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Prevalence and Risk Factors for Obesity among Pregnant Women Managed at a Public Tertiary Health Facility, Southwest, Nigeria

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Abstract

Maternal obesity hurts pregnancy and pregnancy outcomes through increased morbidities in the antenatal period, increased intrapartum interventions and post-partum complications. This study was undertaken to determine the prevalence and risk factors for obesity among pregnant women managed at a Public Tertiary Health Facility, in Southwest, Nigeria. This study is a hospital-based cross-sectional study carried out among 160 pregnant women at the Department of Obstetrics and Gynaecology, Federal Medical Centre, Abeokuta who booked in the first half of pregnancy at the hospital and who presented in labour. Booking weights and heights were extracted from the case note and were used to calculate the body mass index (BMI) which was thereafter classified based on the World Health Organization (WHO) criteria. The labour of respondents was monitored closely, ethical approval was gotten from the Hospital's Health Research and Ethics Board and written informed consent was taken from patients. Data was obtained using a semi-structured questionnaire and analyzed using IBM SPSS version 23. P-value <0.05 was taken as significant. The prevalence of maternal obesity was 24.4% and the risk factors found by this study that were statistically significant (P<0.05) with obesity are advanced maternal age, increasing parity and self-reported satisfactory income. In conclusion, a quarter of pregnant women in this study were obese and some of its risk factors have been identified. It is recommended that awareness and health education programmes especially as regards the negative effects of obesity and strategies to help pregnant women maintain a normal weight should be intensified at the antenatal clinics.

Keywords*: Obesity, Pregnant Women, Prevalence, Risk Factors, Tertiary Health Facility.*

Introduction

Obesity is the presence of fat in an individual over 25% of body weight [1]. It is becoming a global public health issue, and the World Health Organization (WHO) has also noted that obesity is beginning to reach an epidemic proportion [2]. The rising incidence of obesity is no longer limited to developed nations but is also on the increase in developing nations especially with rapid urbanization [2]. In strict terms, obesity is defined as body mass index (BMI) greater than or equal to 30kg/m^2 (Kilogram per meter square) [1].

Although there are readymade criteria used in assessing obesity, none of these criteria accurately correlate with the proportion of fat in the body mass of the individual and are

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therefore indirect measures of obesity. The commonly used criteria for measuring obesity include skin fold thickness, waist circumference, waist-hip ratio, empirical criteria, and weight and height indices [1]. The empirical method is used in pregnancy and obesity is defined as weight $\geq$ 90kg irrespective of the pre-pregnancy weight and height. The patient is morbidly obese in pregnancy if weight $\geq$ 115kg [1]. Using the waist circumference, obesity is defined as value $\geq$102cm in men and $\geq$88cm in women [3]. On the other hand, the skin fold thickness measures the subcutaneous fat and it involves the use of calipers. Obesity is present if the skin fold thickness is greater than expected by 20% or more and the areas of measurement are the biceps, triceps, subscapular and supra iliac [1]. The Body Mass Index (BMI) is the most common method used in defining obesity. It is a standardized and reproducible method anywhere in the world. It is measured as weight/height^2 [4]. BMI is closely related to the degree of body fat in most settings [1]. The BMI is classified according to WHO as; underweight (<18.5kg/m^2) normal (18.5 – 24.9kg/m^2), overweight (25.0 – 29.9kg/m^2) and obese ($\geq$30kg/m^2) [1].

Obesity results due to dis-equilibrium between the endergonic and exergonic processes and the energy imbalance can be influenced by genetics, environment and economic power of individuals [5]. Most experts agree that efforts to stem the epidemic must be targeted at the factors that influence obesity especially obesogenic environments [5].

Around 800 million people worldwide are living with obesity, including over 670 million adults and at least 120 million children and adolescents, according to statistics from 2016. This number is still increasing and WHO estimates that by 2025, approximately 167 million more people – adults and children – will become less healthy because they are overweight or obese [6]. In the United States of America (USA), more than one-third of women are obese [7]. This nutritional disorder has significant adverse effects on pregnancy outcomes hence, the impacts of maternal obesity on reproductive outcomes should not be taken with levity.

The associated adverse effects of maternal obesity include increased incidence of abortion, pregnancy-induced hypertension, gestational diabetes, fetal macrosomia, prolonged pregnancy, prolonged labour, increased incidence of instrumental delivery, postpartum haemorrhage, thrombo-embolism, post-operative wound sepsis, congenital abnormalities, stillbirth and increased neonatal admissions [1, 8, 9]. Maternal obesity has been shown by a study to increase the use of healthcare facilities compared to pregnant women with normal weight [10]. Maternal obesity increases the risk burden of pregnancy (such as abortion, pregnancy-induced hypertension, gestational diabetes etc) and therefore there is a need for antenatal screening for obesity and its predictive risk factors for appropriate anticipatory measures to be instituted to reduce the adverse obstetric complications associated with this increasing public health issue [10].

So many risk factors for maternal obesity have been published in various studies such as advanced maternal age, urbanization, increasing parity, cigarette smoking, increased economic power and lower educational status [11,12,13]. This study aims to determine the prevalence of obesity and its associated risk factors among pregnant women and the findings will positively influence the physician's management plan with the subsequent improved feto-maternal outcome thus, promoting safe motherhood.

Methods

This study was carried out in the ante-natal ward, labour ward and post-natal ward of the Department of Obstetrics and Gynaecology at Federal Medical Centre, Abeokuta. Abeokuta

is the capital city of Ogun State and is located in South-West Nigeria. It is situated 74km North of Lagos along the Ogun River. The city is famously known for its traditional style of hand-woven dyed attire called "Adire". The inhabitants are mainly the "Egbas", a sub-group of the Yoruba race. There are two local government areas; Abeokuta North and South. The population of Abeokuta is about half a million according to National Population Commission 2006 [14]. The Federal Medical Centre, Abeokuta is a tertiary healthcare facility within the Abeokuta South Local Government area with an average delivery rate of 1200 births per annum.

The study was a descriptive cross-sectional study among pregnant women who booked in the first half of pregnancy at the hospital, had single gestation, had no other concurrent medical condition, presented in labour and delivered at the hospital. A total of 160 pregnant women participated in the study and the sample size for this study was determined by using the Leslie Kish equation reported by Araoye in 2004 [15] and using Z^2PQ/d^2. Z (Confidence limits of the survey result at 95%) was put at 1.96, P (Proportion of obese pregnant women) was 9.6% found in a local study in Benin [16], Q = 1-P and d (Precision) was taken at 5%, a sample size of 140 was gotten and adding 10% factor to take care of incompletely filled questionnaire, a sample size of 154 was eventually gotten which was approximated to 160. A systematic random sampling technique was used in the selection of participants after dividing the sample frame (projected number of patients to be seen in two months as determined from previous data which was 290) by the total number of questionnaires (160). A sample interval of two was obtained and every other patient who presented in labour and fitted into the inclusion criteria was recruited until the number of participants needed was met.

Data was collected between November and December 2016 using interviewer-administered semi-structured questionnaires adopted from previous studies and was analyzed using IBM SPSS (Statistical Product and Service Solutions) statistics version 23. Categorical variables (e.g. religion, ethnicity etc.) were summarized as tables, proportions and charts. Continuous variables (e.g. age) were summarized as means (standard deviation. Percentage of obesity and risk factors for obesity were determined. The chi-square test was used to determine the statistical significance of observed differences in cross-tabulated variables. The level of significance was predetermined at a p-value of less than 0.05 at a 95% confidence level.

Ethical clearance for this was obtained from the Research and Ethical Committees of the Federal Medical Centre, Abeokuta with the number HREC/FMCA/2016/044 and informed consent was obtained from the respondents. Patients were assured of optimal treatment whether they declined to participate in the study or even if they opted out at any point in time in the study. Confidentiality was ensured through the anonymous distribution of the questionnaire.

Results

Table 1. Socio-demographic Characteristics of the Respondents

Variables	**Frequency(n=160)**	**Percent (%)**
Age groups (years)		
≤20	3	1.9
21-25	15	9.4
26-30	57	35.6
31-35	54	33.8

36-40	25	15.6
>40	6	3.8
Marital Status		
Single	3	1.9
Married	157	98.1
Religion		
Christianity	113	70.6
Islam	47	29.4
Ethnic group		
Yoruba	126	78.8
Igbo	29	18.1
Hausa	1	0.6
Others	4	2.5
Educational Level		
None	2	1.3
Primary	11	6.9
Secondary	30	18.8
Tertiary	109	68.1
Postgraduate	8	5.0
Employment Status		
Paid employed	80	50.0
Self-employed	57	35.6
Unemployed	23	14.4
Level of Income		
Satisfactory	95	59.4
Unsatisfactory	42	26.3
Indifferent	23	14.3

The majority of the respondents (69.4%) women were within the age range of 26-35 years (35.6% within the range of 26-30 years and 33.8% within the range of 31-35 years). 98.1% of the respondents were married, 70.6% were Christians, 78.8% were of Yoruba tribe, 68.1% had tertiary education, half had paid employment at about three-fifths had satisfactory levels of income (Table 1).

Table 2. Obstetric and Anthropometric Characteristics of Respondents

Clinical Characteristics	**Frequency(n=160)**	**Percent (%)**
Parity		
Primipara	63	39.4
Multipara	88	55.0
Grandmultipara	9	5.6

Weight interval(kg)		
40.1 - 60.0	38	23.8
60.1 - 80.0	86	53.8
80.1 -100.0	28	17.5
100.1 - 120.0	7	4.4
120.1 - 140.0	1	.6
Height Interval(m)		
1.31 - 1.40	1	.6
1.41 - 1.50	1	.6
1.51 - 1.60	50	31.3
1.61 - 1.70	93	58.1
1.71 - 1.80	11	6.9
1.81 - 1.90	4	2.5
BMI Type		
Underweight	8	5.0
Normal weight	68	42.5
Overweight	45	28.1
Obese	28	17.5
Morbid Obesity	11	6.9

More than half (55.0%) of the respondents were multiparous about 5.6% were grand multiparous and the remaining 39.4% were primiparous. More than half of the respondents (53.8%) were within the weight range of 60.1 – 80kg and 17.3% were within the age range of 80.1 – 100. A total of 24.4% were obese (17.5% with mild to moderate obesity and 6.9% with morbid obesity) (Table 2)

Overall Prevalence of Obesity among Pregnant Women

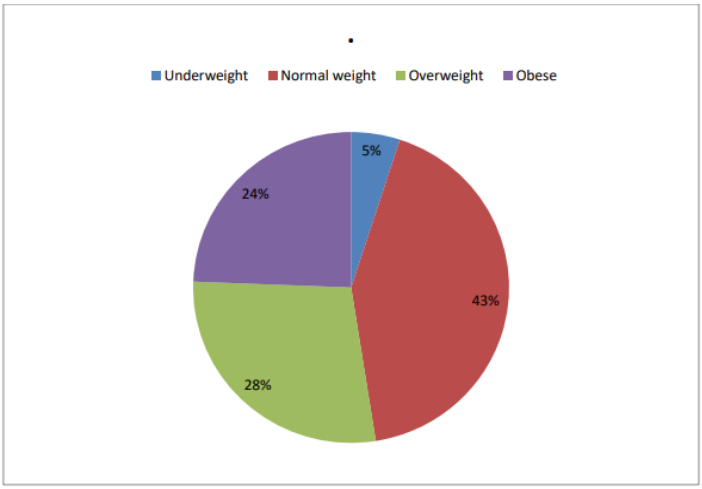

Figure 1. Overall Prevalence of Obesity

In this study, 24.4% were obese, 28.1% overweight, 42.5% had normal weight and 5% were underweight (Figure 1).

Logistic Regression for the Risk Factors of Obesity among Respondents

Table 3. Logistic Regression Analysis of Risk Factors for Obesity in Pregnancy

Risk Factors	P value	Odd Ratio (OR)	95% CI
Age >35	0.001	0.24	0.12-0.56
Ethnic Group	0.536	1.36	0.51-3.66
Educational Level			
Primary	0.133	0.81	0.32-1.62
Secondary	0.465	0.92	0.62-1.34
Tertiary	0.424	1.13	0.96-1.36
Postgraduate	0.292	0.51	0.09-2.68
Employment Status	0.360	1.76	0.82-4.51
Satisfactory Income Level	0.028	2.42	1.08-5.39
Parity (≥1)	0.002	1.61	1.18-2.18
Cigarette Smoking	0.976	0.97	0.10-9.56

Age > 35years (P value 0.001, OR 0.24 and CI 0.12-0.56), a satisfactory level of income (P = 0.028, OR 2.42, 95% CI 1.08 – 5.39) and parity > 1(P = 0.002, OR 1.61, 95% CI 1.18 – 2.18) were risk factors with statistically significant association with obesity among the respondents (Table 3).

Discussion

The prevalence of obesity as found by this study among pregnant women assessing maternal health services in the Federal Medical Centre is 24.4%. It was also found that 28.1% of the respondents were overweight and this group may also be prone to obesity if nothing is done. This high prevalence of obesity may be due to the better socio-economic status of the respondents. This study's prevalence rate of obesity is similar to the value reported by a study in a similar environment to determine the obstetrics performance of obese patients, where a prevalence rate of 20.6% was reported and in Abakaliki, southeast Nigeria, where a 22.6% prevalence rate was also reported [17, 18]. However, it was higher than the values reported in Ibadan, Nigeria (7.4%) and Benin, Nigeria (10.7%) [16, 19]. The prevalence reported in this study is lower than as found in Jos, Nigeria and Ghana where maternal obesity prevalence rates of 33% and 34.8% were reported [19, 20]. It is also lower than a prevalence of 42.3% reported in a study done on prevalence and pregnant women's knowledge of maternal obesity and excessive gestational weight gain among women attending antenatal care in Fako Division, Cameroon and the 40.5% prevalence rate documented in another study done in Saudi Arabia on obesity prevalence and its impact on maternal and neonatal outcomes among pregnant women [21, 22].

The risk factors for maternal obesity found by this study were age greater than 35 years, satisfactory income level and parity greater than 1. The risk of obesity was doubled among those with satisfactory income levels and with parity greater than 1. This finding is similar to those reported in studies done in Ibadan and Abakaliki, Nigeria, where similar risk factors were reported [16, 18]. This finding is also similar to findings in a study done to determine how pregnancy-related weight changes and breastfeeding relate to maternal weight and BMI and another cross-sectional study among Iranian women where similar risk factors were reported [23, 24]. This study finding is however in contrast to findings in

the Netherlands and by the American Society for Clinical Nutrition where educational status, ethnicity, paid employment and cigarette smoking were reported risk factors [25, 26].

Conclusion

This study has revealed that maternal obesity is relatively high among the study respondents and it is associated with increased maternal age, satisfactory income level and increased parity.

It is therefore recommended that the Government and other relevant stakeholders need to institute awareness and health education programmes at the antenatal clinics especially as regards the negative effects of obesity and strategies to help pregnant women maintain a normal weight.

Strengths of the Study

This study used BMI calculation in the classification of the respondents. Using BMI makes this study easily comparable with other studies done elsewhere.

Weaknesses of the Study

The measurements used in arriving at the BMI of the patients were extracted from the patient's case note on booking which was not done by a single individual. There might be marginal errors due to inter-observer variation.

Policy Implication of this Study

This study will help policymakers evaluate the content of antenatal care service programmes in the Country's healthcare centres regarding patient anthropometric measurement, diet and weight control.

Competing Interest

The authors declare no competing or conflict of interest.

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