Current Journal of Applied Science and Technology

39(30): 89-96, 2020; Article no.CJAST.50847
ISSN: 2457-1024
(Past name: British Journal of Applied Science & Technology, Past ISSN: 2231-0843, NLM ID: 101664541)

Assessment of Socio-economic Characteristics and Anthropometric Status of Pre and Post-menopausal Civil Servants in Abeokuta, Ogun State Nigeria

Ojo M. I.[1], Nupo S. S.[2*], Shittu T. A.[3], Sanni S. A.[4] and Ilori O. A.[2]

[1]Biological Sciences Department, Crescent University, Abeokuta, Nigeria.
[2]Nutrition and Dietetics Department, Moshood Abiola Polytechnic Ojere, Nigeria.
[3]Food Science and Technology Department, Federal University of Agriculture Alabata, Nigeria.
[4]Nutrition and Dietetics Department, Federal University of Agriculture Alabata, Nigeria.

Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

Article Information

DOI: 10.9734/CJAST/2020/v39i3030976
Editor(s):
(1) Dr. Umar Nirmal Senior Lecturer, Centre of Advanced Mechanical and Green Technology, Multimedia University, Malaysia.
(2) Dr. Yahya Elshimali, Charles Drew University of Medicine and Science, USA.
(3) Dr. Ekpenyong, Christopher Edet Associate Professor, College of Health Sciences, University of Uyo, Nigeria.
(4) Kleopatra Nikolopoulou, Secondary Science Teacher and School of Education - University of Athens, Address: Zanneio Model School, Kolokotroni 18531, Piraeus, Greece.
Reviewers:
(1) Rupali Sengupta, SNDT Women's University, India.
(2) Rama Ravi, John & Jenner Center for Research, India.
Complete Peer review History: http://www.sdiarticle4.com/review-history/50847

Original Research Article

Received 25 July 2019
Accepted 01 October 2019
Published 06 October 2020

ABSTRACT

Background: Menopause is the consistent and continuous absence of menses for twelve consecutive months among women.
Aim: The study was conducted to assess the Anthropometry and Nutrient intake of pre and post-menopausal civil servant in Abeokuta, Ogun state. Body Mass Index (BMI) and Waist/Hip ratio were used to classify the anthropometric characteristics of the respondents and were compared with the WHO reference standard.
Methods: All statistical analysis was performed using Statistical Package for Social Science (SPSS/RC) Programme (version 16). Chi-square, t-test and Pearson linear correlation were used to assess the relationship between variables.
Results: Result of Body Mass Index (BMI) revealed that a total of 17.4% of pre-menopausal women and 14.8% of the menopausal were obese. Consumption of fruit and vegetable was low for

**Corresponding author: E-mail: nupo.sunday@mapoly.edu.ng;*

both groups of women. There was a significant difference in the WHR ($p< 0.05$) and no significant difference in the mean intake of the two groups considered at $p< 0.05$. There was a positive correlation ($r=0.246$) between age and BMI and a positive correlation ($r=0.164$) between BMI and activity level.

Conclusion: There is a need to educate respondents on weight maintenance. An improvement in respondents' knowledge on the importance of fruit and vegetable, through nutrition education, and way to incorporate these sources of nutrient in the diet will go a long way in improving nutritional status.

Keywords: Menopause; anthropometry; civil servants; body mass index; dietary intake.

1. INTRODUCTION

Menopause is best defined as the absence of menses for 12 consecutive months [1]. Women have regular menstrual cycles every twenty-eight days until about the age of fifty, at which time menstruation becomes irregular. These irregular routine precede the onset of menopause that occurs between the ages of 45 and 55, women begin to experience changes to their body associated with menopause. It is a normal change in a women body and menopause is considered reached.

When a woman has not had a period for twelve months in a row. It marks the permanent end of fertility. Leading up to menopause, the women's ovaries stop producing eggs and her body start producing less of the hormones, estrogen and progesterone [2]. As the ovaries become less functioning and produce less of these hormones, the body responds accordingly. The density of the bones also begins to decrease in women during the fourth decade of life. However, that normal decline in bone density is accelerated during menopause, consequently, both age and menopause act together to decrease bone mass and bone density (osteoporosis). Thus, women are between 2 and 7 times more likely than to suffer a bone fracture, the risk increases with age and after menopause [3].

The age at which women begin menopause can be affected by genetics, race and environmental factors. Women can also go into premature menopause, either naturally or due to the surgical removal of the ovaries. Another consequence of getting older is that the digestive system becomes less efficient and digestion takes longer.

After menopause, women are also more vulnerable to heart disease. Weight increases also seem to coincide with menopause.

According to Burgere et al. [4], women go through different phases of menopause, including peri-menopausal periods. During the perimenopausal period, the regular cyclical occurrence of menstruation is disrupted and menstruation becomes irregular. This phase may last anywhere from six months to a year. During this period, the production of estrogen is reduced and eventually stops. Women are described as postmenopausal when they have gone one year without a menstrual period. Anthropometric coupled with food intake can play a tremendous role in the intensity and occurrence of menstruation. It is against this backdrop that this research was designed to assess the anthropometric status and nutrient intake of pre- and post-menopausal civil servants in Abeokuta, Ogun State Nigeria

2. MATERIALS AND METHODS

2.1 Study Area

The study was carried out in Abeokuta metropolis, Abeokuta is the capital of Ogun State, Nigeria. It is a historic Yoruba town founded by the Egbas in 1830. The town derived its name from the huge masses of rocks which forms the hills surrounding it and under which the original settlers found refuge during the various inter-ethnic wars of the 19th century. Abeokuta is located 80km south-west of Ibadan and 106km north of Lagos state, It has a landmass of about 1,256 square kilometres. The main occupation of the urban dwellers of the metropolis is portrayed as various handcrafts like tie and die manufacture, pottery and batik making. Other activities of the urban dwellers are trading, teaching and civil services. However, the rural area of the metropolis is dominated by farmers of various crops like cocoa, cassava, palm produce and maize.

2.2 Sample Size and Sampling Techniques

There are one hundred and fifty –four 154 ministries in Ogun state secretariat. Multi-staged sampling techniques were used to select three hundred (300) respondents from fifteen (15) ministries. The ministries selected include the ministry of Agriculture, Ministry of education, Ministry of Health, Ministry of Women Affairs, Muslims pilgrims Welfare Board, to mention but a few. They were first enlightened on the purpose of the survey after which a structured questionnaire was administered.

2.3 The Questionnaire

Socio-demographic and lifestyle factors.

A structured questionnaire was used to obtained socio-demographics which included age, education, occupation, monthly household income, reproductive histories (the age of menarche, menopausal and the number of childbirth), and dietary and activity pattern.

2.4 Anthropometric Measurement

Body weight of the respondent was measured to the nearest 0.1 kg using a bathroom scale (BR9011CAP.120 Kg GRAD.1 Kg) with the subject wearing minimal clothing and without shoes. Height was measured to the nearest 0.1 cm using a metre tape with subject barefooted and the back of the heel touching a wall. This protocol was according to International Society for the Advancement of Kinanthropometry guidelines, as described by Norton and Olds. From the values derived, Body mass index (BMI) was calculated and compared with the WHO standard.

Waist and hip measurements was taken using a tailors tape and measured with subjects standing relaxed with arms by their side and balanced on both feet. The tape was held tight to the skin but without compression of the tissue. Waist circumference was measured just above the iliac crest as recommended in the National Institution of Health Guidelines (1999) while Hip circumference was measured according to International Society for the Advancement of Kinanthropometry protocol, taken at the greatest posterior protuberance of the buttocks.

2.5 Dietary Intake

A food frequency questionnaire (FFQ) and 24-hours diet recall were used in this study. Food intake frequency was defined as follows; occasionally, once or twice a week, three or four times a week, once a day, twice a day, three times a day or not at all.

A 24- hr diet recall was used to collect data on the actual food intake of the respondent to calculate actual nutrient intake. Food portion was defined by volume, portion size and price. The use of models and household measures was employed, which was converted to their corresponding weight equivalents. Average daily intake of calories, protein, vitamins and minerals (vitamin A, calcium and iron) was calculated using food composition tables from various source.

2.6 Statistical Analysis

Descriptive statistics were used to explore the distribution of data, t-test, Chi-square test and Pearson Linear Correlation were used to assess the relationship between variables.

All statistical analyses were performed using the SPSS/RC statistical program (version 16 for the window; SPSS, inc., Chincago, IL). Data were presented as mean and standard deviation.

Significant references were made at 95% confidence interval

3. RESULTS AND DISCUSSION

Table 1 shows a summary of the socio-demographic data derived from all respondents sampled in the survey. It can be deducted from the table that the ages of the respondents were categorized into three (3). While the respondents whose ages were less than 40yrs were one hundred and nine (109) in number, equivalent to 36.3%, those whose ages were between 40 and 45 were one hundred and four (104), equivalent to 34.7% and the remaining eightyseven respondents were above 45years.

Considering the marital status of the respondents, 82.9% were married, very few of them, 2.3%, were single while 10.0% were widowed and 4.7% were divorced. Statistics revealed that 88.1% of the respondents were from monogamous families and 11,9% belonged to polygamous families. The household size of the respondents revealed that the majority fell between 2 and 5 and the least population fell in the 14 and above category.

Data also revealed that 16.7% earned between #7,000-#17,000 per month, 35.5% earned

#18,000-#27,000, 31.1% earned #28,000-38,000 while the remaining 16.7% earned #39,000 and above. Majority of the sampled household had an estimated monthly income of #51,000-#100,000 while only few respondents, 0.7%, earned up to #201,000-#250,000. Furthermore, 51.5% of the respondents spend about #20,000 on feeding in a month while only very few, 1.4% spend up to #80,000 on the feeding per month.

Religious –wise, it was discovered that, of the 300 respondents, 53.3% were Muslim while 47.75%, were Christians. Furthermore, data derived on the educational status of the respondents revealed that 5.0% had the first school leaving certificate, 17.3% had a senior school certificate, 21.0% had the national certificate for Education, 11.0% had ordinary National Diploma, 14.3% and Higher National Diploma and 31.3% had university degrees.

The value derived as the mean age at menarche is different from the findings of Subulade [5], who studied menopausal women in Ibadan, Oyo State of Nigeria and derived a mean age at menarche of 15.4 years. The study conducted by Douglas et al. [6] with Japanese women recorded a mean age at menarche of 15.5 years. This difference in the age at menarche may be as a result of factors which may include female biology, as well as genetic and environmental factors, especially nutritional factors. According to Morris 2010, the average age at menarche has declined over the past century but the magnitude of the declined and the factors responsible remain subjects of contention. The average age at menarche is now about 12.5 years in USA and 13.06 years in Iceland, while that of the UK is 11.75 years. However, the mean age at menopause (47.28 years) derived from the study compared to the findings of both Subulade [5] and Douglas *et al.* [6], who found the mean age at menopause to be 48 years and 49.61 years respectively. The constant nature of age at menopause is as a result of the fact that environmental influences like race, education, BMI, number of children, age at menarche, contraceptive use etc., appears only to explain a small proportion of the large variation that usually occurs in the age at natural menopause. The onset of menopause lies mostly in generic inheritance. Therefore, the respondents in the three studies can be said to differ in age at menarche but similar in age at menopause.

Many of the respondents were overweight. Results showed a significant difference of 0.05 ($p<0.05$) in the BMI of the respondents. The percentage of obese respondents among the pre-menopausal women was 17.4% while that of the menopausal women was 14.8%, although, the percentage of overweight respondents was generally higher among the menstruating women (40.4%). This is in line with the findings of the prospective study of 17,000 Finns, by Rissanen et al [7] where data revealed that the mean weight and BMI rose in women aged <50 years and remained fairly constant between the ages of 50-60 tears and fell thereafter.

Table 3 shows the anthropometric data of the respondents describing the BMI distribution of respondents based on WHO classifications. About 1.3% fell in the chronic energy deficiency (CED) range, another 1.3% had mild underweight, 34.3% of the respondents had normal BMI value, 42.o% were overweight; 14.3% had grade I obesity, 5,7% had grade II obesity and only 1.0%had grade III obesity; making the total number of obese respondents to be 21.0%. Many of the respondents were overweight. Results showed a significant difference ($p< 0.005$) in the BMI of the respondents. The percentage of obese respondents among the menopausal women was in line with the findings of the study carried out by Rissanen et al. [7] among 17,000 Finns. The values for the waist/hip ratio showed that 26.0% of the respondents were at low risk, 26.3% had moderate waist/hip ratio and 47.7% belong to the high-risk range. The values observed for the waist to hip ratio in both groups of women were quite similar. Thus the T-test did not show a significant difference ($p<0.05$). The values derived from this study, therefore, suggest that menopause may not be responsible for the weight gain experienced by women in later years. This submission is similar to the report by Bonithon-Kopp et al. [8]. Results showed a positive correlation between BMI and waist to hip ratio.

Data available in Tables 4-7 shows the frequency of consumption of staple foods, drinks, animal protein and fruits and vegetables. Yam was the most preferred food item as 84.3% of the respondents preferred to consume it as much as 3 times in a week. This is closely followed by rice, which 211(70.3%) of the respondents to consumed up to 3 times in a week. However, 78.3% did not consume oats. 79.3% did not consume cornflakes and 93.3% did not consume whole wheat.

Data also revealed that respondents preferred bean pudding to bean porridge (18.7%) or bean

cake (0.7%). Majority of the respondents consumed fish daily (92.7%). The beef was consumed at least once a week by 44.0% of the respondents. Many of the respondents (65.3%) did not consume pork at all. Many respondents also consumed poultry once a week (78.2%).

Table 1. Socio Demographic Characteristics of Respondents

Characteristics	Frequency (N)	Percentage (%)
Age (years)		
< 40	109	36.4
40-45	104	34.7
>45	87	29.0
Total	300	100.0
Marital status		
Married	248	82.9
Single	7	2.3
Widowed	30	10.1
Divorced	15	4.7
Total	300	100.0
Type of family		
Monogamous	259	88.1
Polygamous	35	11.9
Total	294	98.0

Table 2. Reproductive and health characteristics of respondents

CONTD Characteristics	Frequency (N)	Percentage (%)
Amount spent on food by Household (#)		
<20,000	160	51.5
9.6	113	37.5
41,000-60,000	23	
61,000-80,000	4	1.4
Total	300	100.0
Religion		
Islam	160	53.3
Christianity	140	46.7
Total	300	100.0
Educational status		
Primary school	15	5.0
Secondary school certificate	52	17.3
NCE	63	21.0
OND	33	11.0
HND	43	14.3
University degree	94	31.3
Total	300	100.0
Characteristics	**Frequency**	**Percentage (%)**
Age at menarche		
9-12	139	46.3
13-19	161	53.7
Total	300	100.0
Menopausal status		
Pre-menopausal	218	72.7
Menopausal	82	27.3
Total	300	100.0
Number of children		
1-5	286	95.3
6-10	14	4.7
Total	300	100.0
Bone or muscle problem		
Yes	80	26.7
No	220	73.3
Total	300	100.0

Furthermore, respondents did not consume vegetables regularly. It was also observed that okra was the only vegetable that was consumed daily (76.2%). The consumption of fruits was generally very low among the respondents. Mangoes were not taken at all (98.7%) by the respondents. Oranges and pineapple were weekly by 64.0% and 76.2% of respondents respectively.

Table 3. Anthropometric characteristics of respondents

Characteristics	Frequency (N)	Percentage (%)
Body Mass Index		
CED (<16.0)	4	13
Mild underweight (16-18.45)	4	13
Normal (18.5-24.99)	103	343
Overweight (25-29.99)	126	42.0
Obese I (30-34.99)	43	143
Obese II (35-35.99)	17	5.7
Obese III (>=40)	3	1.0
Total	300	100.0
Waist/ hip ratio		
Low risk (<0.79)	78	26.0
Moderate (o.8)	79	26.3
High risk (>0.81)	143	47.7
Total	300	100.0

Table 4. Frequency of consumption of staple foods

Item	1-3times/day	1-3times/wk	occasionally	Not at all
Staple foods				
Rice	70.3	29.0	-	0.7
Spaghetti	-	-	67.7	32.3
Whole wheat	-	5.7	1.0	93.3
Oats	-	-	21.7	78.3
Cornflakes	-	-	20.7	79.3
Bread	0.7	53.7	38.0	7.7
Lafun	19.7	26.0	16.7	37.7
Garri	28.3	52.0	-	19.7
Cocoyam	-	-	7.7	92.3
Plantain	0.7	38.7	42.7	18.0
Irish potatoes	-	-	15.0	85.0
Sweet potatoes	-	-	20.7	79.3
Yam	0.7	84.3	15.0	-
Bean porridge	18.7	8.3	34.3	38.7
Bean cake	0.7	-	35.0	64.3
Bean pudding	0.7	27.3	19.3	52.7
Agidi	0.7	8.7	19.7	71.0
Yam flour	0.7	44.7	38.7	16.0

Table 5. Frequency of consumption of beverages

Drinks	1-3times/day	1-3times/week	Occasionally	Not at all
cocoa powder	-	18.3	27.3	54.3
Kunuzaki	-	8.7	38.7	52.7
Cow milk	0.7	18.3	21.3	59.3
Yoghurt	-	1.0	45.3	53.7
Carbonated drinks	7.7	18.3	21.3	52.7
Malted drinks	-	26.3	19.7	54.0

Table 6. Frequency of consumption of animal products

Animal Products	1-3times/day	1-3times/week	Occasionally	Not at all
Beef	-	44.0	21.3	34.7
Egg	0.7	26.0	39.7	33.7
Goat meat	-	37.7	26.7	35.7
Offal	-	-	18.3	81.7
Pork	-	3.7	14.7	65.3
Poultry	10.7	78.2	5.7	5.3
Fish	92.7	-	-	6.7

Table 7. Frequency of consumption of fruits and vegetables

Vegetables And fruits	1-3times/day	1-3times/week	Occasionally	Not at all
Amarantha	-	-	7.7	91.7
Bitter leaf	-	1.0	1.0	87.7
Cochorus	-	2.0	2.0	97.3
Okra	76.2	11.7	6.7	5.3
Waterleaf	-	6.4	10.7	82.9
Pepper	-	17.1	2.0	80.9
Banana	0.7	10.7	5.7	82.9
Mango	-	-	0.7	98.7
Orange	-	64.0	10.7	82.9
Pawpaw	-	6.4	2.0	91.6
Pineapple	6.4	76.2	1.0	16.4
Water Melon	-	6.4	11.7	81.9

3.1 Result of T-test and Chi-square Test of Respondent's Anthropometry

Table shows the result of the t-test carried out to determine the degree of difference, among the two groups of women. There was a significant difference ($p<0.05$) (t -2.83) between the BMI of the menopausal and pre-menopausal women. However, there was no significant difference in the anthropometry of the two groups when the waist-hip ratios were used as a means of assessment.

4. CONCLUSION

Forty- two per cent (42.0%) of the sampled population were overweight. However, when the BMI of the two groups of women was assessed and compared, a larger percentage of the overweight respondents were the pre-menopausal women while most of the menopausal women had normal weight. However, the distribution of the fat around the body was similar in both groups of women. There was a significant difference between the BMI values of both groups of respondents but not with waist/hip ratio. The high value recorded in the respondents' BMI was as a result of the excess of their energy intake compared to their energy expenditure due to their sedentary nature, as indicated by the calculation of energy balance.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Chen YM, Ho SC, Woo JL. Greater fruit and vegetable intake is associated with increased bone mass among postmenopausal women. Br J Nutr. 2006;96:745-751. H
2. Rolland Cachera MF, Cole TJ, Sempe M. Variation of body mass index in the French population from 0 to 87 years. In Ailhaud, G. et al. (eds), Obesity in Europe. John Liberty Eurotext, Paris. 1991;113-120.

3. Grinker JA, KL, Tucker PS, Vokonas, Rush D. Changes in patterns of fatness in Adult Men in relation to Serum Indicies of Cardiovascular Risk.The Normative Aging Study. Int. J. of Obes. Metab. Disord. 2000;24(10):1369-13785.
4. Burger HG, Dudley EC, Robertson DM, Dennerstein H. Hormonal changes in Menopause Transition. Recent Prog. Horm. Res. 2002;57:257-275.
5. Subulade MO. Antropometry, Oestrogen and Calcium Status of Menopausal Women in Ibadan Metropolis of Oyo State, Nigeria, M.sc Dissertation, UNAAB; 2006.
6. Douglas O, Toyokawa S, Masaru U, Takahash H, Katsumi K. “Ti, ming of menopause, reproductive years and bone mineral density” (A cross- section study of post-menopausal Japanese women) cited in American Journal of Public Health. Vol. 148, NO.11.Printsd in USA Eaton- Evans J. Osteoporosis and role of diet. Br J Biomed Sci. 1994;51:358-370.
7. Rassanen A, Heliovaara M, Aromaa A. Overweight and anthropometric changes in adulthood: a prospective study of 17000 Finns. Int. J. Obes. 1988;12:391^01.
8. Bonithon –Kopp C, Raison J, Courbon G. Skinfold and body circumfernces as measures of body fat patterning in a French active population. J. Clin. Epidemiol. 1991;44:408^166.

Peer-review history:
The peer review history for this paper can be accessed here:
http://www.sdiarticle4.com/review-history/50847