Original Research Article

The nutritional status comparison between the rural and urban post-menopausal women in Ayodhya district.

Abstract

The current study aimed to evaluate the nutritional status and identify nutritional status among post- menopausal women in Ayodhya districts. The sample has comprised 150 post-menopausal women from rural and 150 from urban area aged 45-65 years. A self-structured questionnaire based on SES Agarwal 2005 was used for data collection. This study revealed educational attainment is higher in urban areas, with more women having graduate and postgraduate qualifications. However, rural areas show higher percentages of women with metric and intermediate education. Dietary intake shows that both rural and urban populations consume energy and protein slightly below to the (RDA) recommended dietary allowances, while fat intake of post-menopausal women, in rural and urban areas, exceeded the recommended level of 25 grams per day, i.e. 31.68±4.0 gm and 30.4±4.9 gm consuming fat. respectively in urban and rural area . Wheat and rice are staple foods for both groups, with minimal variation, while flaxseed consumption is higher in urban areas. Presented data has compared nutrient intake to RDA recommended dietary allowances among rural and urban area has found that energy, carbohydrates, iron, vitamin C, zinc, and phosphorus nutrient intake is low. Despite slight variations in both rural and urban areas demonstrate suboptimal nutrient intake, highlighting the need for dietary interventions to address deficiencies.

Key word: Post-menopausal women, Nutritional Assessment, Recommended Dietary intake

1. Introduction

The term 'menopause' refers to the permanent cessation of menstrual periods."(agarwal et al., 2018) Menopause is a key physiological milestone in a woman's life, characterised by the termination of spontaneous menstrual periods.

This cessation stems from a decline in the levels of the sex hormones estrogen and progesterone, coupled with a concurrent elevation in follicle-stimulating hormone (FSH) and luteinizing hormone (LH). This hormonal shift occurs concomitantly with the depletion of the

ovarian reserve. "Researchers and healthcare professionals commonly concur on defining menopause as the cessation of menstrual periods for a minimum of twelve consecutive months following the last menstrual period. In the Indian context, the average age of menopause is reported to be approximately 46.2 years." (Ahuja, 2016).

Women's health has been a global concern for many decadesShailendra Kumar Mishra, "Menopausal Transition and Postmenopausal Health Problems: A Review on Its Bio-Cultural Perspectives," *Health* 03, no. 04 (2011): 233–37, https://doi.org/10.4236/health.2011.34041. The Indian Menopausal Society has projected that by the year 2025, there will be 103 million menopausal women in India. The relatively lower age of menopause observed in India, averaging at approximately 47.5 years, compared with an increasing life expectancy reaching 71 years, necessitates Indian women to navigate through approximately one-third of their lifespan in the menopausal phase. Marya Ahsan and Ayaz Khurram Mallick, "The Effect of Soy Isoflavones on the Menopause Rating Scale Scoring in Perimenopausal and Postmenopausal Women: A Pilot Study," *Journal of Clinical and Diagnostic Research: JCDR* 11, no. 9 (2017): FC13.

More than 80% of women experience physical or psychological symptoms in the year approaching menopause with various distresses in their lives, leading to decrease in quality of life. India has large population, which has already crossed 1 billion mark, with about 586 million females out of which approximately 96 million women are aged above and this number is expected to increase to 401 million by 2026 (Census of India, 2011) Factors that affect age at menopause may have important clinical implications because early menopause is associated with an increased risk of cardiovascular disease and osteoporosis, whereas delayed menopause has been associated with increased risk of breast cancer and endometrial cancer (Goyal et al., 2017) Therefore, the proper conditioning of peri-menopausal women's bodies is significant in improving the symptoms and preventing chronic diseases. Shuping Hao et al., "Dietary and Exercise Interventions for Perimenopausal Women: A Health Status Impact Study," *Frontiers in Nutrition* 8 (2022): 752500. The Zhu JM.(2018) study found that diet and exercise therapy for obese postmenopausal women can significantly improve blood lipid levels, improve insulin resistance, reduce plasma insulin levels and effectively prevent type 2 diabetes. Nutrition plays a vital role as a determinant of wellbeing and quality of life of an individual. Health and wellbeing of any individual depends on various factors like physical, social, psychological and nutritional. Aging is a process that is marked by certain changes in the body and functional ability which has an overall negative effect on the health and life style of elderly (. Shah *et al.*, 2017). Well proporsnate balanced diet helps in maintain healthy life and combat complications associated with menopause. (Goyal et al., 2012). Nutrients such as calcium, iron, fibre, omega 3 fatty acids, phytoestrogens and complex carbohydrates, rich diet is highly advised to manage menopause and prevent its

negative effects. also, evidence indicates that high fibre and low glycemic index foods intakes may be associated with a reduced risk of depression (Gangwisch et al. 2015; Daneshzad et al. 2020). The MD, to date, few data are available on the dietary intake in women with PCOS by using the seven-day food records, which is recognised as the "gold standard" for careful nutritional assessments Barrea *et al, (2019),* A healthy lifestyle that includes exercise, a balanced diet, and a commitment to abstaining from alcohol, tobacco, and other addictive substances is advised. In advancing years, a positive attitude and mental health increase quality of life (QOL). Although poor diet may play a role in the development of osteoporosis, the nutrition research focus has shifted from the examination of single nutrients such as calcium and vitamin D to food groups such as dairy and fruit & vegetables and dietary patterns are highly rich in potassium, magnesium, vitamin C, and niacin according to **Hamidi 2011.** Folates are linked to delay the onset of menopause and lengthens the reproductive life span. Antioxidants reduce the damaging effects of reactive oxygen species on the quantity and quality of ovarian follicles **(Singh et al., 2023; Dasgupta and Ray, 2009; Macdonald et al., 2008)** whole grains, meat, fish, nuts and legumes has been found to have a beneficial impact on bone strength, which is directly linked to enhanced BMD and lower fracture risk. Recent findings have shown that Mediterranean diet adhesion is osteoporosis protective (**Zupo et al. 2020)**. Menopause shows not only biological changes but also the social changes associated with the natural aging process, it is a taboo matter for the society that represents as loss of youth, loss of attractiveness, loss of possibilities. **Soares and Taylor (2007)**reported that in ovary, there is a depletion of ovarian follicles and no longer able to respond to the pituitary hormones, that is, follicle-stimulating hormone (FSH) and luteinizing hormone (LH), and ovarian estrogen and progesterone production ceases, so ovulation becomes somewhat erratic **Lalo, R., (2017).**

This study aims to analyse the dietary intake of rural and urban populations, focusing on energy, protein, fat, and various nutrients in comparison to the Recommended Dietary Allowances (RDAs). It includes the intake of staple foods, seasonal variations, and differences in nutrient intake between rural and urban areas. The study emphasises the importance of dietary interventions and addresses deficiencies in both rural and urban post-menopausal women.

2. Material Method

This study was conducted in 12 month period from August, 2022 to July 2023. It is a cross-sectional study done in randomly selected urban (150) post menopause and rural (150) post

menopause women of Ayodhya district. Variables including age, anthropometric factors height, weight, nutrients intake, nutrient adequacy as well as the food habits were measured.

Total 300 post -menopausal women were identified for collecting information. The women were asked face to face interview and structured questionnaire was used in this study. The collected data included background characteristics, socio-economic status, and psychological well-being. Additionally, general health examination was conducted as part of the study protocol.

1. **Body Mass Index (BMI): (Kg/m^2)**

The BMI of the respondents were calculated using data on height and weight of the respondent using the equation given by Garrow (1981).

$$BMI = \frac{Weight(Kg)}{Height(meter)^2}$$

Body weight and height were measured as using weighing scale and non–stretchable tape and Body mass index (BMI) was calculated by the ratio of weight in (kilograms) to the square of height in meters **(Lee & Nieman 2013).**

2. **Adequacy of food**

For dietary assessment, Arabic Food Frequency Questionnaire (FFQ), which has been developed and tested previously for reproducibility and validity([1]**Tayyem et al. 2014)** was used to determine dietary patterns associated with the risk of osteoporosis. The FFQ questions track the information on the dietary history of participants which assess the dietary habits, Food intake of participants. Food Frequency was classified as per Food plates: Cereals, Plusses, millets, vegetables, milk and dairy products. The adequacy of food and nutrient intakes of the subjects were categorized into the following four groups:

Table No: 1 Adequacy of food/nutrient intake

%SDI (Suggested Dietary Intake)	**Score**
100% and above	I
75-99.9%	II
50-74.9%	III
Below 50%	IV

3. Nutrient intake

The intake of different nutrients like energy, protein, fat, calcium, iron, zinc, phosphorus, has been calculated from foods consumed by the subjects using Food Composition Table. The Average daily nutrient intake of the subjects was compared with Recommended Dietary Allowance (RDA) given by ICMR (2020). Nutrient Adequacy Ratio (NAR) (%) has calculated as:

$$NAR = \frac{Nutrient\ Intake}{RDA} \times 100$$

The frequency of food consumption was determine using food frequency questionnaire. Statistical analyses were conducted using (SPSS) Statistical Package for the Social Sciences and Microsoft Excel. The results has presented as mean ± standard deviation. Chi-square was used to detect the differences among categorical variables.

Results and Discussions

Table: 2

Socio-demographic profile of post- menopausal women

			Rural N=150	Urban N=150	X^2
Age Group	45-50	n	69	75	0.801^{NS}
		%	47.9	52.1	
	50-55	n	38	36	
		%	51.4	48.6	
	55-60	n	22	23	
		%	48.9	51.1	
	60-65	n	21	16	
		%	56.8	43.2	
	Married	n	107	104	

		%	71.3	69.3	
	Unmarried	n	2	7	0.302^{NS}
Marital Status		%	1.3	4.7	
	Widow	n	31	26	
		%	20.7	17.3	
	Divorce	n	10	13	
		%	6.7	8.7	
Monthly Income	<15000	n	31	19	
		%	20.7	12.7	
	15000-30000	n	51	36	
		%	34	24	0.008
	31000-50000	n	48	56	
		%	32	37.3	
	> 50000 1,000,00	n	20	39	
		%	13.3	26	

Table: 2 presented demographic data of post-menopausal women 150 each residing in rural and urban area. There was no significant association between age groups and the distribution of women, chi-square value 0.801.

The data has presented that the distribution of post-menopausal across different marital statuses, along with corresponding percentages. It shows that the married 71.3, 69.3% respectively in rural and urban area, followed by widowed with lower percentages for unmarried and divorced categories. The chi-square value of 0.302 with non-significant suggests no significant association between marital status of respondents.

The data indicates a significant portion 0.008 of individuals earning moderate to high incomes, with the majority falling within the middle-income brackets. There was a smaller representation of individuals with lower incomes, suggesting a varied socioeconomic distribution within the sample.

Table: 3 The mean of Height, Weight, and BMI between two difference groups

Anthropometric factors	Urban Area (N=150)	Rural Area(N=150)	P value
Height (cm)*	154.03±4.04	152.75± 4.41	0.04
Weight(kg)*	56.95±4.14	54.83± 4.48	0.06

BMI (kg m^2)*	24.05±2.09	23.56± 2.37	0.03

The data regarding anthropometric measurement of 150 menopausal women each from rural and urban areas in ayodhya district revealed statistically significant difference . In mean height (cm), mean weight(kg) and(BMI) body mass index (kg/m^2). The Height, Weight and BMI of Urban women was higher than rural women which is similar to the study by Kamadjue et al (2006) about obesity of urban women in Comren. The mean height of rural women was 152.75±4.41 cm whereas for urban women mean height was 154.03 ± 4.04. In a study conducted by Nemati and Baghi (2008) in rural and urban in Iran found that average height in rural areas was 152.1±7.9, while in urban area the height 155.1±7.6. In this study the mean weight of urban women was 56.95+4.14 whereas for rural women were 54.83±4.48.The BMI of urban women (24.05±2.09) kg/m2) was significantly higher than rural women (23.56±2.37).. Frequent eating has been reported to be associated with increased body fat in post - menopausal women (Yallakoulia et al) 57.5%,17%,5.5% and 3.5% rural women were normal, overweight, pre obese and obese

Table: 4 The frequency of variables in different literacy

Location	**Education**						**X^2**
	Illiterate	**Primary**	**Metric**	**Intermediate**	**Graduate**	**Post Graduate**	
Rural	2(1.3)	16(10.7)	22(14.7)	42(28.0)	36(24.0)	32(21.3)	0.553
Urban	1(0.7)	14(9.3)	19(12.7)	32(21.3)	43(26.7)	41(27.3)	

Table 4 Indicate educational status of rural and urban women in the rural areas the percentage of illiterate, primary. In urban areas higher percentage of women were graduates (26.7%) post Post Graduate (27.3). The percentage of illiterates, primary, metric and Intermediates pass rural women was 1.3,10.7,14.7 and 28% respectively while in urban areas the values were 0.7,9.3,12.7 and 21.3%.Goyal,et al in 2017 reported 86% illiteracy among rural women from rural blocks of Allahabad districts. It shows that the literacy level of rural women in Ayodhya district is much better than Allahabad.

Table: 5 Categorization of rural urban menopause women BMI as per WHO

Local	**Body Mass Index Score**

	<18.5 (Underweight)	18.5-24.9 (Normal)	25.0-29.9 (Overweight)	>30.0 (Obese)	Mean±SD	P value
Rural	5(3.3)	96(64.0)	47(31.3)	2(1.3)	23.56±2.37	**0.032**
Urban	1(0.7)	94(62.7)	53(35.3)	2(1.3)	24.05±2.09	

Value in percent Parenthesis is in percentage, Different is Significant at the 0.05 level (2tailed): All Values are mean±SD

Categorization of urban and rural post -menopausal women BMI as per WHO BMI score showed that significant difference. Incas of rural area 3.3 % women were underweight (<18.5, Underweight) as compare to only 0.7 % urban women. The women who were having normal BMI was 64 and 62.7% in rural and urban areas, respectively. The percent of women weighing overweight were 31.3 % in rural areas and 35.3% in urban areas. Goyal et.al (2017) reported distribution of Post- menopausal urban and rural women and found significant differences in the BMI Score. Incas of rural areas 16.5% women were underweight while in urban areas only 9 % were under weight.

According to Kozakowski *al.* (2017) Weight gain frequently occurs during menopause, primarily as a result of hormonal fluctuations, although factors such as genetic predisposition, poor dietary choices, and a sedentary lifestyle also play significant roles. In both clinical and epidemiological contexts, BMI serves as the predominant indicator for assessing both individual and population-wide nutritional status. This research broadens our understanding of dietary habits among women in the initial phase of menopause.

Table: 6 Nutrient adequacy of rural and urban post -menopausal women of Ayodhya district

Nutrient	RDA	Rural	NAR	Scoring	Urban	NAR	Scoring
Energy(Kcal)	2130	1838.78±479.1	86.29	II	1941.72±367.07	91.16	II
Protein(g)	45	45.15±8.0	100.33	I	47.24±7.2	104.97	I

CHO(g)	175	138.21±5.6	78.85	II	141.22±4.4	80.69	I
Fat	25	30.04±4.9	120.16	I	31.68±4.0	126.72	I
Fibre	40	41.14±3.6	102.5	I	39.2±4.6	98	II
Calcium(mg)	1000	972.68±225.9	97.26	II	1011.52±238.4	101.15	I
Iron	29	24.80±4.9	85.51	II	27.20±3.8	93.79	II
Vit. C	65	59.14±7.0	90.98	II	61.40±4.6	94.46	II
Zinc	13	12.78±2.2	82.92	II	15.77±2.0	75.11	II
Phosphorous	1000	893.63±183.2	89.36	II	927±197.2	92.7	II

NAR* Nutrient adequecy ratio , CHO* Carbohydrate

The data of nutrient intake among rural and urban women reveals several key findings.The nutrient intake of energy, protein, carbohydrtes, fat, fibre, calcium, iron, vitamin C, zinc and phosphorus of rural and urban women of Ayodhya district was calculated by using 24 hour recall method. The nutrient adequacy ratio was calculated and it was found that the energy, protein, fat, iron, vit. C, zinc and phosphorus was same and they fall in the score II that was 75-99.9% adequacy. The intake of rural population Scored II for CHO and calcium intake of rural women was higher as whereas fibre score of rural population was higher (Score I) 100 as compare to urban population i.e. 75.9-99.9%. Nemati and Baghi They reported Mean daily calories and nutrient intake of Ardebile women in different area of Iran. The calories, Protein, carbohydrates, fiber, total fat, saturated fat, vit B1, vit B2, Vit. B3, Vit. B6, folic acid, calcium, iron, zinc and selenium of rural women was higher than urban women.

In the present study it was found that energy intake of both rural and urban population was slightly less than the RDA whereas the protein intake was slightly higher than the RDA. The fat intake of post -menopausal of urban and rural women was (31.68±4.0) and 30.4±4.9 which is much higher than the recommended that is 25 g per day. Rural and urban populations exceed fat intake, indicating a potential overconsumption of fats in their diets. The intake of almost all other nutrients i.e. Iron vit. C Zinc and phosphorus less than the RDA both in rural and urban population villarino -Rodriguez et al. (2002) was showed regarding the vitamin intake, the mean dietetic content of thiamine, niacin and vitamin C supplies the 100% of the recommended intake of the population in study women similarly is our study. This effect shows the problem of osteoporosis and osteomalasia in women. Iron, zinc, and phosphorus intake are insufficient in both rural and urban populations, indicating

potential deficiencies in anaemia. Several minerals other than calcium and phosphorus play essential roles in bone health (Bunker, 1994). The food frequency questionnaire correctly identified subjects with calcium intakes below the Malaysian recommended daily allowance (450 mg day^{1}) with 60% specificity and with 92% specificity for women consuming less than 800 mg calcium day (Chee et al, 2002). Postmenopausal women in this study, having dietary calcium intakes far below the recommendations for their age, may be at increased risk of osteoporotic hip fracture later in life.

Table: 7 Food Frequency consumption of Post- menopausal women

This Table provides data on the consumption patterns of wheat daily consumption in urban and rural area was 97%, 96%. Rice daily intake was also similar i.e. 96%,94% respectively

Food Groups	Local		Daily	Weekly	Fortnightly	Monthly	Seasonally	Occasionally	Never
Wheat	Rural	n	146	4	0	0	0	0	0
		%	97.3	2.7	0	0	0	0	0
	Urban	n	145	5	0	0	0	0	0
		%	96.7	3.3	0	0	0	0	0
Rice	Rural	n	144	6	0	0	0	0	0
		%	96.0	4.0	0	0	0	0	0
	Urban	n	142	8	0	0	0	0	0
		%	94.7	5.3	0	0	0	0	0
Ragi	Rural	n	1	2	0	1	32	36	78
		%	0.7	1.3	0.0	0.7	21.3	24.0	52.0
	Urban	n	0	1	4	8	29	30	78
		%	0	.7	2.7	5.3	19.3	20.0	52.0
Rajma	Rural	n	0	27	36	42	0	21	24
		%	0	18.0	24.0	28.0	0	14.0	16.0
	Urban	n	0	33	28	42	0	23	24
		%	0	22.0	18.7	28.0	0	15.3	16.0
Paneer	Rural	n	0	12	21	41	0	48	28
		%	0	8.0	14.0	27.3	0	32	18.7
	Urban	n	0	16	24	37	0	42	31
		%	0	10.7	16.0	24.7	0	28.0	20.7
Egg	Rural	n	0	13	10	16	0	20	91
		%	0.0	8.7	6.7	10.7	0	13.3	60.7
	urban	n	2	12	14	18	0	22	82
		%	1.3	8.0	9.3	12.0	0	14.7	54.7
Flax Seed	Rural	n	0	0	12	56	0	50	32
		%	0	0	8.0	37.3	0	33.3	21.3
	urban	n	0	1	12	50	0	56	31
		%	0	0.7	8.0	33.3	0	37.3	20.7
Milk	Rural	n	92	33	12	4	6	3	0
		%	61.3	22.0	8.0	2.7	4.0	2.0	0
	urban	n	81	31	10	5	16	7	0
		%	54.0	20.7	6.7	3.3	10.7	4.7	0
Curd	Rural	n	60	36	9	0	0	9	36
		%	40.0	24.0	6.0	0	0	6.0	24.0
	urban	n	62	38	10	0	0	6	34
		%	41.3	25.3	6.7	0	0	4.0	22.7
Vegetables Bottle gourd spinach	Rural	n	0	3	7	3	132	0	5
		%	0	2.0	4.7	2.0	88.0	0	3.3
	urban	n	0	5	8	4	131	0	2
		%	0	3.3	5.3	2.7	87.3	0	1.3
	Rural	n	0	0	0	0	142	2	6
		%	0	0	0	0	94.7	1.3	4.0
	urban	n	0	0	0	0	145	3	2
		%	0	0	0	0	96.7	2.0	1.3
Fruits Apple	Rural	n	0	13	20	20	65	19	13
		%	0.0	8.7	13.3	13.3	43.3	12.7	8.7
	urban	n	2	22	23	31	57	10	5
		%	1.3	14.7	15.3	20.7	38.0	6.7	3.3
Pomegranate	Rural	n	5	6	6	120	11	2	0
		%	3.3	4.0	4.0	80.0	7.3	1.3	0
	urban	n	6	9	7	119	7	2	0
		%	4.0	6.0	4.7	79.3	4.7	1.3	0

among rural and urban post-menopausal women. This data suggests that wheat and rice is a staple food item consumed frequently on a daily basis by a vast majority of both rural and urban post-menopausal women, with minimal variation in consumption frequency between the two areas.

In rural and urban areas, similar result was reported that 52.0% of ragi millets are never consumed among both group. This suggests that ragi consumption, while less frequent compared to staple grains like wheat and rice, is still prevalent among both rural and urban post-menopausal women, particularly on an occasional basis, with similar consumption patterns observed across different intervals in both area. . It is similar to the findings of Anbukkani *et al*. (2017) who conducted a study to determine the consumption pattern of minor millets in India and found that small millets and ragi consumption of Rajasthan was very less with 0.75 kg/household/month and 0.56 kg/household/month respectively.

The consumption patterns of rajma (kidney beans) among rural and urban post-menopausal women represents a different consumption interval (e.g., daily, weekly, fortnightly, monthly, seasonally, occasionally, never. In rural areas, there is no reported consumption of rajma on a daily or seasonal basis 18.0% of women consume it weekly, 24.0% fortnightly, and 14.0% monthly. Similarly, in urban areas, no consumption of rajma is reported on a daily or seasonal basis. However, 22.0% of women consume it weekly, 18.7% fortnightly, and 15.3% monthly.

Milk intake daily in rural area was 61.3% which was higher than urban area 54%. Curd intake in urban area was reported 41.3% while in rural area it was 40%. Mathuriya (2013) conducted a study to assess the consumption pattern of milk and milk products in Lucknow city and found that all the households consume milk, while 80.83 and 26.67 per cent of them consume paneer and curd respectively. His results are little similar to the findings of the present studies which show that maximum of the menopausal women (95-100%) consume milk. paneer and curd consumption in rural area, was reported. 8.0% weekly, 14.0% respectively.it fortnightly, and 27.3% consume it monthly. Notably, paneer consumption among rural women 32.0% occasionally. Result was slightly higher than rural area 10.7% of women consume paneer weekly, 16.0% consume it fortnightly, and 24.7% consume it monthly. 28.0% of urban women consume paneer occasionally. In rural and urban area egg consumption is reported highly on the basis of occasionally as, 13.3%, and 14.7% respectively. Mathuriya (2013) In a study evaluating milk and milk product consumption patterns in Lucknow city, it was discovered that all households consumed milk, while 80.83% and 26.67% of them consumed paneer and curd, respectively.

Flaxseed consumption among rural and urban post-menopausal women.8.0% of women consume flaxseed weekly, 37.3% consume it fortnightly and 33.3% consume it monthly. Whereas in urban area flaxseed consumption was higher in occasionally i.e. 37.3%.

Vegetables like bottle gourd intake seasonally in rural and urban area were 88%, 87.3% respectively. Spinach intake in urban area 96.7% and in rural area slightly low i.e. 94% respectively.in fruits Apple and pomegranate intake in rural and urban areas 43%, 4.7% seasonally. In rural area it was 43& and 7% which shows that pomegranate consumption is less than apple fruits. concludes that 72.5-95 per cent of the subjects Mamgain(2019) cnclued in her study that intake of bitter gourd, round gourd and ivy gourd seasonally. Moreover, 32.5-55 percent of the subjects consume spine gourd and drumsticks seasonally.

3. Conclusion

In rural areas, there is a higher proportion of married women compared to urban areas, while urban areas have more unmarried women. However, widowed individuals are slightly higher in rural areas, whereas divorced percentages are higher in urban areas. Anthropometric measurements of menopausal women from both rural and urban areas in Ayodhya district indicate statistically significant differences in mean height, weight and BMI between the two groups. Rural areas have higher percentages of illiterate and primary-educated women compared to urban areas. Urban areas, on the other hand, show higher percentages of women with graduate and postgraduate qualifications. Additionally, rural areas have slightly higher percentages of women with metric and intermediate education compared to urban areas. The categorization of BMI among post-menopausal women in urban and rural areas, according to WHO standards, revealed significant differences. In rural areas, 3.3% of women were underweight compared to 0.7% in urban areas. Whereas, 31.3% of rural women were overweight, while 35.3% of urban women fell into this category. Energy intake of both rural and urban populations was slightly lower than the Recommended Dietary Allowance (RDA), while protein intake was slightly higher than the RDA. Post-menopausal women, both in rural and urban areas, tend to exceed the recommended fat intake level of 25 grams per day. A randomized control trial with 57 women (age 40 ± 3.5 years, BMI 31.1 ± 2.6 kg·m−2) yielded similar results, with low-carbohydrate-high-fat diet having no superior effect on fat mass in comparison to a normal diet (Valsdottir et, al.,2020) .Wheat and rice are staple foods for the majority of women in both areas, with minimal variation. Urban areas show higher occasional consumption of flaxseed compared to rural areas. While seasonal vegetable consumption is common in both

regions, rural areas have slightly lower spinach intake. These findings suggest a need for dietary interventions to address excessive fat intake and promote healthier dietary habits among post-menopausal women.

Recommendation

Given the rising life expectancy and expanding population of menopausal women in India, prioritizing menopausal health has become imperative. Extensive initiatives are needed to educate and raise awareness among these women regarding menopausal symptoms, alleviation of discomfort, and the importance of seeking appropriate medical attention. Notably, postmenopausal women in India currently lack coverage under any targeted health programs, unlike their younger counterparts (RCH and ICDS). Therefore, policymakers should assess successful initiatives implemented for menopausal women in other nations and tailor them to fit local contexts and economic feasibility.

Ethical Approval

Ethical approval to conduct the study was obtained by the ethical committee of Acharya Narendra Deva University of Agricultural and Technology, Kumarganj, Ayodhya.

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