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Prevalence and Comorbidities of Overweight and Obesity Among Patients Admitted in Madonna University Teaching Hospital Elele, Nigeria

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Abstract

Overweight and obesity are major health challenges among young adults globally, particularly in developing countries including Nigeria. They are significant risk factors for the development of chronic diseases such as cardiovascular diseases, hypertension, stroke, hyperlipidemia, and type 2 diabetes mellitus. As a result, it has become a health hazard and is an emerging public health problem. This study determined the prevalence and comorbidities of overweight and obesity among patients admitted to Madonna University Teaching Hospital Elele from 2010 to 2021. A cross-sectional study was carried out using a survey research design and included patients diagnosed with overweight and obesity in the hospital through a simple random sampling technique. A sample size of 305 was selected and 300 analyzable questionnaires were returned. Data were summarized using descriptive and inferential statistics with the Statistical Package of social science (SPSS version 21). A p-value of less than 0.05 was considered significant. Out of the 300 participants, the modal age was 22-25 years (36.5%). The majority of the respondents were female (52.5%), and Igbo was the predominant tribe (45%). Christianity was the predominant religion 90.5% and 122(40.5%) had secondary educational qualifications. The highest prevalence was recorded in 2021 with a prevalence of 39.3%. The majority of the respondents (23.8%) identified insulin resistance as a comorbidity associated with overweight and obesity, followed by hypertension (20.6%), diabetes mellitus (17.3%), sleep disorder (13.2%), and stroke (13.2%). Overall, 206 (68.7%) of the respondents exercise vigorously for 20 or more minutes at least three times a week while a majority of the respondents 204(68.1%) read or watch TV programs about improving health. Most of them 201(66.9%) limit use of sugars and food containing sugar. The study showed that the prevalence of overweight and obesity among patients in the population was high in 2021. Comorbid diseases associated were hypertension, insulin resistance, hypertension, type 2 diabetes mellitus, sleep apnea, and stroke. There was a relationship between age, gender, ethnicity, and educational status in the prevalence of overweight and obesity among the patients. Age, gender, and educational status significantly affected the adoption of a health-promoting lifestyle among the patients.

Keywords: Prevalence; Comorbidities; Overweight; Obesity; Patients; Nigeria

Introduction

In the last two decades, obesity has been related to social and behavioral changes, consumption of caloric foods, high palatability, and low satiety power, as well as higher caloric content of every meal and meal outside the home in fast food chains [1]. It is considered an aggravation of multi-factor character, involving biological, historical, ecological, economic, social, cultural, and political issues [1].

Overweight and obesity have been shown to increase the risk of cardiovascular disease, diabetes and various types of cancer, including cancer of the breast, colon, and endometrium [2]. A limited number of studies have reported race/ethnic differences in knowledge of the health consequences of obesity among U.S. adults, with Black and Hispanic adults having less knowledge compared to White adults [2]. However, there is surprisingly little information regarding knowledge of the health consequences of obesity in race/ethnic minority populations. Overweight and obesity are the fifth leading risk for global deaths. It is not only the degree of excess fat that is important, but also its distribution in the body that determines the health risks associated with the condition.

Overweight and obesity are defined as abnormal or excessive fat accumulation that may impair health. It is not only the degree of excess fat that is important, but also its distribution in the body that determines the health risks associated with the condition. Overweight, and obesity are the fifth leading risk for global deaths. At least 2.8 million adults die each year due to being overweight or obese [3]. The prevalence of obesity has nearly doubled from 1980 to 2018, and 65% of the world's population lives in countries where overweight and obesity kills more people than underweight. This includes all high-income and middle-income countries. In addition, 44% of the diabetes burden, 23% of the ischemic heart disease burden, and between 7% and 41% of certain cancer burdens are attributable to being overweight and obesity. In 2016, more than 40 million children under the age of five were overweight [3]. Once considered a country's problem, overweight, and obesity are now on the rise in low- and middle-income countries, particularly in urban settings. More than 30 million overweight children are living in developing countries and 10 million in developed countries.

World Health Organization (WHO) defines overweight as a BMI equal to or more than 25, and obesity as a BMI equal to or more than 30 [4]. Increased consumption of high calorific foods, without an equal increase in physical activity, leads to an unhealthy increase in body weight. Decreased levels of physical activities will also result in an energy imbalance and lead to weight gain [4]. Despite the recognition of obesity as a public health concern, it has been observed that understanding multiple factors influencing a person's risk is still inadequate [5]. Studies have highlighted the role of variable socio-economic factors in the process of development of

obesity [5]. To have an insight into people's perceptions of obesity, qualitative studies also have been conducted [5].

Obesity is abnormal or excessive fat accumulation with a Body Mass Index (BMI) of 30 kg /m² or more that represents a risk to health [6]. It is undoubtedly one of the biggest medical problems of the 21st century. Regrettably, the problem affects children and adults, and 10% of the world's school-aged children have an excess body weight and a quarter of these children are obese. Overweight and obesity are global public health problems because of their effect on individuals, families and communities [6,7]. The prevalence of overweight and obesity among Polish adults is about 14% [8]. The socio-demographic determinants of obesity among adults in the Nigerian population were female gender, marriage, low physical activity level, positive family history, the urban area of residence, and age \geq 40 years [9]. Excess body weight can be the consequence of genetic factors, endocrine disorders or certain drugs. However, 'simple obesity' is the most common, a consequence of providing too much energy from food products in comparison to energy expenditure (caloric excess). The prevalence of overweight and obesity is increasing, and it is becoming a huge problem among occupational/professional groups that are perceived as preponderantly sedentary. An attendant acquisition or imposition of a lowered physical activity level and other lifestyles with such occupations may contribute to the development of obesity and overweight [10].

Obesity is a public health problem that has raised concern worldwide. According to the World Health Organization (WHO), there will be about 2.3 billion overweight people aged 15 years and above, and over 700 million obese people worldwide in 2019 but as of 2020, more than 1.9 billion adults, 18 years and older, were overweight [11]. Of these over 650 million were obese, 39% of adults aged 18 years and over were overweight in 2016, and 13% were obese. Most of the world's population lives in countries where overweight and obesity kill more people than underweight and 41 million children under the age of 5 were overweight or obese in 2016. Over 340 million children and adults aged 5-19 were overweight or obese in 2016. Obesity is preventable. Worldwide obesity has nearly tripled since 1975 [11]. WHO has also developed the "Global Action Plan" for the prevention and control of non-communicable diseases 2013-2020 which aims to achieve the commitments of the United Nations political declaration of Non-Communicable Diseases (NCDs) which was endorsed by Heads of State and Government in September 2011. The "Global Action Plan" will contribute to progress on 9 global NCD targets to be attained by 2025, including a 25% relative reduction in premature mortality from NCDs by 2025 and a halt in the rise of global obesity to match the rates of 2010 [11]. Although a few developed countries such as the United Kingdom and Germany experienced a drop in the

prevalence rate of obesity in the past decade, the prevalence of obesity continues to rise in many parts of the world, especially in the Asia Pacific region [12]. Obesity in the elderly is considered one of the most serious public health challenges all over the world. It is a complex; multifactorial disease arising from the interactions between genetic, environmental, and behavioral factors together with other factors resulting in energy imbalance and promoting excessive fat deposition [13]. Obesity and overweight are a result of energy imbalance over some time. Obesity can be said to be a global epidemic given the high prevalence in the world today. Obesity is swiftly becoming a global epidemic, which is not restricted to the more “developed” countries. Obesity does not occur overnight [14].

Today’s lifestyle promotes the development of obesity. The lack of physical activity, sedentary lifestyle, and energy-rich diet are the main causes of excess body fat accumulation. Because of improper eating behaviors, children consume an excess amount of energy and their diet is deficient in elements necessary for proper development. Examples of such bad eating habits are snacking highly processed and calorie-rich foods between meals eating in front of the TV screen, skipping breakfasts, drinking sugar-sweetened beverages, “eating out” frequently and “emotional eating”. Bad eating behaviors are crucial factors for the development of obesity. Eating habits are usually formed in early childhood and parents play a very important role in their development [8]. Hence, reviewing the prevalence and comorbidities associated with overweight and obesity among patients is a necessity.

The rates of people being overweight and obese are recognized as global public health concerns. Negative attitudes towards obese and overweight people are prevalent among health care professionals. Nurses and health professionals have a significant role in the health promotion of people who are obese or overweight and can assist people in achieving healthy lifestyles. However, evidence suggests that most patients fail to engage in healthy lifestyles themselves and display negative attitudes because of several social, personal, and healthcare-related factors. Such negative behaviors put health professionals in a precarious position when advising overweight and obese people to adopt healthy lifestyles. Very little research has been done on the prevalence of obesity and overweight among adults in Rivers State. The impact of obesity on their lifestyles with excess adiposity risk, possible causes leading to overweight and obesity and prevention. Thus, the need to fill these voids has steered this project in the direction that it was taken to create awareness in society. Hence, this study determined the prevalence and comorbidities of overweight and obesity among patients admitted to Madonna University Teaching Hospital Elele from 2010 to 2021.

Materials and Methods

Study Design

A descriptive survey research design was employed. Frankfort-

Nachmias & Nachmias stated that descriptive surveys design is a research design most predominantly used in survey as it facilitates the gathering of information about a larger population by collecting information from a portion of that very population from where generalizations can be inferred [15-18]. The design was considered appropriate for use in this study because it gave current information on the topic in discourse.

Study Site

The site for this study was Madonna University Teaching Hospital. It has a working capacity of 500 staff comprising Pharmacists, Doctors, Nurses, Physiotherapists, Microbiologists, Radiologists, and non-medical staff. The hospital is made up of sub-units such as Medical Wards, Surgical Wards, Pediatric Unit Outpatient Department, Pharmacy Department, Accident and Emergency (Casualty), Theatre, Obstetrics and Gynecology, Units and Psychiatric Unit. The Department of Nursing Science is integrated with a 250-bedded unit so that nursing education service and research are closely combined with quality patient and client care.

Study Population

The target population was patients enrolled in Madonna University Teaching Hospital, Rivers State who were diagnosed with obesity and overweight at the time of the study while comparing data from the medical records across the period of the study (2010 to 2021). According to the hospital management records they were 1290 in number across the years, these were adopted as the target population size.

Sample Size Determination/ Sampling Methods

The sample size was determined using Taro Yamane’s formula for calculating sample size. Taro Yamane, a mathematical statistician developed a statistical formula for calculating determining the sample size of the population under study so that inferences and conclusions reached after the survey can be generalized to the entire population from which the sample was obtained. Taro Yamane’s statistical formula is stated as follows;

$$n = N / (1 + Ne^2)$$

n= corrected sample size,

N = population size (N = 1290)

e = Margin of error, e = 0.05 based on the research condition.

Therefore,

$$n = 1290 / 1 + (1290 \times 0.05^2)$$

$$n = 1290 / (1 + 3.225)$$

$$n = 1290 / 4.225$$

$$n = 305.33$$

Therefore, the sample size for this study was 305 patients.

Patients in Madonna University Teaching Hospital were selected using simple random sampling method in form of balloting without replacement. This was chosen because the technique involves random selection of study elements in such a way that each member of the study population has an equal chance of being selected for the study.

Inclusion Criteria

Only patients diagnosed with overweight and obesity in the hospital and those who gave their informed consent to participate in the study were used. We also used patient folders that met these criteria.

Exclusion Criteria

We excluded patients who were diagnosed with overweight and obesity in the hospital but were not willing to participate in the study and those absent during the period of data collection.

Data Collection/ Processing

Relevant data for the analysis was collected through the distribution of structured and validated questionnaires among the population under the study. A total of five eligible patients were used for the pilot survey. These patients were excluded from the main study.

Data Analysis

Data analysis was done using descriptive statistics. The data

were subsequently analyzed electronically with the Statistical Package for Social Sciences (SPSS) software and the presentation of data was done using frequency tables and charts. Research questions were answered using descriptive statistics of frequency tables and figures. Inferential statistics such as students t-test and ANOVA were used to test for differences in two means and more than two means respectively.

Ethical Approval

Ethical approval was obtained from the hospital's research and ethics committee before the commencement of the study. Confidentiality was ensured and the values and norms of patients were studied well and respected to avoid any misconception during and after data collection. All respondents were duly informed that the survey was voluntary and that they were not under compulsion to participate and free to decline at any point during the study. All sources of data obtained in the course of the study were duly acknowledged and confidential.

Results

A total of 305 questionnaires were distributed and 300 questionnaires were returned properly filled making a response rate of 96.8%. From the results, the modal age was 22-25 years (36.5%). The majority of the respondents were female (52.5%), and of Igbo descent (45%). The dominant religion was Christianity with a rate of 90.5%. Overall, 122(40.5%) had secondary education qualifications. Details of the demographic characteristics are presented in Table 1.

Table 1: Demographics characteristics of the respondents.

Variables	Options	Frequency (300)	Percentage (%)
Age distribution	15-18 years	78	26
	19-21 years	51	17
	22-25 years	110	36.5
	26 years and above	61	20.5
Gender	Male	142	47.5
	Female	158	52.5
Ethnicity	Hausa	41	13.5
	Igbo	134	45
	Yoruba	63	21
	Others	62	20.5
Religion	Christianity	271	90.5
	Islam	14	4.5
	Others	15	5
Educational status	No formal Education	31	10.2
	Primary Education	55	18.8
	Secondary Education	122	40.5
	Tertiary Education	92	30.5

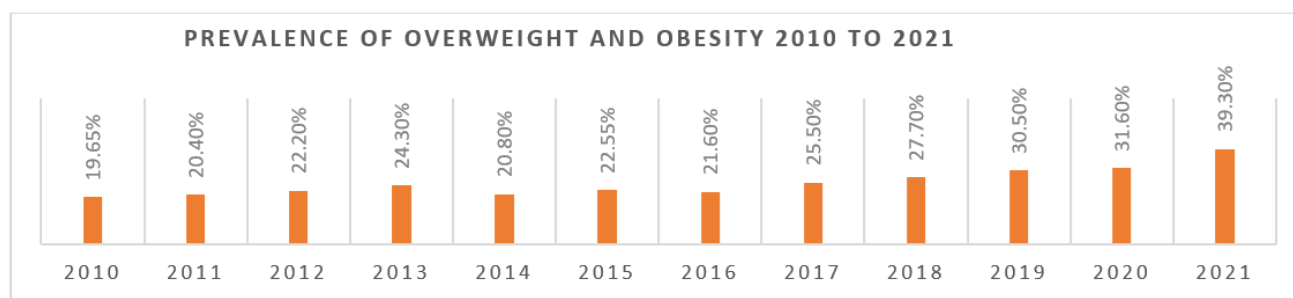


Figure 1: Prevalence of overweight and obesity among patients in Madonna University Teaching Hospital from 2010 to 2021.

Table 2: Comorbidities associated with overweight and obesity among patients.

S/N	Variables	N (300)	(%)
1	Insulin resistance	71	23.8
2	Glucose intolerance	32	10.6
3	Diabetes mellitus	52	17.3
4	Hypertension	62	20.6
5	Sleep apnea (serious sleep disorder in which breathing repeatedly stops and starts)	40	13.2
6	Arthritis	21	6.9
7	Gall bladder disease	15	5
8	Certain types of cancer	20	6.6
9	Heart disease and stroke	40	13.2
10	Others, indicate:	17	5.5

Table 3: Weight management and health promoting lifestyle for prevention of overweight and obesity.

S/N	Variables	N (300)	(%)
1	Report any unusual signs or symptoms to a physician or other health professional	199	66.3
2	Read or watch TV programs about improving health.	204	68.1
3	Inspect my body at least monthly for physical changes/danger signs	188	62.7
4	Attend educational programs on personal health care	99	33
5	Seek guidance or counseling when necessary	165	55
6	Follow a planned exercise program.	161	53.7
7	Exercise vigorously for 20 or more minutes at least three times a week (such as brisk walking, bicycling, aerobic dancing, using a stair climber)	206	68.7
8	Take part in leisure-time (recreational) physical activities (such as swimming, dancing, bicycling)	101	33.5
9	Choose a diet low in fat, saturate fat, and cholesterol	135	45.1
10	Limit use of sugars and food containing sugar (sweets)	201	66.9
11	Read labels to identify nutrients, fats, sodium content in packaged food	174	58.1
12	Eat 2-4 servings of fruit each day	161	53.7
13	Eat 3-5 servings of vegetables each day	173	57.5
14	Others, indicate:	107	35.5

Table 4: Demographic factors vs prevalence of overweight and obesity among patients.

S/N	Demographic variables	Description	n (%)	P-values
1	Age distribution	15-18 years	78(26.0)	0.026
		19-21 years	51(17.0)	
		22-25 years	110(36.5)	
		26 years and above	61(20.5)	
2	Gender	Male	142(47.5)	0.021
		Female	158(52.5)	
3	Ethnicity	Hausa	41(13.5)	0.042
		Igbo	134(45)	
		Yoruba	63(21)	
		Others	62(20.5)	
4	Religion	Christianity	271(90.5)	0.501
		Islam	14(4.5)	
		Others	15(5.0)	
5	Educational Status	No formal education	31(10.2)	0.015
		Primary education	55(18.8)	
		Secondary education	122(40.5)	
		Tertiary education	92(30.5)	

Table 5: Demographic factors vs adoption of health promoting lifestyle among patients.

S/N	Demographic variables	Description	n (%)	P-values
1	Age distribution	15-18 years	78(26.0)	0.01
		19-21 years	51(17.0)	
		22-25 years	110(36.5)	
		26 years and above	61(20.5)	
2	Gender	Male	142(47.5)	0.025
		Female	158(52.5)	
3	Ethnicity	Hausa	41(13.5)	0.351
		Igbo	134(45)	
		Yoruba	63(21)	
		Others	62(20.5)	
4	Religion	Christianity	271(90.5)	0.442
		Islam	14(4.5)	
		Others	15(5.0)	
5	Educational Status	No formal education	31(10.2)	0.033
		Primary education	55(18.8)	
		Secondary education	122(40.5)	
		Tertiary education	92(30.5)	

Discussion

Prevalence of overweight and obesity among patients

From the findings, the highest prevalence was recorded in 2021, followed by 2019 and 2021 and females were predominant. This was consistent with the study by Yang [19]. Graham and Colditz (2019) revealed that the majority of women were obese in the population under study. This suggests that males are predominantly more engaged in rigorous physical activities than females, especially in

middle age. The weight status distribution was similar for both sexes across racial groups. This was also corroborated by the findings of Damianet al. [20], who revealed that the majority of patients were either overweight or obese. Based on these findings, population-based strategies helping to reduce modifiable risk factors such as physical environmental interventions, enhancing primary care efforts to prevent and treat obesity, and altering societal norms of behavior are required.

Comorbidities associated with overweight and obesity among patients

The majority of the respondents had insulin resistance as a comorbidity associated with overweight and obesity, followed by hypertension, type 2 diabetes mellitus, sleep disorder and heart disease/stroke. This was consistent with the findings of Racicka, et al. [21], which revealed that there was a significant incidence of obesity in patients with comorbid diagnosis of adjustment disorder and mental retardation. Standardized body mass index (BMI), prevalence of overweight, and obesity was higher in patients with ADHD in the population. A higher incidence of obesity was shown in patients with analyzed comorbidities. This was also supported by the findings of Fujioka [22], who reported that obesity and overweight have been associated with weight-related comorbidities, such as hypertension, prediabetes, diabetes, or dyslipidemia. The patients must be educated on the importance of adopting a healthy lifestyle to improve their health outcomes in the long run. Healthcare practitioners can also leverage this to offer customized health interventions for populations in different geographical settings.

Weight management and health promoting-lifestyle for prevention of overweight and obesity

The findings on weight management and health-promoting lifestyle for the prevention of overweight and obesity showed that most of the respondents' exercise vigorously for 20 or more minutes at least three times a week. They read or watch TV programs about improving health and minimizing the use of sugar and food containing sugar. This is consistent with the findings of Gormley and Melby [23], who reported that most individuals who engage in unhealthy lifestyle behaviours had poor knowledge of obesity risk and displayed neutral attitudes towards overweight and obesity. This underscored the need for health providers to promote adoption of healthy lifestyle behaviors as an integral component of the treatment and management process.

Conclusion

The study suggested a high prevalence of overweight and obesity among patients in the population in 2021. Comorbid diseases associated were insulin resistance, hypertension, diabetes mellitus, sleep apnea, and stroke. Vigorously for 20 or more minutes at least three times a week, reading or watching TV programs about improving health, and limited use of sugars and food containing sugar proved effective at minimizing weight gain. The study revealed relationships between age, gender, ethnicity, and educational status in the prevalence of overweight and obesity among patients. While age, gender, and education status significantly affect the adoption of a health-promoting lifestyle among patients. Based on these findings, there is a need for educational intervention and health promotion advocacy.

Acknowledgement

None.

Conflict of Interest

The authors declare no competing interests.

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