

Prevalence and Associated Factors of Obesity among the Staff of the University Hospital Center of Owendo: Cross-Sectional Study

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Abstract

Introduction: Obesity is a major determinant of morbidity and mortality related to non-communicable diseases, particularly cardiovascular diseases, type 2 diabetes, and certain cancers worldwide. Its progression is rapid, especially in low- and middle-income countries, particularly in sub-Saharan Africa. Healthcare professionals, although key actors in prevention, are not spared. This study aimed to determine the prevalence of obesity and identify its associated factors among the staff of the University Hospital Center of Owendo (Gabon). **Methods:** This was a descriptive and analytical cross-sectional study conducted in March 2023 among the staff of CHUO. Agents aged 18 years and older, who had been working in the facility for at least six months, were included. Sociodemographic, professional, clinical, and biological data were collected. Obesity was defined by a body mass index (BMI) ≥ 30 kg/m². Logistic regression was used to identify independently associated factors, with a significance threshold set at $p < 0.05$. **Results:** Out of 800 staff working to CHUO, 257 (32.1%) participants with a mean age of 40.9 ± 9.7 years, including 69.6% women, were included. The prevalence of obesity was 38.5%, and that of abdominal obesity was 45.9%. Arterial hypertension was found in 34.6% of the subjects. In bivariate analysis, obesity was associated with female sex, hypertension, diabetes, and elevated blood pressure. In multivariate analysis, only female sex (OR = 2.2; 95% CI: [1.2 - 4.1]; $p = 0.012$) and elevated systolic blood pressure (OR = 1.35; 95% CI: [1.09 - 1.68]; $p < 0.01$) remained significantly

associated. **Conclusion:** Obesity is very common among CHUO staff. It is significantly associated with female sex and elevated systolic blood pressure. These results highlight the need for targeted prevention strategies in the professional environment to reduce cardiovascular risk among healthcare workers.

Keywords

Obesity, Arterial Hypertension, Hospital Staff, Gabon

1. Introduction

Today, obesity constitutes a major public health priority on a global scale. According to the World Health Organization, its prevalence has nearly tripled since 1975, and more than one billion people currently live with obesity in the world [1] [2]. This progression is accompanied by a significant increase in non-communicable diseases, particularly cardiovascular diseases, type 2 diabetes, and certain cancers, making obesity a major determinant of morbidity and premature mortality [2].

In Europe, the scale of the phenomenon is particularly concerning. Recent data indicate that nearly 60% of adults are overweight or obese, reflecting the combined impact of sedentariness, inappropriate dietary habits, and demographic aging [3]. Despite the prevention policies implemented, trends remain generally upward in several countries in the region.

In Africa, obesity is experiencing rapid progression in a context of nutritional and epidemiological transition. Growing urbanization, changes in lifestyles, and the Westernization of dietary habits contribute to the increase in overweight and obesity, particularly in urban settings [4]. This evolution fits into a double nutritional burden, where undernutrition and diseases related to excess weight still co-exist.

In Gabon, this transition is particularly marked in large urban areas, with a progressive increase in the prevalence of overweight and obesity among adult populations [1]. However, specific data concerning certain professional categories, particularly healthcare personnel, remain limited, even though they hold a strategic position in the prevention and management of non-communicable diseases.

The objective of this work was to determine the prevalence of obesity and identify the factors associated with it among the staff of the University Hospital Center of Owendo.

2. Methods

2.1. Type and Setting of the Study

This was a cross-sectional study with descriptive and analytical aims, conducted at the University Hospital Center of Owendo (CHUO), in Gabon. Data collection

took place in March 2023, on the occasion of the open days of the cardiology department. The hospital services were grouped into two categories: care services, including medical, surgical, and pharmaceutical activities, and auxiliary services, grouping support services such as administration, logistics, and maintenance.

2.2. Study Population

The study population consisted of the staff of the CHUO. The participants were divided into five professional categories: medical staff, paramedical staff, administrative and management staff, logistics and support staff, as well as technical and security staff.

All agents aged 18 years or older, who had been working in the facility for at least six months, present at the time of screening, and who had given their informed consent to participate in the study were included. Pregnant women were excluded.

2.3. Study Variables

The collected data included sociodemographic variables (age, sex), professional variables (type of service and professional category), as well as clinical and biological parameters. Anthropometric measurements included weight, height, and abdominal circumference. Hemodynamic parameters included systolic and diastolic blood pressure as well as heart rate. Capillary blood glucose was also measured.

Weight was measured using a calibrated scale, with participants lightly dressed and barefoot. Height was measured using a stadiometer. Waist circumference is measured midway between the last rib and the top of the iliac crest, with a tape measure placed horizontally, at the end of a normal exhalation. Blood pressure was measured after at least 5 minutes of rest, in seated position, using an electronic sphygmomanometer. Heart rate was read on the blood pressure monitor display. Three measurements of blood pressure and heart rate were taken and the average was used for analysis. Capillary blood glucose was measured in fasting patients using a glucometer. The measurements were taken by trained nurses and medical externs trained.

The body mass index (BMI), calculated as the ratio of weight in kilograms to height in meters squared (kg/m^2), was used to classify participants as having normal weight status ($\text{BMI} < 25 \text{ kg}/\text{m}^2$), overweight (BMI between 25 and $29.9 \text{ kg}/\text{m}^2$), or obesity ($\text{BMI} \geq 30 \text{ kg}/\text{m}^2$). Abdominal obesity was defined by an abdominal circumference greater than 102 cm in men and 88 cm in women.

Elevated blood pressure was defined by a systolic blood pressure $\geq 140 \text{ mmHg}$ and/or diastolic $\geq 90 \text{ mmHg}$, or by the use of antihypertensive treatment. Heart rate was considered elevated starting from 80 beats per minute. Capillary blood glucose was deemed elevated for a value $\geq 110 \text{ mg}/\text{dL}$, with suspicion of diabetes starting from $126 \text{ mg}/\text{dL}$.

2.4. Data Collection and Analysis

The data were collected using a standardized survey form. They were then entered

into Microsoft Excel 365 and analyzed using Epi Info version 7 for descriptive analysis, and the online tool pvalue.io for statistical analysis.

Quantitative variables were expressed as means with their standard deviations, and qualitative variables as frequencies and percentages. The analysis of factors associated with obesity was conducted in two steps. A bivariate analysis was first performed to identify potentially associated variables. Variables with a $p < 0.2$ in bivariate analysis, as well as those deemed clinically relevant, were included in the multivariate model. The significant variables were then introduced into a binary logistic regression model to determine independently associated factors. The results were expressed as odds ratios (OR) with their 95% confidence intervals. The statistical significance threshold was set at $p < 0.05$.

2.5. Ethical Considerations

Prior authorization from the competent administrative authorities was obtained before conducting the study. The data were collected anonymously and processed confidentially. Informed consent from each participant was obtained before their inclusion in the study.

3. Results

3.1. Descriptive Study

General Characteristics of the Population

Table 1. General characteristics of the study population.

Variables	Total Population n = 257	Obesity n = 99	Non-Obesity n = 158	p value
Age (years): mean \pm standard deviation	40.9 \pm 9.7	42.1 \pm 8.6	40.2 \pm 10.2	0.13
Sex: n (%)				
-Male	78 (30.4)	23 (23.2)	55 (34.8)	0.05
-Female	179 (69.6)	76 (76.8)	103 (65.2)	
Type of service				
-Care services	167 (65.0)	67 (67.7)	100 (63.3)	0.47
-Auxiliary services	90 (35.0)	32 (32.3)	58 (36.7)	
Types of staff				
-Medical staff	22 (8.6)	4 (4.0)	18 (11.4)	0.15
-Paramedical staff	111 (43.2)	43 (43.4)	68 (43.0)	
-Administrative and management staff	60 (23.4)	27 (27.3)	33 (20.8)	
-Logistics and support staff	37 (14.4)	17 (17.2)	20 (12.7)	
-Technical and security staff	27 (10.5)	8 (8.1)	19 (12.0)	

Out of 800 staff working to CHUO, 257 (32.1%) agents participated in the sur-

vey. The mean age was 40.9 ± 9.7 years with a sex ratio of 0.4. The staff from care services represented 65.0% of the workforce, with 43.2% paramedics. The administrative and management staff grouped 23.4% of the workforce (**Table 1**).

3.2. Clinical and Biological Data

Participants reported being hypertensive (13.6%) or diabetic (2.3%). The prevalence of smoking was 4.3% (**Table 2**).

The mean body mass index was 28.3 ± 6.0 kg/m². The prevalence of obesity was 38.5% (obese individuals). It consisted of obesity at stages I (n = 61; 23.7%), II (n = 27; 10.5%), or III (n = 11; 4.3%). Abdominal obesity was observed in 45.9% of the subjects.

Table 2. Clinical data of the participants.

	Total Population n = 257	Obesity n = 99	Non Obesity N = 158	p value
Cardiovascular Risk Factors				
Known Hypertension	35 (13.6)	23 (23.2)	12 (7.6)	0.001
Known Diabetes	6 (2.3)	5 (5.1)	1 (0.6)	0.03
Smoking	11 (4.3)	6 (6.1)	5 (3.2)	0.34
BMI (kg/m ²): mean \pm standard deviation	28.3 ± 6.0	34.5 ± 3.93	24.5 ± 3.25	-
Weight Status: n (%)				-
Normal IMC	81 (31.5)			
Overweight	77 (30.0)			
Obesity	99 (38.5)			
Abdominal Circumference: mean \pm standard deviation	89.7 ± 17.9	103.0 ± 13.4	81.6 ± 15.3	<0.001
Abdominal Obesity: n (%)	118 (45.9)	80 (80.8)	38 (24.1)	<0.001
Heart Rate	78.0 (12.6)	78.4 (11.7)	77.7 (13.1)	0.63
-Normal	144 (56.0)	53 (53.5)	91 (57.6)	0.52
-Elevated	113 (44.0)	46 (46.5)	67 (42.4)	
Blood Pressure				
-Normal	168 (65.4)	53 (53.5)	115 (72.8)	0.002
-Elevated	89 (34.6)	46 (46.5)	43 (27.2)	
SBP (mmHg): mean \pm standard deviation	127.9 ± 21.6	135.3 ± 22.0	123.3 ± 20.1	<0.001
DBP: (mmHg): mean \pm standard deviation	79.2 ± 13.9	83.0 ± 13.2	76.9 ± 13.9	<0.001
BP Grades				0.04
Normal BP	168 (65.4)	76 (76.8)	115 (72.8)	
Grade I	62 (24.1)	30 (30.3)	32 (20.3)	

Continued

Grade II	21 (8.2)	12 (12.1)	9 (5.7)	
Grade III	6 (2.3)	4 (4.0)	2 (1.3)	
Capillary Blood Glucose: mean \pm standard deviation	95.0 \pm 35.4	94.0 \pm 32.4	95.5 \pm 37.2	0.73
Normal Blood Glucose	201 (85.2)	74 (85.1)	127 (85.2)	0.8
Elevated Blood Glucose	35 (14.8)	13 (14.9)	22 (14.8)	

BMI: body mass index; BP: blood pressure; DBP: diastolic blood pressure; SBP: systolic blood pressure.

The mean values of systolic and diastolic blood pressure were respectively 127.9 \pm 21.6 mmHg and 79.2 \pm 13.9 mmHg. Blood pressure was elevated in 34.6% of the participants. An elevated heart rate was found in 44.0% of the subjects.

The mean capillary blood glucose was 95.0 \pm 35.4 mg/dL. An elevated blood glucose was observed in 14.8% of the participants (**Table 2**).

3.3. Factors Associated with Obesity

In bivariate analysis, the factors associated with obesity were female sex ($p = 0.05$), history of hypertension ($p = 0.001$), diabetes, and elevated blood pressure ($p = 0.002$). There was no association between obesity and the type of service or staff (**Table 2**).

After adjustment for age, sex, blood glucose, and blood pressure, the factors independently associated with obesity were female sex and elevated systolic blood pressure (**Table 3**).

Table 3. Factors associated with obesity in multivariate analysis.

	OR	IC 95%	p
Age	0.995	[0.965; 1.03]	0.13
Female sex vs male	2.2	[1.2; 4.1]	0.012
Capillary blood glucose (+10)	0.970	[0.893; 1.05]	0.46
PAS (+10)	1.35	[1.09; 1.68]	<0.01
PAD (+10)	1.05	[0.756; 1.45]	0.78

4. Discussion

This work showed a high frequency of obesity among hospital staff, confirming the extension of this problem beyond the general population to professional groups who are nevertheless sensitized to health issues [1] [2].

The prevalence observed in the present study is higher than that reported in other studies conducted in sub-Saharan Africa and North Africa, where estimates among hospital staff often remain below 30% [4]-[10]. However, these averages

mask significant disparities related to urbanization and socio-economic contexts.

The observed female predominance is consistent with all African data, where women present a significantly higher risk of obesity [3] [5]-[7]. This disparity is generally attributed to biological factors, but also sociocultural ones, notably norms valuing plumpness and differences in physical activity levels [11] [12].

In Europe, obesity also constitutes a major problem, with nearly 60% of adults overweight or obese [8]. If the overall levels may seem comparable, the contexts differ significantly. European countries have better structured prevention systems and more developed public health policies, which influence early detection and management of risk factors.

4.1. Factors Associated with Obesity

The independent association between obesity, female sex, and elevated blood pressure is in agreement with the literature data. Obesity is a major risk factor for cardiovascular diseases, particularly arterial hypertension, as has been widely demonstrated [11].

The absence of association with professional category suggests that the determinants of obesity are cross-cutting and exceed the differences in functions within the hospital environment. This observation aligns with data showing that individual and environmental factors play a predominant role in the occurrence of obesity [11] [12].

4.2. Limitations of the Study

This study presents certain limitations. Its cross-sectional nature does not allow establishing a causal relationship between the studied factors and obesity. Recruitment during a screening campaign could introduce a selection bias by including participants who are potentially more sensitized to health issues.

Furthermore, the absence of variables such as physical activity, dietary habits, sleep quality, shift work or psychosocial factors limits the analysis of obesity determinants. Their absence may have resulted in residual confounding. Finally, the single-center nature of the study restricts the generalization of results to other facilities or the entire country.

5. Conclusion

The prevalence of obesity is high among CHUO hospital staff. The factors associated with it are female sex and elevated systolic blood pressure. These results highlight the need to develop targeted prevention strategies within healthcare personnel. As key actors in the care system, these professionals should play a central role in promoting health-friendly behaviors, provided they themselves benefit from appropriate interventions.

Conflicts of Interest

None.

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