OPEN ACCESS Pakistan Journal of Nutrition

ISSN 1680-5194
DOI: 10.3923/pjn.2024.67.72

Research Article
Assessment of Nutritional Status of Women in Pre and Post-Menopausal Stage among Teaching Staff of Federal Polytechnic Institute in North-Central Nigeria

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Abstract

Background and Objective: Women's quality of life can be affected by biological and social changes during menopause. This study was undertaken to assess the nutritional status of women in the pre and post-menopausal stage among teaching staff of Federal Polytechnic, Bida, Niger State. **Methodology:** A total of 120 menopausal women were stratified using age (30 years and above) and were selected using a systematic random sampling technique. Data on socio-economic and demographic profiles, physical activity and incidence of non-communicable diseases were collected using a well semi-structured questionnaire. The nutritional status of the respondents was determined using anthropometric indices (height, weight, waist and hip circumference) while BMI and waist-hip ratio was calculated using standard procedures. Data collected were analyzed using descriptive statistics. All statistical analyses were performed using the Statistical Package for Social Science (SPSS) version 20.0 for windows (SPSS Inc., Chicago, IL, USA). **Results:** Results showed that majority of the respondents (87.70%) were between 30-45 years, while 13.30% were between 46 years and above. Most of the respondents (62.24%) do not engage in any exercise activity, while 37.76% engaged in moderate exercise. The BMI of the respondents revealed that 13.3, 33.41 and 52.5% were normal, overweight and obese, respectively. The mean BMI of the respondents was 27.474.35, mean waist-hip ratio (WHR) of the respondents was 0.830.04. **Conclusion:** A high prevalence of abdominal obesity was observed. There is a need to sensitize the women on the intake of nutrient-dense foods (calories) and also involved in physical activity in order to prevent non-communicable diseases.

Key words: Menopause, nutritional status, physical activity, pre and post-menopausal stage¿ women

Citation: Gbadamasi, O.F. and A.R. Akinlade, 2024. Assessment of nutritional status of women in pre and post-menopausal stage among teaching staff of federal polytechnic institute in north-central Nigeria. Pak. J. Nutr., 23: 67-72.

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Competing Interest: The authors have declared that no competing interest exists.

Data Availability: All relevant data are within the paper and its supporting information files.

INTRODUCTION

Women are born with about 1.5 million ova and reach menarche with around 400,000. Most women menstruate about 400 times between menarche and menopause, using all responsive ova. When all these ova become atretic, the ovary is no longer capable of responding to pituitary gonadotropins. And the production of estrogen and progesterone and other ovarian hormone is reduced[1].

Menopause is a natural transition accompanying not only biological changes but also the social and cultural changes associated with the aging process[2-4]. It usually sometimes occurs from 40-60 years and however, marks the end of the reproductive phase of a women's life[5].

Menopause is defined as the permanent cessation of menses resulting from reduced ovarian hormone secretion that occurs naturally or is induced by surgery, chemotherapy, or radiation[6]. While most women transverse the menopausal transition with little difficulty, others may go significant stress[7]. And with the increasing age, emerging physical health problems can cause significant changes in the women's lifestyle, leading to social withdrawal, avoidance and curtailment of physical activities.

According to the definition by Stapes of reproductive aging workshop, (STRAW) in 2001, the time from the beginning of irregular menses through the first 12 months of the amenorrhea as the pre and post-menopause [8]. The period from the last menses to death as post menopause the first 5 post-menopausal years are defined as early post menopause, which is followed by late post menopause. During menopause, approximately 85% of women report experiencing symptoms of varying types and severity. In longitudinal studies during the early menopausal period the prevalence of vasomotor symptoms among women ranges from 30-80%, depressed mood occurs in approximately one third and sleep disturbance in more than 40%, diminished sexual function and virginal dryness are also common[9]. There is a significant period of physiological changes and it can be a challenging time in a woman life.

Menopause is one of the crucial stages in women's lives, which leads to various physiological changes, women experiences symptoms other than cessations of menstruation[10], in which the women are even unaware of these symptoms. Menopausal issues symptoms may be an important issue for midlife women because menopause has been associated with impaired quality of life[11,12]. However, due to a lack of specialized health care that addresses the health needs of women during this stage of pre- and post-menopause, achievements in longevity remain limited. In order to provide competent care, it is necessary to identify their health needs in others[13]. It is a well-established fact that an adequate diet is important for good health and to combat some of the complications of menopause to a certain extent. Therefore, this study was conducted to assess the nutritional status of Pre and Post-menopausal Women among Teaching Staff of Federal Polytechnic, Bida.

MATERIALS AND METHODS

A descriptive and cross-sectional study was conducted at Federal Polytechnic, Bida.

Study population and location: The respondents were female academic staff of the Federal Polytechnic in Bida. Federal Polytechnic Bida is located in south-west of Niger in Nigeria, with a population of 188,181[14]. The vegetation is drying arid; the major ethnical group is Nupe and noted for the production of traditional craft notably glass, braze arty-crafty.

Sample size/sampling techniques: The multi-stage sampling techniques were used, which include: Stratified method (to different schools and age) Systematic sampling method (according to register) after which three criteria were used to determine the appropriate sample size, the level of precision, the level of risk and the degree of variability in the attributes being measured.

$$n = \frac{n}{1 + N(e)^2}$$

Where:

n = The sample size
e = The level of precision which error is 5%
N = The total population

$$n = \frac{154}{1 + 154(0.05)^2}$$

Where:

n = 111

Therefore, the total sample size was 111.

However, to take of non-respondent and to increase representativeness, 10% was added, a total of 120 staff was sampled.

Sampling procedure: The sample was collected by proportionate allocation. It was proportional to the population density of female staff in Federal Polytechnic, Bida.

Method of data collection: A well-detailed questionnaire was used to collect the necessary information of the respondents. And the questionnaire contained different sections as follows;

Socio-economic and demographic data include: General information, lifestyle.

Nutritional status includes: Dietary information, anthropometric indices.

General information: Information about the respondent, such as age, education, occupation, type of family, income e.t.c was collected through personal interview method.

Dietary Information: Information on food habits, existing food frequency and food consumption pattern was assessed.

Anthropometric Measurement: The height (m) was measured using an anthropometric rod to the nearest 0.1 m. The respondents were weighed on a portable platform weighing balance to the nearest 0.5 kg with light-cloth. A non-flexible tape was used to measure the waist and hip circumference mad to the nearest 0.1 cm. The anthropometric data were further used in computing BMI, using the formula expressed as the ratio of weight in kilograms to height in square meters.

$$\text{BMI} = \frac{\text{Weight (kg)}}{\text{Height (m)}^2}$$

Equipment used for data collection: A portable anthropometric height meter was used to measure heights (m) of respondents and a weighing balance was used to measure the weights (kg) and the waist and hip circumference was measured using non-elastic fiber measuring tapes to the nearest cm.

Ethical consideration: This research was conducted according to the experimental protocols approved by the authority of Federal Polytechnic, Bida. Also approval from the respondents was obtained before initiation of the study.

Data analysis: The data was collected and analyzed in the computer using a statistical package for social science (SPSS), version 20.0. Data generated were subjected to descriptive statistics such as mean, standard deviation, percentage and frequencies.

RESULTS AND DISCUSSION

Table 1 shows the Socio-economic and demographic profile of the menopausal stage. The pre-menopausal women (86.7%) were between 30-45 years, while women aged 46 and above constituted 9.10% of the study population, whereas 90.90% of post-menopausal women were 46 years and above. All pre-menopausal women were married and the majority of the post-menopausal women (90.90%) were married and 9.10% of the post-menopausal women were unmarried. Only 15.30% of the pre-menopausal women had tertiary education, about 74.50% had postgraduate degree (PGD) and 10.20% had masters, while 13.64% of the post-menopausal women had tertiary education, 9.10% had post graduate degree (PGD) and 77.27% had masters. Majority of the pre-menopausal women spouse (94.90%) were civil-servant and 5.10% were business personnel, while all the spouse of the post-menopausal women were civil servant. All the pre-menopausal and majority of post-menopausal women (68.18%) belonged to nuclear type of family, while the few (31.82%) belong to a larger family. Majority (84.69%) of the pre-menopausal women and all the post-menopausal women were belong to higher income group.

Table 2 shows the BMI classification of the respondents which revealed that 0.8% of the women were underweight, 13.3% were normal, 33.3% were overweight, 27.5% were obese I and 25.0% were obese II Respectively.

Table 3 reveals the BMI of the respondents according to their menopausal stages. It is observed that 1.02% of the pre-menopausal women were underweight, 14.29% were normal, 50.00% were overweight, 19.3% were obese I and 15.31% were obese II, while 9.09% of the post-menopausal women were normal, 45.45% were overweight, 36.36% were obese I and 9.09% were obese II.

The BMI of respondent with grade I obesity was higher in post-menopausal women (36.36 kg/m) than those of the pre-menopausal women (19.39 kg/m), while the BMI of respondents with grade II was higher in pre-menopausal women (15.31 kg/m) than those of the post-menopausal women (9.09 kg/m).

Table 4 Shows the exercise behaviour of menopausal women. It revealed that higher percentages (86.36%) of the post-menopausal women do not exercise, while few do exercise (13.46%). Therefore, 37.76% of pre-menopausal women do exercise and 62.24% do not exercise.

In the present study, women with higher levels of education are more likely to be overweight or obese in relation to their physical activity in all the two phases of menopause. Similar results were reported by Guthrie[15] who

Table 1: Socio-economic and demographic profile of menopausal stage

	Pre-menopausal stage (n = 98)		Post-menopausal stage (n = 22)	
Particulars	Frequency	Percentage	Frequency	Percentage
Age (years)				
30-45	85	86.70	2	9.10
46 and above	13	13.00	20	90.90
Total	98	100.00	22	100.00
Marital status				
Married	98	100.00	20	90.90
Unmarried	-	-	2	9.10
Educational level				
Tertiary	15	15.30	3	13.64
PGD	73	74.50	2	9.10
Masters	10	10.20	17	77.27
Total	98	100.00	22	100.00
Occupation of spouse				
Civil servant	93	94.90	22	100.00
Business personnel	5	5.10	-	-
Total	98	100.00	22	100.00
Composition of family				
1-4	12	12.24	-	-
5-6	69	70.41	15	68.18
>7	17	17.35	7	31.82
Total	98	100.00	22	100.00
Family income (₦)				
>100,000	83	84.69	22	100.00
<100,000	15	15.31	-	-
Total	98	100.00	22	100.00

Table 2: BMI classification of respondents

Indices	Frequency	Percentage
Underweight		
<18.5	1	0.8
Normal		
18.5-24.9	16	13.3
Overweight		
25.0-29.9	40	33.4
Obese I		
30.0-39.9	33	27.5
Obese II		
>40	30	25.0
Total	120	100.0

WHO Classification[16]

Table 3: BMI of the respondents according to their menopausal stages

	Pre-menopausal stage (n = 98)		Post-menopausal stage (n=22)	
Variables	Frequency	Percentage	Frequency	Percentage
Underweight	1	1.02	-	-
Normal	14	14.29	2	9.09
Overweight	49	50.00	10	45.45
Obese I	19	19.39	8	36.36
Obese II	15	15.31	2	9.09
Total	98	100.00	22	100.00

involved 1181 Australian born women aged 45-55 to test whether physical activity and educational level are major contributor to health and well-being. The response rate in the groups was significantly associated with years of education, employment status, body mass index (BMI) and self-rated health of the respondents.

Table 4: Exercise behavior of the menopausal women

	Pre-menopausal stage (n = 98)		Post-menopausal stage (n=22)	
Particulars	Frequency	Percentage	Frequency	Percentage
Do you exercise				
Yes	37	37.76	19	86.36
No	61	62.24	3	13.64
Types of exercise				
Walking	25	25.51	19	86.36
Games	-	-	-	-
Any other	12	12.24	-	-
Period of initiation				
Years	19	19.39	15	68.18
Month	18	18.36	4	18.18
How many times				
Morning	32	32.65	19	86.36
Evening	5	9.10	-	-

Weight gain and waist-hip ratio (WHR) are the anthropometric indices used to assess the respondent's nutritional status. This study showed that post-menopausal women were 46 years and above and pre-menopausal women were 30-45 years, their mean height were 157±2.85 and 153±0.80, respectively, mean weight was 70 and 63 kg, respectively and their mean BMI was 29.5±4.75 and 26.7±4.05, respectively. The tendency to obesity and overweight was increased in this group due to the mean BMI. Similar result was reported by researchers who compared anthropometric measurements of mean BMI of 30 obese menopausal women aged 50 years in Kolkata (27.5±3.50), while post-menopausal women had significantly higher the waist-hip ratio (0.83±0.05 cm) than pre-menopausal (0.80±0.03 cm) and the waist circumference (110 and 103 cm) respectively, which is a risk factor for many non-communicable diseases[17]. As people age, their metabolic rate slows, so they need fewer calories to maintain normal weight. Similar result was obtained by a study[18] that was carried out on 240 women who were overweight pre-menopausal, aged (40-45) at Miami. The waist-hip ratio was used to classify the respondents (0.90±0.09 and 0.85±0.08), respectively. Abdominal obesity was found in menopausal women which is the risk factor for cardiac diseases, hypertension and type 2 diabetes mellitus, this aligns with a similar study that found higher waist circumference in post-menopausal women compared to pre-menopausal women[18]. Therefore, post-menopausal women are more prone to health complications due to abdominal obesity.

Bone mass can decrease in this stage, moderate exercise have a modest effect on preventing post-menopausal bone loss[19]. Women suffer more from chronic backache, headache and loss of bone mass, stiffness, regular cold, cough, weak muscles; they often have poor circulation during this stage.

Age of menopause is dependent on nutritional, climatic and socio-economic factors. Results of this study showed that the age at which menopause occurs is genetically pre-determined unlike the age of menarche.

In the present study, majority of the women were obese (52.5%), while 33.3% were overweight and 13.3% were normal, abdominal obesity was maximum in these two studied groups of women. A similar study reported by researchers[20] who examined the changes in body fat mass in 373 postmenopausal women aged 49-50 years in Denmark has found that regional distribution of body fat in the abdominal area is significantly related to cardiovascular risk factors independent of total adiposity or BMI. In post-menopausal women, more android fat and less ganoid fat was observed and increased weight correlated with heart disease again.

The present study expands our knowledge about dietary patterns in women at an early stage of menopause. It highlights compatibilities with current health advice concerning the prevention of diseases common at the stage of life. The similar study[21] also showed this, regarding the vitamin intake, the mean content of thiamine, of niacin and vitamin C supply. Also, the fruit and vegetables intake of post-menopausal women was less as observed in the present study, which may affect some nutrients intake (e.g., foliate, calcium, iron, vitamin D, vitamin B12, etc.). Therefore, the diets of menopausal women in these groups are inconsistent with healthy diets and it is nutritionally inadequate.

LIMITATIONS OF STUDY

One of the limitations of the study is the sample size. This limited sample may not fully represent the diverse population of menopausal women in different settings. Additionally, the

study focused on teaching staff, which may introduce selection bias and limit the generalizability of the findings to other occupations or demographic groups. It is also important to note that the data collected relied on self-reported information, which can be subject to recall bias.

CONCLUSION

In the present study, overweight and abdominal obesity was observed among women. Hence health care providers need to educate women about menopause as a time to evaluate their health, lifestyle and diet intake.

RECOMMENDATION

Menopause is an inevitable stage and therefore one must take good care of herself during this time. Having a positive attitude towards life, sharing concerns with friends, spouse, relatives, or a supportive group can help. Diet should be moderately dense in nutrient and regular exercise is necessary for healthy living. It is important to visit a gynecologist for routine health checkups in order to rule out complications as early as possible. Special attention should be paid to these groups by health care centers.

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