Prevalence and Predisposing Factors of Obesity Among Adults in Makurdi, Benue State, Nigeria

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ABSTRACT

The study was conducted in Makurdi, Benue State, Nigeria, using a descriptive cross-sectional design. The study population consisted of adults who are within the age of 18-90 years. A total of 385 adult residents were selected using a multistage sampling technique. Data were collected through a structured, interviewer-administered questionnaire and anthropometric measurements including height and weight. The Body Mass Index (BMI) was calculated to determine obesity status. Data were analyzed using descriptive statistics such as frequencies, percentages, and means, while inferential statistics were used to examine associations between socio-demographic variables and prevalence of obesity at a significance level of $p < 0.05$, using SPSS version 23. Findings from the study revealed that the majority of respondents had normal weight (72.7%), while 13.8% were obese, 7.8% overweight, and 5.7% underweight. Awareness of obesity was moderate, with 55.6% of participants aware of obesity and its associated risks, and 50.1% acknowledging its link to serious health conditions. Knowledge assessment revealed that 49.9% of respondents had good knowledge of obesity, 46.8% had moderate knowledge, and 3.4% demonstrated poor knowledge. The main predisposing factors identified included excessive television viewing (60.0%), overeating (61.0%), eating in front of television (79.7%), high consumption of carbonated drinks (63.9%), consumption of chocolate (72.5), inadequate sleep or stress (62.1%), sedentary lifestyle (55.1%), having less than 8hrs sleep (70.4%), and excessive computer/phone usage (56.6%). Socio-demographic factors such as age, marital status, educational level, ethnicity, religion, and family type showed significant associations with obesity prevalence ($p < 0.05$), while sex, occupation, and income were not statistically significant ($P > 0.05$). It is therefore recommended that continuous community-based health education, nutrition counselling, and routine screening for obesity be strengthened to improve awareness and mitigate the rising trend of obesity among adults in Benue State.

Keywords: Obesity, Prevalence, Knowledge, Predisposing Factors, Adults.

INTRODUCTION

Globally, obesity is a serious public health issue and one of the leading contributors to disease burden. The disease burden has continued to rise globally. It is currently affecting more than 890 million people worldwide[1]. According to the World Health Organization, the global prevalence of obesity is estimated at 27.8%[1]. The Global Burden of Disease Study places Pakistan's population as the ninth most obese in the world[2]. Given the significant incidence of obesity in the world, it is prioritized as a serious concern in terms of the economies of industrialized countries[3]. Medically, obesity is described as an abnormal or excessive accumulation of body fat that presents a substantial risk to individual health. The World Health Organisation defines overweight as having a Body Mass Index (BMI) above 25 kg/m², while a BMI exceeding 30 is categorised as obesity[4].

Obesity is typically results from eating more calories, especially those from fatty and sugary foods beyond that the body expends through physical activity[5]. Fat is the body's storage form for extra energy. Obesity is increasingly becoming a challenge for most people these days. Modern lifestyles are increasingly characterised by the consumption of cheap, high-calorie foods combined with prolonged sedentary behaviour, such as spending extensive periods sitting at office desks, on couches, or in front of electronic devices[5]. As a result, obesity and overweight have become leading global health concerns, now responsible for more deaths globally than underweight[1]. While most existing studies exploring the health implications of overweight and obesity have been conducted among adult populations, emerging evidence indicates that childhood and adolescent obesity also carry serious short-, medium-, and long-term health consequences, underscoring the need for early preventive interventions.

Numerous variables contribute to the etiology of obesity, with genetics and particular genes connected to obesity having a significant influence[6]. There are, however, some environmental factors that contribute to obesity. Obesity has been associated with associated with numerous systematic health complications. Evidence indicates that children who are overweight or obese are more likely to remain so into adulthood, thereby increasing their susceptibility to chronic illnesses such as hypertension, cardiovascular disease, metabolic disorders, osteoarthritis, breathing problems, and several dental conditions like periodontal disease[7]. Additionally, obesity adversely affects oral health-related life, contributing to a greater prevalence and severity of oral disorders[8]. As a result, identifying obese individuals and prioritizing their general and oral health care needs present issues for medical and dental professionals[9].

Health care providers oversee preventing, recognizing, and advising patients about weight disorders[9]. Health practitioners are the only group capable of assisting patients in recognizing obesity and the related health problems, according to studies on patient perceptions[10]. However, it was discovered that doctors were reluctant to offer their patients advice on managing and preventing their obesity[11]. The causes of this are unknown, although they could be related to a lack of information and unfavourable attitudes among medical professionals toward the management of obesity[13].

METHODOLOGY

Study Area

This study was carried out in Makurdi. Makurdi is the administrative headquarters and capital city of Benue state. Geographically, the city is situated in the central part of the country, lying along the Benue River between latitude $07^{0}43$'N and Longitude $08^{0}35$'E. The city also hosts a major operational base of the Nigerian Air Force. Makurdi came into existence in 1927 following the extension of the railway line from Port Harcourt to Jos and Kaduna. Since then, the city has evolved rapidly into an important commercial hub and transportation centre in the central part of the Nation. According to National Population Commission[12], the city's population was approximately 500,797 as of the 2006 population census.

The climatic condition of Makurdi is influenced by the humid south-westerly winds and the dry north-easterly trade winds. The city records an average annual rainfall of about 1,290 mm, and experiences generally high temperatures throughout the year. The months of February and March are typically the hottest, with temperatures ranging between a minimum of $22.5^{O}C$ and a maximum of $40^{O}C$[27].

Geographically, the substratum of Makurdi and its surroundings is dominated by the formation known as the Makurdi Sandstone. In several low-lying areas, particularly around Wadata, the sandstone is overlain by shale deposits. The soil composition across the city varies from fine sandy texture along the riverbanks to the silty sands and clayey soils in other locations. During the rainy season, even a light rain can cause untarred roads to become extremely muddy and difficult to navigate[12].

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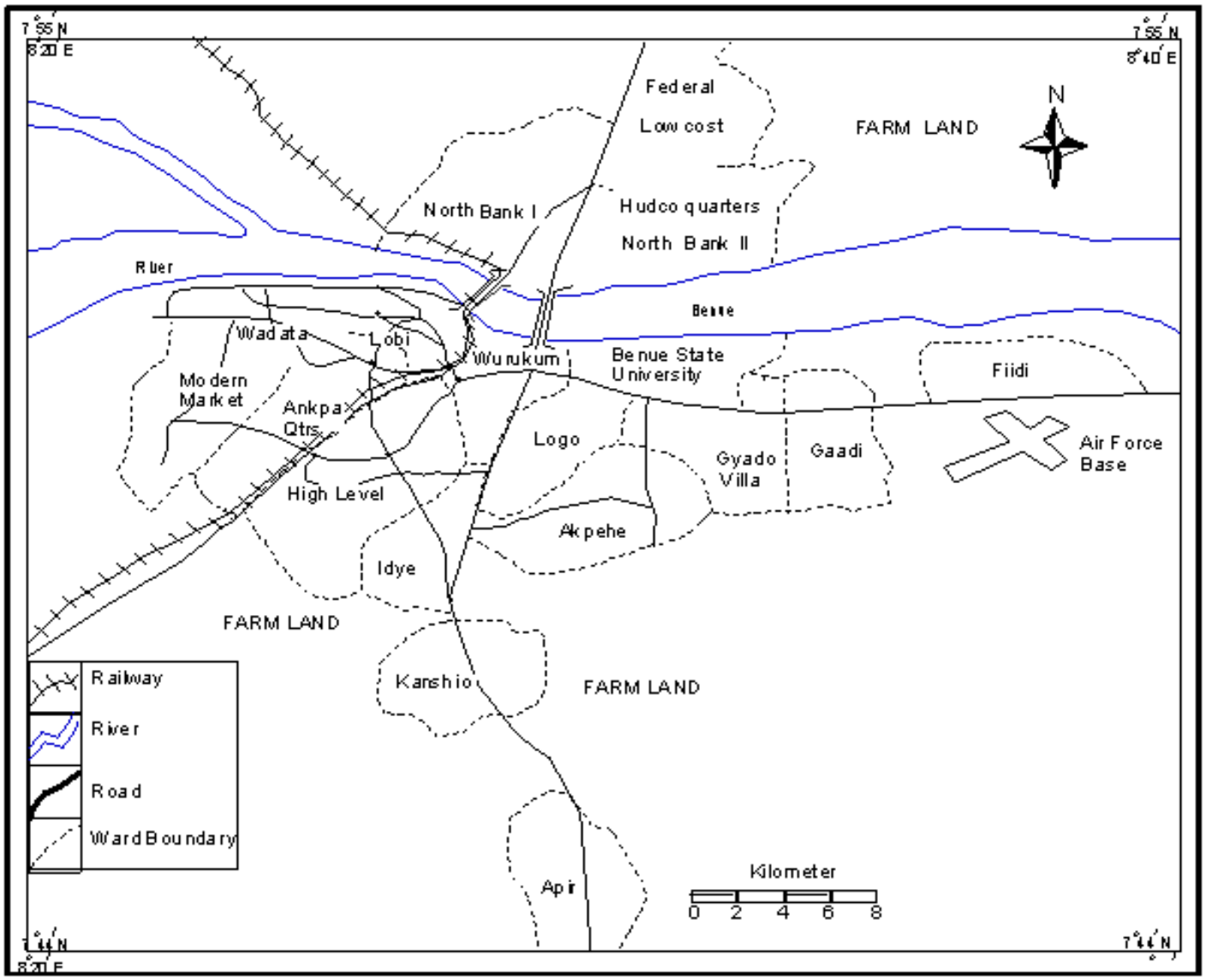

Figure 1: Map of Makurdi, Benue State

Source: Minstry of Land and Survey[13]

Study Design

A descriptive cross-sectional study design was adopted for the study. This will allow for quantitative data relating to the study to be obtained from the study population is a constructive and definite manner.

Study Population

This study focused on only adults who are within the age range of 18-90 years. All eligible adults within the study location were sampled. House to house visits sampling was conducted. Adults seen on the streets within the study location were also sampled.

Inclusion and Exclusion Criteria

The inclusion and exclusion criteria for this study are as follows:

Inclusion criteria

All adults who are resident in Makurdi and who consent to participate in the study.

Exclusion criteria

Infants who do not pass the criteria defined for adults were be excluded. Also, adults who do not consent to the study were excluded. Furthermore, adults with life threatening conditions such as cancer, liver problems etc were excluded.

Sample Size Determination

A sample size of 385 was utilized for the study with a 10% non-response rate included. This was obtained using the formula below:

$n = (z^2pq/d^2)$ (Umerri *et al.*[14])

Where n= the desired minimum sample size.

Z = the standard normal deviate, corresponding to 1.96 at 95% confidence interval.

P = estimated prevalence (50.4% = 0.5)

Q = Complementary probabilities [q = (1-P) = 1-0.74 = 0.53)].

D = degree of accuracy desired (set at 0.05)

Sampling Technique

A multistage sampling was adopted to select the study participants from households in the Local Government Area of Benue State. The first stage involved the selection of five council wards that were used for the study from the eleven council wards available using a simple random sampling technique of balloting without replacement. In the second stage, six (6) streets were randomly selected from each selected ward using simple random sampling from an enumerated list of all streets in the ward. In the third stage, from each selected street, thirteen households were selected using a systematic sampling method. In the final stage, one adult respondent was selected from each household using simple random sampling where more than one eligible adult was available. The selected adults were then administered the data collection instrument for the study.

Data Collection Method

The field investigation comprised two major components: anthropometric measurements and a questionnaire survey. Both components were administered to all selected participants. To ensure participant privacy and confidentiality, the questionnaires were completed anonymously. Prior to the main data collection exercise, the questionnaire was pretested and necessary adjustments were implemented before the final exercise. The final version of the questionnaire was structured into four different sections:

Section A was concerned with the sociodemographic information of respondents.

Section B was concerned with the prevalence of adults at risk for obesity

Section C determined the knowledge of adults on obesity

Section D assessed the predisposing factors to obesity among adults in Makurdi.

Anthropometric measurements

Body weight (in kilogram) and height (in centimetres) was measure for all adults. Thereafter, the body mass index (BMI) was computed by dividing each person's weight by the square of their height in metres (kg/m^2).

The assessment of body composition was guided by the World Health Organisation classification standards for adults[1,4]. According to the reference criteria;

Overweight: BMI greater than +1 SD (equivalent to BMI 25 kg/m^2 at 19 years)

Obesity: BMI greater than +2 SD (approximately 30 kg/m^2 at 19 years of age)

Thinness: BMI less than -2 SD

Demographic and Lifestyle Data Collection

Data for the study was obtained using an interviewer administered questionnaire. The instrument will be developed by the researcher after rigorous review of literatures. The questionnaires were pretested and necessary adjustments will be made before the final exercise. The instrument was structured to elicited information on demographic and socioeconomic characteristics, meal pattern, dietary habits, levels of physical activity and sedentary behaviour.

The questionnaire designed consisted of two major sections. Section A contained information the socio-demographic attributes of respondents. Section B was concerned about the knowledge of the students and their perceptions on obesity.

Ethical Consideration

Ethical clearance for this research was secured from the Bingham University Teaching Hospital to enable ethical conduct of study involving human participants. Also, informed consent was obtained from participants after a detailed explanation of the purpose and nature of the research. Participation will be voluntary, and only individuals who give their consent will be included in the study.

Method of Data Analysis

The collected data were summarized and presented using descriptive statistics such as simple percentages. Comparative analysis of the study was done by subjecting the data obtained to chi-square analysis using statistical package for social sciences (SPSS), version 23. A significant level of $p < 0.05$ was adopted to determine statistical significance

RESULTS

Results obtained revealed that most of the respondents were females (50.9%) who were single (56.4%). Majority of the participants (47.0%) were between the age range of 18–30 years and were Christians (62.9%). A higher frequency was observed among participants with secondary education (28.3%), followed closely by those with tertiary education (26.8%). Majority of the respondents were civil servants (28.3%) and traders (27.3%). Also, most of the participants belonged to nuclear families (49.6%). In terms of ethnicity, the majority were Tiv (43.9%). This is presented in Table 1.

Presented in Figure 2 is the prevalence of obesity among adults in Makurdi. Results obtained revealed that majority of the participants had a normal weight (72.7%). This was followed by those who were obesed (13.8%), overweight (7.8%), and underweight (5.7%). These findings shows that while the majority of the adult population in the study area maintain a healthy weight, a significant proportion fall within the overweight and obese categories. Also, the knowledge of adults on obesity in Makurdi is presented in Figure 3. Results from the study showed that 49.9% of the respondents demonstrated good knowledge of obesity, while 46.8% had moderate knowledge. Only a small proportion (3.4%) exhibited poor knowledge.

The awareness of obesity among adults in Makurdi is presented in Table 2. Findings of revealed that 55.6% of respondents were aware of obesity, while 44.4% were not. Television (13.8%), radio (11.7%), and health

facilities (11.2%) were the main sources of information. However, 45.2% had not heard of obesity. In terms of prevention strategies, 20.8% mentioned regular exercise, 14.5% healthy eating, and 12.2% weight management, though 44.4% were unsure. About 50.1% believed obesity leads to serious health conditions like diabetes, hypertension and heart diseases. Also, 50.1% of the participants were aware of relevant programs or services to prevent or manage obesity.

Table 1a: Socio-demographic Characteristics of Participants

Variables	Frequency(N=385)	Percentage (%)
Sex		
Male	189	49.1
Female	196	50.9
Age (years)		
18-30	181	47.0
31-40	159	41.3
41-50	40	10.4
51-60	5	1.3
Mean Age ± SD	31.5 ± 7.8	-
Marital Status		
Single	217	56.4
Married	168	43.6
Level of Education		
Non-formal Education	31	8.1
Nursery Education	59	15.3
Primary Education	83	21.6
Secondary Education	109	28.3
Tertiary Education	103	26.8
Ethnicity		
Tiv	169	43.9
Igbo	47	12.2
Hausa	36	9.4
Idoma	78	20.3
Yoruba	55	14.3
Religion		
Christianity	242	62.9
Islam	65	16.9
Others	78	20.3
Type of Family		
Nuclear Family	191	49.6

Extended Family	156	40.5
Joint Family	38	9.9
Occupation		
Civil Servant	109	28.3
Trader	105	27.3
Artisan	35	9.1
Others	136	35.3

Source: Field Survey, (2025)

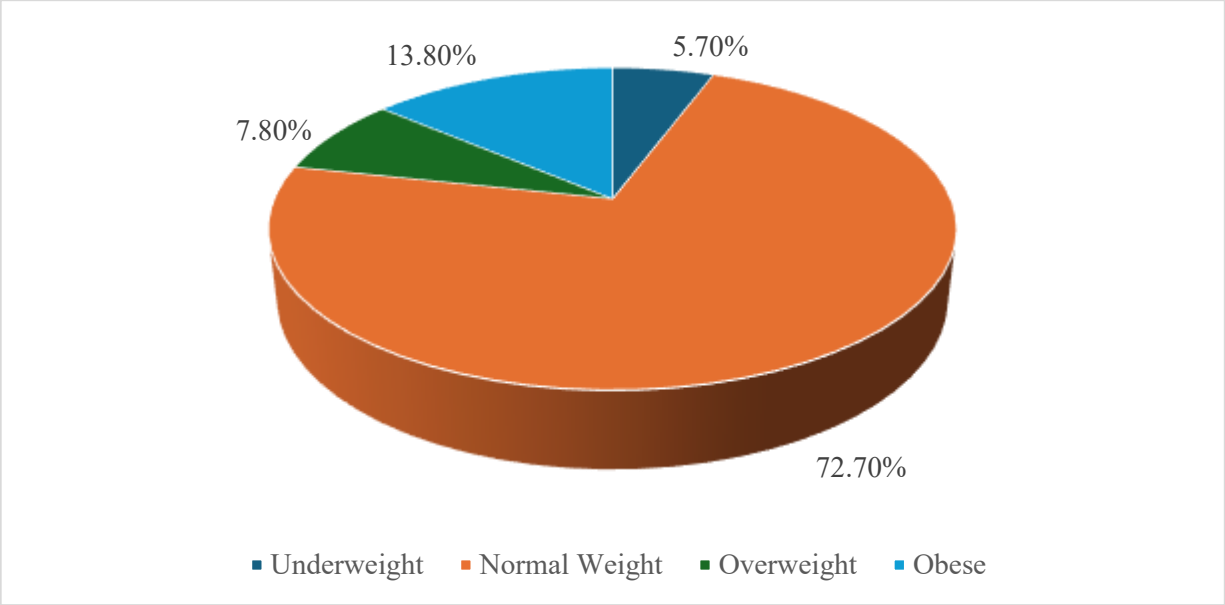

Figure 2: Prevalence of Obesity among Adults in Makurdi

Table 2: Awareness of Obesity among Adults in Makurdi

Variables	Frequency(N=385)	Percentage (%)
Aware of Obesity		
Yes	214	55.6
No	171	44.4
Source of Information		
Health facility	43	11.2
Television	53	13.8
Radio	45	11.7
Family/Friend	22	5.7
Book/Newspaper	10	2.6
Relative/Neighbour	16	4.2
Other sources	22	5.7
Not heard of it	174	45.2

Strategies to prevent Obesity		
Regular	80	20.8
Healthy eating habits	56	14.5
Weight Management	47	12.2
Regular Medical Check-ups	31	8.1
I am not sure	171	44.4
Obesity leads to Serious health conditions		
Yes	193	50.1
No	192	49.9
Awareness of programs or services to prevent or mange obesity		
Yes	193	50.1
No	192	49.9

Source: Field Survey, (2025)

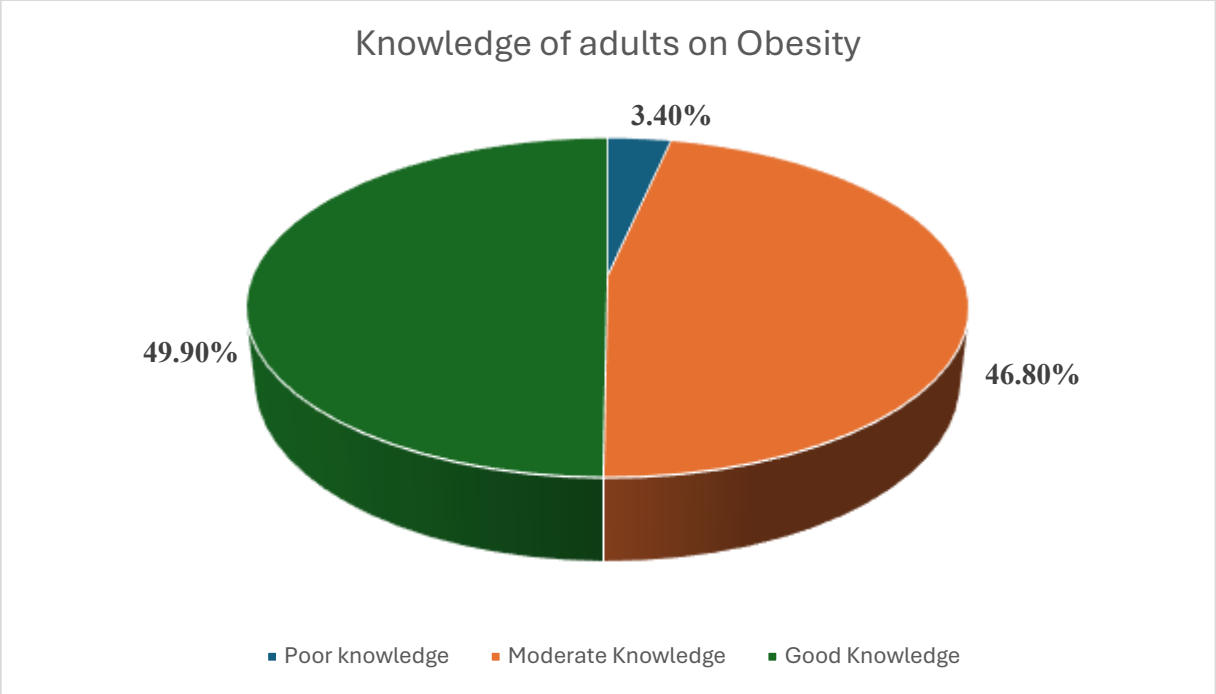

Figure 3: Knowledge of Adults on Obesity in Makurdi, Benue State

Table 3 presents the predisposing factors to obesity among adults in Makurdi, Benue State. Findings of the study revealed that eating in front of the television, chocolate eating habit, family history of obesity, consumption of energy-dense foods, and excessive use of computers were significantly associated with obesity among the respondents ($P<0.05$). However, factors such as excessive television viewing, eating too much, sedentary lifestyle, excessive consumption of carbonated drinks, inadequate sleep or stress, old age, and sport practice in school did not show statistically significant relationships with obesity ($P>0.05$).

Table 4 presents the relationship between socio-demographic information and the prevalence of obesity among adults in Makurdi, Benue State. The findings show that obesity was significantly related with age, marital status, educational level, ethnicity, religion, and type of family ($p < 0.05$). Higher prevalence was observed among

younger adults (18–30 years), singles, those with non-formal and secondary education, Hausa and Idoma ethnic groups, Muslims, and respondents from nuclear families. Sex, occupation, and monthly income were not significantly associated with obesity.

Table 3: Predisposing Factors to Obesity among Adults in Makurdi, Benue State

Variables	Prevalence of Obesity				χ^2	P value
	Underweight (%)	Normal weight (%)	Overweight (%)	Obese (%)		
Excessive TV Viewing						
Yes	12 (5.2)	166 (71.9)	19 (8.2)	34 (14.7)	0.85	0.83
No	10 (6.5)	114 (74.0)	11 (7.1)	19 (12.3)		
Eating too much						
Yes	12 (5.1)	173 (73.6)	16 (6.8)	34 (14.5)	1.42	0.70
No	10 (6.7)	107 (71.3)	14 (9.3)	19 (12.7)		
Eating in Front of TV						
Yes	0 (0.0)	53 (67.9)	9 (11.5)	16 (20.5)	10.89	0.01
No	22 (7.2)	227 (73.9)	21 (6.8)	37 (12.1)		
Sedentary lifestyle						
Yes	7 (4.0)	131 (75.7)	11 (6.4)	24 (13.9)	2.74	0.43
No	15 (7.1)	149 (70.3)	19 (9.0)	29 (13.7)		
Excessive Carbonated Drinks						
Yes	15 (6.1)	178 (72.4)	16 (6.5)	37 (15.0)	2.44	0.48
No	7 (5.0)	102 (73.4)	14 (10.1)	16 (11.5)		
Chocolate Eating Habit						
Yes	15 (5.4)	195 (69.9)	29 (10.4)	40 (14.3)	10.36	0.01
No	7 (6.6)	85 (80.2)	1 (0.9)	13 (12.3)		
History of Obesity						
Yes	0 (0.0)	38 (74.5)	10 (19.6)	3 (5.9)	20.66	0.00
No	10 (5.2)	139 (72.8)	9 (4.7)	33 (17.3)		
Not sure	12 (8.4)	103 (72.0)	11 (7.7)	17 (11.9)		
Inadequate Sleep/Stress						
Yes	14 (5.9)	177 (74.1)	22 (9.2)	26 (10.9)	5.60	0.13
No	8 (5.5)	103 (70.5)	8 (5.5.)	27 (18.5)		
Eating Energy-dense Food						
Yes	0 (0.0)	117 (74.5)	23 (14.6)	17 (10.8)	32.92	0.00
No	22 (9.6)	163 (71.5)	7 (3.1)	36 (15.8)		

Excessive use of Computer						
Yes	19 (8.7)	148 (67.9)	23 (10.6)	28 (12.8)	14.75	0.00
No	3 (1.8)	132 (79.0)	7 (4.2)	25 (15.0)		
Practice Sport in School						
Yes	3 (3.7)	60 (73.2)	11 (13.4)	8 (9.8)	6.21	0.10
No	19 (6.3)	220 (72.6)	19 (6.3)	45 (14.9)		
Old age						
Yes	2 (2.1)	72 (74.2)	9 (9.3)	14 (14.4)	3.47	0.32
No	20 (6.9)	208 (72.2)	21 (7.3)	39 (13.5)		

Table 4a: Association between Socio-demographic Characteristics and Prevalence of Obesity among Adults in Makurdi, Benue State

Variables	**Frequency**	**Prevalence of Obesity**				χ^2	P value
		Underweight (%)	**Normal weight (%)**	**Overweight (%)**	**Obese (%)**		
Sex							
Male	189	12(6.3)	136(72.0)	15(7.9)	26(13.8)	.302	.960
Female	196	10(5.1)	144(73.5)	15(7.7)	27(13.8)		
Age (years)							
18-30	181	4(2.2.)	131(72.4)	11(6.1)	35(19.3)	24.846	.003
31-40	159	13(8.2)	117(73.6)	14(8.8)	15(9.4)		
41-50	40	5(12.5)	29(72.5)	3 (7.5)	3(7.5)		
51-60	5	0(0.0)	3(60.0)	2(40.0)	0(0.0)		
Marital Status							
Single	217	6(2.8)	157(72.4)	18(8.3)	36(16.6)	10.621	.014
Married	168	16(9.5)	123(73.2)	12(7.1)	17(10.1)		
Education							
Non-formal	31	1(3.2)	21(67.7)	2(6.5)	7(22.6)	41.944	.000
Nursery	59	3(5.1)	48(81.4)	2(3.4)	6(10.2)		
Primary	83	2(2.4)	58(69.9)	16(19.3)	7(8.4)		
Secondary	109	14(12.8)	77(70.6)	1(0.9)	17(15.6)		
Tertiary	103	2(1.9)	76(73.8)	9(8.7)	16(15.5)		
Ethnicity							
Tiv	169	19(11.2)	127(75.1)	0(0.0)	23(13.6)	61.935	.000
Igbo	47	0(0.0)	35(74.5)	7(14.9)	5(10.6)		
Hausa	36	0(0.0)	24(66.7)	5(13.9)	7(19.4)		

Idoma	78	3(3.8)	47(60.3)	17(21.8)	11(14.1)
Yoruba	55	0(0.0)	47(85.5)	1(1.8)	7(12.7)

Source: Field Survey, (2025)

Table 4b: Association between Socio-demographic Characteristics and Prevalence of Obesity among Adults in Makurdi, Benue State

Variables	Frequency	Prevalence of Obesity				χ^2	P value
		Underweight (%)	Normal weight (%)	Overweight (%)	Obese (%)		
Religion							
Christianity	242	14(5.8)	181(74.8)	21(8.7)	26(10.7)	12.663	.049
Islam	65	0(0.0)	47(72.3)	4(6.2)	14(21.5)		
Others	78	8(10.3)	52(66.7)	5(6.4)	13(16.7)		
Type of Family							
Nuclear	191	19(9.9)	135(70.7)	4(2.1)	33(17.3	96.890	.000
Extended	156	3(1.9)	128(82.1)	9(5.8)	16(10.3)		
Joint	38	0(0.0)	17(44.7)	17(44.7)	4(10.5)		
Occupation							
Civil Servant	109	9(8.3)	71(65.1)	13(11.9)	16(14.7)	14.447	.107
Trader	105	8(7.6)	73(69.5)	7(6.7)	17(16.2)		
Artisan	35	0(0.0)	25(71.4)	3(8.6)	7(20.0)		
Others	136	5(3.7)	111(81.6)	7(5.1)	13(9.6)		
Monthly Income							
Low	35	2(5.7)	28(80.0)	0(0.0)	5(14.3)	4.163	.655
Medium	197	11(5.6)	142(72.1)	15(7.6)	29(14.7)		
High	153	9(5.9)	110(71.9)	15(9.8)	19(12.4)		

Source: Field Survey, (2025)

DISCUSSION

This study was conducted to examine obesity among adults in Makurdi, Benue State. Result from the study revealed that 13.8% were obese, 7.8% were overweighed and 5.7% were underweighted. The implication of this finding is that although the majority of adults maintain normal weight, a considerable proportion are already within unhealthy weight categories. This places them at increased risk of obesity-related non-communicable diseases. From a public health perspective, this indicates a growing double burden of malnutrition, where undernutrition and overnutrition coexist within the same population. The prevalence of obesity recorded in this study is lower than a 4% prevalence recorded by Sola et al.[15] in Benue State and 1.4% recorded in Ikeja LGA of Nigeria by Oyewande et al.[16]. It is also higher than an 8.8%, 5.5%, 11.1%, 2.3%, 1.3% 6.5%, 10.9% and 8.4% prevalence reported by Olatunbosun et al.[17], Agofure[18], Osunkwo et al.[19], Olufemi and Abiodun[20], Ogunlade and Asafa[21], Ukegbu et al.[22], Umuerri et al.[14] and Adebayo et al.[23] from Ibadan, Delta, Benue, Lagos, Ile-Ife and

Delta States of Nigeria respectively. The high prevalence rate could be attributed to poor dietary habits, inadequate physical activity, increased screen time and sedentary lifestyles among the adult population in Makurdi. It could also be attributed to the epidemiological transition ongoing in the population. The 13.8% prevalence recorded in this study is however, lower than a 15.0% prevalence reported by Ramalan et al.[24] in Nigeria, 29.8% reported by Idowu et al.[25] in Nigeria, 21.9% reported by Emmanuel et al.[26] in Makurdi, 21.0% reported by Wahab et al.[27] in Northern Nigeria, 24.3% reported by Akogwu et al.[28] in Sokoto, and 17% prevalence reported by Okafor et al.[29] in Nigeria. The low prevalence compared to previous studies could be attributed to high levels of awareness of weight management. The differences in findings suggest that obesity is influenced by contextual environmental and lifestyle factors. It highlights the need for location-specific prevention strategies rather than a one-size-fits-all approach.

Findings form the study revealed that 7.8% of the participants were overweight. This finding highlights the presence of a double nutritional burden within the population, which poses a challenge for public health planning as interventions must address both undernutrition and overnutrition simultaneously. This shows that a notable percentage of adults in Makurdi are at risk of progressing to obesity if preventive measures are not adopted. The prevalence of overweight in this study is lower than the 17.45% reported by Olatunbosun et al.[17] in Ibadan, 22% reported by Sola et al.[15] in Benue State, 23% documented by Agofure[18] in Delta State, 26% reported in Nigeria by Ramalan et al.[24], and 35.8% documented by Emmanuel et al.[14] in Makurdi. The prevalence is also lower than the 13.5% reported by Emmanuel et al. among fresh undergraduate students of a private university in Ogun State[26]. It is also lower than the 14% prevalence reported by Olufemi and Abiodun[20] in Lagos, 14.8% reported by Ogunlade and Asafa[21] in Ile-Ife, 13.4% reported by Ukegbu et al.[22] in South-east Nigeria. The lower prevalence compared to some urban areas like Ibadan and Lagos may reflect differences in population density, environmental conditions, socioeconomic status, and exposure to high-calorie diets. However, the prevalence of overweight in this study is higher than the 6.6% prevalence reported by Oyewande et al.[16] in Ikeja, Lagos State, and 2.2% documented by Akinlade et al.[30] in Oyo State. The higher prevalence compared to other studies could be due to increasing urbanization, evolving lifestyle habits, and a gradual shift toward sedentary occupations within Makurdi. Sampling techniques, age distributions, and temporal differences in data collection may also explain the disparities. The implication of these variations is that urbanization and lifestyle transition play a significant role in shaping obesity patterns, and as Makurdi continues to urbanize, the prevalence may increase if preventive measures are not implemented.

The study revealed a 5.7% prevalence of underweight. This finding highlights the presence of a double nutritional burden within the population, which poses a challenge for public health planning as interventions must address both undernutrition and overnutrition simultaneously. This finding shows that a small but noteworthy percentage of the adult population in Makurdi is at risk of malnutrition-related health complications. The prevalence of underweight (5.7%) recorded in this study is comparable to the 5.0% reported by Emmanuel et al.[26]. Similarly, Olufemi and Abiodun[20] reported a 5.8% prevalence of underweight among male adults in Lagos. A 5.7% prevalence recorded for underweight in this study is higher than the 2% reported by Sola et al.[15]. This can be attributed to differences in urban economic strength, healthcare access and nutritional education. However, it is lower than the 10% reported by Ogunlade and Asafa[21]. The lower prevalence compared to other studies could be attributed to better access to food, healthcare, and nutritional awareness in Makurdi's urban setting. Differences in study methodology, sample size, and season of data collection may also explain the variation. The difference in the findings can be attributed to differences in economic stability and nutrition education. This suggests that improving economic stability and nutrition education may contribute to better overall weight outcomes in the population.

The findings of the study revealed that 55.6% of the participants were aware of obesity. The implication of this finding is that while awareness exists among many adults, a substantial proportion of the population still lacks basic information about obesity. From a public health perspective, this indicates the need for sustained and targeted health education campaigns, especially among populations with limited access to reliable health information. This finding is in line with the study by Easter et al.[31] which reported that 65.9% of young women in Calabar South LGA were aware of obesity while 34.1% had poor awareness. The findings of this study agree with the report by Anto et al.[32] which showed that majority of the participants were aware of obesity. The observed agreement could be attributed to the role of mass media and healthcare institutions in public health

education across urban and semi-urban settings in Nigeria. However, the finding contradicts the report of Ojofeitimi et al.[33], who reported that 76.7% of the participants had low level of awareness of obesity among women in Obafemi Awolowo University Community Ile-Ife. Differences across studies may reflect variations in literacy levels, media access, urban–rural differences, and exposure to health promotion programs.

This study found that majority (49.9%) of respondents demonstrated good knowledge of obesity. This suggests that the majority of adults in Makurdi have at least a moderate understanding of obesity and its related health implications. The implication of this finding is that knowledge alone may not be sufficient to prevent obesity, as the presence of overweight and obesity despite moderate to good knowledge suggests a gap between awareness and actual health behavior. Public health interventions should therefore focus not only on knowledge improvement but also on behavioral change strategies and supportive environments that promote healthy lifestyle practices. Similar findings were reported among preclinical students of university of Benin, Edo State[61], among secondary school students of Royal Crystal college Ile-Ife[34], among overweight and obese individuals from a South-western community in Nigeria[35]. The high level of good knowledge among study participants could be attributed to increased access to health information through media channels such as television, radio, and health facilities. A good knowledge of obesity recorded in this study is similar to the report of Mabiala Babela et al.[36] who documented satisfactory level of knowledge about obesity in their study in Congo. A good knowledge of obesity was also document among undergraduates of Babcock University, Ilishan-Remo, Nigeria[37].

However, the finding of the present study disagrees with the report of Oyewande et al.[16], who reported very low knowledge of the risk factors of overweight and obesity. It also disagrees with the report of Olawuyi and Ikeoluwa[38], who documented low knowledge of the risk factors of obesity. This finding also contradicts another study by Ojofeitimi et al.[33] that reported that majority (76.7%) of their participants had poor levels of knowledge about the dangers of obesity. The lower knowledge in these studies may reflect lower education levels, reduced media access, and limited exposure to health messaging. Differences between studies may be explained by variations in educational status, access to information, and cultural perceptions of body weight.

The predisposing factors to obesity among adults was excessive television viewing, overeating, eating while watching television, living sedentary lifestyle, high intake of carbonated drinks and chocolate, having inadequate sleep or stress, overuse of digital devices, not playing sports in school and poor engagement in physical activities. The implication of these findings is that most of the identified risk factors are modifiable lifestyle behaviors, which presents an opportunity for effective prevention through health promotion, lifestyle counseling, and community-based interventions. From a public health perspective, interventions that reduce sedentary behavior and promote active living are essential to controlling the rising trend of obesity. These factors are similar to those reported by Oyewande et al.[16] where television viewing, sedentary behaviour, poor engagement in physical activities were major contributors to overweight and obesity. It is also similar to those reported by Ukegbu et al.[22] where consumption of unhealthy snack foods were major contributors to obesity in five tertiary institutions in south-east Nigeria.

The study found a significant association between age, marital status, education, ethnicity, religion, type of family and obesity. The highest prevalence of obesity was observed among participants aged 18–30 years that were single, with non-formal education. A possible explanation for this is that younger adults may be attributed to increased exposure to sedentary lifestyles, fast food consumption and reduced physical activity. These findings are consistent with other studies that have shown similar trends. For instance, a study by Jafar et al.[39] found that age, urban residence, being literate and having a high economic status and a high intake of meat are associated with obesity. Furthermore, Patsopoulou et al.[40] in Central Greece found a significant association between lower maternal educational level, eating without feeling hungry and obesity. The findings of this study also align with that of Back et al.[41] who found a significant relationship between age, alcohol consumption, presence of chronic disease and prevalence of obesity in Japanese-Brazilians.

The findings of this study are also in line with the findings of Idowu et al.[25] whose study revealed age, marital status, religion, ethnicity, educational level, duration of diagnosis of diabetes and hypertension were the predisposing factors of obesity. A possible reason for high prevalence of obesity among the study population

could be limited access to health information, contributing to unhealthy behaviours and poor dietary patterns. The influence of ethnicity and religion may reflect cultural differences in diet, body image norms, and physical activity, while the significant association with type of family suggest that extended family settings may promote more structured dietary and lifestyle habits compared to nuclear or joint family system. This finding is in line with the findings of Osunkwo et al.[19] who reported that sex, level of education, marital status and residing in urban areas were the predisposing factors of obesity. Usu et al.[42] also reported a similar trend, noting that household income, parental history, alcohol intake, educational level was associated with the increased likelihood of being obese.

CONCLUSION

Obesity remains a significant public health concern among adults in Makurdi, Benue State, and Nigeria at large. Findings from this study reveal that while the adult population in Makurdi demonstrates a relatively high level of knowledge regarding obesity and its associated risk factors, this awareness has not sufficiently translated into healthier lifestyle choices, as evidenced by the notable prevalence of overweight and obesity across key socio-demographic groups.

Particularly concerning is the high prevalence observed among young adults aged 18–30, females, and individuals with tertiary education, indicating that even among the educated population, behavioural and environmental factors may override knowledge. Additionally, socio-cultural dynamics, dietary transitions, sedentary behaviours, and limited engagement in physical activity appear to be influencing trends in obesity prevalence, especially among nuclear families and certain ethnic groups. This underscores a significant gap between knowledge and practice, highlighting the need for well-structured, community-specific interventions that move beyond awareness campaigns.

RECOMMENDATIONS

Based on the findings of this study, the following are recommended:

1. Government and health agencies should intensify targeted public health education on obesity, emphasizing its risk factors, long-term health implications, and prevention strategies. Messages should be culturally sensitive and tailored to different age groups, especially younger adults and high-risk populations.

2. The Benue State Ministry of Health, in collaboration with the Primary Healthcare Development Agency should integrate routine screening for body mass index (BMI) and waist circumference into standard clinical care within all primary healthcare centres. Such an initiative would facilitate early identification of individuals at risk of obesity and enable prompt intervention through structured referrals for dietary counselling, physical activity guidance, and behavioural modification programs.

3. The Benue State Ministry of Education, in partnership with the National Orientation Agency (NOA) and workplace health promotion units, should ensure that comprehensive health education on nutrition and physical activity is incorporated into school curricula and workplace wellness programs. Such initiative would cultivate lifelong healthy habits and improve awareness of the importance of weight management from childhood through adulthood.

4. To strengthen the evidence base for effective interventions, it is imperative that academic and research institutions, particularly universities and public health research centres, undertake sustained surveillance and longitudinal studies on obesity trends within Makurdi and similar urban centres. These studies should explore behavioural, environmental, and genetic factors of obesity to guide the design of context-specific, evidence-based prevention strategies.

5. The Benue State Government, in coordination with the Ministries of Health, Education, Agriculture, Urban Development, and Information, should establish a task force dedicated to obesity prevention and

control. This task force should formulate comprehensive policies, harmonize existing health promotion efforts, and oversee the implementation of interventions aimed at reducing the prevalence and long-term burden of obesity across the state.

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