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## Effect of dietary habit on the prevalence of osteoporosis disease among the middle socio-economic group

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### Abstract

Dietary habit plays an important role in the prevalence of osteoporosis disease among the middle socio-economic group. One hundred respondents aged 30 years and above of both sex belonging to middle socio-economic group were selected from urban area of Agra through multistage stratified random sampling technique. The prevalence of osteoporosis disease was found to be 15.00% which was significantly more among non-vegetarian, eating daily outside home, consuming no milk and milk quantity below 200 gms per day as compared to their counterparts respectively ( $p < 0.05$ ) while insignificantly more among respondents consuming five and more meals per day, irregular in taken meals and eating no snack between meals as compared to their counterparts respectively even at 5% level of significance. It can be concluded that the dietary habit of the respondents differed significantly according to certain food habits in the present study.

**Keywords:** Adolescent, rural, urban, habits, attitudes, education

### Introduction

Osteoporosis is the major health problem affecting the quality of life of a large population of older people around the world. Osteoporosis is a silent disease occurring without any marked symptoms. Indians particularly one-third and half of all postmenopausal women are thought to be prone to the disease.

Osteoporosis is the term used for disease that causes a reduction in the bone mass. The remodeling of bones (its formation and resorption) is a continuous process. Till 30-35 years rate of bone formation is more than bone resorption. Hence, this is the period of attainment of peak bone mass but after the age of 40-50 years rate of bone resorption slightly exceeds its formation that leads to a gradual decrease in bone mass (WHO, 1998) [8].

Osteoporosis depends on number of factors such as nutritional status, sex hormone status, parathyroid hormone level and vitamin deficiencies (Heaney, 1999).

The modifiable factors which influence bone health are gender, age, family history/heredity, ethnicity/race, body size/height, hormone levels, certain diseases and early menopause while non-modifiable factors are chronic low calcium intake, vitamin d intake, prolonged medications, inactivity, cigarette smoking and alcohol.

### Objective

To study the effect of dietary habit on the prevalence of osteoporosis disease among the women belonging to middle socio-economic group.

**Sample:** The study was carried out on one hundred women belonged to middle socio-economic group from urban area of Mathura district which was selected through purposively sampling technique.

**Tool:** A schedule constructed by the investigator was used for the collection of required information for the present study.

### Results and Discussion

The obtained data were classified, analysed statistically for drawing valid conclusions and were discussed in light of the work conducted previously.

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**Table 1:** Effect of dietary habit on the prevalence of osteoporosis disease among the middle socio-economic group

Dietary Habit	Respondents						Prevalence Rate
	Osteoporosis Patients		Normal		Total		
	No.	%	No.	%	No.	%	%
Vegetarian	7	46.7	66	77.6	73	73.0	9.59
Non-vegetarian	8	53.3	11	12.9	19	19.0	42.11
Eggitarian	0	0.0	8	9.4	8	8.0	0.00
Total	15	15.0	85	85.0	100	100.0	15.00

$\chi^2 = 6.201, df = 1, p < 0.05$

Out of 100 respondents, majority of them (73.0%) were vegetarian, followed by 19.0% non-vegetarian and minimum (8.0%) were eggitarian. Among the normal subjects, majority of them (77.6%) were vegetarian, followed by 12.9% non-vegetarian and minimum (9.4%) were eggitarian. Out of the osteoporosis patients, majority of them (53.3%) were non-vegetarian, followed by 46.7% vegetarian and none of them were found to be eggitarian. Statistically, significant

difference regarding their eating habits was observed between normal subjects and disease patients. Further analysis of data reveals that prevalence of osteoporosis was more among the non-vegetarian (42.11%) respondents as compared to vegetarian (9.59) respondents. Gupta and Chopra (2013) found in their study that the prevalence rate was 33.0% which was more among vegetarian respondents (39.13%) as compared to non-vegetarian respondents. (19.35%).

**Table 2:** Effect of meals per day on the prevalence of osteoporosis disease among the middle socio-economic group

Meals Per Day	Respondents						Prevalence Rate
	Osteoporosis Patients		Normal		Total		
	No.	%	No.	%	No.	%	%
Three	10	66.7	60	70.6	70	70.0	14.29
Four	4	26.7	24	28.2	28	28.0	14.29
Five and Above	1	6.7	1	1.2	2	2.0	50.00
Total	15	15.0	85	85.0	100	100.0	15.00

$\chi^2 = 0.093, df = 1, p > 0.05$

Out of 100 respondents selected for present study, majority (70.0%) of them were having three meals per day, followed by 28.0% having four meals per day and minimum (2.0%) were having five meals and above per day. Out of osteoporosis respondents, majority (66.7%) were having three meals per day, followed by 26.7% having four meals per day and minimum (6.7%) were having five meals and above per day. Among the normal respondents, majority (70.6%) were having three meals per day, followed by 28.2% having four

meals per day and minimum (1.2%) were having five meals and above per day. Statistically, insignificant difference regarding number of meals per day was observed between normal respondents and disease patients. Further, analysis of data from the above table shows that the prevalence of osteoporosis was 15.00% which was more among the respondents who took four meals and above per day (50.00%) as compared to respondents took three and four meals per day.

**Table 3:** Distribution of normal subjects and osteoporosis patients according to regularity in taking meals and prevalence of disease

Regularity in Taking Meals	Respondents						Prevalence Rate
	Osteoporosis Patients		Normal		Total		
	No.	%	No.	%	No.	%	%
Yes	10	66.7	60	70.6	70	70.0	14.29
No	5	33.3	25	29.4	30	30.0	16.67
Total	15	15.0	85	85.0	100	100.0	15.00

$\chi^2 = 0.093, df = 1, p > 0.05$

Out of 100 respondents, majority of them (70.0%) were regular in taking meals whereas only 30.00% were irregular in taking meals. Out of 15 osteoporosis patients, majority (66.7%) were regular in taking meals and rest (33.3%) were irregular. Among the normal respondents, majority of them (70.6%) were regular in taking meals and remaining (29.4%) were irregular. Statistically, significant difference regarding

regularity in taking meals was not observed between normal respondents and disease patients. Further analysis of data from the above table indicates that the prevalence rate was found more among the respondents taking irregular meals (16.67) as compared to respondents taking regular meals (14.29).

**Table 4:** Distribution of normal subjects and osteoporosis patients according to habit of eating out side home and prevalence of disease

Eating Out Side Home	Respondents						Prevalence Rate
	Osteoporosis Patients		Normal		Total		
	No.	%	No.	%	No.	%	%
Yes	15	100.0	84	98.8	99	99.0	15.15
No	0	0.0	1	1.2	1	1.0	0.00
Total	15	15.0	85	85.0	100	100.0	15.00

$\chi^2 = 5.724, df = 1, p < 0.05$

Out of total selected respondents, majority of them (99.0%) consumed outside food and remaining (1.0%) did not consume outside. Among the osteoporosis patients, all of them (100.0%) consumed outside food. While among normal respondents, majority of them (98.8%) consumed outside food and remaining (1.2%) did not consume outside. Statistically, significant difference regarding habit of eating outside the home was observed between normal respondents

and disease patients. Further analysis of data indicates that the prevalence of osteoporosis was more among the subjects (15.15%) who consumed food outside home as compared to subjects (0.00%) who did not consume food outside home. Baran, D. *et al.* (1989) [1] reported that supplementation with dairy products has shown to retard vertebral bone loss in pre-menopausal women.

**Table 5:** Distribution of normal subjects and osteoporosis patients according to frequency of eating out side home and prevalence of disease

Frequency Eating Out Side Home	Respondents						Prevalence Rate
	Osteoporosis Patients		Normal		Total		
	No.	%	No.	%	No.	%	%
Daily	3	20.0	8	9.5	11	11.1	27.27
Once in Week	7	46.67	30	35.7	37	37.4	18.92
Once in Fortnight	4	26.67	40	47.6	44	44.4	9.09
Once in Month	1	6.67	6	7.2	7	7.1	14.29
Total	15	15.0	85	85.0	99	100.0	15.00

$\chi^2 = 2.791, df = 2, p < 0.05$

Majority of the selected respondents (44.4%) ate once a fortnight outside the home, followed by 37.4% once in a week 11.1% daily and minimum (7.1%) consumed once in a month. Out of osteoporosis respondents, majority of them (46.67%) ate once a week outside the home, followed by 26.67% once in a fortnight and minimum (6.67%) consumed once in month. Out of normal subjects, majority of them (47.6%) ate once a fortnight outside the home, followed by 35.7% once in

a week and minimum (7.2%) consumed once in a month. Statistically, significant difference regarding frequency of eating outside the home was observed between normal subjects and disease patients. Further analysis of data indicates that the prevalence of osteoporosis was 15.00% which was more among the subjects (27.27%) who took food daily out side home as compared to subjects who took food weekly, fortnightly or monthly out side home.

**Table 6:** Distribution of normal subjects and osteoporosis patients according to eating snack between meals and prevalence of disease

Eating Snack between Meals	Respondents						Prevalence Rate
	Osteoporosis Patients		Normal		Total		
	No.	%	No.	%	No.	%	%
Yes	10	66.7	60	70.6	70	70.0	14.29
No	5	33.3	25	29.4	30	30.0	16.67
Total	15	15.0	85	85.0	100	100.0	15.00

$\chi^2 = 0.093, df = 1, p > 0.05$

Out of 100 respondents, (70.0%) of them consumed snacks regularly where as 30.0% did not consume snacks regularly. Out of 100 osteoporosis patients, (66.7%) of them consumed snacks regularly, remaining (33.3%) did not consume snacks regularly. Among the normal respondents, majority of them (70.6%) consumed snacks regularly and remaining (29.4%) did not consume snacks regularly. Statistically, insignificant

difference regarding habits of eating snacks between meals was not observed between normal respondents and osteoporosis patients. Further, analysis of data from the above table indicates that the prevalence of osteoporosis was more among the subjects (16.67%) who did not consume snacks between meals as compared to respondents who consumed snacks between meals (14.29%).

**Table 7:** Distribution of normal subjects and osteoporosis patients according to consumption of milk and prevalence of disease

Milk Consumption	Respondents						Prevalence Rate
	Osteoporosis Patients		Normal		Total		
	No.	%	No.	%	No.	%	%
Yes	8	53.33	74	87.06	82	82.00	9.76
No	7	46.67	11	12.94	18	18.00	38.89
Total	15	15.00	85	85.00	100	100.00	15.00

$\chi^2 = 9.825, df = 1, p < 0.05$

Out of 100 subjects, majority of them (82.00%) consumed milk whereas remaining (18.00%) did not consume milk. Out of the osteoporosis patients, majority of them (53.33%) consumed milk whereas remaining (46.67%) did not consume milk. Among the normal subjects, majority of them (87.06%) consumed milk and remaining (12.94%) did not consume milk. Statistically, significant difference regarding the consumption of milk between normal respondents and osteoporosis patients was observed. Analysis of data from the

above table indicates that the prevalence of osteoporosis was more among the respondents who did not consume milk (38.89%) as compared to respondents who consumed milk (9.76%). Gupta, A. (1996) [2] concluded that a dietary deficiency of calcium beginning in early life leads to lower peak bone mass and consequently osteoporosis at an early age. Kelsey, *et al.* (1992) [6] found no association between the milk intake with risk of proximal humeral fracture.

**Table 8:** Distribution of normal subjects and osteoporosis patients according to quantity of milk consumed by them and prevalence of disease

Quantity of Milk Consumed in ml.	Respondents						Prevalence Rate
	Osteoporosis Patients		Normal		Total		
	No.	%	No.	%	No.	%	%
101 - 200	6	75.00	18	24.32	24	29.67	25.00
201 - 300	2	25.00	38	51.36	40	48.78	5.00
301 and Above	0	0.00	18	24.32	18	21.95	0.00
Total	15	15.00	85	85.00	100	100.00	15.00

$$\chi^2 = 9.319, df = 2, p < 0.05$$

Out of 100 respondents selected for the present study, majority of them (48.78%) consumed milk between 201 - 300 ml, followed by 29.27% milk between 101 - 200 ml and remaining (21.95%) consumed milk of 301 ml and above. Out of osteoporosis patients, majority of them (75.00%) consumed milk between 101 - 200 ml and remaining (25.00%) consumed milk between 201 - 300 ml. Out of normal respondents, majority of them (51.36%) consumed milk between 201 - 300 ml, followed by 24.32% each consumed milk between 101 - 200 ml and 301 ml and above respectively. Statistically, significant difference regarding the quantity of milk consumed between normal respondents and osteoporosis patients was observed ( $\chi^2=9.319$ ,  $df = 2$ ,  $p<0.05$ ). Analysis of data from the above table shows that the prevalence of osteoporosis was (15.00%) which was more among the respondents (25.00%) who consumed milk 101 - 200 ml as compared to respondents who consumed milk 201 - 300 ml (5.00%) and 301 ml and above (0.00%). Saeko Fujiwara, *et al.* (1997)<sup>[7]</sup> focused that intake of milk almost everyday (5 times/week) marginally decreased the risk of fracture (relative risk [RR] 0.54; 95% confidence interval [CI], 0.25-1.07).

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