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Research

Diet quality of women of reproductive age in Sagamu local government area, Ogun state, Nigeria

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Background

Diet quality refers to a diversified, balanced and healthy diet which is reflected in variety and diversity, adequacy, moderation and overall balance. Women's diet quality during reproductive years influences their long-term health.

Objective

This cross-sectional study assessed the socio-demographic and socio-economic status, anthropometric status, dietary intake and diet quality of 270 women of reproductive age.

Methods

A probability sample was taken from households in the Sagamu Local Government Area, Ogun State, Nigeria. A semi-structured interviewer-administered questionnaire was used to obtain information on socioeconomic and socio-demographic characteristics of the respondents. Weight, height, waist and hip circumferences of the respondents were measured, body mass index calculated and compared with standards. Dietary intake was assessed using a multi-pass 24-hour dietary recall questionnaire. The Diet Quality Index International (DQI-I) questionnaire was used to assess diet quality on a scale of 100. The data obtained were analyzed using SPSS, version 23. Chi-square and correlation were employed to determine the association and relationship between variables. The level of significance chosen was at $p<0.05$.

Results

51.1% had a normal body mass index though there was high prevalence of overweight (29.6%) and obesity (14.4%). 57.4% were centrally obese and 46.7% had high waist-to-hip ratio, indicating high disease risk. The main staples consumed were cereals, roots and tubers and legumes. Carbohydrate and protein were in excess while potassium, calcium, folate, vitamin C and fiber were inadequate. Consumption of fat, saturated fat, cholesterol, sodium, protein, and iron were at recommended levels. The total DQI-I score was 62.9/100. The diet variety score, 12.5, indicating good diet variety. The diet adequacy score was 17.6, indicating low diet adequacy. The diet moderation score was 25.64, indicating good moderation. The dietary balance score was 7.1, indicating good overall balance.

Conclusions

We conclude that most of the respondents had good dietary variety, good dietary moderation and good overall balance; however, there was low diet adequacy, with a distinct pattern of low consumption of fruits and vegetables. It is recommended that the DQI-I tool be widely used in Nigeria as a means of assessing and comparing diet quality at state level.

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INTRODUCTION

Human health is significantly influenced by diet, and there is a wealth of research on the connection between food intake and non-communicable diseases (NCD) (WHO, 2019). A varied, balanced, and healthful diet that gives energy and all the nutrients need for growth and an active, healthy life is referred to as a high-quality diet. Diet quality refers to a diversified, balanced and healthy diet, which provides energy and all essential nutrients for growth and a healthy and active life (Onyeji & Sanusi, 2018). It refers to both the amounts of nutrients and the uptake of specific nutrients from the diet to help and support body maintenance, growth, physiological changes (Lassi et al. 2020). Diet quality is reflected in the variety and diversity of foods groups consumed, adequacy, moderation and overall balance (Kim et al., 2003, Onyeji & Sanusi, 2018). It has been demonstrated that a wide variety of foods increases calorie and micronutrient intake in underdeveloped nations (Hoddinott & Yohannes, 2002). Nigerian cuisines are not particularly diverse or varied and have been linked to chronic non-communicable diseases (Sanusi et al., 2019).

Undernourishment of mothers is a worldwide issue that remains neglected in underdeveloped nations where the main health concerns include stunting of children, low birth weight, and maternal death (Onyeji & Sanusi, 2018; Onyeji & Sanusi, 2020; Darton-Hill, 2012). The worrisome rise in obesity rates and hidden hunger (Black et al., 2013) in developing nations is particularly concerning for women of childbearing age (WRA) (WHO, 2016).

When diets lack the necessary nutrients for optimum health, unfavorable health effects typically result. Nutritional issues result from either an excess or a shortage of one or more nutrients (Nabuuma et al., 2021). Micronutrient deficiency is the absence of vitamins and minerals that are essential for good health and can be caused by a bad diet or illnesses (Gómez et al., 2013). While dietary diversity provides sufficient nutrient intakes among groups, nutritional status is thought to be a result of biological processes that entail food use although diet quality and chronic non-communicable diseases have been proven to have inverse connections (FAO, 2021).

WRA in impoverished nations frequently experience hidden hunger (Black et al., 2013. They are especially vulnerable to nutritional inadequacies because of the physiological demands of both pregnancy and lactation (FAO & WHO, 2018; FAO, 2021). One method among many to enhance WRAs' micronutrient nutrition is to promote a varied diet (FAO & WHO 2018; FAO, 2021; Park, 2015). Women who live in low-income households often consume meals that are deficient in various nutrients, which, along with their low incomes, high food costs, and lack of knowledge, causes so-called hidden hunger (Ghattas, 2014). The fundamental strategy for achieving and maintaining nutritional sufficiency is consuming a range of foods from various dietary groups (Miller & Welchhh, 2013).

A high diet quality should be adaptable to individual needs in order to safeguard sound health and prevent sickness. It should be capable of promoting growth and development efficiently. However, diet quality refers to both the quantity of nutrients in the diet as well as the absorption of particular nutrients to assist and support bodily functions such as development, maintenance, and physiological changes and statuses including pregnancy and breastfeeding, physical activity, and also the improvements of the body's immunity against infection and the onset of diseases. It is understood that improving diet quality can simultaneously address various forms of malnutrition.

Poor dietary habits lead to poor pregnancy outcome (such as pre-eclampsia, miscarriage, gestational diabetes and other cardiovascular disorders) (Kangaru et al., 2017; Martin et al., 2013). WRA are nutritionally vulnerable owing to the physiological demand of pregnancy as well as lactation (FAO, 2016). In order to promote bodily maintenance, growth, physiological condition (such as pregnancy and breastfeeding), physical activity, and immunity against illness, the diet quality of an individual is a key determinant. According to (Oyebanjo, 2013) 59.2% of households in parts of Ogun State were found to be food insecure and 32.5% of women in Sagamu had varying types of anemias (Oluwafolahan et al., 2017). However, diet quality is poorly researched among WRA in this area. Therefore, the present study aimed at investigating the diet quality of women of reproductive age in one area of the state.

METHODS

This research project was cross-sectional and descriptive in nature. It was conducted in Sagamu, a city in southwest Nigeria's Ogun State. It has a population of 435,200 (NPC, 2019) and its major spoken language is Ijebu, a dialect of Yoruba.

STUDY SAMPLE

The study sample consists of apparent healthy women of reproductive age. Inclusion criteria included women of child bearing age (15-49 years) not on medication, who have been resident in the study location for at least the past three years and were not pregnant as the time of data collection. Women who were sick and those who did not consent were excluded from the study.

SAMPLE SIZE DETERMINATION

The sample size was calculated first using the following formula:

$$N=\frac{Z2P(1-P)}{d2}$$ (Charan & Biswas, 2013)

N is the minimum sample magnitude
Z, the standard normal variable, equals 1.96 (a constant) at the 95% confidence level (CI).
P is the sampling frame's proportion or estimate (the percentage of women in the 20 percentile of reproductive age (Thiele & Weiss, 2003).
Q = 1-P
d = tolerance/error i. e., precision = (0.05)

The sample size for the present study was then calculated from the following second formula:

$$N=\frac{(1.96^2)(0.2\times0.8)}{0.05^2}=246$$

A total number of 270 respondent participated in the study, which allowed a loss of 24 cases.

SAMPLING TECHNIQUE

A multi stage sampling technique was adopted in this study. 5 wards were randomly selected out of 15 wards in Sagamu Local Government. In each ward, 3 communities were randomly selected. A systematic random sampling technique was then used to select 18 households from each of the communities. Women of reproductive age were selected randomly from these households.

METHOD OF DATA COLLECTION

Information on socioeconomic and socio-demographic characteristics, such as household identification, composition, age, size, highest level of education attained by the respondents, primary occupation, and estimated monthly income of the respondent, was gathered through a semi-structured questionnaire administered by an interviewer.

A multi-pass 24-hour dietary recall questionnaire was utilized to collect thorough data on the food and beverages consumed over the previous 24 hours, and the proprietary Total Diet Assessment (TDA) software was utilized to examine nutrients and compared with the recommended dietary intake and the percentage of the 2006 US Recommended Dietary Allowance (RDA) met was calculated. The Diet Quality International Tool (DQI-I) was used to assess the respondents' diets based on their intakes and scores. It rates the diet's quality on a range of 0-100, focusing on four major aspects: diet variety/diversity (0-20 points), adequacy (0-40 points), moderation (0-30 points), and overall balance (0-10 points) (Kim et al., 2003). We made a slight modification in Kim et al.'s method, using 9 food groups instead of 5, which resulted in our placing a greater focus on different sources of protein.

DIET VARIETY/DIVERSITY

Two methods were used to evaluate dietary diversity: first, to examine if the intake comes from a variety of sources both within and between food groups, and second, to ascertain the variation within protein sources. Eating at least one meal a day from each of the food groups yields the highest overall diversity score as shown in (Kim et al., 2003).

DIET ADEQUACY

Diet Adequacy was evaluated based on the 8 Components and was given according to the continuous scale's percentage attainment of the advised intake, which goes from 0 points for 0% to 5 points for 100%. When protein makes up more than 10% of the total energy consumed, the consumption of protein is deemed appropriate as shown in (Kim et al., 2003).

DIET MODERATION

Diet Moderation was evaluated based on the levels of intakes of nutrients which was categorized into three levels based on the severity of the impact on health. The lowest category comprises intakes below which there would be no discernible negative effects in a healthy individual. The highest tier's excess consumption may be linked to long-term health consequences. Intakes in between the lowest and highest levels are covered by the middle tier in (Kim et al., 2003).

OVERALL BALANCE

In terms of proportionality in energy sources and fatty acid composition, overall balance was assessed as shown in (Kim et al., 2003).

WEIGHT AND HEIGHT MEASUREMENT

A portable bathroom scale (HANSON model), which was calibrated to the nearest 0.1 kg, was used in the weighing of the respondent wearing light clothes while standing straight on it with their arms by their sides and their heads straight while respondents' height was measured using a stadiometer while standing upright, barefoot, with their backs to the height meter and their eyes straight ahead in the Frankfurt posture in line with WHO guidelines (Blake et al., 2019, Willet, 2013). Body mass index (BMI) was calculated using the weight and height in kg/m2 (WHO, 2015).

WAIST & HIP CIRCUMFERENCES

A non-stretch tape measure (Butterfly, China) was used to measure waist circumference in accordance with WHO guidelines. The tape measure was placed at the midpoint between the lower rib margin and iliac crest. To the nearest 0.1 cm, measurements were obtained and recorded (WHO, 2015) while hip circumference was measured by wrapping a horizontally oriented tape around the hip at its widest point, with the measurement being taken to the nearest 0.1cm.

ANTHROPOMETRIC INDICES MEASURED

The waist circumference (WC) and waist-hip ratio (WHR, dividing the waist circumference by the hip circumference) were used to estimate the prevalence of obesity. WC was regarded as low <80cm, high 80-88cm, and very high >88cm (WHO, 2015). WHR was regarded as low (<0.80cm), moderate (0.81-0.85cm) and high (0.86cm) for females. BMI was categorized into underweight (<18.5), normal (>18.5-24.99), overweight (>25-29.99), and obesity (>30 kg/m2) (WHO 2015).

STATISTICAL ANALYSIS

Statistical analysis was performed using the statistical package for social science (SPSS version 23). Descriptive statistics such as frequencies, percentages, mean and standard deviation were used to analyze socio-demographic characteristics and socioeconomic parameters, nutritional and health status of the respondent. The multi pass 24-hour dietary recall was examined and compared with the recommended dietary allowance using TDA software. The relationship between diet quality and other variables was examined using Pearson's and Spearman's correlation analyses.

RESULTS

SOCIO-DEMOGRAPHIC CHARACTERISTICS OF THE SAMPLE

Table 1 provides data on the socio-demographic characteristic of this sample of women of reproductive age.

ANTHROPOMETRY

Figure 1 shows the BMI of the respondents. 4.8% were underweight, 51.1% were normal, 29.6% were overweight, and 14.4% were obese. Figure 2 shows that 57.4% had high and 42.6% had low circumference and none were moderate. 33.3% had low waist to hip ratio, 20% had moderate waist to hip ratio values and 46.70% had high waist to hip ratio values.

Table 1. Socio-demographic characteristics of the respondents

Variables	Frequency (n=270)	Percentage
Age		
15-19	29	10.8
20-29	60	22.2
30-39	75	27.8
40-49	106	39.3
Tribe		
Yoruba	258	95.6
Igbo	8	3
Hausa	1	0.4
Others	3	1.1
Religion		
Christianity	183	68
Islam	85	31.6
Traditional	2	0.4
Marital status		
Single	88	32.6
Married	164	60.7
Divorced	5	1.9
Widowed	13	4.8
Estimated monthly income*		
Less than ₦10000	38	14.1
₦10001-₦50000	141	52.4
₦50001-₦100000	67	24.9
₦100001and above	24	8.6
Employment status		
Employed	86	31.9
Unemployed	52	19.3
Self employed	132	48.9
Occupation		
Trading	78	29.7
Artisan	52	19.8
Civil servant	31	11.8
Corporate worker	42	16.0
Student	39	14.8
Others	21	8
Educational level completed		
No formal education	6	2.2
Primary education	23	8.6
Secondary education	136	50.6
Tertiary education	104	38.7
Total	**270**	**100**

- 1USD = 869 NGN

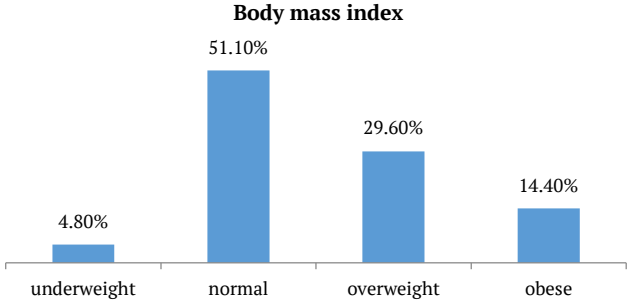

Figure 1. Body mass index of the respondents

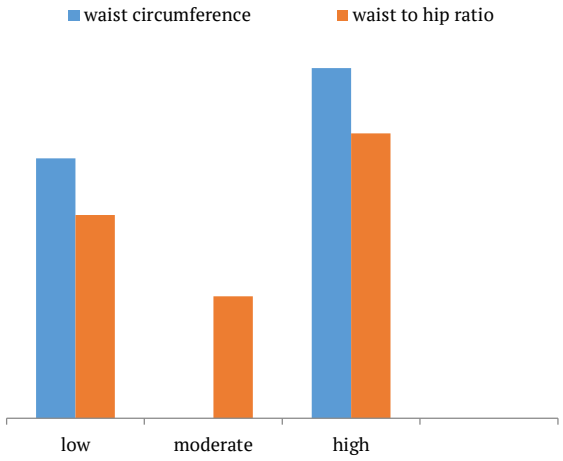

Figure 2. Waist circumference and waist to hip ratio of the respondents

NUTRIENT INTAKE AND PERCENTAGE RDA MET BY THE RESPONDENTS

The data in Table 2 illustrate the average nutrient intake of respondents compared to their RDA along with the percentage of RDA met.

Table 2. Nutrient intake and percentage RDA met by the respondents

Variable	Mean	Recommended Dietary allowance	%RDA met
Calories (Kcal)	1734	2000	87.0
Protein(g)	86	46	187
Carbohydrate(g)	212	130	163
Fiber(g)	17.9	25-26	68.9
Fat(g)	57.3	ND	-
Saturated fat	13.6	ND	As low as possible while consuming a nutritionally adequate diet.
Monounsaturated fat	17.0	ND	
Polyunsaturated fat	9.34	ND	
Cholesterol	213	ND	
Vitamin A(RE)	9318.	700	1330
Vitamin C(mg)	14.3	75	19.1
Vitamin B1(mg)	1.15	1.1	104
Vitamin B2(mg)	0.97	1.1	88.2
Vitamin B3(mg)	16.5	1.4	1180
Vitamin B6(mg)	1.13	1.5	75.3
Folate(mcg)	143	400	35.8
Vitamin B12(mcg)	3.85	2.4	160
Calcium(mg)	317	1200	26.4
Phosphorus(mg)	83	700	30.4
Sodium(mg)	976	1500	65.1
Potassium(mg)	1200	1200	100
Zinc(mg)	12.5	8	157
Iron(mg)	18.1	8-15	120
Magnesium(mg)	222	360	61.7

ND-Not determinable **RDA-US Recommended dietary allowance from 2006 (Institute of Medicine 2006)

DIET QUALITY INDEX COMPONENTS AND MEAN SCORE

Table 3 shows the diet quality of respondents using the DQI-I tool. The average score for diet quality was 62.9 out of 100. The breakdown shows that diet variety scored 12.5 out of 20, with detailed scores for overall food groups and within-group variety for protein sources. Diet adequacy scored 17.6 out of 40, with variations across different food groups such as grains, vegetables, fruits, fiber, protein, iron, calcium, and Vitamin C. Diet moderation scored 25.6 out of 30, indicating levels of moderation in total fat, saturated fat, cholesterol, sodium, and empty calories. Overall balance scored 7.1 out of 10, with scores for macronutrient ratio and fatty acid ratio. These findings highlight areas for improvement in diet quality, particularly in variety, adequacy, and balance of nutrients.

Table 3. Diet quality index component and percentage diet quality met

COMPONENT	MEAN	SCORE POINT	PERCENTAGE MET
DIET VARIETY			
Overall food groups (meat/poultry/fish/eggs/dairy/beans/grain/fruit/vegetable)	9.27±3.36	15	
Within group variety for protein sources (Meat, poultry, fish, diary, beans and egg)	3.23±1.69	5	
TOTAL DIET VARIETY	**12.5**	**20**	**19.9**
DIET ADEQUACY			
Vegetable group	2.19±2.11	5	
Fruit group	0.36±1.10	5	
Grain group	4.48±1.38	5	
Fiber group	1.48±1.83	5	
protein group	3.60±1.73	5	
Iron group	2.73±2.00	5	
Calcium group	2.24±2.04	5	
Vitamin C group	0.56±1.53	5	
TOTAL DIET ADEQUACY	**17.6**	**40**	**28.1**
DIET MODERATION			
Total fat	5.55±1.54	6	
Saturated fat	5.11±1.64	6	
Cholesterol	4.38±2.67	6	
Sodium	4.76±2.44	6	
Empty calories	5.76±0.52	6	
TOTAL DIET MODERATION	**25.6**	**30**	**40.8**
OVERALL BALANCE			
Macronutrient ratio (carbohydrate:protein:fat)	3.71±1.86	6	
Fatty acid ratio (PUFA:MUFA:SFA)	3.39±1.15	4	
TOTAL OVERALL BALANCE	**7.1**	**10**	**11.3**
TOTAL DIET QUALITY INDEX	**62.9**	**100**	**100**

PROPORTION OF DIETARY INTAKE OF RESPONDENTS BY THE DIET QUALITY COMPONENTS

61.8% of the participants had at least one serving of each of the dietary groups we used. In addition, 64.6% consumed at least 3 protein sources per day (meat, poultry, fish, diary, beans, egg).

Figure 3 shows the diet adequacy results that 89.6% of the respondents consumed 6-11 servings of grain daily. 72% of the respondents ate the recommended amount of protein (⩾10% of the total calorie intake) and 54% consumed the recommended amount of iron group. Most of the respondents did not consume the recommended amount of fiber per day (20-30g), nor 3-5 vegetable servings, nor 2-4 fruit servings per day. Less than 50% consumed the recommended amount of calcium and vitamin C, as shown in Figure 4.

Most of the respondents ate less than the recommended maximum amounts of fat, saturated fat, cholesterol, sodium and empty calories (as suggested by Kim et al., 2003). 61.8% consumed a healthy proportion of macronutrient-rich foods and 56.8% consumed a healthy proportion of fatty acid rich foods.

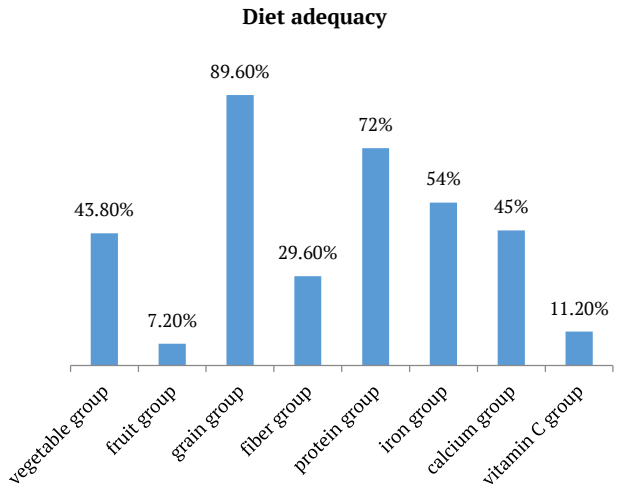

Figure 3. Proportion of dietary intake of respondents by the diet quality components (diet adequacy)

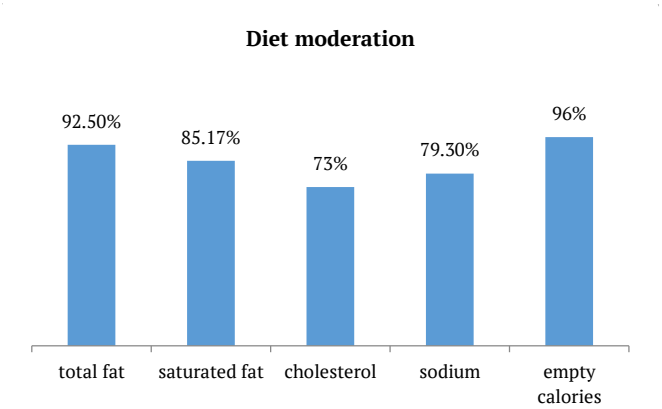

Figure 4. Average proportion of the maximum recommended dietary intake of respondents by the diet quality component called diet moderation

RELATIONSHIP BETWEEN NUTRIENT INTAKE, DIET QUALITY COMPONENTS, ANTHROPOMETRIC CHARACTERISTICS AND SOCIO-ECONOMIC CHARACTERISTICS

There was no relationship between nutrient intake and anthropometric characteristics such as body mass index, waist circumference, waist to hip ratio as shown in Table 4. Table 4 also shows that there is no relationship between diet quality components and anthropometric characteristics such as body mass index, waist circumference, waist to hip ratio. Table 5 shows that there is no significant relationship between diet quality components and socio-economic characteristics such as monthly income of respondents, family size and number of children in the households.

Table 4. Correlations between diet quality components with body mass index, waist circumference, and waist to hip ratio

	Body MASS INDEX		WAIST CIRCUMFERENCE		WAIST TO HIP RATIO	
	r-value	p-value	r-value	p-value	r-value	p-value
Energy intake	**-0.005**	**0.934**	**0.018**	**0.773**	**0.048**	**0.430**
Protein intake	**0.030**	**0.629**	**-0.004**	**0.948**	**0.041**	**0.504**
Carbohydrate intake	**-0.092**	**0.130**	**-0.036**	**0.554**	**0.042**	**0.494**
Fat intake	**-0.007**	**0.909**	**0.006**	**0.924**	**0.023**	**0.712**
Diet variety	**-0.061**	**0.319**	**-0.005**	**0.941**	**0.058**	**0.342**
Diet adequacy	**-0.140**	**0.140**	**-0.047**	**0.440**	**0.068**	**0.265**
Diet moderation	**0.012**	**0.846**	**0.081**	**0.184**	**0.110**	**0.265**
Overall balance	**0.018**	**0.774**	**-0.001**	**0.981**	**0.091**	**0.134**
Diet quality	**-0.064**	**0.293**	**-0.001**	**0.981**	**-0.003**	**0.967**

Table 5. Correlations between diet quality components and socio-economic characteristics

	Monthly income		Family size		Number of children	
	r-value	**p-value**	**r-value**	**p-value**	**r-value**	**p-value**
Diet variety	0.064	0.294	-0.440	0.475	-0.085	0.248
Diet adequacy	-0.013	0.834	0.040	0.509	-0.055	0.456
Diet moderation	0.097	0.112	0.001	0.981	0.062	0.399
Overall balance	0.033	0.591	0.010	0.864	0.028	0.702
Diet quality	**0.087**	**0.154**	-0.039	0.522	-0.064	0.293

DISCUSSION

A semi-structured questionnaire administered by a researcher was used in this study to collect data on the respondents' socioeconomic and socio-demographic traits. BMI, WHR, and waist circumference were measured. The Diet Quality Index International (DQI-I) questionnaire, which has a range from 0 to 100, was used to assess the quality of the diet. Four main areas were evaluated: moderation (0–30 points), diversity (0–20 points), adequacy (0–40 points), and a balanced diet (0–10 points). Dietary quality serves as an indicator of the extent to which individuals incorporate various food groups into their eating patterns. When women of reproductive age eat a diet rich in a variety of food groups, they are more likely to meet their nutritional needs.

Among the respondents, overweight and obesity were highly prevalent. These might be due their sedentary lifestyle or due to the excess intake of fat or carbohydrate. Most of our respondents are involved in business and trading which may be linked to their sedentary lifestyle.

Those suffering from poor diet quality among these women in the Sagamu may often have a low socio-economic status and limited educational attainment. Most of the respondents were identified as being in low socio-economic earning between (12USD-58USD) monthly and low educational statuses as most of the respondents had secondary school education completed as shown in Table 1. However, our measurements of diet quality did not have statistically significant correlations with these or other socioeconomic variables.

In Table 2, excess intake was reported for carbohydrate and protein. Findings showed over half (61.8%) of the respondents consumed at least one serving per day from each of the 9 food groups we used. In addition, many of the respondents consumed at least three protein sources per day (meat/poultry/fish/diary/beans and egg) (Figure 3).

In addition, consumption of potassium, calcium, folate, Vitamin C and fiber may have been inadequate, perhaps reflecting an inadequate intake of fruits and vegetables. This finding aligns with Onyeji & Sanusi's (2018) findings from WRA in Southeast Nigeria, which stated, like often is the case in some developing nations, their sample appeared to be consuming more energy, processed foods, refined grains, and foods that are high in saturated fat, sugar, and salt -- which may also reflect a transition to a Western diet (Popkin 1998).

The highest attained DQI-I score was for overall balance (71%) with a score of 7.1 out of highest possible score of 10, with moderation (64%) coming in second with a score of 25.6 out of highest possible score of 40, and variety (62.5%) follows with a score of 12.5 out of highest possible score of 20. According to the DQI-I standard (Table 3), the weakest aspect of the diet quality was Diet Adequacy (58.6%) with a score of 17.6 out of the highest possible score of 30.

There was no significant relationship between dietary intake and diet quality scores among our sample ($p>0.05$) and also there was no significant relationship among socio-economic and socio-demographic characteristics with diet quality scores.

Poor quality diets are indicated by overall DQI-I scores of less than 60%, based on the standards utilized by Kim et al. (2003). Our respondents obtained a total DQI-I of 62.9%. This can be compared with the mean scores of 60.5% and 59.1% reported for the USA and China (Kim et al., 2003), 67% for (Kim et al., 2003), 61% for (Veugelers et al., 2005) and 57.8% and 64.4% reported for Tunisian migrants versus non-migrant Tunisians and French, respectively (Mejean et al.,

2007). However, the total DQI-I of 62.9% was higher than 42.9% reported for the Mediterranean (Tur et al., 2005) and 58% from a Canadian study (Setayeshgar et al., 2017). However, such comparisons are uncertain because we used a somewhat different food group definition.

According to Kim et al. (2003), total adequacy assesses the consumption of food components that must be provided in sufficient amounts to prevent under nutrition and deficiency diseases. As shown in Table 4, in our case, total adequacy made up 17.6% out of the total of 40%. This was lower than the adequacy reported by Kim et al., 2003, for USA (28.1%) and for China (28.0%). We recorded intakes of 50% or more of the recommended intake for grains, protein, and iron. However, intake scores were lower than 50% of the recommendation for fruit, vegetables, fiber, calcium and Vitamin C. Given that fruits and vegetables provide the majority of the micronutrients that are essential to good health (Thiele & Weiss, 2003; Ball et al., 2006), the low consumption of fruits and vegetables found in this study may have a detrimental effect on the respondents' health (George & Pamplona, 2004).

The total for the "moderation" component found in this study was 25.6, out of a total possible of 30% (Table 3). Moderation assesses habitual nutrient and food intake linked to chronic illnesses and necessitates restriction. The body needs specific amounts of cholesterol, salt, saturated fat, and total fat to function properly; nevertheless, excessive intake of these nutrients might hasten the onset of chronic illnesses (Weisburger, 2000). Figure 4 shows that 92.5% consumed less than the maximum recommended level of total fat. Intake of saturated fat was also normal. 85.2% of the participants consumed less than the recommended maximum level of saturated fat. Intakes below the recommended maximums for cholesterol and sodium were met by 73% and 79.3% respectively. Cholesterol intake largely fell within the recommended levels, with 73% of individuals consuming less than 400mg per day. Sodium intakes were largely within normal levels, with 73% of the participants consuming less than the recommended maximum amount of sodium. Excessive sodium in one's diet can result in high blood pressure for certain individuals and can pose a significant risk for those with congestive heart failure, cirrhosis, or kidney failure (Aronow et al., 2011). 61.8% of the respondents consumed a healthier proportion of macronutrients according to the instrument we used.

The majority of our sample seemed unconcerned about maintaining a balanced diet and instead focused on warding off hunger by eating whatever food was available even though most of them cooked their main meals themselves. Present nutritional issues in Nigeria involve excessive consumption of high-calorie foods and insufficient intake of whole grains, fruits, and vegetables (Onyeji & Sanusi, 2018). Recently, there has been a rise in non-communicable diseases among Nigerians, leading to health conditions such as obesity, diabetes, and hypertension (Maiyaki & Garbati, 2014).

Caution should be used in generalizing the results of this study, first because it was restricted to a single Ogun State Local Government area. Secondly, comparing its results to other studies that used the DQI-I approach may not be warranted, because instead of using five food groups, we used nine, focused more on protein groups.

CONCLUSION

We found that among our sample of women of reproductive age, the main staple foods consumed were cereals, roots and tubers and legumes and there was a distinct pattern of low consumption of fruits and vegetables. There was a high prevalence of overweight and obesity.

Designing and executing successful interventions to improve diet quality in Sagamu and other urban regions of Ogun State requires a focus on identifying factors that influence food and dietary choices in urban settings. This study shows that understanding the relationships between the components of a healthy diet is crucial for developing targeted interventions and dietary recommendations that not only focus on increasing overall nutrient intake but also emphasize the significance of attaining a varied and well-balanced diet low in harmful ingredients in order to guarantee the best possible nutrition and health results. This realization will aid in the creation of focused programs that cater to the unique needs and preferences of the populace while encouraging better eating practices.

AUTHOR CONTRIBUTIONS

Conception of study: BAO and CAO. Study design: All authors Provision of study materials: All authors. Data Collection: BAO. Data entry, Analysis and Interpretation: All authors. Drafting of Manuscript: All authors. Manuscript Review: All authors

CONFLICT OF INTEREST

The authors declare that they have no other potential conflicts of interest.

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