Gender Differences and Lifestyle Behaviours Among Obese Hypertensive Patients in Edo State, Nigeria

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ABSTRACT

Background: *Obesity and hypertension represent significant global public health challenges. Lifestyle behaviours, including dietary habits and physical activity levels, are well-established determinants in the development and management of both conditions.*

Objective: *The study assessed gender differences in lifestyle behaviours among obese hypertensive patients attending Irrua Specialist Teaching Hospital, Edo State, Nigeria.*

Methods: *A cross-sectional study was conducted among 440 obese hypertensive adults aged 20–65 years, selected using purposive sampling. Lifestyle behaviours were assessed using a validated questionnaire covering socioeconomic characteristics, physical activity, dietary habits, weight monitoring, and meal planning. Data were analyzed using IBM SPSS Statistics version 22, and chi-square tests were used to compare gender differences, with significance set at $p < 0.05$.*

Results: *Among the 440 obese hypertensive participants, 30.2% were males and 69.8% females. Most (96.4%) were aged 31 and above; 58.0% had a tertiary education, and 79.1% were married. Males demonstrated higher mean lifestyle behaviour scores (2.93 ± 0.84) compared to females (2.64 ± 0.77). Statistically significant gender differences were observed in regular physical activity ($\chi^2 = 6.66$, $p = 0.01$), meal planning involving fruits and vegetables ($\chi^2 = 4.21$, $p = 0.04$), and avoidance of fatty/sugary foods ($\chi^2 = 5.03$, $p = 0.03$). No significant differences were found between genders in BMI classification ($\chi^2 = 0.13$, $p = 0.72$) or blood pressure levels ($\chi^2 = 3.29$, $p = 0.07$).*

Conclusion: *Males exhibited moderately better lifestyle behaviours than females. These findings highlight the need for gender-responsive interventions to address behaviour gaps in managing obesity and hypertension.*

Keywords: Gender differences, Lifestyle behaviours, Obese hypertensive patients, Physical activity

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INTRODUCTION

Non-communicable diseases, particularly obesity and hypertension, are major contributors to global morbidity. Their coexistence significantly increases cardiovascular risk, especially in low- and middle-income countries like Nigeria. While lifestyle modification is key to prevention, gender-specific behaviors may influence risk and outcomes (1,2). According to Adegoke et al., sufficient epidemiological data confirm a persistent linear association between obesity and blood pressure, with further evidence showing the frequent coexistence of obesity and hypertension (3). Furthermore, obesity and hypertension are two of the leading modifiable risk factors for

cardiovascular diseases (CVDs) and other NCDs such as type 2 diabetes mellitus (T2DM). Adegoke et al. additionally noted that in Nigeria, hypertension and obesity are the major risk factors for CVD, and there is a mechanistic basis for the relationship between these two diseases, including elevated sympathetic nervous system activity, renin-angiotensin-aldosterone pathway activation, hyperinsulinemia, and the production of adipokines (3).

Gender has been identified as a significant determinant of obesity and hypertension risk, with studies suggesting that behavioural and biological factors contribute to disparities. However, few studies in Nigeria have examined how gender influences lifestyle behaviours in this population and interactions between potentially modifiable congenital factors that are manageable for public health interventions (3,4). The risk factors for obesity reported in Nigeria include sex, age, locality, educational status, physical activity, income, and diet (5,6). Chukwuonye et al. opine that the dietary risks of consuming energy-dense foods, engaging in sedentary behaviours, and consuming foods high in saturated fats (fast foods) contribute, contributed significantly to the increased prevalence of obesity in Nigeria (6). The prevalence of obesity was also reported among low-income classes (12.2%), middle-income (16%), and high-income groups (20%), confirming that the disorder is most widespread in the upper and middle classes in Nigeria (6) In a post- hoc analysis conducted in two urban settlements within the Enugu metropolis, Okoye and colleagues described the hypertension incidence of hypertension in overweight/obese subjects aged 20 years and older (7). The study involved 301 individuals, among whom 198 (65.8%) had hypertension, with 110 (55.6%) being newly diagnosed. The findings confirmed the high rates of hypertension among overweight/obese individuals, and the prevalence increased with BMI, which calls for targeted health education to address the disease burden (8).

Although awareness is critical, behavioral differences between men and women may play a more decisive role in chronic disease management (9), (10). Education significantly influences health awareness, with lower educational attainment linked to poor risk perception and higher rates of hypertension and metabolic syndrome (11) (12). Research highlights that improving cardiovascular risk education could mitigate these risks, underscoring the role of education in fostering better health outcomes (13). Hypertension is a major global health issue influenced by diet and lifestyle. Studies have shown that knowledge plays a critical role in its management, as seen in Saudi Arabia, where 83% of participants recognized the importance of a high-fiber diet, and 76% acknowledged reducing animal fat (14). Similarly, 92% of Ethiopian hypertensive patients were aware of lifestyle modifications like salt reduction and consuming fruits and vegetables to manage hypertension (15). These findings highlight the need for education to improve hypertension risk perception and management.
Gender-based differences in physical activity, dietary choices, and health-seeking behavior have been observed globally, yet are underexplored in Nigerian clinical populations. Understanding these disparities is essential for designing equitable and effective interventions for obese hypertensive patients (16).

The study aims to assess gender differences in lifestyle behaviors among obese hypertensive patients at Irrua Specialist Teaching Hospital, Edo State, Nigeria. It focuses on identifying disparities in physical activity, dietary habits, weight monitoring, and other lifestyle practices between male and female patients, to inform gender-responsive public health interventions for improved disease management and prevention.

METHODS

Study design and setting

A descriptive cross-sectional study was conducted at Irrua Specialist Teaching Hospital (ISTH), a federal tertiary healthcare facility located along KM87 Benin–Auchi Expressway in Edo State, Nigeria. The hospital serves a diverse population within Edo State and its environment. Data collection was carried out over an 11-month period, from February 2022 to December 2023.

Study population and sampling technique

The study population comprised obese hypertensive adults aged 20 to 65 years attending the outpatient clinic of ISTH. A total of 440 participants were enrolled using purposive sampling. Inclusion criteria were clinical confirmation of both obesity (BMI ≥30 kg/m^2) and hypertension, along with the provision of informed consent. Exclusion criteria included critical illness and being outside the age range of 20–65 years.

Data collection instruments and procedures

Data were obtained using a structured, interviewer-administered questionnaire. The instrument assessed lifestyle behaviours across four domains which include physical activity dietary habits routine weight monitoring and meal planning. Each item was rated on a 5-point Likert scale ranging from "Strongly Agree" (score = 5) to "Strongly Disagree" (score = 1). Composite lifestyle behaviour scores were calculated by averaging the scores across the four domains. These were categorized as poor (1.00–2.49), moderate (2.50–3.49), and good (3.50–5.00)

Anthropometric and clinical data were collected using standard procedures. Height and weight were measured using a stadiometer and a digital weighing scale to calculate BMI. Waist circumference was measured using a non-stretchable tape and classified into normal, high, or very high risk. Blood pressure was measured with a calibrated digital sphygmomanometer and categorized as normal (110–130/70–85 mmHg), mild (131–139/86–89 mmHg), or severe (≥140/90 mmHg).

Data analysis

Data were analyzed using IBM SPSS version 22. Descriptive statistics (frequencies, percentages, means, and standard deviations) summarized sociodemographic, anthropometric, and clinical variables. Composite lifestyle scores were compared by gender, and statistical significance was set at $p < 0.05$.

Ethical consideration

Ethical clearance was obtained from the Health Research Ethics Committee of Irrua Specialist Teaching Hospital (ISTH/HREC/20222702/274). Written informed consent was obtained from all participants prior to data collection. All procedures adhered to the ethical standards outlined in the Declaration of Helsinki and the Nigerian National Code of Health Research Ethics.

RESULTS

Sociodemographic characteristics of the respondents

A total of 440 respondents/participants participated in the study, yielding a 100% response rate. Out of the 440 participants, 30.2% were males, while 69.8% were females. The age distribution revealed that the highest proportion (96.4%) was 31 years and older, 3.0% were within the age group 21-25 years, and 0.7% were within the age bracket 26-30 years, while none were recorded for the age group 15-20 years. The mean age of the respondents was 33.37 ± 2.50 years. The majority (79.1%) of the study participants were married, 9.1% were widowed, 8.9% were single, and 3.0% were divorced. The majority (93.0%) of the respondents subscribed to Christianity, while 6.8% subscribed to Islam. More than half (58.0%) of the respondents had a tertiary education, 20.9% had a secondary education, 19.5% had a primary education, and 1.6% had no formal education. A total of 10.5% of the respondents were in business, 9.8% were civil servants, and 3.0% were farmers. The details of these results are presented in Table 1.

Anthropometry and clinical status

According to the body mass index (BMI) of the respondents, 53.2% of the 440 participants were within 30-34.9 (class 1 obesity), 28.9% were within 35-39.9 (class 2 obesity), and 18.0% were within 40 and above (class 3 obesity). The waist circumference of the male respondents was 1.6%, 5.9%, and 20.9% for those < 94 cm (normal), 94-102cm (high), and > 102cm (very high), respectively, while the waist circumferences of the female respondents were 0.0%, 2.3% and 69.3% for those ≤ 80.9cm (normal), 81-88.9cm (high), and ≥ 90cm (very high), respectively.

A total of 30.7% had normal (110/70-130/85) blood pressure (BP), 33.2% had mild (131/86-139/89) BP, and 36.1% had severe (140/90 and above) BP (Table 2).

Gender-based differences in lifestyle practices among respondents

The study revealed notable gender-based disparities in specific lifestyle practices among obese hypertensive patients. Males were significantly more likely to engage in regular physical activity (44.4%) compared to females (25.4%), with this difference being statistically significant ($p = 0.01$). Similarly, more males (36.1%) reported routine weight monitoring than females (26.4%), though this difference was not statistically significant ($p = 0.08$).

In contrast, females demonstrated stronger engagement in meal planning that includes fruits and vegetables (41.7% vs. 29.3%; $p = 0.04$), reflecting a greater focus on structured dietary habits. However, when it came to avoiding fatty and sugary foods, males performed better (49.6% vs. 36.5%; $p = 0.03$), indicating more adherence to heart-healthy dietary restrictions. These findings suggest that while women show strength in dietary organization, men are more active and make more conscious efforts to limit unhealthy food intake.

Table 1: Sociodemographic characteristics by gender

Variable	Male (133) Freq.(%)	Female (307) Freq.(%)	Total (N = 440) Freq.(%)
Age (years)			
21–25	3 (2.3)	10 (3.3)	13 (3.0)
26–30	1 (0.8)	2 (0.7)	3 (0.7)
≥ 30	129 (97.0)	295 (96.1)	424 (96.4)
Mean Age ± SD			33.37 ± 2.50
Marital status			
Single	14 (10.5)	25 (8.1)	39 (8.9)
Married	108 (81.2)	240 (78.2)	348 (79.1)
Divorced	3 (2.3)	10 (3.3)	13 (3.0)
Widowed	8 (6.0)	32 (10.4)	40 (9.1)
Religion			
Christianity	124 (93.2)	285 (92.8)	409 (93.0)
Islam	9 (6.8)	21 (6.8)	30 (6.8)
Others	0 (0.0)	1 (0.3)	1 (0.2)
Education			
None	2 (1.5)	5 (1.6)	7 (1.6)
Primary	18 (13.5)	68 (22.1)	86 (19.5)
Secondary	25 (18.8)	67 (21.8)	92 (20.9)
Tertiary	88 (66.2)	167 (54.4)	254 (58.0)
Occupation			
Civil Servant	15 (11.3)	19 (6.2)	34 (7.7)
Business	12 (9.0)	34 (11.1)	46 (10.5)
Farmer	6 (4.5)	7 (2.3)	13 (3.0)
Applicant	2 (1.5)	2 (0.7)	4 (0.9)
Housewife	0 (0.0)	5 (1.6)	5 (1.1)
Others	7 (5.3)	16 (5.2)	23 (5.2)

Table 2: Anthropometry and clinical status by gender

Variable	Male (133) Freq.(%)	Female (307) Freq.(%)	Total (440) Freq.(%)
BMI category			
30–34.9 (Class I)	72 (54.1)	162 (52.8)	234 (53.2)
35–39.9 (Class I)I	37 (27.8)	90 (29.3)	127 (28.9)
≥ 40 (Class III	24 (18.1)	55 (17.9)	79 (18.0)
Waist circumference			
Normal (≤94M/≤80.9F)	7 (5.3)	0 (0.0)	7 (1.6)
High (94–102M/81–88.9F	26 (19.5)	10 (3.3)	36 (8.2)
Very High (≥102M/≥90F)	100 (75.2)	297 (96.7)	397 (90.2)
Blood pressure			
Normal (110–130/70–85)	52 (39.1)	83 (27.0)	135 (30.7)
Mild (131–139/86–89)	42 (31.6)	104 (33.9)	146 (33.2)
Severe (≥140/90)	39 (29.3)	120 (39.1)	159 (36.1)

Distribution of lifestyle practice levels by gender

The graph in Figure 1 compares the percentages of male and female obese hypertensive patients across three lifestyle practice categories: Good, Fair, and Poor, based on composite scores from physical activity, dietary habits, weight monitoring, and meal planning.

Males showed a stronger overall performance in lifestyle practices. Specifically, 18.0% of males achieved a good lifestyle score (3.50–5.00), compared to only 6.5% of females. For the fair category (2.50–3.49), 48.9% of males were classified as moderate, while 22.5% of females fell within this range. In contrast, 71.0% of females demonstrated poor lifestyle practices (score range 1.00–2.49), which was more than double the proportion of males (33.1%) in the same category.

This distribution clearly illustrates a gender disparity: males were more likely to adopt healthier lifestyle behaviors, while females were more concentrated in the poor practice category. These findings highlight the need for gender-specific public health strategies, particularly aimed at improving behavioral outcomes among women.

Table 3: Chi-square analysis on the association between gender and socioeconomic and lifestyle behaviour

Variable	Male (n = 133)	Female (n = 307)	χ^2	p-value
Age (years)			0.08	0.78
21–25	3 (2.3)	10 (3.3)		
26–30	1 (0.8)	2 (0.7)		
≥ 30	129 (97.0)	295 (96.1)		
Marital status			0.36	0.55
Single	14 (10.5)	25 (8.1)		
Married	108 (81.2)	240 (78.2)		
Divorced	3 (2.3)	10 (3.3)		
Widowed	8 (6.0)	32 (10.4)		
Education			4.51	0.03*
None	2 (1.5)	5 (1.6)		
Primary	18 (13.5)	68 (22.1)		
Secondary	25 (18.8)	67 (21.8)		
Tertiary	88 (66.2)	167 (54.4)		
BMI category			0.13	0.72
30–34.9 (Class I)	72 (54.1)	162 (52.8)		
35–39.9 (Class II)	37 (27.8)	90 (29.3)		
≥ 40 (Class III	24 (18.1)	55 (17.9)		
Waist circumference			7.89	0.005*
Normal (≤94M/≤80.9F)	7 (5.3)	0 (0.0)		
High (94–102M/81–88.9F	26 (19.5)	10 (3.3)		
Very High (≥102M/≥90F)	100 (75.2)	297 (96.7)		
Blood pressure			3.29	0.07
Normal (110–130/70–85)	52 (39.1)	83 (27.0)		
Mild (131–139/86–89)	42 (31.6)	104 (33.9)		
Severe (≥140/90)	39 (29.3)	120 (39.1)		
Regular physical activity			6.66	0.01*
Yes	59 (44.4)	78 (25.4)		
No	74 (55.6)	229 (74.6%)		
Routine weight monitoring			3.02	0.08
Yes	48 (36.1)	Yes: 81 (26.4)		
No	85 (63.9)	No: 226 (73.6)		
Meal planning (fruits & veggies)			4.21	0.04*
Yes	39 (29.3)	128 (41.7)		
No	94 (70.7)	179 (58.3)		
Avoidance of fatty/sugary foods			5.03	0.03*
Yes	66 (49.6)	112 (36.5)		
No	67 (50.4)	195 (63.5)		

*Statistically significant at $p < 0.05$

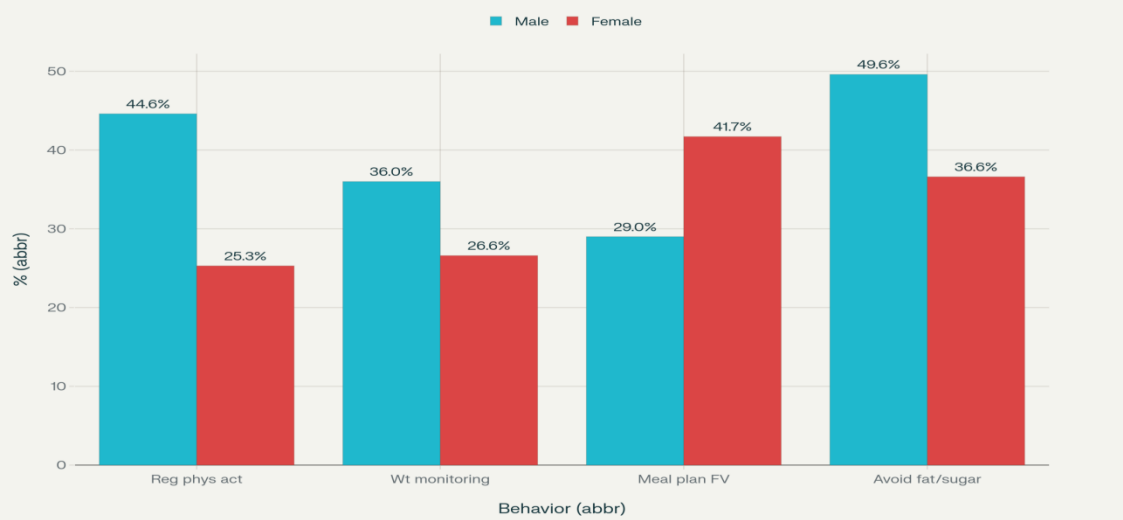

Figure 1: Gender-based differences in lifestyle practices

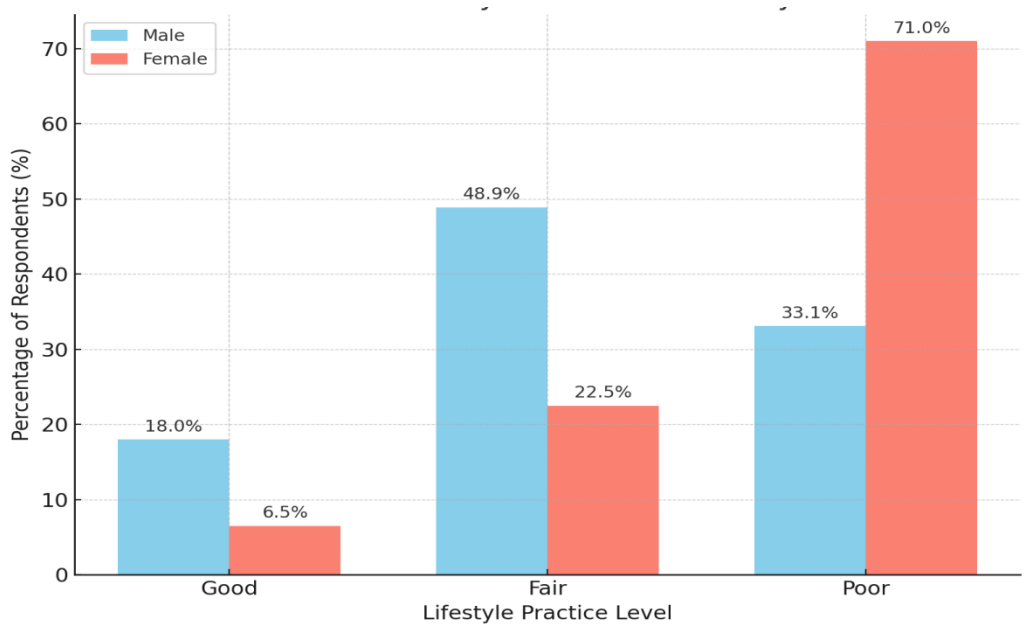

Figure 2: Distribution of lifestyle practice levels by gender

DISCUSSION

Findings from the study revealed that a larger proportion (69.8%) of the participants were females compared with their male counterparts (30.2%), with the majority (96.4%) of 340participants being 31 years and older, suggesting that the study predominantly involved older individuals. This finding is consistent with a study carried out by Olatona et al. to ascertain the dietary practices. The study revealed that participants' levels of obesity were comparatively high and that their nutritional knowledge was inadequate (18).

A core finding of this study was the presence of significant gender differences in lifestyle

behaviors. Males were more likely to engage in regular physical activity (44.4% vs. 25.4%), monitor their weight, and avoid fatty/sugary foods. In contrast, females showed stronger engagement in meal planning but had significantly lower overall lifestyle practice scores. These findings suggest that despite being the majority in the sample, women are less likely to engage in key behaviors needed for effective obesity and hypertension management. This disparity may be influenced by time constraints, caregiving roles, cultural norms, or reduced access to exercise and dietary support systems (19).

This finding was consistent with research conducted by Hammouh et al. (20) to identify dietary patterns. The study evaluated Jordanian older adults' nutritional knowledge, perceptions, and practices. The study concluded that understanding, accepting, and implementing nutrition-related behaviors are critical to averting malnutrition, guaranteeing health, and preserving quality of life (21).

Despite over 40% of respondents having high perception scores regarding obesity and diet-related health risks, only 10% demonstrated good health practices—revealing a significant attitude-behavior gap. This discrepancy suggests that although many individuals understand the importance of healthy lifestyles, this awareness does not consistently translate into action. Such gaps have also been noted in other studies across similar populations, where high awareness did not lead to improved physical activity or dietary changes. This underscores the need for behaviourally targeted interventions, rather than solely knowledge-based education. General nutritional knowledge may play a role in the relationship between nutrition and health education and practices related to obesity (22).

These relationships, as well as the knowledge that metabolic processes largely determine the course of disease, suggest that treating obesity and cardiometabolic complications might be very effective in overcoming acute infection, and also in reducing the risk of cardiometabolic diseases and mortality (23).

Only a few hospital-based studies on hypertension knowledge among hypertensive adults in Nigeria have been conducted. This study aims to identify knowledge gaps that require further research and provide information for developing hypertension prevention strategies. A recent study conducted in Egypt revealed minimal awareness of hypertension and low support for lifestyle changes (24).

Huijbregts et al. claim that one practical strategy to assess the health consequences of dietary adherence by individuals is to examine nutritional knowledge and practices in connection to illness outcomes (25).

These results align with previous studies that have identified gender as a critical determinant of health behaviour. Research in similar low- and middle-income contexts has shown that women often face unique barriers to physical activity, including social norms, safety concerns, and limited discretionary time. This reinforces the importance of designing interventions that address gender-specific challenges and leverage strengths, such as women's greater engagement in dietary planning (26).

It also encouraged engaging with and learning from local community knowledge about food production and feeding (27). In addition to lacking confidence or knowledge about integrating prevention into clinical care, health professionals' judgments about who might benefit from prevention and negative views about the effectiveness of prevention hinder the implementation of practice guidelines. This is compounded by an often-prevailing view that preventing obesity is a matter of personal responsibility and choice (28).

LIMITATIONS OF THE STUDY

This study has a few limitations. Its cross-sectional design prevents establishing causal relationships. The sample was drawn from a single tertiary hospital, limiting generalizability. Gender representation was uneven, with females comprising 69.8% of participants, which may affect comparative strength. Additionally, the questionnaire was not designed to explore gender-specific behavioral barriers, and responses may have been influenced by recall or social desirability bias. Future studies should consider qualitative and longitudinal approaches to better understand and track gender-related behavioural patterns.

CONCLUSION

The study identified significant gender differences in lifestyle behaviours among obese hypertensive patients. Males were more likely to engage in physical activity, weight monitoring, and dietary restraint, while females, despite being the majority, had lower overall lifestyle scores. These

findings highlight the need for gender-responsive interventions to address behavioural gaps and improve health outcomes. Future research should explore the underlying causes of these disparities to guide targeted public health strategies.

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Conflict of interest declaration

The authors declare no potential conflicts of interest with respect to the research, authorship and/or publication of this article.

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