CHAPTER 30

FOOD HABITS, FOOD CONSUMPTION PATTERN AND ANTHROPOMETRIC MEASUREMENTS OF THE PHYSICALLY CHALLENGED INDIVIDUALS IN OWERRI METROPOLIS

BY

ONYENEKE ESTHER-BEN N*., DAVIDSON AMARACHI MICHELLE [1] AND ANYANWU, MARYCYNTHIA IJEOMA[2]

Department Of Nutrition and Dietetics, Faculty Of Health Science Imo State University, Owerri, Imo State Nigeria*,[1]

Department Of Food Technology, Federal Polytechnic Nekede, Imo State, Nigeria[2]

***Corresponding Author: Onyeneke Esther-Ben Ninikanwa,**

Department of Nutrition and Dietetics, Imo State University Owerri, Nigeria.

E-mail: estyninika@gmail.com/estyninika@imsu.edu.ng

Abstract

This study investigated the Food habits,dietary pattern and anthropometric indices of physically challenged individuals in Owerri metropolis. A cross section design was adopted for the study. A population of 391 disabled subjects (300 with exclusively physical inactivity and 91 with intellectual disability) mean age 28.5+/-5 years were enrolled from Alvan Ikoku University of Education Owerri , and *Special School for the Deaf Dan Anyiam Stadium Owerri and Special School for the deaf Orji Flyover all located in Owerri Municipal respectively. Using Yamane Taro formula, a sample size of 198 subjects (48pupils & teachers) and (150 individuals) were obtained. Data were collected using structured questionnaire eliciting data for Food consumption pattern, frequency of food consumption, 24-dietary recall and anthropometric indices. The data were analyzed using SPSS and presented in tables and frequencies. The results revealed that 34.8% were overweight while 29.8% were obesed. The mean height, weight, waist circumference and hip circumference for all were 1.74±0.90, 51.76±15.15, 30.24±5.74 and 34.46±5.6.6, and 0.9±0.4 respectively. It was observed that physically challenged individuals in the study have good average z-score which is indicative of a healthy population, (62.1%) subjects eat up to thrice daily, 64.1% of the subjects skipped meals especially breakfast and lunch due to lack of time and finance .Majority (99.5%) of the subjects engaged in snacking. A greater proportion of the respondents (60.1% for Alvan Ikoku) and (123.2% Special School for the deaf) were involved in smoking and*

alcoholic consumption respectively which exposed them to weaknesses in their cognitive abilities. Study has shown normal nutritional status of most of the physically challenged individuals, with high prevalence of overweight and obesity among them when compared to previous studies. There is need to enhance nutrition education among physically challenged individuals; the government should provide nutrition extension workers to enlighten them on the importance of good dietary practices and its effect on their health and nutritional status.

Key words; **Food choice, dietary pattern, Nutritional status, physically Challenged**

1.0 INTRODUCTION

1.1 Background of study

The rate of physical and mental impairment in individual is in its spiked rate today in developing and developed countries which Nigeria is not excluded. Disability is any limitation, as a result of an impairment of the ability to perform in a way or within the range considered normal for a person. The disability is characterized by excesses or shortfalls in performing a normal day-to-day activity; these might be temporary or permanent, reversible, or occurring directly from the deficiency as a response of the individual concerned, especially in terms of psychological, physical, sensorial, or any other type of deficiency (Bhaumik *et al*., 2008).The impairment in nutritional status, consequent to quantitative and qualitative inadequacy of diet, could be one of the first steps in the development of co-morbidities in disabled subjects. Nigeria is now known to be amongst the top low income developing countries that have the highest population of mentally and physically challenged individual

According to the World Health Organization, in (2018), about 29 million of the 195 million people who comprise Nigeria's national population were living with a disability. Data from the 2018 Nigeria Demographic and Health Survey reveal that an estimated 7 percent of household members above the age of five (as well as 9 percent of those 60 or older) have some level of difficulty in at least one functional domain, seeing, hearing, communication, cognition, walking, or self-care; and 1 percent either have a lot of difficulty or cannot function at all in at least one domain. These estimated rates, while significant, are probably even higher because currently available data likely underestimate the prevalence (World Bank, 2020).

Intellectual disability was previously known as – “mental retardation,” and distinguished by notable limitations in cognitive performance and learning, disclosing itself as dysfunction in practical, civic, and conceptual skills. This disability commences before the age of 18 years; its etiology involves a group of genetic, acquired (congenital and developmental), environmental, and sociocultural factors (Bove and Sobal, 2017).Thus, their ability to communicate themselves linguistically or their reading and writing abilities are not well developed, apart from that, their sense of responsibility and confidence. In routine activities such as grooming, personal care, and food preparation, the level of autonomy based on the severity of the disability (Bruce, 2020).

A diet containing too many ingredients that are detrimental in excess or lacking essential nutrients is likely to have adverse consequences for mental outcomes (Associate Parliamentary & Health, 2008) whereas a balanced diet is important for physical wellbeing and mental health, with implications for performance. Thus, people should have a varied diet with good nutritional content and regular intake to ensure the best possible cognitive development and performance (Bellisle, 2014). Homes influence all aspects of a persons' life to some degree including the development of food choices as well as controlling the availability and types of food in the home (Brown and Ogden, 2014; Golan and Crow, 2014). Moreover, the family provides a key environment for young adults to learn and develop eating habits and food preferences. Food consumption is a vital aspect of daily life of an individual. Although its primary function is to fulfill biological needs, food plays an important role in many activities in the general well being of individuals that are unrelated to nutrition (Rozin, 2016).

The family is seen as one of the major contexts of a child's development which includes cognitive development and achievement (Scott-Jones, 2014).Conditions where such adults cannot decide on their own food intake, it is essential for the offered food to be wholesome to meet their energy and nutrient requirements. However, the minimum nutritional needs are not met due to monotonous or inadequate food intake in terms of both, quantity or quality. This study will therefore investigate the role diets play in the nutritional status of mentally and physically challenged individuals in Owerri metropolis. This will be done by checking the food consumption pattern, and the anthropometric measurement of the individual. , food choices differ among disabled individuals due to certain reasons best known to them (Obiakor, 2016)

Although, studies has shown that malnourished children can become adults with lower physical and intellectual abilities, lower levels of productivity and higher levels of chronic illness and disabilities. (UNICEF, 2018) but none have centered on individuals physically and mentally challenged in Owerri metropolis. In spite of the fact that an optimal diet is crucial, daily moderate-intensity of exercise is also well-established as an important determinant for good health, helping to lower blood pressure, reduce body fat, and improve glucose metabolism. There is strong scientific evidence that a change in dietary habits can reduce the effect of several of the risk factors for chronic diseases (Puska *et al,* 2016).This study therefore attempts to investigate the food consumption pattern and anthropometric indices of the physically challenged individuals, in Owerri metropolis Imo state.To ascertain if nutrition has connection to their mental and physical abnormalities.

2.0 Materials and methods

2.1Study Area

The study was carried out in Owerri metropolis covering a specific institution for disabled individuals including Alvan Ikoku Federal University of education, Owerri, and Dan Anyiam Stadium Owerri and Special School for the deaf both located at Orji Flyover all in Owerri Municipal.

2.2 Population of the Study

Alvan Ikoku Federal University of education currently has about 100 number of individuals with physical disability, while the Dan Anyiam Stadium was the meeting venue for about 200 deaf subjects. The special school for the deaf, located at Orji flyover, has about 91 pupils and teachers, that are physically challenged, with small percentage of the pupil's intellectually disabled.

2.3 Study Design

A cross sectional design was employed to determine the food consumption of the individuals which makes up 100% of the total population.

2.4 Sample Size Determination

This was done to determine the number of pupils and students to be used for the study.

The formula to be used is:

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

The estimated total number of individuals is 391.

Using the above formula for sample size determination

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

Where:

N = 391

1 = Constant

e = 0.05 confident interval

n = sample

Therefore;

$n = 391/1+ 391(0.05)^2$

$n = 391/1+391 (0.0025)$ *n = approximately 198.*

2.5 Sample Selection

Simple random technique was used to sample 48 pupils and teachers from the special school, and 150 individuals from Alvan Ikoku university of education .

3.6 Data Collection

A well validated and structured questionnaire was used in collecting data from the respondents. The questionnaire was designed to elicit information on personal data, frequency of food consumption, food consumption pattern and factors affecting food consumption. The questionnaire was given to the subjects to fill, and guidance was given to them too, on how to fill the questionnaire.

3.6.1 Anthropometric Measurements:

Anthropometric indices of the respondents was taken; these includes measurement of weight (kg) and height (m) ; Which was used to estimate body mass index (BMI) of the respondents according to the WHO Standard (2018).

3.7 Statistical Analysis

Information obtained from the questionnaire was coded into the computer using statistical package (SPSS). Descriptive statistics was used. Results from the questionnaire was then expressed in frequencies, percentages and pie chart.

3.0 Results

3.1 Section A: Personal Data of the subjects

Table 4.1 shows the personal data/characteristics of the subjects. A total of 198 respondents, were recruited of which 104 (52.5%) were females and 94

(47.5%) were males. The age distribution of the subjects showed that 39(19.7%) were aged 6-13 years, 20.2(20.2%)were aged 14-21 years, 119(60.1%) were aged 21-28 years. Approximately half (46.5%) of the respondents were single, 26.8% were married, 17.7% were divorced while none 9.1% were widowed. Half of the participants were from Imo State (58%), 20.2% from Abia State, 3.5% from Enugu, 13.6% from Anambra while (4.5%) were from Ebonyi state. 6.6% respondents were from Umueze, 16.7% were from Mbaitoli, 4.1% were from Awka South, 36.4% were from Owerri, 1.0% from Nnewi South, while 24.7% were from other LGAs in the state respectively. All (100%) of the subjects were Christians as none practiced traditional or Islam religion. All the participants were Igbo's (100%).

Table 4.1: PERSONAL DATA

Sex	N	%
Male	94	47.5
Female	104	52.5
Total	198	100.0
Marital status		
Single	92	46.5
Married	53	26.8
Divorced	35	17.7
Widowed	18	9.1
Total	198	100.0
State of origin		
Imo	115	58
Abia	40	20.2
Enugu	7	3.5
Anambra	17	13.6
Eboyi	9	4.5
Total	198	100.0
LGA		
Umueze	13	6.6
Mbaitalu	33	16.7
Akwa south	28	4.1
Others	49	24.7
Nnewi south	2	1.0
Owerri	72	36.4
Mbano	1	0.5
Total	198	100.0
Ethnic group		
Igbo	198	100.0
Religion		
Christianity	198	100.0
Total	198	100.0
Age (years)		
6-13	39	19.7
14-21	40	20.2
21-28	119	60.1
Total	198	100.0

3.2a BMI/Anthropometric Indices

Table 4.2a below shows body mass index of the respondents. 17.2% of the respondents were underweight, 18.2% were normal, 34.8 were overweight while 29.8% were obese.

Table 4.2a BODY MASS INDEX (BMI)		
Underweight	34	17.2
Normal	36	18.2
Overweight	69	34.8
Obese	59	29.8
Total	198	100.0

3.2.b Anthropometric Indices

Table 4.2b below shows the anthropometric z-score of the respondents. The mean height, weight, waist circumference and hip circumference for physical challenged individuals in Owerri Municipal were 1.74±0.90, 51.76±15.15, 30.24±5.74 and 34.46±5.6.6, and 0.9±0.4 respectively.

Table 4.2b ANTHROPOMETRIC			
S/N	**N**	**X/SD**	**Df**
Height	198	1.74±0.90	n-2
Weight	198	51.76±15.15	n-2
Waist cir.	198	30.24±5.74	n-2
Hip.cir	198	34.46±6.6	n-2
WHR	198	0.9±0.4	n-2

3.3; Demographic Characteristics

Table 4.3 shows the demographic characteristics of respondents in Owerri metropolis. Occupational distribution of the respondents showed that Traders 119(60.1%) were mostly their major occupation followed by farming 35(17.7%). Spouses in the area were more of business women 86(43.4%) followed by civil servants 70 (35.4%). Family size population ranged from three 79(39.9%) to others 26.8%. Results also revealed that fathers 77.3% were the head of most families/homes with a few having mothers 12.1% as heads in their respective homes. Occupational distribution of the fathers ranged from traders 26.3% to civil servants 11.6% while others were pensioners 19.7%. Occupational distribution of mothers ranged from traders 39.4% to civil servants 6.1% while others were pensioners 11.6%. Income distribution of the subjects showed that 9.6% earned less than N10000 monthly, 10.1% earned between N10000-N20000 monthly, 39.4% earned

between N20000-N30000 per month, 29.8% earned between N30,000-N40000 while 11.1% earned greater than N40000 per month. 10.6% of the respondents had access to Pit toilets while majority 89.6% had access to water system. Most of the respondents sourced their light from EEDC 65.2%, while 10.6%, 0.5% & 23.7% sourced their light from generator plants, solar and kerosene respectively. Almost half of the respondents 50.0% used gas as their main fuel for cooking, while 19.2%, 20.7%, 10.1% used firewood, kerosene and charcoal as their fuels for cooking respectively. Most participants too lived in block houses 65.7% while 13.6%, 10.1% lived in mud and thatch houses respectively. Majority 43.9% had public water supply as their source of drinking water while 20.7% & 35.4% had stream water and borehole as their respective sources of drinking water.

Table 4.3: Demographic Characteristics

Occupation		
Driver	1	0.5
Conductor	1	0.5
Farmer	35	17.7
Trader	119	60.1
Teacher	1	0.5
Others	41	20.7
Total	198	100.0
Spouse occupation		
Civil servant	70	35.4
Business woman	86	43.4
Trader	34	17.2
others	8	4.0
Total	198	100.0
Family size		
One	47	23.7
Two	19	9.6
Three	79	39.9
Others	53	26.8
Total	198	100.0

Head of house		
Father	153	77.3
Mother	24	12.1
Other	21	10.6
Total	198	100.0
Father occupation		
Trader	52	26.3
Civil servant	23	11.6
Pensioner	39	19.7
Others	84	42.4
Total	198	100.0
Mother occupation		
Trader	78	39.4
Civil servant	12	6.1
Pensioner	23	11.6
Others	86	42.9
Total	198	100.0
Monthly income of the head of the house (#)		
Below10,000	19	9.6
10,000-20,000	20	10.1
20,000-30,000	78	39.4
30,000-40,000	59	29.8
40,000>	22	11.1
Total	198	100.0
Amount of money spent per week(#)		
>5,000	87	43.9
10,000	13	6.6
20,000	59	29.8
>20,000	39	19.7
Total	198	100.0
Type of toilet use		
Pit	21	10.6
Water system	177	89.4
Total	198	100.0

Source of light		
EEDC	129	65.2
Generator	21	10.6
Solar	1	0.5
kerosin	47	23.7
Total	198	100.0
What do you do for a living		
Trader	66	33.3
Farmer	57	28.8
Civil servant	19	9.6
none	56	28.3
Total	198	100.0
By what time do you go to bed		
8-9pm	138	69.7
9.01-10.00pm	60	30.3
What time do you leave for work		
5.00-6.00am	72	36.4
6.01-7.00am	87	43.9
7.01-8.00am	39	19.7
Total	198	100.0
What is your source of drinking water		
Municipal water supply	87	43.9
Stream water	41	20.7
Bore hole	70	35.4

3.4 Food Consumption Pattern

Table 4.4 below shows data on the food consumption pattern of the subjects. 31.3% of the respondents ate twice a day, 62.1% ate thrice a day while 6.6% ate four times and more than three times daily respectively. 70.7% of the respondents prepared their meals themselves, 10.1% purchased while 19.2% did the both in the morning 61.1%, afternoon 9.6% and other times during the day respectively. Food purchases were mostly done twice a week (50.5%), while 39.9% and 9.6% purchased theirs frequently and occasionally respectively. Foods were sourced from eatery (59.6%), canteen (30.8%) and local buka (9.6%). Almost all respondents (99.5%) took snacks. 80.8% of the

respondents ate fruits/veggies frequently (60.6%), 29.3% ate occasionally, 9.6% ate twice a week while 0.5% rarely ate. More than half of the subjects (60.1%) took alcohol having different brands like guilder (35.9%), Star 23.7%, Henekein 20.2% and others 20.2% daily 47.5%, weekly 42.9% and rarely 9.6% respectively.

More than half of the subjects (123.2%) smoked different brands like Benson (46%), Rothmas 40.4% and Palmall frequently 31.3%, occasionally 19.2% and rarely 49.5% respectively. Availability of foods in the locality included beans 0.5%, fruits 9.6%, 73.7% and vegetables 16.2% eaten once per day 30.8%, twice per day 16.7%, thrice per day 42.4% and four times per day 10.1% respectively. More than half of subjects skipped breakfast (64.1%), (16.2% & 19.7%) skipped mid-breakfast and lunch respectively. 50.5% of the subjects skip meals because of lack of time, 7.1% skip meals because of lack of money, 32.8% skip meals because of time of preparation while 9.6% skipped meals because of other factors not mentioned. Fathers and mothers had the lion shares in food sharing in the homes followed by the child with percentage frequencies of 50.5%, 33.3% and 9.6% respectively. 47.5% of subjects consumed snacks daily, 33.3% consumed 4-6times a week, 9.6% consumed snacks 1-3times weekly while 9.6% never had snacks. 66.2% of the respondents took carbonates drinks (Coke, Fanta, malt, sprite) while 33.8% had none.

Table 4.4: Food Consumption

Times do you eat per day		
Twice	62	31.3
Thrice	123	62.1
Four times	13	6.6
Total	198	100.0
Your usual source of food		
Prepared	140	70.7
Purchased	20	10.1
both	38	19.2
Total	198	100.0
Often do you purchase food		
Morning	121	61.1
Afternoon	19	9.6
Both	58	29.3
Total	198	100.0

If yes how often		
Frequently	79	39.9
Twice in a week	100	50.5
Occasionally	19	9.6
Total	198	100.0
Food source		
Eatery	118	59.6
Canteen	61	30.8
Local buker	19	9.6
Total	198	100.0
Do you take snacks		
Yes	197	99.5
No	1	0.5
Total	198	100.0
Do you eat fruits/veg.		
Yes	160	80.8
No	38	19.2
Total	198	100.0
How often		
Frequently	120	60.6
Twice a week	19	9.6
Occasionally	58	29.3
Rarely	18	0.5
Total	198	100.0
Do you take alcohol		
Yes	119	60.1
No	79	39.9
Total	198	100.0
What brand		
Gulder	71	35.9
Star	47	23.7
Henekien	40	20.2
Other	40	20.2
Total	198	100.0
Please how often		
Daily	94	47.5
Weekly	85	42.9
Rarely	19	9.6
Total	198	100.0
Do you smoke		
Yes	46	123.2
No	152	76.8
Total	198	100.0
If yes your brand		
Benson	91	46.0
Rotmas	80	40.4
Pullmall	27	13.6
Total	198	100.0

Please how often		
Frequently	62	31.3
Occasionally	38	19.2
Others	98	49.5
Total	198	100.0
Food available in your locality		
Beans	1	0.5
Fruit	19	9.6
Cassava	146	73.7
Vegetable	32	16.2
Total	198	100.0
How many are eaten per day		
Once	61	30.8
Twice	33	16.7
Thrice	84	42.4
Four times	20	10.1
Total	198	100.0
Meal skipped in family		
Breakfast	127	64.1
Mid breakfast	36	16.2
lunch	39	19.7
Total	198	100.0
Reason for skipping		
Busy	100	50.5
No money	14	7.1
Time of preparation	65	32.8
others	19	9.6
Total	198	100.0
Lion share in the family		
Father	100	50.5
Mother	66	33.3
First child	19	9.6
Others	13	6.6
Total	198	100.0
Source of food		
Garden farm	65	32.8
Market	95	48.0
Market and farm	38	19.2
Total	198	100.0

Times you consume snacks per week		
Daily	94	47.5
4-6time week	66	33.3
1-3time week	19	9.6
Never	19	9.6
Total	198	100.0
Do you take carbonated drink		
Yes	131	66.2
No	67	33.8
Total	198	100.0
If yes please specify		
Coke	104	52.5
Fanta	39	19.7
Malt	42	21.2
Sprite	13	6.6
Total	198	100.0

3.5 Food Frequency Consumption (FFQ)

Table 4.5 below shows frequency of food consumption of the respondents from roots and tubers, cereals, legumes and milk and milk products groups. 20.2% of the subjects consumed cereals weekly, 20.2% consumed 2-3permonth, 16.2% consumed 1-2per week, 23.2% consumed 2-4per week while 20.2% consumed cereals 5-6perweek. 20.2 consume root and tubers occasionally, 39.4% consumed 1-2perweek, 20.2% consumed 3-4perweek while 20.2% consumed 5-6perweek. 20.2% of respondents consume legumes occasionally, 20.2% consume legumes 3-4perweek, 36.4% consume 5-6perweek while 23.2% consume legumes daily. Half of the respondents 59.6% consume green leafy foods 2-3per month, 40,4% 1-2times weekly, while 23.2% consumed 5-6times weekly. 59.6% of the subjects consume fruits 2-3times per month, 20.2% consumed 1-2times weekly while 20.2% consumed fruits on daily basis. 20.2% of the subjects consume nuts occasionally, 63.6% consume nuts 3-4times per week, while 16.2% consumed nuts on a daily basis. Almost half of subjects consumed dairy products occasionally (40.4%), 36.4% consumed 2-3times per month while 23.2% consumed 3-4times per week. 20.2% had beverages occasionally, 16.2% had beverages 1-2times per week while 63.6% had beverages 3-4times per week. 20.2% of the respondents consume fish occasionally, 43.4% consume fish 2-3times per month while 36.4% consume fish 1-2times weekly. Almost half of the respondents (40.4%) consumed milk

products occasionally, 20.2% consumed 1-2times per week while 23.2% consumed milk products 5-6times per week. Majority also had fats/oil foods (39.4%) 3-4 times weekly, (40.4%) 5-6 times weekly while 20.2% had fats/oil foods on a daily basis.

Table 4.5 Food Frequency Consumption

Cereals		
Occasionally	40	20.2
2-3permonth	40	20.2
1-2per week	32	16.2
3-4per week	46	23.2
5-6per week	40	20.2
Total	198	100.0
Root and tuber		
Occasionally	40	20.2
1-2 per week	78	39.4
3-4per week	40	20.2
5-6 per week	40	20.2
Total	198	100.0
Legumes		
Occasionally	40	20.2
3-4per week	40	20.2
5-6per week	72	36.4
Daily	46	23.2
Total	198	100.0
Green leafy		
2-3per month	72	36.4
1-2per week	80	40.4
5-6 per week	46	23.2
Total	198	100.0
Fruits		
2-3per month	118	59.6
1-2per week	40	20.2
Daily	40	20.2
Total	198	100.0
Nuts seeds		
Occasionally	40	20.2
3-4per week	126	63.6
Daily	32	16.2
Total	198	100.0

Eggs , meat, poultry		
Occasionally	80	40.4
2-3per month	72	36.4
3-4 per week	46	23.2
Total	198	100.0
Beverages		
Occasionally	40	20.2
1-2per week	32	16.2
3-4per week	126	63.6
Total	198	100.0
Fish		
Occasionally	40	20.2
2-3per month	86	43.4
1-2per week	72	36.4
Total	198	100.0
Milk		
Occasionally	80	40.4
1-2per week	40	20.2
3-4per week	32	16.2
5-6per week	46	23.2
Total	198	100.0
Fats/oil		
3-4per week	78	39.4
5-6per week	80	40.4
Daily	40	20.2
Total	198	100.0
Water		
2-3per month	46	23.2
3-4per week	40	20.2
5-6per week	32	16.2
Daily	80	40.4
Total	198	100.0

4.0 Discussion of Findings

4.1 Food consumption pattern and anthropometric indices of physically challenged individuals in Owerri Municipal

This study investigated the, Imo state. Good nutrition is particularly important to young and mentally healthy population because of the physiological changes that occur in the body as one ages (Akarolo-Anthony, 2014). The information on the personal data of the subjects in this research showed that half (46.5%) of the total respondents were married, this could be attributed to the fact that all the participants were adults as such has reached the age for marriage. This findings supports the findings of (Caroll, 2012) on the average age of university student in Texas. Fifty nine percent of the respondents were single this could be due the fact that the respondents were young people and

as such still have time to get married later. This finding is in agreement with Norval *et al.,* (2020) asserted that the greater indicated likelihood of being in single in disabilities of the highest quality is among those who are at ages 22-25, net of estimated effects of time since first marriage and several variables that might commonly affect age at marriage and marital outcomes.

Almost all (100%) of the subjects were Christians, this could be due to Christianity is the presiding religion in the locality. All the respondents are Igbo's, this could be attributed to the fact that the study was carried out in a rural area in the South east where the natives are Igbo's. A greater percentage (69.2%) of the respondents earned less than or equal to N40,000 per month while a lower percentage (11.1%) earned more than N40,000 per month, this could be attributed to the kind of commodity they sale and the economic situation of the rural areas. Majority (60.1%) of the respondents were below 28 years of age while minority (19.7%) were between 6-13years of age, this could be attributed to the fact that young adults have a greater urge to engage in trade and as such dominate the working population of any locality.

4.2 Anthropometric Characteristics

From the result as indicated in table 4.2a, it was observed that about 17.2% of the respondents were underweight, 18.2% were normal, 34.8% were overweight while 29.8% were obese. Normal BMI is an indication of ideal weight and possibly active life style which are both not risk factor for cardiovascular disease. Knowledge about the health implications of high BMI could be a contributory factor for attention to efforts at weight control revealed in the study. Obesity is regarded as worldwide epidemic as a result of the high caloric intake coupled with less physical activity (Redon *et al*., 2018). The rate of overweight and obesity in developing countries is increasing due to the changing lifestyle such as consumption of diets high in sugar, fats and inactivity factors linked with risk factors associated with risking chronic disease globally (WHO, 2002). This disagrees with the high prevalence of overweight (43.1%) and obesity (33.3%) reported in a study by Pellegrini (2020) on changes in weight and nutritional habits among physically challenged teens in Abuja.

4.3 Z-score Anthropometric Measurements

The mean height, weight, waist circumference and hip circumference for were 1.74±0.90, 51.76±15.15, 30.24±5.74 and 34.46±5.6.6, and 0.9±0.4

respectively. It was observed that physically challenged individuals in Owerri Municipal LGA have good average z-score which is indicative of a healthy population.

4.4 Demographic Characteristics of Respondents

Socioeconomic or demographic characteristics in nutrition knowledge become important when it influences healthy choices and practices. However, knowledge does not necessarily translate to practice due to factors such as demography and food availability. Nutrition knowledge results (Table 4.2) showed that, traders in Owerri municipality and its metropolis have moderate to good level of nutrition knowledge. This could be attributed to the level of educational attainment by majority which was secondary school level. This study suggests that traders in Owerri have average level of nutrition knowledge as opposed to low level expected by virtue of being an urban area. Evidences have shown that good nutritional status and dietary behavior can be achieved through good demographic factors viz-a-viz nutritional knowledge.

4.5a Dietary/Food Consumption Pattern

Regular eating practices and healthy food choices ensure individuals meet their nutritional requirements for growth and health maintenance. As shown in Table 4.4 greater percentage (62.1%) subjects eat up to thrice daily. This could be attributed to the availability of food in the locality as families had women that trade foodstuffs. Most of them prepared their meals themselves but skipped them. This could be associated with the fact that most of the subjects skip meals especially breakfast (64.1%) and lunch. Factors such as lack of time and finance were stated to contribute to their meal skipping patterns. The lack of time could have limited subjects to prepare or eat meals regularly subjecting them to irregular meal patterns resulting to their preference for snacks and dinner over breakfast and lunch. Skipping of meals have been seen to affect blood sugar levels and insulin responses that puts subjects at higher risk of diabetes and cardiovascular diseases.

Majority (99.5%) of the subjects engaged in snacking, this could be attributed to the fact that the natures of their business do not give room for them to have time for good meals and snacks are easily available and affordable. Subjects' choice of snacks reflects those high in sugar, refined products and high in fats compared to healthy snacks. This shift shows transition in nutrition

associated with poor dietary practices linked to rising risks of overweight and obesity in developing countries (WHO, 2012). Most times these foods are accompanied with carbonated drinks. These foods have been demonstrated to be high in sugar, refined products and high in fats compared to healthy snacks such as nuts (walnuts, groundnuts, cashew nuts etc), banana, apple, almonds, hard boiled eggs etc. The subject's attraction to these foods could be due to their convenience, ease of availability and low cost in the market areas where they carry out their businesses. Webber and Sobal (2017) in their study, found that food access was a dynamic factors for a disabled individual to obtain adequate food for healthy, personal acceptable diet; and a level of consumer agency at household or individual's disposal (e.g. money, transport, health and physical capability, social networks, time) and contextual factors such as location, climate and availability of local grocery stores and other food outlets. Alcohol consumption can negatively interfere with health and nutrient metabolism. Although alcohol is rich in calories (7 kilocalories per gram), but empty in nutrients. Results from alcohol consumption and smoking revealed that a greater proportion of the respondents (60.1%) and (123.2%) were involved in smoking and alcoholic consumption respectively. This points to the fact why these individuals are posed to experience weaknesses in their cognitive abilities. This finding tallies in the context of high calorie diet which reduces hippocampal plasticity and impairs cognitive function through brain-derived neurotrophic factor-mediated effects on dendritic spines (Stranaham, *et al*, 2018).

4.5b Food Frequency Consumption (FFQ)

Table 4.5 results showed the frequency of food from roots and tubers, cereals, legumes and milk and milk products groups consumed by physically challenged individuals in Owerri metropolis. This is because foods from these food groups are what can easily be found in the locality and as such form their staples. The subjects consume most cereals, fruits and vegetables 2-4 times a week. This could be attributed to the level of nutrition knowledge of the health benefits of fruits and vegetable consumption, although they are costly and their availability are seasonal. This finding is in disagreement with Siti (2022) who opined that fruit intakes such as oranges, watermelon, bananas and guava were highly consumed; as pesticides were the main reason for not consuming vegetables and the main reason for not consuming fruits is that they cannot be kept long. The subject's consumed legumes occasionally; this may be due to the cost of these foods. In general the results

from food frequency table could be attributed to the high level of overweight and obesity that occurred among the subjects in this study because foods from these foods groups are high in calories. Consumption of vegetables was seen to be high compared to fruits intake. This could be attributed to the facts that green vegetables are mostly consumed along side dishes prepared from cereals, roots and tubers food groups and most fruits are seasonal and as such tend to be costly. This finding is in consistence with Layade and Adeoye (2014) that most preferred fruit by students was banana (34%) while the least preferred was cashew (1%). The most preferred vegetable was pumpkin leaves (32%) while the least preferred was celosia (20%). Only 37% of students consumed recommended fruits and vegetables.

4.6 Nutritional Status

The body mass index and waist hip ratio of the subjects were used to assess their nutritional status. About 17.2% of the respondents were underweight, 18.2% were normal, 34.8% were overweight while 29.8% were obese respectively. The results in this study are consistent with the results in the survey by Odugbemi *et al*. (2018) Furthermore, the Waist Hip Ratio of respondents revealed that 52.2% are at low risk of cardiovascular disease, 24.4% are at moderate risk while 23.3% are at high risk of cardiovascular disease, and this is in agreement with the result on the BMI status of the respondents. The rate of overweight and obesity in developing countries is increasing due to the changing lifestyle such as consumption of diets high in sugar, fats and inactivity factors linked with risk factors associated with risking chronic disease globally (WHO, 2012).

Conclusion

This study has shown that physically challenged individuals in Owerri metropolis have good level of nutrition knowledge. Most of the physically challenged individuals have normal nutrition status and the prevalence of overweight and obesity is till high among them in this context when compared to previous studies. The observed high prevalence of overweight and obesity shows the observed poor dietary practices due to heavy intake of calories which encouraged adipose fat accumulation in the respondents dietary practices of the respondents are not optimal. Physically challenged people; meal pattern are inadequate and food choices characterized by highly refined food products, high sugar and fat products compared to healthier food choices. They contradicted themselves in practices despite exhibiting

good nutritional knowledge and positive attitudes towards nutrition. Research, has shown that there is need to enhance nutrition education among physically challenged individuals. The government should provide nutrition extension workers to enlighten them on the importance of good dietary practices and its effect on their health and nutrition status. A more elaborate study involving accurate weight food intakes of the subjects should be undertaken so that actual energy balances of the subjects could be known as well as their actual food nutrient intakes. Further assessment of the level of nutrition knowledge possessed by Nigerians should be conducted so that appropriate strategies could be mapped out to eradicate the poor level of nutrition knowledge among Nigerians.

REFERENCES

Akaralo, A. O (2014) Activity pattern, energy intake and obesity among Nigerian urban market women. *International journal of food science and nutrition* 55(2): 58-90.

Allen H, Lungaho S, Shaheen M, Harrison G, Neumann C, Kirksey A (2014). Maternal body mass index and pregnancy outcome in the nutrition collaborative research support program. *Eur J Clin Nutr*. 48:S68–76.

Bailey, L., Mitchell, C., Miller, C., Smiciklas-Wright, H. (2017). Assessing the effect of underreporting energy intake on dietary patterns and weight status. *J Am Diet Assoc*. 107:64–71.

Bellile, J. M, Garcia-Perez, Frost, G. Aljuraiban, G.S. Chan Q and Van Horn, L. (2014) Nutriome metabolome relationships provide insight into dietary intake metabolism. *National Food:* 1(7): 426-36.

Benton, N. (2019) Prevalence of obesity and trends in the distribution of body mass index among US adults, 1999-2010. *Journal of the American Medical Association,* Vol. 307, No.5, pp 491-497.

Bhaumik, S., Watson, J. M., Thorp, C. F., Tyrer, F., & McGrother, C. W. (2018). Body mass index in adults with intellectual disability: distribution, associations and service implications: a population-based prevalence study. Journal of Intellectual Disability Research, 52, 287-298.

Bingham G. (2017) Use of online dietary recalls among older UK Adults: A feasibility study of an online dietary assessment tool. World Health Organization Report at Geneva: Switzerland; 11(7):1451.

Bouchard, C. and Perusse, L. (2015) Genetics of obesity. *Annual Review of Nutrition* 3:337-354.

Boye, C. F. and Sobal, J. (2013) Food choices among newly married couples: convergence, conflict, individualism and projects. *Appetite* 40, 25-40.

Boye, C. F., Sobal, J. and Rauschenbach, B, S (2017) Food choices among newly married couples: convergence, conflict, individualism and projects. *Appetite* 40, 25-40.

Black, E., Coward, A., Cole, J., Prentice, M. (2016). Human energy expenditure in affluent societies: an analysis of 574 doubly-labelled water measurements. *Eur J Clin Nutr*. 50:72–92.

Brown, N. and Ogden F. L. (2014) BMI and risk of dementia in two million people over two decades: A retrospective cohort study. *Lancet Diabetes Endocrinol* .3:431

Bruce, Å. (2020). Strategies to prevent the metabolic syndrome at the population level: role of authorities and non-governmental bodies. *British Journal of Nutrition*, 83, 181-186

Caruth D. Y Gonzalez, R. Urpi-Sada, M. Michael P. and Petera M. (2012) Diet related metabolic associated with cognitive decline revealed by untargeted metabolisms in a prospective cohort. *Molecular Nutrition of Food Research* 63(18).

Carroll, N. (2017). Prevalence of obesity and trends in the distribution of body mass index among US adults, 1999–2010. *Journal of the American Medical Association*, vol. 307, no. 5, pp. 491–497, 2012.

Chadwick, D. D., Jolliffe, J., Goldbart, J., & Burton, M. H. (2016). Barriers to Caregiver Compliance with Eating and Drinking Recommendations for Adults with Intellectual Disabilities and Dysphagia. *Journal of Applied Research in Intellectual Disabilities,* VL: 19, 153-162

Cooke, E. Coward A. Cole, J. and Prentice, M. (2017) Human energy expenditure in affluent societies; an analysis of 274 doubly labeled water measurements. *European journal of Clinical nutrition* 50:72-92

Cooper, S-A., Melville, G., & Morrison, J. (2014). People with intellectual disabilities. *British Medical Journal*, 329, 414-415

Cox, N., and Anderson, S. (2014). Food Choice. In: Micheal, J., Barrie, M., John, M., and Lenore, A. (Eds). Public Health Nutrition: 146-166. *Black Well Publishing Company Oxford, Limited Kingdom*.

Disdall, B.B and Tsao, T. T (2017) The physiology of body weight regulation: Are we too efficient for our own good? *Diabetes Spectrum* 31: 166-170.

Ene-Obong (2012). Eating Right: A Nutrition Guide. University of Calabar Press. Calabar. Pp. 63-70.

FAO, (2018). Globalization of food systems and nutrition. Agriculture and Consumer Department, *Food and Agriculture Organization,* Rome, Italy.

FAO/WHO (2020). Diet, Nutrition and the Relevance of Chronic Diseases: Report of a Joint FAO/WHO Expert Consultation. WHO Technical Report Series No. 916 Geneva.

Fisher, T.O., and Birch, L.L. (2017). 'Restricting Access to Palatable Foods Affects Children's Behavioral Response, Food Selection and Intake'. *American Journal of Clinical* Nutrition 69 (6), 1264-1272.

Gibson E. S (2017) Anthropometric Reference Data for Children and Adults: United States, 2011-2014. *Vital Health Stat 3 Anal Stud* Aug;(39):1-46

Golan G. and Crow, C. F. (2014) Recovery after nasal surgery vs. tonsillectomy; Discriminant validation of the post-operative quality of recovery scale. *Acta Anaesthesiology Scand;* 58:345-51.

Gravestock, K. (2010) Obesity and Intellectual disability, mental retardation and assessment of dietary intake. *Clinical chemistry* 64(1)82.

Guasch-Ferré M, Bhupathiraju SN, Hu FB. (2019) Use of Metabolomics in Improving Assessment of Dietary Intake. Clinical chemistry 64(1):82.

Harrison, G., Galal, M., Ibrahim, N., Khorshid, A., Stormer, A., Leslie, J. (2016). Underreporting of food intake by dietary recall is not universal: a comparison of data from Egyptian and American women. *J Nutr*. 130:2049–54.

Hove S.S, and Brown I. J, (2014) Metabolic profiling strategy for discovery of nutritional biomarkers: Proline betaine as a marker of citrus consumption. The *American journal of clinical nutrition*.;92(2):436–43.

Kayode O, Ayankogbe O, Olatona A, Olamoyegun A, OkparaIgwe U, Sabir A (2020). Obesity among health service providers in Nigeria: Danger to long term health worker retention? *Pan Afr Med J* ;22:1.

Kidy, S. Y (2017) Objective assessment of dietary patterns by use of metabolic phenotyping: a randomised, controlled, crossover trial. The Lancet Diabetes & Endocrinology.;5(3):184–95.

Lewin, K. (2014). Forces Behind Food Habits and Methods of Change in 'The Problem of Changing Food Habits. *National Academy of Science Bulletin 108'*. National Academy of Science, Washington, DC.

Mclvor, D. (2020) Healthy ageing; the natural consequences of good nutrition – a conference report. *European Journal of Nutrition* 57(Suppl2):S15-S34.

Mendez I and Glorieux, I. (2014) Change and stability in commensality patterns: a comparative analysis of Belgian time use data from 1996, 1999 and 2004. *Sociological Review*57, 703-726.

Mervis, P. Pandey, C. M, Singh U and Gupta A. (2017) Scales of measurement and presentation of statistical data. *Ann Card. Anaesth*, 21:419-422.

Mills KT, Bundy JD, Kelly TN, Reed JE, Kearney PM, Reynolds K, (2016). Global disparities of hypertension prevalence and control: a systematic analysis of population-based studies from 90 countries. *Circulation*; 134:441–50.

Misra A, Pandey M, Devi J, Sharma R, Vikram K, Khanna N (2017). High prevalence of diabetes, obesity and dyslipidaemia in urban slum population in northern India. *Int J Obes Relat Metab Disord*. 25:1722–9.

Norval I, Posma S, Urpi-Sarda M, and Vestergaard, H. (2017) Diet-Related Metabolites Associated with Cognitive Decline Revealed by Untargeted Metabolomics in a Prospective Cohort. *Molecular Nutrition & Food Research*.;63(18):n/a–n/a.

Obiakor, P.N. (2016). Introduction to Home Economics. *Nigerian Journal of Nutrition Sciences.* Vol. 30 (2): 70-75. City Print, Owerri.

Chan Q, Silva L, (2016). Nutriome-metabolome relationships provide insights into dietary intake and metabolism. *Nat Food*;1(7):426–36.

Quatronomi. D. (2017) Estimating under-reporting of energy intake in dietary surveys using an individualised method. *Britain Journal of Nutr* 97(6):1169–76.

Robertson, J., Emerson, E., Gregory, N., Hatton, C., Turner, S., Kessissoglou, S., & Hallam, A. (2020). Lifestyle related risk factors for poor health in residential settings for people with intellectual disabilities. *Research in Developmental Disabilities*, 21, 469-486.

Roy S (2012). Factors affecting the work productivity of Oraon agricultural laborers of Jalpaiguri district, West Bengal. *Am J Phys Anthropol*. 117:228–35.

Snell K. L and Luckason S. (2017) Estimating underreporting of energy intake in dietary surveys using an individualized method.. Acta *Anaesthesiol Scand*. 58:345–51.

Sobal, J., and Bisogni, Devine, C., and Jastran, M. (2016). A Conceptual of the Food Choice Process Over the Life Course. In "*The Psychology of Food Choice'*, CAB International, London.

Spronk, I. Kullen, C. and Burdon C. O'Connor H. (2014) Relationship between nutrition knowledge and dietary intake. *Br. Journal Nutrition* 111:1713-26.

Stranaham, M. S., Peerson, J., Love, B., Achterberg, C., and Murphy, S. P. (2016). Food Insecurity Is Positively Related to Overweight in Women. *Journal of Nutrition*. 131, 1738-1745.

Trustwell J. and Schoeller, D. (2017). Evaluation of dietary assessment instruments against doubly labeled water, a biomarker of habitual energy intake. *Am J Physiol Endocrinol Metab*. 281:E891–9.

Webber, H. U and Sobal B. (2020) A cross sectional analysis of physical activity and obesity indicators in European participants of the EPIC-PANACEA study. *International Journal of Obesity* 33:497-509.

Whitney, E., and Rolfes, S. (2017). Understanding Nutrition. 8th Edition. Wardsworth Publishing Company, New York.

WHO (2012). International Classification of Functioning, Disability and Health ICF: World Health Organization.

WHO (2018). Nutrition for Health and Development: A Global Agenda for Combating Malnutrition.

World Bank (2020). Disability Inclusion in Nigeria : A Rapid Assessment. World Bank, Washington, DC