Risk	20 (47.6)	34 (54.8)	2 (100.0)	20 (90.9)	44 (62.9)	10 (55.6)	0 (0.0)	130 (59.1)
Total	42 (100.0)	62 (100.0)	2 (100.0)	22 (100.0)	70 (100.0)	18 (100.0)	4 (100.0)	220 (100.0)
Fasting Blood Glucose								
High-Risk FBG	2 (4.8)	28 (45.2)	0 (0.0)	0 (0.0)	12 (17.1)	2 (11.1)	0 (0.0)	44 (20.0)
Not At Risk	40 (95.2)	34 (54.8)	2 (100.0)	22 (100.0)	58 (82.9)	16 (88.9)	4 (100.0)	176 (80.0)
Total	42 (100.0)	62 (100.0)	2 (100.0)	22 (100.0)	70 (100.0)	18 (100.0)	4 (100.0)	220 (100.0)

Table 3: Association between the Selected Risk Factors of Cardiovascular Diseases and Body Mass Index of the Respondent

Variables	Body Mass Index				χ^2	P-value
	Underweight	Normal	Overweight	Total		
Abdominal Obesity						
At Risk	0	28	40	52	8	128
Not At Risk	17	50	17	8	0	92
Total	17	78	57	60	8	220
Systolic Blood Pressure						
At Risk	4	20	20	28	8	80
Not At Risk	13	58	37	32	0	140
Total	17	78	57	60	8	220
Diastolic Blood Pressure						
At Risk	4	24	24	30	8	90
Not At Risk	13	54	33	30	0	130
Total	17	78	57	60	8	220
Fasting Blood Glucose						
At Risk	4	14	14	12	0	44
Not At Risk	13	64	43	48	8	176
Total	17	78	57	60	8	220

*Statistically significant at $p \leq 0.05$

DISCUSSION

In this current study, the prevalence of underweight, overweight and obesity (malnutrition) was found to be 7.7%, 25.9% and 30.9% respectively. The percentage of respondents with obesity assessed by body mass index in this study was similar to that of Iwuala et al., (2015) who conducted a study on hospital service providers of Lagos University Teaching Hospital and reported that 27.3% of the hospital service provider were obese. The percentage of respondents who were overweight was similar to that of Sola et al., (2011) who reported that 22% of adults Nigerian living in rural and urban communities of Benue State were overweight. The Centers for Disease Control and Prevention (CDC, 2017) buttress the trend on nutritional status of adult assessed by BMI and reported that 39.8% of United State of America adults were obese which is similar to that of this present study (30.9% obesity).

Prevalence of abdominal obesity was observed to be significantly high among the respondents and this may be considered a serious issue because central/ abdominal obesity is a strong independent risk factor for hypertension and cardiovascular disease (Grundy et al., 2004). This might explain the observed high rate of high blood pressure in this study. There was a greater than 1% and less than 2% observed trend on prevalence of abdominal obesity among the three (3) similar occupations (Nurse, Community Health Extension Worker and Health Attendance/ Assistant).

Overweight and obesity have been shown to correlate with increased risks for coronary heart disease, type 2 diabetes mellitus, cancers, high blood pressure, high blood cholesterol concentration, stroke, liver and

gallbladder disease, respiratory difficulties, osteoarthritis and gynecological difficulties (CDC, 2018). A similar trend was observed in this study, where a significant association was observed between abdominal obesity, blood pressure and BMI of the respondents.

CONCLUSION

A high prevalence of overweight and general obesity, elevated fasting blood glucose, high blood pressure and high abdominal obesity was recorded among the primary healthcare workers. This may expose the primary healthcare workers to poor health in the future by predisposing them to cardiovascular diseases. The key risk factors of cardiovascular disease assessed in this study was predominantly high among the Community Health Extension Workers except high blood pressure which was common among the Nurses.

RECOMMENDATION

Regular exercise regimen should be encouraged among these primary healthcare workers and compulsory medical check-up to keep watch of their health status. Further study should be done to assess the link between the risk factors of cardiovascular diseases and job occupation.

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