Nutritional profile of post-Menopausal women belonging to lower middle-income group of Pilani town of Rajasthan: An observational study

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Abstract. Woman are important pillars of every society. They contribute human potential and strength to the development of a nation. Nutrition plays an important role in building their health, which is generally compromised especially among lower and lower middle class. An observational study was done on 70 post-menopausal woman of age group 45-60 years of age of lower middle-income group who used to visit general OPD of Birla Hospital, Pilani, Rajasthan from February 2019 to February 2020.Subjects were evaluated for their nutritional status by 7 days dietary recall method, to get information on the dietary pattern, nutrient intake, source of nutrients and food habit. A questionnaire was filled for their family history and physical activities. Certain exercises and endurance tests were done for checking their physical fitness. It has been observed that 80%of the respondents are healthy females with good stamina and functional flexibility and with no complaint of joint pains (commonly seen in post-menopausal woman), as their diet was rich in milk and milk products throughout life. This study fosters a deeper understanding of how diet taken in early childhood, through adolescence and beyond affect health later in life and would be helpful to woman at large.

Keywords: Nutrition profile; functional flexibility; endurance; dietary recall

1 Introduction

Diet plays an important role in determining a person's health at every stage of life. Dietary habits and food intake largely determine the nutritional profile of a person. Nutritional profile refers to the state of an individual as it is affected by food intake and utilization of nutrients. (1)

The WHO constitution (1946) envisages" the highest attainable standard of health is a fundamental right of every human being". (2)

At every phase of life, women have specific needs and opportunities to optimize their health and wellbeing. (3).

Women's nutrition received political and programme focus in 2018, owing to the nationwide launch of the POSHAN Abhiyaan 2018-20. (4), which was launched by honorable Prime Minister from Jhunjhunu, Rajasthan on 8th march 2018(5).

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Menopausal woman represents a community on the threshold of the ageing process. After menopause, females show increased susceptibility to slow developing chronic disease states like cardio-vascular disorders, cancer(lung/Breast), diabetes, osteoarthritis, osteoporosis due to estrogen deficiency, slight stature, limited lean body mass etc. owing due to low estrogen levels.(6).

Physical fitness levels also decrease with age. Functional fitness represents the physical capacity that is needed to undertake normal everyday activities, independently and without the early onset of fatigue. (7) However, as the age proceeds physical fitness (strength, endurance, agility, and flexibility) reduces.

More than 80% of the woman experience physical and psychological symptoms in these years. (8).

This study was carried out with the objective to find out how dietary habits and dietary intake throughout lifetime influences the health and functional fitness in later years especially among post-menopausal woman.

This study fosters a deeper understanding of how diet taken in early childhood, through adolescence and beyond affect heath later in life and would be helpful to woman at large.

2 Methodology

A total of 200 females of age group 45-60 years of Pilani and adjoining areas who used to come to general OPD of Birla Sarvajanik Hospital, Pilani, Rajasthan were randomly selected. After briefing them about the objective of the study a 7 days dietary recall was taken initially. The different food items consumed were converted into their raw equivalents, categorized into their respective food groups and the daily intake of protein, fat, carbohydrate and calcium were calculated using the tables of nutritive value of Indian foods (9).

Their background information regarding their occupation, medical history, dietary habits was collected by questionnaire method.

Anthropometric measurements were taken too. Body weight was measured by digital weighing scale and height by salter's spring balance.

For fitness they were tested for sit and reach test and sit up test. The sit and reach test is a common test of flexibility and is an easy and quick test to perform. It helps to measure the extensibility of the arm strings and lower back (11). Sit up test measures the strength and endurance of the abdominals and hip-flexor muscles were done on them to check their bone health.

RDA (Recommended Dietary Allowance) for Indians recommends 2450 kcal for woman (heavy worker), 50 gm proteins, 15 grams fat, and 400 mg calcium per day (12). Table1shows the RDA for woman.

Table 1. Dietary requirement

Particulars	Weight (kg)	Energy (Kcal)	Protein g/day	Fat g/d	Calcium mg/d	Iron mg/d
Sedentary worker	50	1800	50	15	400	30
Moderate worker	50	2100	50	15	400	30
Heavy worker	50	2450	50	15	400	30
Pregnant woman	50	+300	+15	25	1000	38

Source: ICMR, 1989 (13)

Average intake of nutrients of respondents was calculated and compared with the R.D.A given by ICMR (Indian council of medical research).

BMI was calculated by using the formula given by Garrow (10) i.e., BMI=WT (Kg)/HT (m^2) as shown in Table2.

Table 2. BMI standards

GRADE	BMI
Normal Range	18.5-24.9
Overweight/Pre-obese	>25
Grade I	30-34.9
Grade II	35-39.9
Grade III	>40

Source: Textbook of Nutrition and Dietetics by Kumud Khanna (14)

The data obtained by 7-day dietary recall is converted into raw ingredients and nutrient intake was calculated using food composition table (15) and compared with recommended dietary allowance. The percent of recommended dietary allowance (RDA) was calculated using the following formula: Percent RDA= Intake of nutrients X 100 RDA

Nutrient intake of 7 consecutive days will be added and mean values of these will be used for further analysis as shown in Table3.

Table 3. Average Daily Intake of Food (Moderate cost)

Foods (gm)	N=200(veg)	Suggested intake (Heavy worker)
Cereals	300	440
Pulses	62	60
Green leafy vegetables	100	100
Roots and tubers	80	100
Fruits	-	60
Milk and milk products	1200	400
Fats and oils	40	40
Meat, fish and eggs	-	-
Sugar and jaggery	50	40

Source: Data collected

3 Data Analysis

On the basis of a sample of 200 women respondents a good 75% of women were found to be under the normal BMI range of 18.5 to 24.9 whereas 19% of the women were underweight (Refer Table 4). Average BMI of underweight women was 17.5 marginally lower than required standard of 18.5 (Fig 1)

Table 4. Body mass Index (BMI)

Body mass Index (BMI)				
BMI	Range	Average BMI	Number of Women	% of Women
Less than 18.5	Underweight	17.5	38	19%
18.5-24.9	Normal	21.6	150	75%
>25	Overweight	31.8	12	6%
Total number of women			200	

Source: Prepared by the researcher

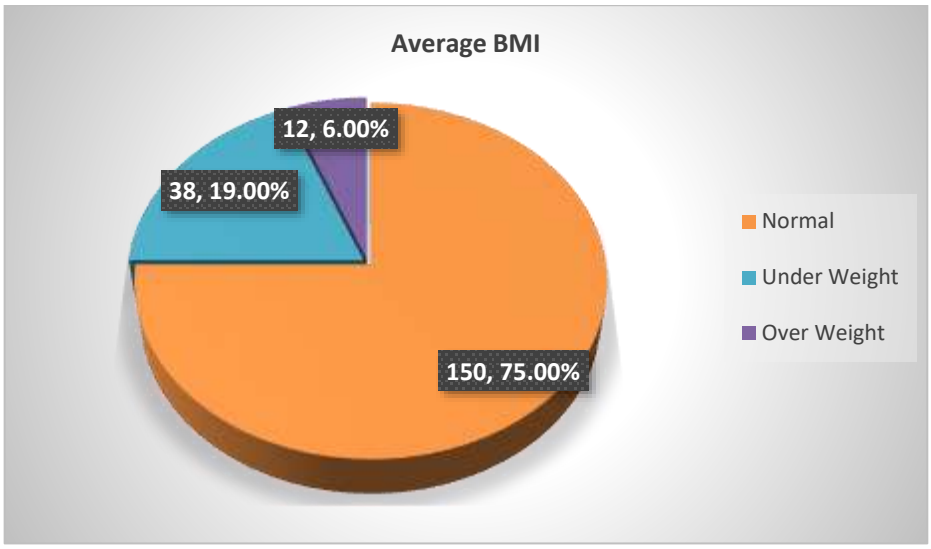

Fig. 1. Average BMI of respondents

It was found that in this region average daily intake of women comprises of a very good amount of dairy and dairy products as a habit since childhood. On an average a woman consumes 1.2 liters of milk products in their diet along with required portion of Jaggery and pulses in sufficient quantity (refer Table 5).

Table 5. Average daily intake of food

Average daily intake of food		
Foods (Grams)	Average intake ±σ	Suggested Intake
Cereals	300±35.5σ	400
Pulses	62±14.2	60
Green leafy Vegetables	100±7.2	100
Roots& tubers	80±10.6	100
Fruits	Rarely	60
Milk & Milk products	1200±130.2	400
Foods & Oils	40±10.7	40
Sugar & Jaggery	50±7.2	40

Source: ICMR 1987(17)

Daily average intake of nutrients due to consumption of above mix of foods it has been observed that these women have a good balance of Calcium (1150 on an average) with a standard deviation (SD) of 130.2, which is way higher than that recommended by RDA. An average of 2100 Protein intake and 55 units of fats are consumed by them (Refer Table 6).

Table 6. Average daily intake of nutrients

Average daily intake of nutrients		
Nutrients	Average intake ±σ	RDA
Energy	1920±120	2450
Proteins	55±3.5	50
Fat	57±4.7	15
Calcium	1150±178	400

Source: ICMR 1990(18) n=200

78% of women were found to be fit on the basis of Sit and reach test and were found to be above the desired norms. Only a small 3% could not qualify the test.

Table 7. Result of sit and reach test

Result of sit and reach test			
Standard Norms	Frequency	Cm.	Inches.
Super	2%	> +30	> +11.5
Excellent	5%	+21 to +30	+8.0 to +11.5
Good	37%	+11 to + 20	+4.5 to +7.5
Average	33%	+1 to +10	+0.5 to +4.0
Fair	20%	-7 to 0	-2.5 to 0
Poor	2%	-15 to -8	-6 to -3
Very Poor	1%	< -15	< -6
	100%		

SOURCE: Research Quarterly on fitness (19)

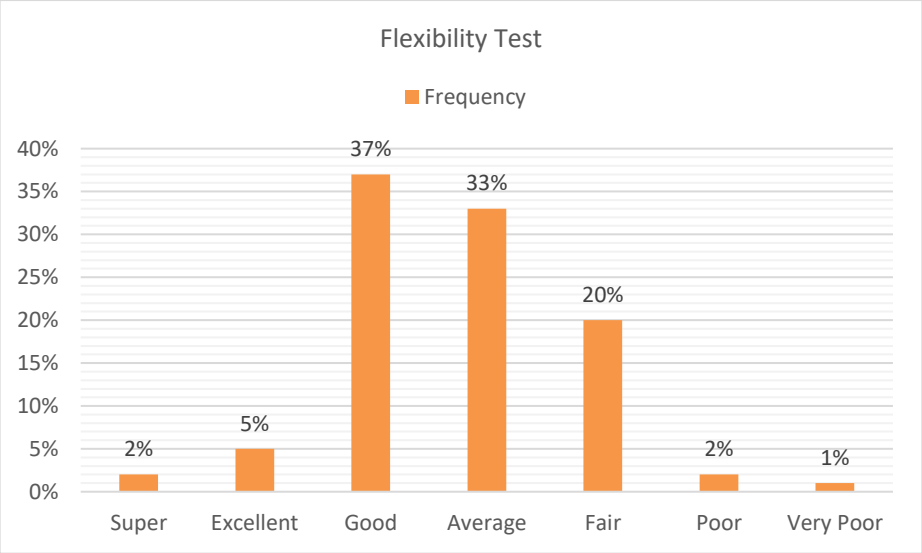

Fig. 2. Flexibility Test

4 Findings

It was found that the subjects were taking 2 meal patterns throughout their life which comprises of milk and milk products and cereals and early dinners comprising of cereals and milk and milk products again. The 2 meal pattern was the reason behind controlled weight and also toward the underweight range in some cases. This pattern might increase the probability of sugar level fluctuations in the subjects.

The BMI of around 45% respondents were in the normal range of 18.5-24.9.25% of subjects were underweight with BMI less than 18.5.and 30% of subjects were overweight with a BMI of 25(Figure:1).

The average daily intake of energy was1920±120 kcal which was less than the RDA of 2450kcal given by ICMR (Table-6). The energy balance was disturbed as energy intake was less as compared to energy output. This was the main was the reason behind low weight in subjects as per the ICMR standards

The average daily intake of Proteins was55±3.5 grams which was almost equal to 50 grams, RDA given by ICMR (Table-6). Protein is essential for normal calcium metabolism, and on high protein diet calcium is absorbed more. A study shows decrease in calcium balance in post-menopausal women was improved by increased dietary protein which causes decreased calcium excretion indicating increased calcium absorption (20).

The average daily intake of fat was found to be 57±4.7 grams per day which was much higher than the recommended levels of 15 grams/day (Table-6). Increased fat intake was used for energy supply to balance out the energy intake through other sources like cereals.

The average daily intake of calcium was1150±178grams per day which was much higher than the RDA of 400 grams given by ICMR (Table:6). The increased intake of milk and milk products was the reason behind high calcium sources along with moderate consumption of green leafy vegetables.

It was observed that the food groups taken by subjects on an average show that there is difference between RDAs and their intake (Table-5). It was found that among all the food groups, the subject's diet was rich in milk and milk products group, intake of around 1.2liters on an average, which is the reason behind their good bone health in spite being menopause with no complaint of pain in knees and joints, which is generally seen in females of this age.

Bone related problems starts around the time of menopause. The amount of calcium naturally excreted by the body increases during this time that is why the amount of calcium needed goes up. Estrogen helps our gut absorb calcium, so we absorb calcium less effectively as our hormone level changes and if these calcium needs aren't met, bone loss can accelerate (21).It has been observed that this belt of Rajasthan takes more of milk and milk products in their diet along with finger millets, dalia and dals as their staple food.

Women when tested for endurance exercises, sit and reach test and sit up test it was found that 37% of the females were in good range of flexibility.33% respondents were in average range and 20% of respondents were in fair range. Whereas only 2% and 1% were in poor and very poor range (Figure-2).

It has been found that in this belt of Rajasthan females work in fields especially those of low and lower middle socio-economic status and walk many kilometers due to lack of proper conveyance adding to their fitness and normal parameters of BMI, flexibility and fitness and overall health and well-being.

Woman who walks more than 7.5 miles per week has higher mean bone density of the whole body and of legs and trunk region than women who walk less than 1 mile/week (22).

5 Implications

When the world is following vegan diet, with a big no to animal products including milk, this study on dietary intake and eating habits of menopausal woman of low and lower middle socio-economic status will highlight the importance of milk and milk products which is considered as a complete meal in itself along with easy availability. Milk and milk products are still in priority in food list of this small town. Milk and buttermilk are considered as a welcome drink to the guest coming come home instead of tea and other beverages. For determining the physical fitness more endurance exercises can be added to support the study.

This study when done with the help of bio-medical parameters will help in establishing the importance of milk and milk products which are very important for females particularly for bone health if taken regularly since early childhood.

This study will showcase the way for other detailed studies on Diet and Bone health taking ways to find out bone health through x-ray techniques like DEXA scan.

6 Limitations

This study was restricted to analyzing health by looking into nutritional intake of subjects with no complain of any joint pains as the subjects were completely fit and able to do their endurance exercises like sit and reach for physical fitness.

Sit and reach test is specific to the range of motion and muscles and joints of the lower back and hamstrings and may not be relevant to other parts of the body.

Bio-chemical assessment is required for accurate analysis of health and bone health.

References

1. Sangwan, S., Chikara, S.andPuni, S. (1993). Factors affecting nutrition status. Indian Journal of Nutrition and Dietetics.30:159-63.
2. Constitution of the world Health organization, Basic Documents, forty-fifth edition, supplement, October 2006.
3. WHO newsletter, Women’s and girl’s health throughout the life course, 30 May 2019.
4. Poshan Abhiyaan, E-learning, ICMR-NIN modules.
5. POSHAN Abhiyan, Ministry of women and Child Development, Government of India.
6. WHO newsletter, Women’s and girl’s health throughout the life course ’30 May 2019.

7. Milanovic Zoran, Pantelic Sasa, NicJames, Age related decrease in physical activity and functional fitness among elderly men and women, Dove press journal, clinical interventions in aging 2013:8,549-556.
8. J Clin Diagn Res.2013 Jan; 7(1): 135-9.doi: 10.7860/JCDR/2012/4910.2688.Epub 2013 Jan 1.
9. Gopalan, C.; Rama, Sastri, B. V and Balasubramaniam, S.C. (1989). Nutritive value of Indian foods, Revised and updated by Narasinga RaoB.S.
10. Khanna, Kumud (2001). Textbook of Nutrition and Dietetics, 189.
11. Wells, K.F. & Dillon, E.K. (1952). The sit and reach. A test of back and leg flexibility. Research Quaterly, 23.115-118.
12. Swaminathan M. (2000). Advanced textbook of Nutrition and Dietetics, 20-21.
13. Swaminathan M. (2000). Advanced textbook of Nutrition and Dietetics, 2021.
14. Khanna Kumud (2001). Textbook of Nutrition and Dietetics, 189.
15. Gopalan, C.; Rama, Sastri, B. V and Balasubramaniam, S.C. (1989). Nutritive value of Indian foods, Revised and updated by Narasinga Rao B.S.
16. Swaminathan M. (2000). Advanced textbook on Food & Nutrition, 21.
17. ICMR (1987). Nutritive value of Indian foods. National Institute of Nutrition. Indian council of medical Research.204.
18. ICMR (1990). Nutrient requirements and recommended dietary allowances for Indians. A report of expert group of Indian council of medical research, National institute of Nutrition, Hyderabad.
19. Wells, K.F. & Dillon, E.K. (1952). The sit and reach. A test of back and leg flexibility. Research Quarterly, 23.115-118.
20. Heaney, R. (1982). Nutritional factors estrogen in age related boneless. Clin.Invest.Med.5:147-155.
21. Nordin, D.E., A. Horsman and R, Crilly, (1980). Treatment of spinal osteoporosis in postmenopausal women. Brit.Med. Journal 281:451.
22. E. A Krall et al. Am J Med .1994 Jan; 96(1): 20-6.doi:10.1016/0002-9343 (94)90111-2.