

# TITLE: INVESTING THE DIETARY HABITS OF MENOPAUSAL WOMEN & ASSESSING NUTRITIONAL STATUS AND IDENTIFYING POTENTIAL HEALTH COMPLICATIONS; AN OBSERVATIONAL STUDY

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## ABSTRACT

### **Background:**

Menopause, occurring typically between 45-56 years, is marked by the permanent cessation of the menstrual cycle and estrogen deficiency after 12 months of amenorrhea. This physiological transition, involving declines in ovarian follicles, FSH, LH, and estrogen, affects overall health with symptoms like hot flashes, night sweats, vaginal dryness, insomnia, mood changes, increased cardiovascular risk, and osteoporosis. It is associated with increased body fat, Dyslipidemia, and insulin resistance, heightening the risk of cardiovascular diseases. The loss of estrogen's protective effects increases the likelihood of coronary heart disease (CHD) by 2-3 times. Factors such as reduced physical activity, hormonal changes, and diet contribute to higher BMI and central obesity, which are linked to hypertension and Dyslipidemia. Rising chronic disease prevalence among postmenopausal women highlights the need for attention to diet, lifestyle, and food intake. This study examines the dietary habits and physical activity of menopausal women to understand their correlation with nutritional status and health risks.

### **Objective:**

The primary objective of this study is to assess the dietary intake, physical activity and anthropometric measurements of menopausal women. The secondary objectives of the study are to analyze the potential health complications which occur due to dietary habits and to establish a correlation between their current lifestyle and nutritional status.

### **Methodology:**

The study conducted was an observational study that included 100 participants from D.Y. Patil Hospital and D. Y. Patil College, Nerul, Navi Mumbai. The participants were selected through convenience sampling and according to the inclusion and exclusion criteria. The data of patients was collected after

the consent of the patients, through personal interviews of the subject, with the help of a questionnaire. The questionnaire consisted of demographic details of the patients, and anthropometric measurements, dietary information like food preferences, and dietary intake with the help of 24-hour recall and Food Frequency Questionnaire. The data was then analyzed using SPSS Tool.

**Result:**

The study provides a comprehensive analysis of the surveyed population i.e. menopausal women's BMI distribution, physical exercise engagement, dietary habits, co-morbidity status, and associations with health indicators like BMI and WHR. The largest group, 54%, falls within the normal BMI category, with significant portions also in overweight (28%) and obese classes (16%). Physical exercise engagement is evenly split, and walking is the most common exercise. High carbohydrate and fat intakes are prevalent, with 84% and 74% of respondents, respectively. Co-morbidities are reported by 56% of participants, with hypertension and diabetes being the most common. No significant associations were found between physical exercise or occupation and BMI or WHR. Daily consumption patterns highlight a reliance on rice, wheat, sugar, and milk, with minimal intake of fruits and dark green leafy vegetables. These findings underscore the need for targeted health interventions to improve dietary and physical activity habits.

**Conclusion:**

This study provides an in-depth analysis of health and lifestyle factors among menopausal women, focusing on BMI distribution, physical exercise habits, dietary patterns, co-morbidities, weight changes post-menopause, and the consumption of fried junk food and aerated beverages. Although many individuals maintain a normal BMI, there is a significant incidence of overweight and obesity, highlighting potential health concerns. While physical activity is moderately prevalent, it requires more frequent engagement. The dietary patterns indicate a high intake of carbohydrates and fats, with insufficient protein, likely influencing BMI trends. The high occurrence of co-morbidities, such as hypertension and diabetes, highlights the complexity of managing health in this demographic. Weight changes post-menopause are evenly divided between gain and stability, necessitating targeted interventions. Despite some positive trends in beverage choices, the intake of fried junk food remains high. The diet predominantly consists of carbohydrate-rich staples and dairy, with low consumption of fruits, vegetables, and protein-rich foods, pointing to nutritional imbalances. High non-consumption rates of beneficial foods suggest areas for improvement through targeted education and interventions. The observed supplement consumption patterns reveal a majority relying on dietary sources, while a minority prioritizes supplements for bone health, particularly Calcium and Vitamin D. The lower usage of Vitamin B12 suggests gaps in awareness or perceived need. These findings highlight the need for targeted public health strategies to promote education on balanced nutrition and appropriate supplement use, especially for at-risk populations. The study underscores the importance of promoting balanced diets, increased physical activity, and integrated healthcare approaches to better address the complex health needs and enhance the well-being of menopausal women.

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## 1. INVESTING THE DIETARY HABITS OF MENOPAUSAL WOMEN & ASSESSING NUTRITIONAL STATUS AND IDENTIFYING POTENTIAL HEALTH COMPLICATIONS; AN OBSERVATIONAL STUDY

Menopause is a non-pathological estrogen deficiency condition in which there is a permanent cessation of menstrual cycle. When a woman experiences amenorrhea which lasts for more than 12 months, it marks the start of the menopausal phase of a woman's life. It usually occurs between the ages of 45-56 years.[1] Menopause is a physiological aging process in which the number of ovarian follicles gradually decline due to which there is deficiency of follicle stimulating hormone (i.e. FSH), luteinizing hormone (LH) and estrogen production.[1] The various physiological changes that take place in the body during menopause have a direct impact on the overall health of an individual physically, emotionally and mentally. Various symptoms are experienced during this

transition period and they vary from person to person. The usual symptoms related to menopause are: hot flushes and night sweats, vaginal dryness, insomnia, changes in mood, depression or anxiety, changes in body composition, cardiovascular risk and osteoporosis.[2] With various clinical studies and increasing knowledge, we know that this transition period leads to changes in body composition i.e. there is an increase in body fat mass, dyslipidemia and insulin resistance which leads to an increase in the risk of cardiovascular risk. The presence of endogenous estrogen in a woman's body acts as a protection, against developing cardiovascular diseases.[3] The probability of having coronary heart disease (CHD) in menopause is 2-3 times higher than in reproductive age.[1] Obesity and higher BMI is observed in a lot of menopausal women due to various reasons such as lack of physical activity, physiological and hormonal changes and diet. There is more amount of visceral fat deposition around the abdominal region, which is a marker of central obesity. Women with central obesity have higher chances of developing hypertension and dyslipidemia.[4] Clinical studies show that there are rising numbers of post-menopausal women who are suffering from one or more chronic disease condition. Therefore, it is essential to focus on diet, lifestyle and food intake of post-menopausal women for maintaining a healthy life.[5] This study aims to analyze dietary habits and physical activity of menopausal women and how it has a correlation to their current nutritional status and pre-existing health risks which could lead to serious disease condition and poor quality of life.

**Table 1: BMI Categorization**

BMI category		
	Frequency	Percent
Normal	54	54.0
Obese Class 1	14	14.0
Obese Class 2	2	2.0
Overweight	28	28.0
Underweight	2	2.0
Total	100	100.0

**Interpretation:**

This table provides an overview of the distribution of individuals across different BMI categories within the sample population, showing the prevalence of each category and providing insights into the distribution of weight statuses. Largest group in this sample, comprising 54% of the total participants belong to the normal BMI category, 14% of the total belongs to obese class 1 category, 28% of the total belonging to overweight category, 2% of the total being in the obese class 2 category and 2% in the underweight category.

**Table 2: Physical Exercise Status**

Physical Exercise		
	Frequency	Percent
No	52	52.0
Yes	48	48.0

**Interpretation:**

The table presents the frequency distribution of individuals based on their engagement in physical exercise, with an equal distribution between individuals who report engaging in physical exercise ("Yes") and those who do not ("No"), each comprising 48% and 52% of the total sample, respectively.

**Table 3: Average Dietary Intake by 24 Hour Recall**

		Frequency	Percent
Carbs	High	84	84.0
	Moderate	16	16.0
Protein	High	20	20.0
	Low	38	38.0
	Moderate	42	42.0
Fats	High	74	74.0
	Moderate	26	26.0

**Interpretation:**

This table provides insight into the dietary habits of the surveyed population, categorized by their consumption levels of carbohydrates, proteins, and fats. The majority of individuals report a preference for high carbohydrate intake, comprising 84% of the sample and moderate carbohydrate intake of 16% of total population. In contrast, protein intake is distributed, with 20% reporting a high intake and 42% indicating a moderate intake and 38% representing low protein intake. Conversely, fat consumption leans towards high intake, representing 74% of respondents and moderate fat intake at 26% of the total population.

**Table 4: Comorbidity Status**

Co-morbidity	Frequency	Percent
Diabetes	9	16.1%
Diabetes + Hypertension	12	21.6%
Diabetes + Dyslipidemia	4	7.2%
Diabetes+ Hypertension + Dyslipidemia	3	5.4%
Dyslipidemia	5	8.9%
Dyslipidemia+ Hypertension	4	7.2%
Dyslipidemia + Weight gain	1	1.8%
Hypertension	12	21.5%
Hypertension + Hypothyroidism	1	1.8%
Hyperthyroidism	2	3.6%
Hypothyroidism	2	3.6%
Hypothyroidism + Dyslipidemia	1	1.8%
<b>Grand Total</b>	<b>56</b>	

**Interpretation:**

This table provides comprehensive insights into the co-morbidity landscape among the surveyed individuals, highlighting the prevalence and combinations of concurrent health conditions. Notably, the most prevalent co-morbidity is Hypertension, accounting for 21.5% of the sample, followed closely by Diabetes + Hypertension at 21.6%. Additionally, Diabetes is reported by 16.1% of respondents, indicating its significance as a co-morbid condition. Other notable co-morbidities include Dyslipidemia (8.9%), Hyperthyroidism (3.6%), and Hypothyroidism (3.6%). Furthermore, several individuals exhibit combinations of co-morbidities, such as Diabetes + Dyslipidemia and Hypertension + Dyslipidemia, which emphasizes the complexity of health conditions within the surveyed population.

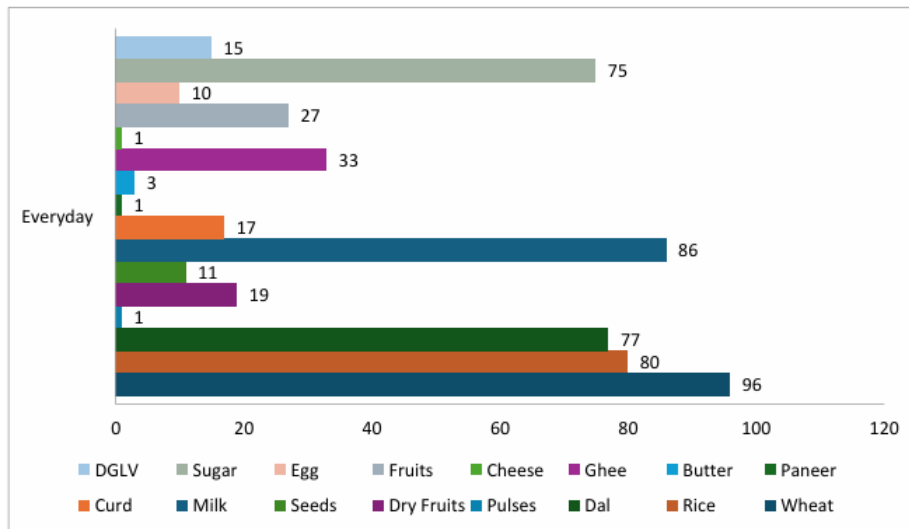
**Table 5: Frequency of Fried Food and Aerated Beverages Consumption**

		Frequency	Percent
Frequency of fried junk food			
	2-3 times/week	15	15.0
	2-3/month	45	45.0
	Everyday	3	3.0
	Once/week	2	2.0
Consumption of aerated beverages			
	No	58	58.0
	Yes	42	42.0
if yes (frequency)			
	1/week	26	26.0
	2-3/week	5	5.0
	Very rarely	11	11.0

**Interpretation:**

The table depicts the frequency of consumption of fried junk food and aerated beverages within the surveyed population. Regarding fried junk food consumption, the majority (45%) report indulging 2-3 times per month, followed by 15% who consume it 2-3 times per week. A smaller percentage consumes fried junk food every day (3%) or once a week (2%). In terms of aerated beverage consumption, 58% of respondents report not consuming them at all, while 42% indicate consumption. Among those who consume aerated beverages, 26% do so once a week, 5% 2-3 times a week, and 11% very rarely.

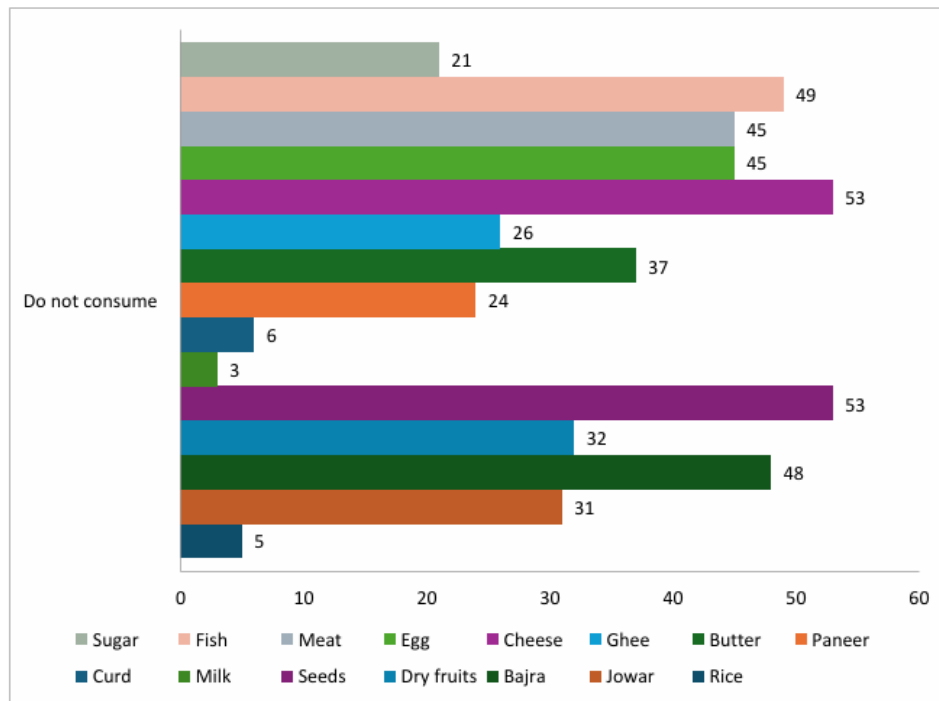
**Table 5: Number of People consuming the following foods everyday**



**Interpretation:**

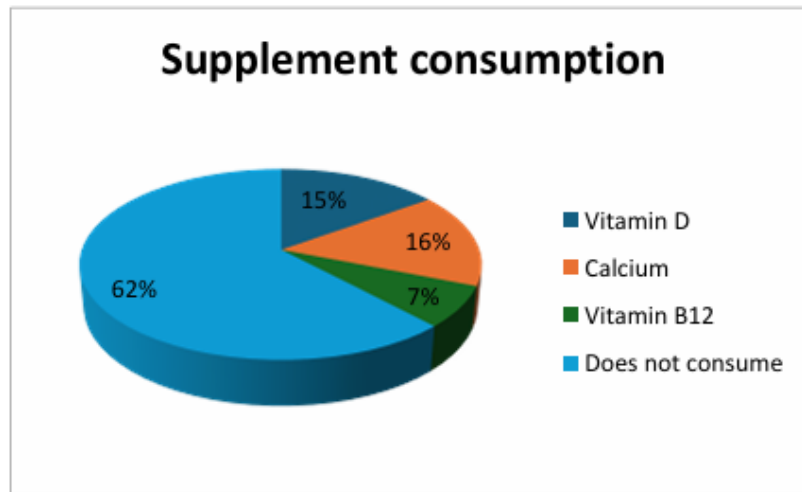
This figure illustrates the number of people consuming various foods on a daily basis. The data highlights significant dietary habits among the study population. The key observations include: Rice (96 people) and Wheat (86 people) is the most commonly consumed foods, forming staple components of the daily diet. Sugar (80 people) and Milk (77 people) are also consumed frequently, indicating their prevalent use in everyday meals. Dal (33 people) and Curd (27 people) show moderate daily consumption, reflecting their role as common protein and probiotic sources respectively. Foods such as Ghee (19 people), Pulses (17 people), Paneer (15 people), and Butter (11 people) are less commonly consumed daily, suggesting they are included in diets but not as primary staples. Minimal daily consumption is noted for Eggs (10 people), Fruits (9 people), Dry Fruits (3 people), Cheese (1 person), and Seeds (1 person), indicating these items are less integrated into everyday meals. Dark Green Leafy Vegetables (DGLV) is consumed by only one person daily, highlighting a potential area for dietary improvement due to their nutritional benefits. These consumption patterns provide insights into the nutritional habits of the population, indicating a reliance on carbohydrate-rich staples and dairy products, with lesser emphasis on fruits, vegetables, and protein-rich foods. This information can guide nutritional interventions and health recommendations for improving dietary balance among the study population.

**Table 6: Number of People who do not consume a particular food item**



**Interpretation:**

The bar chart illustrates the number of people who do not consume various food items. The data highlights notable dietary exclusions among the surveyed population. Key observations include: Cheese and Seeds have the highest non-consumption rates, each with 53% people not consuming them. Fish and Meat, with 49 and 45% respectively. Eggs are not consumed by 45% population. Bajra and Jowar are not consumed by 48% and 31% people respectively. Ghee and Butter have 26% and 37% non-consumers. Paneer is not consumed by 24% people. Dry fruits are not consumed by 32% people. Sugar has a relatively low non-consumption rate with only 21% people avoiding it. Curd and Rice are consumed by almost all participants, with only 6% and 5% not consuming them respectively. Milk is not consumed by 3% of the population. This data indicates a diverse range of dietary habits with certain foods like cheese, paneer, and meat being less commonly consumed, while staples like curd and rice are almost universally included in the diet.

**Table 7: Frequency of Supplement Consumption****Interpretation:**

This pie chart titled "Supplement consumption" shows the distribution of respondents based on their intake of various supplements. The chart reveals that a significant majority, 62%, do not consume any supplements. Among those who do, 16% take Calcium, 15% take Vitamin D, and 7% take Vitamin B12. This data indicates that while a substantial portion of the population surveyed does not engage in supplement consumption, there is a notable minority that does, with Calcium being the most commonly consumed supplement, followed closely by Vitamin D.

**4. CONCLUSIONS**

The present study offers a detailed examination of health and lifestyle factors among the menopausal population, with significant insights into BMI distribution, physical exercise engagement, dietary habits, co-morbidities, post-menopausal weight changes, and consumption patterns of fried junk food and aerated beverages. The findings reveal a considerable proportion of individuals falling within the normal BMI range, yet there remains a notable prevalence of overweight and obesity, underscoring potential health risks. Physical exercise engagement is moderately balanced, though there is room for improvement in promoting more frequent activity. Dietary habits show a predominant intake of carbohydrates and fats, with less emphasis on protein, reflecting dietary patterns that may contribute to the observed BMI trends. The high prevalence of co-morbidities such as hypertension and diabetes highlights the complexity of health management needs in this population. Post-menopausal weight changes are evenly split between weight gain and no change, indicating the need for targeted interventions during this life stage. Consumption patterns of fried junk food and aerated beverages show positive trends in beverage choices, though the intake of fried junk food remains significant. The dietary analysis reveals a strong reliance on carbohydrate-rich staples and dairy products, with minimal daily consumption of fruits, vegetables, and protein-rich foods, indicating potential nutritional imbalances. High non-consumption rates of nutritionally beneficial foods suggest areas for nutritional improvement through targeted education and interventions. In conclusion, the analysis demonstrates no statistically significant association between occupation and the health indicators Waist-to-Hip Ratio (WHRC) and Body Mass Index (BMI) within the surveyed population. The lack of significant differences across occupational categories suggests that factors outside of the workplace, such as individual lifestyle choices and behaviors, may have a greater impact on these health metrics. These findings underscore the importance of targeting public health interventions towards promoting healthy habits and behaviors across all aspects of life, rather than focusing solely on occupational influences. This comprehensive approach could be more effective in addressing and improving WHRC and BMI among diverse populations. In summary, the supplement consumption patterns observed indicate a significant portion of the population relies on dietary sources for nutrients, with a notable minority prioritizing supplements for bone health, particularly Calcium and Vitamin D. The relatively lower usage of Vitamin B12 suggests potential gaps in awareness or perceived necessity. These insights underscore the critical need for targeted



public health strategies to promote education and awareness about the benefits of balanced nutrition and the appropriate use of supplements, especially for populations vulnerable to nutrient deficiencies. Overall, this study underscores the importance of promoting balanced dietary habits, increased physical activity, and integrated healthcare approaches to address the complex health needs and improve the well-being of the population.

## 6. REFERENCES

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