Consumption Pattern, Physical Activity Level and Anthropometric indices of Consumers of Franchised Fast Food in South Western States in Nigeria

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ABSTRACT

***Background:** : Consumption pattern of franchised fast foods is not only a result of necessity but also status reflector for some consumers. Among several factors that determine health, physical activity level is found to play a major role in contributing to healthy lifestyle.*

***Objective**: The study assessed the consumption pattern, physical activity level and anthropometric indices of consumers of franchised fast food in South Western States in Nigeria.*

***Method**: A multi-stage sampling technique was used for the study to draw out 300 samples. A well-structured and pre-tested questionnaire was used to collect data on fast food consumption and anthropometric indices. Global Physical Activity Questionnaire (GPAQ) was used to measure physical activity level. Data were analyzed using the statistical software in IBM SPSS version 20. Level of significance was set at $P<0.05$.*

***Results**: Greater (56.7%) percentage of the respondents were females. Almost half (46.7%) of the respondents had first degree. Most people in the study preferred roasted and fried chicken to other franchised fast foods. There are 49% of the respondents who are moderately active, just 19% of the respondent were sedentary, and 32% of the respondents were very active. There are 32% and 48% of the respondents that were overweight and obese respectively and a significant difference was observed between female respondents' physical activity and waist to hip ratio ($p=0.050$).*

***Conclusion:** The study shows high prevalence of abdominal obesity in both gender. Also majority of the population are either overweight or obese.*

Keyword: *Fast Food, Physical Activity, Consumption pattern, Anthropometrics.*

Received: 15-04-23
Accepted: 13-06-23
doi: https://dx.doi.org/10.4314/njns.v44i2.13

INTRODUCTION

Fast food has developed into a notable component of diet and a prevalent eating pattern among people all over the world. It involves the mass production of quick meals that are uniform

in size, shape, colour, and flavour (1). According to Afolabi et al. (1), intake of fast food is common among adolescents and young adults. The wealthy especially, perceived the rising fast food culture as a mark of high social status or a manner of displaying affluence and high trendy way of living. Fast food consumption is not just driven by necessity, but for some consumers, it also serves as a status symbol (2).

Due to its accessibility, fast foods have also evolved to include food sales in schools, making it a common food choice for children (2). In the intellectual and downtown districts of Nigerian towns and semi-urban areas, fast food businesses are popping up on every street corner. Fast food is increasingly making up the majority of meals consumed outside the home in Nigeria. Fast food is increasingly being consumed in metropolitan areas, where it is especially common among young urban people in Nigeria. There are many different fast food options available at Nigerian restaurants, including chicken pies, scotch eggs, samosas, spring rolls, hamburgers, sausage rolls, pizza, and fries, all of which may be available had for affordable costs (2, 3). Consuming fast food is one of the things that has been linked to obesity. Convenience, price, menu options, flavour, and taste are all factors that affect how often people eat fast food.

Franchised fast food consumption is no longer limited to industrialized nations; it has now reached poorer nations as well. Fast food and takeout consumption is rising everywhere, but it is especially common among young people and adolescents in Western cultures (4, 5). The loss of the family tradition of dining together has led to the replacement of the traditional meal with the culture of fast food consumption, which is especially prevalent among young people (5). The world is busy right now. Everyone is moving fast. Fast food consumption is not just a trend among young people. There are many others in the same circumstance, especially those who reside in cities. For them, each day is getting shorter than the one before. Fast food eating is now a common practice for many families, especially those in big cities where everyone works all day (5).

They lack the time to find ingredients or plan wholesome meals. The vast number of young, wealthy people is another factor. Most nations have a bigger proportion of young people, who spend more money on fast food (6). Fast food is known for having poor nutritional quality, and is particularly low in iron, calcium, riboflavin, vitamin A, and vitamin C (7). It also appeals to the western palate and every developing communities by being fatty, lacking in fiber and nutrients, and high in salt, sugar, and empty calories (7).

The condition of the body as a result of food intake, absorption, and use is known as nutritional status (8). Complex interactions between internal (age, sex, diet, behaviour, physical exercise, and illnesses) and external (food safety and societal, cultural, and economic conditions) environmental elements determine it (9).

Energy expenditure is influenced by the skeletal muscles' frame motion during physical activity (10). Physical activity level is determined to be a significant contributor to body fitness, illnesses, and weight increase among other aspects that affect health. The ratio of energy expended to calories ingested can be used to gauge an individual's level of activity. Also, the amount of physical activity engage in can be impacted by weight status from eating fast foods. Results from earlier studies have demonstrated a significant difference in weight gain between people who regularly eat fast foods and those who only do so occasionally (10). It has been estimated to be the primary cause of the following illness conditions, accounting for 6% of deaths globally: 30% of ischemic heart disease, 21% to 24% of breast and colon cancer, and 27% of diabetes are all global burdens (11).

The WHO member states agreed in 2013 to reduce physical inactivity by 10% by 2025. Physical inactivity is the fourth leading cause of mortality worldwide, and it has been on the rise with 1 in 3 adults not being very active. The risk of hypertension, cardiovascular diseases (CVDs), strokes, diabetes, depression, and several types of colon cancer is decreased by physical activity (12). Physical inactivity and a sedentary lifestyle have been linked to adiposity and increased weight gain.

Hence, this research examined the consumption pattern, physical activities level and anthropometric indices of franchised fast foods consumers in South Western States of Nigeria. This study will be very helpful in developing wise decisions and the best interventions to decrease health complications that may arise from franchised fast food consumer consumption pattern of indulging in unhealthy foods.

MATERIALS AND METHODS

Study Area

The south western zone comprises of six states (Lagos, Ekiti, Ondo, Oyo, Ogun and Osun) with an estimated population of 28 million people (13). The study areas are Ikeja Local Government Area in Lagos State, Abeokuta South Local Government Area in Ogun State and Ibadan Local Government in Oyo State. Palm oil, timber, rubber, yams and shea butter are the chief articles of trade at Abeokuta which happens to be the capital of Ogun State. Ibadan is the capital city of Oyo State. The city is a major center for trade in cassava, cocoa, cotton, timber, rubber and palm oil. Ikeja, the capital of Lagos State. Ikeja has a very strong commercial base (14). A large number of businesses mostly retail and services based operate in the area.

Study Design

A cross-sectional study that was design to accessed the consumer of franchised fast food.

Sample Size

Minimum sample size was calculated using the formula below:

$$N = \frac{Z^2 \times (p \times q)}{d^2}$$

Where,

N = the minimum sample size

Z^2 = the standard normal deviate corresponding to a level of significance of 0.05 is 1.96

p = Prevalence of overweight in Nigeria is 26% (11).

q = 1-p (i.e. 0.74)

d = the desired precision: 5%

Applying the formula, the minimum sample size is:

$$N = \frac{(1.96)^2 \times (0.26 \times 0.74)}{(0.05)^2}$$

N = 295

The calculated sample size was 295. However, it was added up to 300 for the purpose of the study. This additional 5 samples was added to compensate for non-response rate.

Sampling Techniques

A multi-stage sampling procedure was used. In the first stage, one-third (three (3) states (Lagos, Oyo and Ogun) out six) of the states in south west were chosen randomly. In the second stage, the state capital (Ikeja, Ibadan and Abeokuta) were purposively selected because they were the most populous (13). Furthermore, the third stage involved the identification of thirty-four (34) registered franchised fast food outlets in Lagos, twenty-seven (27) in Ibadan and thirteen (13) in Abeokuta and ten (10) franchised fast food centers was purposively selected. This ten selected franchised fast food outlets were divided in ratio 5:3:2 respectively. The formula for selection was according to Otemuyiwa and Adewusi, (15) with slight modification. Stage four, Simple random sampling technique was used to draw the sample for the purpose of the study.

Collection of Data

A well-structured and pre tested questionnaire was used for the survey. Secondary data for the study were collected from different websites, portals, and published articles. The global physical activity questionnaire (GPAQ) was used to measure physical activity (30). Individuals are considered physically active when they achieved metabolic equivalent tasks (METs) minutes of 600 or more per week.

Data Analysis

The data collected from the respondents were analyzed using the statistical software, SPSS (Statistical Product and Service Solutions) which satisfy the goals set for the analysis. Descriptive and inferential analysis were used to determine relationship among categorical variables. Pearson correlation analysis were used to study the franchised fast food consumption pattern and

its association. Level of significance was set at 0.05 (95% confidence interval). The physical activity level was analyzed by computing the total time spent in physical activity during a typical week and the intensity of physical activity are taken into account. GPAQ classification according to WHO physical activity level is 600METs to 1200METs for Moderately (Normal) physical Activity Level, less than <600METs is Sedentary/Low physical activity level and >1200METs high (very active) physical activity level.

RESULTS

Socio demographic and economic- status of the respondents

Table 1 reveals that 300 respondents in total were gathered for the study, with a higher percentage of female (56.7%) than male (43.3%). Majority (68.6%) belonged to the Yoruba tribe. Respondents aged 26 to 39 made up 38.7% of the sample. A total of 48.7% of the survey participants were moderately active. Ogun State (35.4%) and Lagos State (37.3%) have the larger percentage of respondents while compare to Oyo State (27.3%). The unmarried (54.0%) had the highest percentage of respondents under study, and cohabiting respondents (0.7%) had the lowest. More so, 15.3% of respondents were self-employed, while 25.3% of respondents worked for the government and 19.3% worked in the private sector. 37.3% of respondents were homemakers. The highest level of education held by 46.0% of the subjects was first degree, and 50% had income of over 500,000 Naira.

Anthropometric Indices

Table 2 shows descriptive distribution of body mass index, waist to hip ratio, blood pressure and health status. The percentage of responders who were overweight was 32%, with 26.7% having grade I obesity, 20.0% having normal weight, 14.7% having grade II obesity and 6.7% having morbid obesity at 6.7%. Most (91.8%) of females and 63.1% of males had high risk of acquiring cardiovascular diseases.

Franchised Fast Food Consumption Pattern of Respondents

Table 3 shows the frequency of franchised fast food consumption pattern of the respondents. This shows that 40% of the respondents consumed franchised fast foods for four to five times per week whereas about half (49.3%) of the respondents takes it once daily. According to the study, the 44.9% of the respondents consumed roasted chicken as an animal protein source, followed by 31.3% of those who consume fruit and vegetable salad within a week. Less than one-third (31.9%) of respondents chose that fast food outlet because of the tasty food they received and 48.7% ate fast food from a franchise three to four times in past thirty days. More than one-third of respondents (35.1%) drank water with franchised fast food, whereas 40% consume franchised fast foods four to five times in the past seven days and majority of respondents (67.1%) preferred takeaway.

Physical Activity

Figure 1 shows the classification of physical activity in pie chart. There are 49% of the respondents who are moderately active (that is they meet up to 150 minutes of moderate intensity physical activity or 75 minutes of vigorous intensity physical activity), only 19% of the respondent were sedentary (that is they couldn't meet up to 150 minutes of moderate intensity physical activity or 75 minutes of vigorous intensity physical activity), whereas the total of 32% of the respondents were very active (that is they exceed 300 minutes of moderate intensity physical activity or 150 minutes of vigorous intensity physical activity).

Association between Waist to Hip ratio and Physical Activity

Table 4 shows that there is no significant difference between respondents' physical activity and the waist to hip ratio in male respondents (0.806) but a significant difference in female respondents (0.050).

Relationship between Franchised Fast Food consumption patterns with Body Mass Index (BMI).

Table 5 shows the result of Pearson analysis carried out to determine the relationship between participants' fast food consumption pattern and their BMI. There is a significant difference among respondents who consumed franchised fast food taken along with fruits and vegetables in the past seven days ($p=0.001$) and also in frequency of consumption of fast foods in the past seven days ($p=0.018$) while no significant difference observed in other variables.

DISCUSSION

In this study, majority of respondents were between the ages of 25 and 37 years, were Yoruba (70.5%), females (56.7%), and single (54.4%), and most were from Lagos and Ogun states. In contrast to the other states under consideration, Lagos State has a larger percentage of consumers due to its higher human population and franchised fast food restaurants (14).

It is important to note that majority (67%) of the respondent that consumer franchised fast food fall between the age group of 18-39. This indicates that youth patronized franchised fast food than any other age group and this is in support with Farzan's study (6) that state that consumption of franchised fast food were common among youth. Farzan's study also reported that effective marketing techniques, mouthwatering dishes, and eye-catching advertising (6) through social media and other platform accessible mostly by the youth are the major reason why they are the age group that consume fast foods mostly.

Just 27.3% of the consumers of franchised fast foods in this study had merely primary school education, whereas majority (70.5%) of consumers had first degree and postgraduate degree. This result is similar to the study of Rizwan et al. that assess the fast food consumption pattern at Bangladesh (17).

This study also revealed that high income earner patronized franchised fast foods than low income earner. Franchised fast food has a reputation for being connected with high income earners, both as an individual and a family. This study supports Farzan's research results that franchised fast food restaurants target high-income households (6).

This study shows that only 20% of the respondents have normal weight and majority (80%) of the respondents are either overweight or obese. This is in line with numerous studies that suggested that frequent consumption of franchised fast food is one of the major factors contributing to the global burden of disease. Franchised fast food is low in dietary fiber in terms of fruits and vegetables but high in salt, sugar, and saturated fat. It has also been connected to an increase in diabetes, obesity, hypertension, and other cardiovascular diseases (18, 19).

Also, it was found in this study that majority of the respondents both male (61.3%) and female (91.8%) had a high risk of cardiovascular diseases. In contrast to the study of Mohammadbeigi et al. that report 33.2% prevalence of abdominal obesity among female respondent which far lesser when compare with this study (20). This implies that most of the respondents under this study have increased risk of cardiovascular diseases due to their frequent consumption of franchised fast food.

According to this study, there is a significant difference between the waist-to-hip ratio and physical activity among male respondents ($p=0.050$), but no significant difference among female respondents ($p=0.806$). This findings demonstrated a substantial difference in weight gain in terms of abdominal fat between people who regularly consume fast food and those who do not (21). These results offer a similar perspective to that of Amole et al. study that females showed a higher abdominal obesity pattern than the males ($p<0.05$); implying therefore, that female are at higher risk for related disease than male (22).

This study shows that fewer respondents consumes franchised fast food three to five times daily while most of them consume it just once in a day. More than half of the respondent consume franchised fast foods in the past seven days and also preferred to take roasted and fried chicken and as animal source protein. This findings are relevant to the research by Jahan et al. and Gupta et al. regarding the most preferred fast food items consumed, such as fried chicken, roasted chicken, and sandwiches (19, 23).

In this study, fewer respondents consumed fruit or vegetable salad with franchised fast foods at least six time in past seven days. The findings of the current study show that a higher intake of fast-food significantly predicts lower dietary quality. . In fact, a high intake of free sugar has been found to be independently associated with a low intake of several important nutrients such as calcium, zinc, potassium, sodium, and vitamin B12 [24, 25].

This study also found that a higher percentage of respondents (35.1%) drank water when they ate franchised fast food. This is not consistent with previous findings suggesting that individuals who frequently consume fast-food tend to consume more free sugar and less fiber, fruit, and fewer vegetables (24). Given that fast food is frequently paired with sugar-sweetened beverages and that most young adults prefer soda to water, fresh juice, or milk when they eat (24). This could be as result of increase awareness of the health risk associated to frequent consumption of soda drink.

The physical activity level of the respondents in this study reveals that about half of the respondent were moderately active whereas only one-third of the respondents were very active while few were sedentary. This study shows that there is significant association between male waist to hip ratio and physical activity and no significant between female respondents. This finding oppose the study of Kate et al. whose result shows significant association in female respondent and not in male (26). These results are somewhat in keeping with earlier research that during the past few decades, the use of fast food, which results in excessive calorie intake, combined with insufficient physical exercise, has raised the risk of obesity among the global population (27, 28).

In the analysis carried out to check the association between body mass index and the consumption pattern of participants who take franchised fast food, it shows that there was significant association in the frequency of those that consume fast food with fruits and vegetables in the past seven days ($p=0.001$). This outcome demonstrated the necessity of reinforcing the nutritional advantages of fruits and vegetables. This result and that of Kelly and Yeong study have demonstrated a possible and favourable relationship between dietary intake of fruits and vegetables towards achieving healthy idea body weight (29). A healthy diet should include fruits and vegetables, which can be eaten as main dishes or even as snacks. The body benefits from the vitamins, minerals, fiber, and other photochemical components found in fruits and vegetables and the nutritional value of fruits and vegetables may prevent obesity and overweight from developing in the body (30).

CONCLUSION

The study shows that franchised fast foods are mostly consumer among young adult who are higher income earners. Majority of the study population are either with first degree and more, which suggested that higher level of education can have a lot to do with consumption of franchised fast foods. The study also identified the important of tasty nature of franchised fast food as a major reason for consumer patronage. Most people in the study preferred roasted and fried chicken to other franchised fast foods.

It can be adduced to the population under study that about half of the respondents were moderately active. The study shows high prevalence of abdominal obesity in both gender. It can also be said of the study that majority of the population are either overweight or obese. The association between physical activity level with waist to hip ratio among male respondents show significant difference. This might present a baseline view for another study that healthy physical activity level might have appreciable effect on achieving healthy abdominal fat.

In order to promote a healthy lifestyle, this study suggested that, it is imperative to make sure that a variety of healthy food menu alternatives are available in franchised fast food outlets that are not only high in calorie but also in essential micronutrients and dietary fiber.

Acknowledgement

All thanks goes to almighty God.

Conflict Of Interest

The authors declare no conflict of interest.

Table 1: Socio Demographic and Economic Status of the Respondents

Socio Demographic and Economic Variables	Frequency	Valid Percentage (%)
Sex		
Male	130	43.3
Female	170	56.7
Total	**300**	**100.0**
AGE		
18-25	86	28.7
26-39	116	38.7
40-59	72	24.0
60-69	26	8.6
Total	**300**	**100.0**
Level of Education		
Primary School	10	3.3
Secondary School	72	24.0
First Degree	138	46.0
Post-Graduate degree	72	24.0
Preferred not to state	8	2.7
Total	**300**	**100.0**
Location		
Ogun State	106	35.4
Oyo State	82	27.3
Lagos State	112	37.3
Total	**300**	**100.0**
Marital Status		
Never Married	162	54.0
Married	106	35.2
Separated	14	4.7
Divorced	2	0.7
Widowed	8	2.7
Cohabiting	6	2.0
Preferred not to state	2	0.7
Total	**300**	**100.0**
Work Status		
Government Employee	76	25.3
Private Sector	58	19.3
Self Employed	46	15.3
Home Maker	112	37.3
Unemployed	2	0.7
Preferred not to state	6	2.0
Total	**300**	**100.0**

Ethnicity		
Igbo	72	24.0
Hausa	14	4.7
Yoruba	206	68.6
Refuse to state	8	2.7
Total	**300**	**100.0**
Average Monthly Household Income		
₦10,000-150,000	70	23.3
₦151,000-250,000	42	14.0
₦251,000-500,000	36	12.0
More than ₦500,000	150	50.0
Refuse to state	2	0.7
Total	**300**	**100.0**

NOTE: *All total frequency that is less than 300 is due to non-responses of the respondents.*

Table 2: Body Mass Index and Waist to Hip Ratio

Body Mass Index	N	%	***Mean ± SD***
Normal weight	60	20.0	***15.36 ± 15.69***
Overweight	96	32.0	
Grade I Obesity	80	26.7	
Grade II Obesity	44	14.6	
Morbid Obesity	20	6.7	
Total	**300**	**100.0**	
Waist-to-Hip Ratio (Female)			
Low Risk	2	1.2	***0.94 ± 0.06***
Moderate Risk	12	7.1	
High Risk	156	91.8	
Total	**170**	**100**	
Waist-to-Hip Ratio (Male)			
Low Risk	16	12.3	***1.01 ± 0.05***
Moderate Risk	32	24.6	
High Risk	82	63.1	
Total	**130**	**100**	

SD: Standard Deviation

Table 3: Frequency of Franchised Fast Food Consumption Pattern of Respondents

Frequency of Daily Consumption of fast foods	N	%
2-3 times	44	14.9
Less than 2 times	64	21.6
Once	136	45.9
Don't know	52	17.6
Total	**296**	100.0
FFF consumed in the past 7 days		
Less than two times	50	16.6
2-3 times	112	37.3
4-5 times	120	40.0
6 or more	18	6.1
Total	**296**	**100.0**
Type of Animal Protein Consumed with a Fast Food Meal during The Past 7 Days		
Boiled Seafood	20	6.7
Fried seafood	40	13.3
Roasted chicken	132	44.0
Fried chicken	64	21.3
Snail	30	10.0
None		2.0
Don't Know		2.7
Total	**300**	**100.0**
Frequency of consuming fast Food with Fruit or Vegetable Salad during the Past 7 Days		
Less than 2 times	94	31.3
2-3 times	54	19.3
4-5 times	26	8.7
6 or more	16	5.3
Refuse to state	106	35.3
Total	**300**	**100.0**
Reasons for consumption of Fast Foods		
Proximity for fast foods restaurants	64	21.3
Environment	36	12.0
Tasty meals	92	30.7
Habit	54	18.0
Time constraint to prepared food	20	6.7

Others	12	4.0
Don't know	22	7.3
Total	**300**	**100.0**
FFF consumed within the past one month		
Daily	20	6.7
5-6 times per week	42	14.0
3-4 times per week	146	48.7
1-2 times per week	38	12.7
Less than a day per week	36	12.0
Don't	18	6.0
Total	**300**	**100.0**
Type of Drink taken alongside FFF during the past one month	N	%
Soft drinks (Soda)	72	24.3
Milk shakes	4	1.4
Fruit drinks	86	29.1
Water	104	35.1
Alcoholic drinks	4	1.4
Fruit wines	26	8.8
Total	**296**	**100.0**
Time FFF are consume		
Morning	30	10.1
Afternoon	188	63.5
Evening	78	26.4
Total	**296**	**100.0**

Note: FFF- Franchised Fast Food

Figure 1: Physical Activity

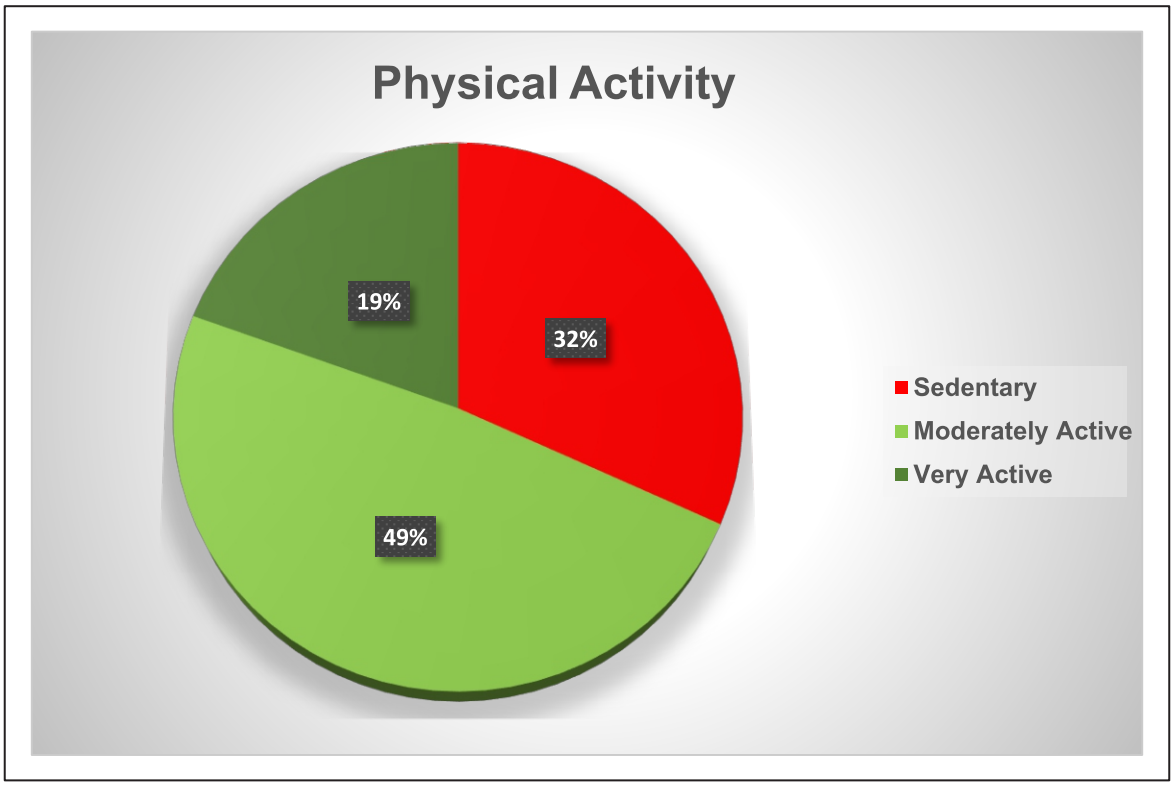

Table 4. Association between Female and Male Waist to Hip ratio with Physical Activity

			WHR Female		
Physical Activity	Low risk N (%)	Moderate risk N (%)	High risk N (%)	Total N (%)	p.Value
Sedentary (<600METs)	2 (1.2)	4 (2.3)	42 (24.7)	48 (28.2)	0.806
Moderately active (600METs-1200METs)	0 (0)	4 (2.4)	84 (49.4)	88 (51.8)	
Very active (>1200METs)	0 (0)	4 (2.4)	30 (17.6)	34 (20.0)	
Total	**2 (1.2)**	**12 (7.1)**	**156 (91.8)**	**170 (100)**	
			WHR Male		
Physical Activity	Low risk N (%)	Moderate risk N (%)	High risk N (%)	Total N (%)	p.Value
Sedentary (<600METs)	10 (7.6)	12 (9.3)	36 (27.7)	58 (44.6)	0.050*
Moderately active (600METs-1200METs)	6 (4.6)	10 (7.7)	32 (24.6)	50 (38.5)	
Very active (>1200METs)	0 (0)	10 (7.7)	14 (10.8)	22 (16.9)	
Total	**16 (12.2)**	**32 (24.7)**	**82 (63.1)**	**130 (100)**	

Table 5. Association between Frequency of Franchised Fast Food consumption with Body Mass Index (BMI)

Frequency of Franchised Fast Food consumption	**BMI**
Question	**p.Value**
Frequency of consuming franchised fast food within the past 30 days	0.076
Consumption of fast food more than once each day during the past 30 days	0.713
Frequency of fast food consumed in the past 7days	0.230
How often fast food consumed each day	0.159
Frequency of consumption of fast foods in the past 7 days	0.018*
Franchised fast food often consumed	0.162
Frequency of fast food consumed with fruit or vegetable salad during the past 7 days	0.001*

Asterisk (*) shows significant difference at p <0.05

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