Assessment of Nutritional Intake and Nutritional Knowledge of Rural Post-Menopausal Women

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ABSTRACT

Menopause is one of the most challenging periods for every woman. Balanced diet and healthy life style have a great bearing on their future health. The objective of the study was to assess nutritional intake as well as nutritional knowledge in rural post-menopausal women. The study included 140 disease free post-menopausal women; non-users of HRT recruited from November 2018 to February 2019. Variables including socio-demographic and anthropometric factor, calorie and nutrient intake, food frequency as well as the nutritional knowledge were recorded for each woman. In order to determine dietary intake, information of 24-hour dietary food recall was recorded for three successive days. The results of the study revealed that majority of the respondents belonged to the age group of 45-55 years having mean age at menopause was 50.21±4.05 (45%) of them were belonged to agriculture. Actual mean food and nutrient intake of the respondent was founded to be more than RDA which may be due to their eating habits and economics status. BMI of the study population showed that 35.1% overweight and 14.4 % had grade II obesity. The findings showed that rural postmenopausal women, aged 51.65±5.40 years had energy intakes (EI) 2226±395 (1.43%) above the RDA, consisting protein (1.2%), calcium (5.2%) less than RDA and fat (42.8%) above the RDA. Food habits of the respondent indicate insufficient knowledge of nutritional need and recommendation. Low nutritional knowledge was seen in most of the study population. Nutritional knowledge was positively associated with education and socio-economic status but in this study area most of the women (56.4%) were illiterate, and (44.9%) women belong to lower income group.

Key words: - Post-menopause, nutritional knowledge, food consumption

INTRODUCTION

Natural menopause has been defined by World Health Organization (WHO) as at least 12 consecutive months of amenorrhea not due to surgery or any other cause. [1] Menopause is the time of change in a woman's life marking the end of fertility, usually occurring between the ages of 45-55 years. India has a large population, with 43 million postmenopausal women and it is projected to be 103 million by 2026. [2] The level of the hormone estrogen in the body falls which can cause symptoms such as weight gain, hot flushes, night sweats, irritability, mood swings, poor concentration, frequent headaches, joint pains or irregular periods.

Nutrition and lifestyle also have an important role to play in the management of menopausal symptoms. Diet and food intake have a pivotal role in maintaining human health. Unhealthy diet, obesity, and nutritional deficiencies may lead to various disorders. [3] The menopause is a time to look after yourself by making healthier

lifestyle choices to make this mid-life transition easier. Evidences support that increasing number of women are suffering from one or more chronic disease associated risk factors following ending of their menstrual cycles. [3] Diet and food intake have a pivotal role in maintaining human health. Unhealthy diet, obesity and nutritional deficiencies may lead to various disorders. [4]

Anthropometric value is closely related to nutrition, genetic makeup, environmental characteristics, social and cultural conditions, lifestyle, functional status and health. Anthropometric evaluation is an essential feature of gematric nutritional evaluation for determining malnutrition, being overweight, obesity.

The overall aim of this study was to evaluate the nutrients status in postmenopausal women and also to assess the nutritional knowledge of this group of women.

Objective
1. To assess nutritional status of rural post-menopausal women by anthropometric measurement
2. To analyze food and nutrient consumption by conducting diet survey.
3. To evaluate nutrition knowledge among post-menopausal women.

MATERIALS AND METHODS
A community-based sample survey was carried out among 140 postmenopausal women in Jhinjhana and Vedkheri area of the utter Pradesh.
Study period
November 2018 to February 2019.
Inclusion criteria
- Age >40 years
- Women who had their last menstrual period before 12 months
- Willing to participate
Exclusion criteria
- Perimenopausal women

- Women following a special diet.
- women, those who have undergone hysterectomy (A surgical operation to remove all or part of the uterus and women have any chronic disease.

Subjects were randomly selected. A structured questionnaire was used to collect sociodemographic. A dietary recall for 24 hours was used to obtain dietary information. Anthropometric data included (BMI = weight/height 2), waist circumference (WC), and waist to hip ratio (WHR). Weight was taken using a digital scale, recorded to the accuracy of 0.1 kg. Participants were wearing lightweight clothing and without shoes. BMI was interpreted according to the World Health Organization (2012) recommendations. Waist circumference was measured with an inelastic tape at the midpoint between the iliac crest and the lower border of the last floating rib at the end of a normal expiration. Waist circumference was considered high when waist circumference >80 cm.

$$BMI\ (kg/m^2) = BW\ (kg)/\ BH\ (m)^2$$

RESULT
(Table 1) reveals the percentage distribution of rural post-menopausal women according to socio demographic variables followed by age of women, age at menopause, caste, religion, type of family, marital status, education of the women, occupation of the women and socioeconomic status of the respondent.

In (Table 2) out of the total 140 rural post-menopausal women were33 (23.5%) underweight, 36 (25.7%) were heaving the normal body weight, 50(35.7%) were overweight, 15(10.7%) were grade I obese and 6(4.2%) were suffer from grade II obesity. WHR observations show that 55% of the postmenopausal women were at risk of obesity.

Table 1: General characteristics of the rural post-menopausal women

S. No	Socio demographic variable	Category	Postmenopausal women (140) n (%)
1.	**Age in year**	**45-50**	**10**
		50-55	15
		55-60	**35.7**
		60-65	20
		65-70	14.2
		≥ 70	**5**
2.	**Religion**	**Hindu**	**88**
		Muslim	**11.4**
3.	**Type of Family**	**Joint**	**24.2**
		Nuclear	**75.5**
4.	**Marital Status**	**Married**	**62.8**
		Widowed	**35**
		Separated	**2.1**
5.	**Education of women**	**Illiterate**	**56.4**
		Primary	**14.2**
		High School	**6.4**
		Intermediate	**18.5**
		Graduate	**4.2**
6.	**Occupation of women**	**Housewife**	**35.7**
		Service	**5.7**
		Business	**2.1**
		Labor	**11.4**
		Agriculture	**45**
7.	**Socio economic status**	**(Upper) >5156 Rs**	**25**
		Upper middle	**7.1**
		Lower middle	**22.8**
		Lower	**44.9**
8.	**Age at menopause**	**35-40**	**4.2**
		40-45	**7.1**
		45-50	**18.5**
		50-55	**70**

Table 2: Classification of post-menopausal based on BMR and WHR

BMI	Presumptive diagnosis	Study population (n=140)	
		Frequency	**%**
≤18.5	**Under weight**	**33**	**23.5**
18.5-22.9	**Ideal BMI**	**36**	**25.7**
≥ 23	**Over weight**	**50**	**35.7**
≥ 25	**Obese I**	**15**	**10.7**
≥ 30	**Obese II**	**6**	**4.2**
WHR			
0.80	**Normal**	**63**	**45**
≥ 0.80	**Obese**	**77**	**55**

Table 3: Mean food intake(g) among the study population

S. No	Food groups	Less than RDA	Equivalent to RDA	More than RDA	Actual mean food intake	Balance diet for moderate worker RDA	%of deficiency or excess
1.	**Cereals**	46	14	80	**355.7**	330	**7.78+**
2.	**Pulses**	68	40	32	**34**	75	**54-**
3.	**GLVs**	22	40	78	**116.3**	100	**16.3+**
4.	**Other vegetable**	76	30	34	**266.5**	200	**33.2+**
5.	**Roots and tubers**	44	16	80	**242.5**	200	**21.2+**
6.	**Fruits**	102	9	30	**45.2**	100	**54.8-**
7.	**Milk & milk products**	80	22	38	**169.5**	200	**15.2-**
8.	**Sugar and jaggary**	83	33	24	**27.82**	30	**7.26+**
9.	**Fat & oil**	35	50	55	**31.82**	28	**13.64+**

(Table 3) The data on food intake of respondent showed that cereal & millet consumption was more that RDA in 80 respondents. The actual mean consumption 355.7 which 7.78% excess in comparison to RDA. Pulse consumption was found to be less than RDA 68 respondents and actual mean consumption was 34 which is less

than 54% in comparison to RDA. Leafy vegetable and other vegetables consumption were to be excess by 16.3% & 33.2%. milk and milk product were found to be less than RDA by 15.2%. Main source of milk was tea, curd and milk. As group of these women belong to agriculture family the consumption of green leafy vegetable and other vegetable is higher than RDA. Due to lack of knowledge the fat and oil, sugar consumption was found to be higher than RDA i.e. 13.64% and 7.26%.

Table 4 shows the mean daily energy intake among the study participant was 2262±395.6 kacl/day. The protein and calcium intake were found to be less than RDA 54.34±12.9 (1.2% less than RDA) and 568.3±172 (5.2% less than RDA) respectively. However, the fat consumption was found to be excess by 35.7±10.6 (42.8%).

Table 4: Mean nutrient intake among the study population

Nutrient	Mean±SD	RDA for moderate activity	% of excess or deficiency RDA
Energy	**2262±395.6**	**2230**	1.43+
Protein	**54.34±12.9**	**55**	1.2-
Fat	**35.7±10.6**	**25**	42.8+
Calcium	**568.3±172**	**600**	5.2-
Iron	**21.6±10.7**	**21**	2.8+

Table 5: frequency of consumption of calcium rich food by the study population (n=140)

Foods	Daily	Twice a week	Trice a week	Weekly	fortnight	Monthly	occasionally	Not at all
Milk products	140(100.0)	-	-	-	-	-	-	-
Nuts and oilseed	-	-	10(7.14)	54(38.57)	-	-	43(30.7)	33(23.5)
Soy products	7(5)	-	-	16(11.42)	-	15(10.71)	6(4.2)	96(68.57)
GLVs	-	6(4.28)	64(45.71)	17(12.14)	53(37.8)	-	-	-

Table 5 Shows the frequency of calcium rich food by post-menopausal women. All the study population consumed milk product daily. About 38% of the women consumed nuts and oilseed weekly, 30.7% consumed occasionally, only 7.14% consumed nuts and oil seed trice in a week. Whereas 23.5% women did not consume at al.

Maximum number of post-menopausal women (45.71%) consumed green leafy vegetable trice in a week followed by weekly (12.14%) and (37.8%) fortnightly. Maximum number of post- menopausal women did not consume soy product at all. Only (5%) women consumed soy product daily. Very few women consumed soy products weekly (11.4%) and monthly (10.7%).

Table 6. Nutritional knowledge among study population

S. No	Knowledge items	Correct answers by post menopause women n (%)
1.	Requirement of nutrient for a balance diet	28 (20)
2.	How to obtain necessary nutrient	28(20)
3.	The most energy (Kcal) provider nutrient	98(70)
4.	The type of nutrients for body building	54(38.5)
5.	Foods with the highest fiber content	32(22.8)
6.	High Cholesterol food content	28(20)
7.	Food with the highest calcium content	112(80)
8.	The outcome of excessive caloric intake	112(80)
9.	The prospect of high sugar intake	98(70)
10.	Effect of poor calcium intake	112(80)
11.	The type of food that provide phytoestrogen	Nil
12.	The benefit of phytoestrogrnic food	Nil

(Table 6) reveals the percentage of nutritional knowledge in rural post-menopausal women.

DISCUSSION

Dietary practices and nutritional knowledge have a potential to affects a person's quality of life. Studies focussing on current dietary intake among rural postmenopausal women are scarce. Inadequate nutrient intake and poor knowledge about their nutritional requirement may impose a risk for affecting the health. The present study has 2 main objectives; first: to assessed the nutrients and energy intake of postmenopausal women and its relationship to BMI and

second is to assess the nutritional knowledge of the study population.

A large study carried out by *Davis SR* [6] also stated that the accumulation of fat during menopause is more concentrated in the abdomen. Increased waist circumference and WHR may be explained by sedentary lifestyle, faulty dietary practices which cause increased accumulation of abdominal fat, decreased basal metabolic rate with age and decreased energy expenditure which has also been studied among 402 postmenopausal women in Mysore, Karnataka. [7]

In the present study 36(25.7%) rural postmenopausal women had normal BMI and 33 (23.5%) rural were underweight whereas 50 (35.7%) rural women were overweight. Grade I obesity was seen in 10.7% post-menopausal women while Grade II Obesity was seen in only 6 (4.2%) rural women. The study conducted by *Ranasinghe, C.,* in 2017 Department of Allied Hospitality Studies, Manipal University, Manipal Karnataka *India* showed that 57% women belonged to normal range of BMI which is more than to the findings of the present study while 30 % were suffer from grade I and 17% from grade II obesity in their study which is more than findings of the present study. [8] Generally, women have more complex and stressful aging process than men do, as a consequence of hormonal changes that occur during menopausal transition. [9] The onset of this physiological development not only marks the end of women's reproductive function but makes them more vulnerable to a new set of health problems including cardiovascular diseases, osteoporosis.

The RDAs for the postmenopausal women were compared with the current dietary intake and gaps in the macro- and micro-nutrient intake were observed. The mean daily energy intake among the study participant was 2230 ± 395.6 kcal, Protein 54.34 ± 12.9 g, fat 35.7 ± 10.6 g, calcium 568.3± 172 mg, Iron 21.6 ± 10.7 mg. This result is supported by the study carried out by *Raj JP in 2015 CSI Hospital, Erode, Christian Medical College, Vellore, Tamil Nadu, India.*Where The mean dietary calcium intake was 632.72 ± 28.23 mg/day. The proportion of women consuming less than 800 mg/day of dietary calcium was 74.5%. [10] It was observed that fats were consumed in excess among all the socioeconomic groups, which indicates that the postmenopausal women were following faulty dietary habits. The intake milk and milk products, pulses and fruits were lower than RDA. All food groups' intakes were inadequate when compared except for sugars, and fat and oil, vegetables which were significantly higher than the RDA. Frequency of the consumption calcium rich food and Phyto estrogenic rich food also observed in this study, which indicate that about 38% of the women consumed nuts and oilseed weekly, 30.7% consumed occasionally, only 7.14% consumed nuts and oil seed trice in a week. Whereas 23.5% women did not consume at al. Maximum number of post-menopausal women (45.71%) consumed green leafy vegetable trice in a week followed by weekly (12.14%) and (37.8%) fortnightly. Maximum number of post- menopausal women did not consume soy product at all. Only (5%) women consumed soy product daily. Result of *Bhurosy, T., & Jeewon, R. (2013)* in Department of Health Sciences, Faculty of Science, University of Mauritius also supported the result of current study as they indicate the frequency of calcium rich food product were low. [11] Very few women consumed soy products weekly (11.4%) and monthly (10.7%). Nutritional knowledge also checks of all study population with specific pre-designed questions.

This study recommends education and interventions on healthy eating, healthy life style which is necessary to promote and improve healthy ageing and to overcome the post-menopausal problem. The following study limitations are important when considering the reported findings. The small sample size due to convenience sampling restricts in generalizing the findings Even

though the study collected dietary information by 24 h recall for 3 days, the estimations and recall may be faulty. The study is relevant with the current scenario among postmenopausal women as growing numbers are observed in the postmenopausal community. Batter food intake and Nutrition knowledge have a major impact on the health and the well-being of the postmenopausal women.

CONCLUSIONS

The study highlights the poor intake of protein, calcium and saturated fat intakes were meeting the RDA for postmenopausal women. Based on the observed results among the postmenopausal women, all food group intakes were inadequate except sugars, fat and oil and cereals. Majority of the postmenopausal women had BMI above 23 (overweight).

Recommendation

Menopausal health demands priorities in Indian scenario due to increase in life expectancy and growing population of menopausal women. Great efforts are required to educate and make these women aware of menopausal symptoms, reduction of discomfort and enable them to seek adequate nutrition. In India, postmenopausal women are yet to be covered in any specific health program in contrast to their younger counterparts (RCH, ICDS etc.) hence policy makers should evaluate successful programs for the menopausal women of other countries and adopt them to suit local conditions and economic viability.

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