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# Prevalence and Factors Associated with Obesity Among Healthcare Workers in An Urban Area in Lagos State, Nigeria

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## ABSTRACT

**Background:** Obesity is a major concern affecting millions globally. Healthcare workers are particularly at risk from high stress levels and long working hours**,** often disrupting healthy lifestyle habits. This study aimed to determine the prevalence and factors associated with obesity among healthcare workers in an urban area in Lagos State.

**Methods:** The study was a descriptive cross-sectional study. A self-administered questionnaire was used to collect data, including weight and height, from 300 health workers selected using multistage sampling. Data was analyzed and presented as frequency tables. Logistic regression was used to identify factors associated with obesity with significance at $p<0.05$.

**Results:** The prevalence of overweight and obesity were 25.0% and 17.3% respectively. Factors associated with obesity among the respondents, included history of diabetes (AOR = 3.319, 95%CI = 1.133 – 9.719, p = 0.029), increased consumption of processed cereals (AOR = 6.998, 95% CI = 1.748 – 28.015, p = 0.006), and workplace stress (AOR = 2.142, 95%CI = 1.058 – 4.335, p = 0.034).

**Conclusion:** Healthcare workers have high obesity rates, emphasizing the need for workplace interventions like better working hours and wellness programs tailored to their demanding schedules.

**Keywords:** Prevalence; Obesity; Health Personnel; Anthropometry; Body Mass Index



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## INTRODUCTION

Obesity is a prevalent condition arising from a complex interplay of genetic, environmental, and lifestyle factors, with sedentary habits and poor dietary choices acting as significant contributors and characterized by abnormal or excessive accumulation of body fat to the extent that it poses a risk to health. In modern settings, sedentary living, reduced physical activity, and increased consumption of energy-dense, nutrient-poor foods are major drivers of this condition. The negative repercussions from obesity extend beyond aesthetic considerations, through significantly elevating the risk of developing various chronic diseases, such as type 2 diabetes, cardiovascular disorders, osteoarthritis, sleep apnea, and specific cancers.[1] The American Medical Association has lately acknowledged obesity as both a medical condition and a primary contributor to avoidable fatalities and persistent health issues.[2]

This recognition extends beyond physical well-being, as obesity has also been significantly correlated with mental health disorders..[2,3] The prevalence of obesity worldwide is high and still rising with the increasing adoption of westernized practices that provide a predisposition to its occurrence.[4] The World Health Organization (WHO) reported that more than two billion people experience this condition, with over 340 million being children and adolescents.[5] The impact of obesity is profound, contributing to over 2.8 million deaths and 36 million disability-adjusted life years (DALYs) annually, constituting 2.3% of the total global DALYs.[5]

Nearly 60% of adults and approximately one in three children (29% of boys and 27% of girls) in the WHO European Region experience the impact of being overweight and obesity. Recent assessments indicate that overweight and obesity rank as the fourth most prevalent risk factor for noncommunicable diseases (NCDs) in the region.[6] A notable trend in developing countries, particularly among women, is the ongoing rise in adult obesity attributed to excessive nutrition. While overweight and obesity are commonly perceived as issues in high-income nations, low- and middle-income countries (LMICs), especially urban populations in sub-Saharan African countries, are now grappling with an escalating prevalence of both conditions.[7] Between 1980 and 2013, the occurrence of overweight and obesity was reported to have near doubled in Sub-Saharan Africa, mirroring global trends.[5] In Nigeria, this pattern is consistent, with a recent meta-analysis reporting prevalence rates of overweight and obesity at 26.0% (95% CI: 23.0–29.0) and 15.0% (95% CI: 13.0–16.0) respectively.[8] Health workers who serve as the gate keepers of health in various communities are not spared from this web of non-communicable diseases, and a myriad of studies have shown similar or even heightened global and local prevalence of obesity in this cohort when compared to that of the general population.[9, 10]

Increasing focus is also being directed towards the prevalence of overweight and obesity in healthcare workers, attributed to various lifestyle factors such as inadequate dietary habits, disrupted sleep patterns from shift work/call duty, and the presence of work stress and burnout.[9] Generally, obesity among healthcare workers not only affects their personal well-being but also raises concerns about the quality of patient care.[10] Given the vital and demanding nature of their roles, healthcare workers' own health is crucial for maintaining a resilient and effective healthcare system.[10]

The prevalence of obesity in Nigeria among healthcare workers has been reported to range from 15% to 25%, depending on the region and specific population studied. [10] A study conducted among health workers in a tertiary hospital in Ibadan found that 28.4% of the respondents were overweight, while 15.3% were obese.[11] Similarly, in a survey of health workers in one tertiary centre in Lagos, 35.3% were overweight and 13.9% were obese.[12] These figures suggest that health workers in Nigeria are experiencing obesity at rates comparable to, or even higher than, the general population, indicating that the issue is pervasive even among those who are knowledgeable about its health implications. Most studies on obesity in the country were focused on single centre or cadre assessments of health workers, and this would be the first study involving health workers over a wide range of facilities, cadres and practice in an urban local government area.

Urban areas tend to report higher rates, reflecting greater access to energy-dense foods and more sedentary lifestyles.[12,13] The stigma surrounding obesity further discourages seeking help, and this is further worsened by their status as providers of health services. This research has the potential to influence policies and practices, promoting the holistic health of healthcare professionals and, by extension, the communities they serve. Therefore, this study aimed to assess the prevalence of



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overweight and obesity and determine factors associated with these conditions among healthcare workers across diverse health facilities in an urban local government area of Lagos State.

## MATERIALS AND METHODS

This study was a descriptive cross-sectional study to determine the prevalence and factors associated with obesity among healthcare workers in Kosofe Local Government Area, Lagos State. The study included all healthcare workers aged 18 years and above, including contract staff, who had been working within the local government area for at least three months. Eligible participants comprised doctors, nurses, pharmacists, physiotherapists, laboratory scientists, and other allied health professionals duly registered with their respective professional regulatory bodies. Pregnant staff and acutely ill healthcare workers were excluded from the study.

The sample size determination was done using Cochran's formula; ($n= Z^2pq/d^2$), where: n is the minimum sample size, d = desired level of precision of the study at 5%, Z = standard normal deviate corresponding to 1.96 at 95% confidence interval, and p = prevalence of obesity in Nigeria in a systematic review = 15% = 0.15. (8) Since the study population size is less than 10,000; the modification for finite population correction (fpc) was included; ($nf = n/ (1+ n/N)$), where *nf*= is the derived sample size for a finite population less than 10,000, n = is the derived sample size (from Cochran's formula), when the population is more than 10,000 = 196, N = estimate of the population size = 2,474. Therefore, with a non-response rate of 10%, the minimum sample size calculated was 200. Although the calculated sample size was 200, 325 questionnaires were distributed to improve coverage, precision and anticipated non-response, and 300 fully completed questionnaires were returned and analysed.

Multistage sampling method was applied to select the respondents to be involved in the study, comprising three stages. Stage one involved the selection of facilities: Seven public facilities (One general hospital and six primary health centres) and fourteen private facilities [Two multi-specialist private hospitals (out of 18 multi specialist hospitals) and twelve private hospitals (out of 105 non-multi-specialist hospitals)] were selected by simple random sampling (balloting). Stage two involved the use of stratified sampling method to determine the number of respondents from the public and private facilities to be selected. The respondents were proportionally sampled utilizing the formula: Population sampled from each facility = (Study population in one centre/total population in all centres) X minimum sample size. Stage three involved the selection of respondents using simple random sampling (balloting). Data was collected using a self-administered questionnaire. The questionnaire consisted of 5 sections: Section A contained the demographic details, Section B contained the meal frequency, physical activity, work history of the respondents, Section C contained the dietary pattern of the respondents, Section D assessed work-related stress of the respondents using the workplace stress scale (WSS).[13]

A digital weighing scale was used to acquire the weight of the respondents which was documented to the nearest 0.1 kilogram. The weight was measured after ensuring adjusting to zero point with each use and respondents standing straight, ensuring they wore light clothing without bags, shoes and heavy jewelry or equipment, and emptied pockets. A tape measure was used to calibrate and measure the height of respondents to the nearest 0.01 metre. The respondents stood erect, without shoes and any form of head gear and had their heads positioned with gaze forward (Frankfurt position) while backing the calibrated wall.

The Body Mass Index was calculated from the formula: Weight (kg) / Height$^2$ (m$^2$). The Body Mass Index was categorized as, underweight (<18.5 kg/m$^2$), normal (18.5 to 24.9 kg/m$^2$), overweight (25 to 29.9 kg/m$^2$), and obese (≥ 30 kg/m$^2$) to determine obesity. The questionnaire was pretested with twenty-two healthcare workers in another LGA in Lagos prior to commencement of data collection to confirm that questions were properly understood.

Four research assistants who were medical students in their 500 Level and had commenced their clinical postings, were trained on how to conduct the data collection with the questionnaire, and how to properly conduct the weight, and height, to prevent measurement bias. The training consisted of five repeat sessions on different days with each session spanning an hour. Data collection was performed between May and August 2024.



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Data collected electronically was entered into Microsoft Excel and analyzed using Epi Info 7 statistical software. The analyzed data from the questionnaire was presented as frequency tables. Quantitative variables were described using measures of central tendency (mean, median) and measures of dispersion (range, standard deviation) as appropriate. Body mass index was acquired from the respective weight and height. Logistic regression was used to determine the predictors of obesity, and p-value < 0.05 was taken for statistical significance.

Ethical approval was acquired from the Human Research Ethics Committee (HREC) of the Lagos University Teaching Hospital (Approval No: ADM/DSCST/HREC/APP/6559). Approval was also sought from the health service commission and hospital management of various government and private facilities. Informed consent was obtained from the respondents involved in the study. Voluntary participation, assurance of privacy and confidentiality on disclosed information was given to each respondent.

This study possessed strengths in its ability to determine the prevalence of obesity in the study population, by virtue of the study design applied. Randomization and multivariable analysis performed, served as tools to reduce bias in the study. A limitation of the study however was also in the study design being cross-sectional, denying the ability to establish temporal relationships or causality between various independent and outcome variables.

## RESULTS

A total of 300 health workers filled their questionnaires completely out of 325 questionnaires handed in this study, giving a response rate of 92.3%. The mean age of the respondents was 42.6 ± 9.7 years with a range of 24 to 71 years. The highest frequency of respondents 112(37.3%) were within the age group of 40 to 49 years. Majority of the respondents were female 221(73.7%). Respondents included doctors/dentists 36(12.0%), nurses/nurse assistants 160(53.3%), pharmacists/pharmacy technicians 18(6.0%), laboratory scientists/technicians 44(14.7%), and other allied healthcare professionals 42(14.0%).

The highest frequency of respondents 84(28.0%) had their average monthly income between range of 150,000 and 200,000 naira. Majority of the respondents 242(80.7%) had their household size at six people or less.

Almost two thirds of the respondents 192(64.0%) had history of alcohol intake. A fifth of the respondents 60(20.0%) had a chronic illness. The prevalence of hypertension and diabetes among the respondents was 14.0% and 6.3% respectively. The prevalence of overweight and obesity among the respondents was 25.0% and 17.3% respectively. The mean body mass index (BMI) of the respondents was 25.13 ± 4.5 kg/m$^2$ (Table 1).

**Table 1:** Socio demographic characteristics and prevalence of obesity among respondents

| Variable | Freq (n = 300) | Percent |
|---|---|---|
| **Age group (years)** | | |
| 20 – 29 | 26 | 8.7 |
| 30 – 39 | 92 | 30.7 |
| 40 – 49 | 112 | 37.3 |
| 50 – 59 | 55 | 18.3 |
| ≥ 60 | 15 | 5.0 |
| **Range** | 24 – 71 | |
| **Mean ± SD** | 42.6 ± 9.7 | |
| **Sex** | | |
| Male | 79 | 26.3 |
| Female | 221 | 73.7 |
| **Occupation** | | |
| Doctor/Dentist | 36 | 12.0 |
| Nurse/nurse assistant | 160 | 53.3 |
| Pharmacist/pharm technician | 18 | 6.0 |
| Lab scientist/technician | 44 | 14.7 |
| Others* | 42 | 14.0 |
| **Average monthly income (₦)** | | |
| <50,000 | 27 | 9.0 |
| 50,000 – <100,000 | 61 | 20.3 |
| 100,000 – <150,000 | 48 | 16.0 |
| 150,000 – <200,000 | 84 | 28.0 |
| ≥200,000 | 80 | 26.7 |
| **Household size** | | |
| ≤ 6 | 242 | 80.7 |
| > 6 | 58 | 19.3 |
| **History of alcohol intake** | | |
| Yes | 192 | 64.0 |
| No | 108 | 36.0 |
| **Presence of any chronic illness** | | |
| Yes | 60 | 20.0 |
| No | 240 | 80.0 |



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| Variable | Freq (n = 300) | Percent |
|---|---|---|
| **Chronic Illness †** | | |
| Hypertension | 42 | 14.0 |
| Diabetes | 19 | 6.3 |
| Arthritis | 5 | 1.7 |
| Asthma | 3 | 1.0 |
| Hypertensive diabetic | 9 | 3.0 |
| **Body Mass Index (BMI) (kg/m²)** | | |
| <18.50 (Underweight) | 13 | 4.3 |
| 18.50 – 24.99 (Normal) | 160 | 53.3 |
| 25.00 – 29.99 (Overweight) | 75 | 25.0 |
| ≥ 30 (Obese) | 52 | 17.3 |
| **Mean ± SD** | 25.13 ± 4.5 | |

*Others - Physiotherapist, Sonologist, Radiographer, Optometrist, Optician, † Multiple responses allowed

The highest frequency of respondents 135(45.0%) reported that they performed vigorous exercise for at least 30 minutes less than once a week. The highest frequency of respondents, 97(32.3%) also reported that they spent at least 30 minutes in the past week on activities such as walking and cycling, less than once a week. Half of the respondents 150(50.0%) ate two meals daily most frequently. The highest frequency of respondents, 115(38.3%) ate breakfast daily. Over a third of the respondents 113(37.7%) ate food from a food vendor one to two times weekly. Majority of the respondents 186(62.0%) drank less than 8 glasses (two litres) of water daily. Majority of the respondents used public transport most frequently to get to work 264(88.0%) and worked within a range of 41 to 60 hours per week 196(65.3%). Using the workplace stress scale, a quarter of the respondents 75(25.0%) were under considerable (severe/dangerous) workplace stress (Table 2).

**Table 2:** Physical activity, meal frequency, and work history of respondents

| Variable | Freq (n = 300) | Percent |
|---|---|---|
| Perform vigorous exercise for ≥30 minutes | | |
| Daily | 0 | 0 |
| > once a week | 12 | 4.0 |
| Weekly | 105 | 35.0 |
| < once a week | 135 | 45.0 |
| Occasionally/Never | 48 | 16.0 |
| Spends ≥30 minutes on activities such as walking or cycling | | |
| Daily | 34 | 11.3 |
| > once a week | 74 | 24.7 |
| Weekly | 83 | 27.7 |
| < once a week | 97 | 32.3 |
| Occasionally/Never | 12 | 4.0 |
| Most frequent number of meals daily | | |
| 2 | 150 | 50.0 |
| 3 | 139 | 46.3 |
| 4 | 11 | 3.7 |
| Frequency of breakfast consumption weekly | | |
| Never | 9 | 3.0 |
| 1 – 2 times | 72 | 24.0 |
| 3 – 4 times | 15 | 5.0 |
| 5 – 6 times | 89 | 29.7 |
| Everyday | 115 | 38.3 |
| Frequency of eating from a food vendor weekly | | |
| Never | 55 | 8.3 |
| < once | 51 | 17.0 |
| 1 – 2 times | 113 | 37.7 |
| 3 – 4 times | 60 | 20.0 |
| 5 – 6 times | 21 | 7.0 |
| Average number of glasses of water daily | | |
| < 8 | 186 | 62.0 |
| ≥ 8 | 114 | 38.0 |
| Most frequent mode of transport | | |
| Public transport | 264 | 88.0 |
| Private vehicle | 24 | 8.0 |
| Taxi/Uber | 7 | 2.3 |
| Walk | 5 | 1.7 |



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| Variable | Freq (n = 300) | Percent |
|---|---|---|
| Hours of work /week (hours/week) | | |
| ≤ 20 | 12 | 4.0 |
| 21 – 40 | 66 | 22.0 |
| 41 – 60 | 196 | 65.3 |
| 61 – 80 | 12 | 4.0 |
| > 80 | 14 | 4.7 |
| Workplace stress | | |
| Not considerable (Absent/low/moderate) | 225 | 75.0 |
| Considerable (Severe/Dangerous) | 75 | 25.0 |

Foods consumed by respondents in high frequency such as daily included carbohydrates; rice 95(31.7%), cassava products 100(33.3%), and animal proteins; red meat 83(27.7%), poultry and poultry products 71(23.7%). Plant proteins such as beans 125(41.7%) and oils such as palm oil 116(38.7%) and vegetable oil 117(39.0%) were regularly consumed three to four times per week. Leafy and non-leafy vegetables were also frequently consumed by respondents with 48(16.0%) each consuming daily and 36(12.0%) and 60(20.0%) respectively consuming more than once daily (Table 3).

**Table 3: Food frequency of respondents**

| Food | Frequency (%) (n = 300) | | | | | |
|---|---|---|---|---|---|---|
| | < once/ week | 1 – 2x/ week | 3 – 4x/ week | 5 – 6x/ week | Daily | >once daily |
| **Carbohydrates** | | | | | | |
| **Rice** | 0(0) | 42(14.0) | 85(28.3) | 54(18.0) | 95(31.7) | 24(8.0) |
| **Wheat** | 179(59.7) | 28(9.3) | 12(4.0) | 66(22.0) | 15(5.0) | 0(0) |
| **Corn/Maize** | 167(55.7) | 93(31.0) | 27(9.0) | 13(4.3) | 0(0) | (0) |
| **Custard, Pap** | 192(64.0) | 61(20.3) | 36(12.0) | 11(3.7) | 0(0) | 0(0) |
| **Oat** | 223(74.3) | 61(20.3) | 9(3.0) | 0(0) | 7(2.3) | 0(0) |
| **Processed cereals (noodles, spaghetti, cornflakes custard, etc.)** | 156(52.0) | 48(16.0) | 84(28.0) | 12(4.0) | 0(0) | 0(0) |
| **Yam** | 145(48.3) | 111(37.0) | 44(14.7) | 0(0) | 0(0) | 0(0) |
| **Cassava (Garri, Fufu, Lafu)** | 48(16.0) | 103(34.3) | 34(11.3) | 0(0) | 100(33.3) | 15(5.0) |
| **Potatoes** | 241(80.3) | 40(13.3) | 19(6.3) | 0(0) | 0(0) | 0(0) |
| **Cocoyam** | 270(90.0) | 6(2.0) | 24(8.0) | 0(0) | 0(0) | 0(0) |
| **Plantain** | 156(52.0) | 72(24.0) | 60(20.0) | 0(0) | 0(0) | 12(4.0) |
| **Proteins** | | | | | | |
| **Beans** | 55(18.3) | 88(29.3) | 125(41.7) | 0(0) | 21(7.0) | 11(3.7) |
| **Groundnut** | 115(38.3) | 149(49.7) | 24(8.0) | 0(0) | 0(0) | 12(4.0) |
| **Soyabeans** | 240(80.0) | 60(20.0) | 0(0) | 0(0) | 0(0) | 0(0) |
| **Egusi, cowpea & others** | 82(27.3) | 126(42.0) | 20(6.7) | 72(24.0) | 0(0) | 0(0) |
| **Dairy products** | 46(15.3) | 66(22.0) | 46(15.3) | 71(23.7) | 36(12.0) | 35(11.7) |
| **Skimmed milk** | 181(60.3) | 23(7.7) | 84(28.0) | 0(0) | 0(0) | 12(4.0) |
| **Red meat** | 33(11.0) | 45(15.0) | 69(23.0) | 36(12.0) | 83(27.7) | 34(11.3) |
| **Poultry and products** | 33(11.0) | 69(23.0) | 34(11.3) | 35(11.7) | 71(23.7) | 58(19.3) |
| **Fish and products** | 0(0) | 44(4.7) | 115(38.3) | 12(4.0) | 106(35.3) | 23(7.7) |
| **Fats and oil** | | | | | | |
| **Red palm oil** | 34(11.3) | 80(26.7) | 116(38.7) | 24(8.0) | 46(15.3) | 0(0) |
| **Vegetable/Groundnut oil** | 33(11.0) | 57(19.0) | 117(39.0) | 23(7.7) | 59(19.7) | 11(3.7) |
| **Margarine, butter** | 228(76.0) | 48(16.0) | 24(8.0) | 0(0) | 0(0) | 0(0) |
| **Fruits** | 114(38.0) | 81(27.0) | 58(19.3) | 0(0) | 23(7.7) | 24(8.0) |
| **Leafy vegetables** | 67(22.3) | 92(30.7) | 46(15.3) | 11(3.7) | 48(16.0) | 36(12.0) |



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| Food | Frequency (%) (n = 300) | | | | | |
|---|---|---|---|---|---|---|
| | < once/ week | 1 – 2x/ week | 3 – 4x/ week | 5 – 6x/ week | Daily | >once daily |
| **Non-leafy vegetables** | 56(18.7) | 56(18.7) | 58(19.3) | 22(7.4) | 48(16.0) | 60(20.0) |
| **Bread** | 69(23.0) | 22(7.3) | 140(46.7) | 47(15.7) | 0(0) | 22(7.3) |
| **Biscuit, cake, meat-pie, doughnuts & other salty snacks** | 102(34.0) | 105(35.0) | 35(11.7) | 12(4.0) | 12(4.0) | 34(11.3) |
| **Confectionaries** | 209(69.7) | 45(15.0) | 35(11.7) | 0(0) | 11(3.7) | 0(0) |
| **Beverages** | 45(15.0) | 114(38.0) | 47(15.7) | 60(20.0) | 22(7.3) | 12(4.0) |
| **Carbonated soft drinks** | 91(30.3) | 132(44.0) | 18(6.0) | 24(8.0) | 23(7.7) | 12(4.0) |
| **Caffeine** | 171(57.0) | 82(27.3) | 24(8.0) | 12(4.0) | 11(3.7) | 0(0) |

Bivariate analysis showed history of workplace stress (p = 0.035), type 2 diabetes (p = 0.020), spending ≥30 minutes on activities such as walking or cycling (p = 0.028), and consumption of processed cereals (p = 0.002), as factors associated with obesity among the respondents (Table 4).

**Table 4:** Association between respondent characteristics and obesity

| Variable | Chi-square value | p value |
|---|---|---|
| **Socio demographic Characteristics** | | |
| Age | 1.462 | 0.839* |
| Sex | 2.642 | 0.104 |
| Occupation/Cadre | 2.972 | 0.562 |
| Average monthly income | 0.999 | 0.920* |
| Household size | 3.650 | 0.056 |
| History of alcohol intake | 0.747 | 0.387 |
| Hypertension | 0.317 | 0.547 |
| Diabetes mellitus (type 2) | 5.388 | **0.020** |
| **Physical activity, meal frequency, and work history** | | |
| Perform vigorous exercise for ≥30 minutes | 1.818 | 0.615* |
| Spends ≥30 minutes on activities such as walking or cycling | 12.853 | **0.018*** |
| Most frequent number of meals daily | 0.307 | 0.856** |
| Frequency of breakfast consumption weekly | 2.286 | 0.686* |
| Frequency of eating from a food vendor weekly | 1.945 | 0.755* |
| Average number of glasses of water daily | 0.152 | 0.697 |
| Most frequent mode of transport | 4.541 | 0.157* |
| Hours of work /week (hours/week) | 4.432 | 0.327* |
| Workplace stress | 4.467 | **0.035** |
| **Food Frequency of Respondents** | | |
| **Carbohydrates** | | |
| Rice | 4.592 | 0.332 |
| Wheat | 3.371 | 0.494* |
| Corn/Maize | 2.888 | 0.404* |
| Custard, Pap | 4.350 | 0.214* |
| Oat | 1.758 | 0.609* |
| Processed cereals (noodles, spaghetti, cornflakes custard, etc.) | 15.066 | **0.002** |
| Yam | 1.910 | 0.385 |
| Cassava (Garri, Fufu, Lafu) | 4.138 | 0.384* |
| Potatoes | 5.905 | 0.052 |
| Cocoyam | 0.674 | 0.755* |
| Plantain | 3.394 | 0.326* |
| **Proteins** | | |
| Beans | 8.456 | 0.065* |



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| Variable | Chi-square value | p value |
|---|---|---|
| Groundnut | 4.302 | 0.215 |
| Soyabeans | 1.681 | 0.195 |
| Egusi, cowpea & others | 2.178 | 0.548 |
| Dairy products | 7.885 | 0.163 |
| Skimmed milk | 0.376 | 0.965* |
| Red meat | 4.517 | 0.477* |
| Poultry and products | 6.570 | 0.255 |
| Fish and products | 4.473 | 0.333* |
| **Fats and oil** | | |
| Red palm oil | 9.178 | 0.057 |
| Vegetable/Groundnut oil | 7.065 | 0.200* |
| Margarine, butter | 1.629 | 0.443 |
| Fruits | 1.733 | 0.785 |
| Leafy vegetables | 3.816 | 0.575 |
| Non-leafy vegetables | 6.680 | 0.332 |
| Bread | 8.907 | 0.058* |
| Biscuit, cake, meat-pie, doughnuts & other salty snacks | 8.878 | 0.096* |
| Confectionaries | 2.880 | 0.408* |
| Beverages | 2.974 | 0.711* |
| Carbonated soft drinks | 4.547 | 0.464* |
| Caffeine | 6.101 | 0.167* |

*fisher's exact p value

Logistic regression analysis of obesity and associated factors revealed that a positive history of type 2 diabetes (AOR = 3.319, 95%CI = 1.133 – 9.719, p = 0.029), presence of workplace stress (AOR = 2.142, 95%CI = 1.058 – 4.335, p = 0.034), and frequent consumption of processed cereals five to six times a week (AOR = 6.998, 95% CI = 1.748 – 28.015, p = 0.006) were significantly associated with the presence of obesity among the respondents (Table 5).

**Table 5:** Logistic regression analysis of obesity and associated factors after bivariate analysis

| Variable | AOR (95%CI) | p value |
|---|---|---|
| **History of Type 2 Diabetes** | | |
| Present | 3.319(1.133 – 9.719) | **0.029** |
| Absent | (Reference (1.0)) | |
| **Spends ≥30 minutes on activities such as walking or cycling** | | |
| Daily | (Reference (1.0)) | |
| > once a week | 1.254(0.299 – 5.250) | 0.757 |
| Weekly | 1.441(0.361 – 5.747) | 0.605 |
| < once a week | 2.377(0.597 – 9.465) | 0.219 |
| Occasionally/Never | 5.560(0.800 – 38.626) | 0.083 |
| **Workplace stress** | | |
| Not considerable (Absent/low/moderate) | (Reference (1.0)) | |
| Considerable (Severe/Dangerous) | 2.142(1.058 – 4.335) | **0.034** |
| **Consumption of processed cereals** | | |
| < once/week | (Reference (1.0) | |
| 1 – 2x /week | 0.859(0.287 – 2.574**)** | 0.787 |
| 3 – 4x /week | 2.141(0.974 – 4.706) | 0.058 |
| 5 – 6x /week | 6.998 (1.748 – 28.015) | **0.006** |

CI – Confidence interval, AOR – Adjusted Odds Ratio



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## DISCUSSION

Healthcare workers' prevalence of obesity within this population presents a significant public health challenge, with implications for workforce efficiency, healthcare costs, and the quality of patient care. Excess weight has been linked to an increased risk of chronic diseases, including cardiovascular conditions, diabetes, and musculoskeletal disorders, which contribute to absenteeism and reduced productivity.[9] This study provides crucial insights into the prevalence of obesity among healthcare workers in Kosofe LGA, Lagos, highlighting an interplay between dietary patterns, physical activity levels, and occupational stress in obesity.

The mean body mass index (BMI) of 25.13 ± 4.5 kg/m² categorizes the population as overweight, with 25.0% of respondents classified as overweight and 17.3% as obese. These figures align with global trends, particularly in urban settings, where lifestyle factors contribute to the rising prevalence of obesity. (7 – 8, 15 – 17) Notably, the study revealed that the presence of type 2 diabetics was significantly associated with obesity (AOR = 3.319, 95% CI = 1.133 – 9.719, p = 0.029), underscoring the well-established relationship between obesity and metabolic diseases.

Dietary patterns appear to be a key determinant of obesity among the respondents. Increased consumption of processed cereals was significantly associated with higher odds of obesity (AOR = 6.998, 95% CI = 1.748 – 28.015, p = 0.006), reinforcing the link between high glycemic index (GI) foods and weight gain. High-GI carbohydrates cause rapid spikes in blood glucose, leading to excessive insulin secretion, which in turn promotes fat storage. Over time, this pattern contributes to insulin resistance, increased fat accumulation, and ultimately obesity.[18] A study analyzing dietary patterns in Nigeria reported that individuals adhering to a traditional high-GI diet had a higher likelihood of obesity. Another study examining Western dietary influences found that individuals in the highest category of unhealthy dietary patterns had a 1.65 times greater risk of overweight or obesity compared to those in the lowest category (OR = 1.65; 95% CI: 1.45, 1.87; P < 0.0001).[18]

The study also identified workplace stress as a significant predictor of obesity, with stressed individuals having more than double the odds of being obese (AOR = 2.142, 95% CI = 1.058 – 4.335, p = 0.034). Chronic occupational stress is known to contribute to weight gain through neuroendocrine mechanisms, particularly by elevating cortisol levels, which promote fat accumulation. Stress-induced eating behaviors, particularly the consumption of high-calorie comfort foods, further exacerbate the risk of obesity. It must be noted that the relationship between stress and obesity may be in either one direction or the reverse and the bidirectional relationship between obesity and stress is particularly concerning among healthcare workers, as excess weight may reduce job performance, contribute to physical discomfort, and increase social stigma, further perpetuating workplace stress in a vicious cycle.[2]

Urbanization and modern lifestyles further contribute to the rising prevalence of obesity, primarily through reduced physical activity levels. In this study, none of the respondents engaged in vigorous daily exercise for at least 30 minutes, while only 11.3% reported spending at least 30 minutes daily on moderate physical activities such as walking or cycling. This lack of physical activity was independently associated with obesity on bivariate analysis (p = 0.018). Though it was not significant in multivariate analysis, it may still suggest a role of exercise in preventing weight gain as literature highlights through maintaining energy balance and improving insulin sensitivity. (9) A similar study reported that obesity was significantly associated with sedentary behavior (OR = 1.45, 95% CI: 1.21 – 1.75) and physical inactivity (OR = 1.52, 95% CI: 1.23 – 1.87), reinforcing the importance of integrating structured exercise programs into healthcare workers' routines.[19]

The paradox of healthcare workers struggling with obesity while serving as advocates for healthy living underscores the need for targeted interventions. Workplace nutrition programs reducing reliance on processed cereals and carbohydrates, and stress management programs, including counseling services, and administration controls such as workload and work hours adjustments can help to improve the health workers' anthropometry over time. Additionally, structured physical activity initiatives, such as designated walking breaks, on-site gym facilities, and incentives for active commuting, could help mitigate poor nutrition and sedentary lifestyles, and play a role in reducing obesity prevalence among healthcare workers.



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## CONCLUSION

This study revealed a high prevalence of obesity, with associated risk factors ranging from personal to workplace factors. It underscores the growing burden of obesity among healthcare workers, and its complex interplay with non-communicable diseases, dietary habits, physical activity levels, and occupational stress. The results emphasize the critical need for targeted interventions that address the health challenges faced by healthcare workers and should be viewed as not only a personal health issue but a broader public health imperative. Meaningful action will require leadership from hospital management teams, professional regulatory bodies, and government health authorities at state and national levels. These stakeholders should champion the development and enforcement of occupational policies to reduce stress and implement workplace wellness programs to improve self-care and promote healthy lifestyles. This will not only improve their well-being but also enhance their capacity to serve as effective role models for healthier living.

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