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A Study to Assess the Effectiveness of Structured Teaching Program on Knowledge Regarding Osteoporosis Among Post-Menopausal Women of Selected Areas of Distt. Mandi (H.P)

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ABSTRACT

Abstract: Osteoporosis is a silent, progressive disease characterized by decreased bone mass and structural deterioration, leading to an increased risk of fractures. Postmenopausal women are particularly vulnerable due to hormonal changes, especially the decline in estrogen levels. In India, the prevalence of osteoporosis is high among post-menopausal women, particularly in rural areas where awareness and access to preventive healthcare are limited. Educational interventions like structured teaching programs can help bridge the knowledge gap and promote preventive practices.

Aim : To assess the effectiveness of a structured teaching program on knowledge regarding osteoporosis among post-menopausal women in selected areas of District Mandi, Himachal Pradesh.

Materials and Methods: A pre-experimental, one-group pretest/post-test design was adopted. A total of 100 post-menopausal women were selected through non-probability purposive sampling. A structured questionnaire was used to assess their knowledge regarding osteoporosis before and after the intervention. The structured teaching program included lectures, visual aids, and demonstrations related to osteoporosis prevention. Data were analysed using descriptive and inferential statistics; the effectiveness of the intervention was tested using the paired t-test, and associations with demographic variables were analysed using the chi-square test.

Findings: The pretest findings revealed that 5% had good knowledge, 29% of women had poor knowledge, 66% had average knowledge. After the intervention, 62% demonstrated good knowledge, 38% had average knowledge, and none had poor knowledge. The mean knowledge score increased from 13.56 (SD = 4.76) in the pretest to 22.20 (SD = 3.43) in the post-test. The paired t-test showed a statistically significant improvement ($t = 14.28, p = 0.00001^*$). A significant association was found between knowledge levels and variables such as occupation and type of family.

Conclusion: The structured teaching program was effective in significantly enhancing the knowledge of post-menopausal women regarding osteoporosis. Educational interventions can play a critical role in promoting awareness and preventive practices, especially in rural settings where health literacy is low.

Keywords: Knowledge, Structured teaching programme, Himanchal Pradesh.

1. INTRODUCTION

Musculoskeletal system (locomotor system) is a human body system. That provided our body with movement, stability, shape and movement. Skeletal system, whose main component is the bone. Bones articulate with each other and form the joints, providing our bodies with a hard-core, yet mobile, skeleton. The integrity and function of the bones and joints is supported by the accessory structures of the skeletal system; articular cartilage, ligaments and burase. According to WHO it is a silent disease and causes fracture of bones. Due to an increase in longevity of life India, osteoporotic fracture are becoming a major causes of morbidity and mortality. The bone fracture is the main sign of osteoporosis. After menopausal in women the process of osteoporosis is accelerated due to deficiency of estrogen. Estrogen helps in the positive calcium metabolism and osteogenesis. Menopause accelerated the bone loss 2-5% per year, which may continue till 10 years. Prevalence of osteoporosis increases in women under age of 45-55 years.

Osteoporosis becoming a public health problem in India. Current prevalence of osteoporosis in worldwide estimate to effect 200 million women- approximately one-tenth of women aged 60, one-fifth of women aged 70, two-fifth of women aged 80, two-thirds of women aged 90. Current prevalence of osteoporosis in India is estimated that 50 million women were suffered. Prevalance according to (2021) survey rate of osteoporosis in Himanchal Pradesh 40-50% among in menopausal women's.

1.1 Need of the Study

Osteoporosis is a major health issue in women after the menopause. On average, women lose up to 10% of their bone mass in the first five years after menopause. After this, the rate of bone loss slows. About one in two women over the age of 50 will experience at least one fracture due to osteoporosis. In India 50 million women are suffered from osteoporosis after menopause. Some of reasons women were suffered from osteoporosis after menopause primarily lack of awareness regarding this type of health problems.

The basic requirement for managing any chronic health disorder starts with evaluation of the awareness about the disease among the target subjects. Although a good understanding of the disease may not be sufficient to bring about changes in health related behaviour, adequate knowledge is a prerequisite for the success of preventive efforts. There is evidence suggesting that knowledge about osteoporosis is a contributor to osteoporosis preventive behaviour, although this is not a clear-cut relationship. In India, awareness of osteoporosis is low, since there has been relatively little effort to publicize the disease. Although few surveys indicate that awareness about the disease in the urban population is inadequate, there are no large-scale surveys undertaken to assess the depth of awareness and understanding of osteoporosis in postmenopausal women.

1.2 Objectives

1. To assess the level of knowledge regarding osteoporosis among post-menopausal women of selected areas.
2. To evaluate the effectiveness of structured teaching program on knowledge regarding osteoporosis among post-menopausal women in selected areas.
3. To find the association of knowledge regarding osteoporosis among postmenopausal women with their selected socio-demographic variables.

1.3 Conceptual Framework

Conceptual Framework Based on CIPP (context, input, process, product) Model Context Evaluation Purpose: To identify the need for the intervention and define objectives.

Need Identified: High prevalence of osteoporosis and poor awareness among postmenopausal women in rural Mandi.

Problem Statement: Post-menopausal women lack adequate knowledge about osteoporosis, its prevention, and management.

Objective: To improve knowledge regarding osteoporosis through a structured teaching program.

Target Population: Post-menopausal women (45–65 years) in selected rural areas of District Mandi, H.P.

Input Evaluation Purpose: To assess strategies, resources, plan for implementing the intervention.

Intervention: Structured teaching program (STP) including lectures, visual aids, and demonstrations.

Resources: Educational materials, facilitators (nurses/health educators), community centers. Tools: Self-structured knowledge questionnaire (30 items).

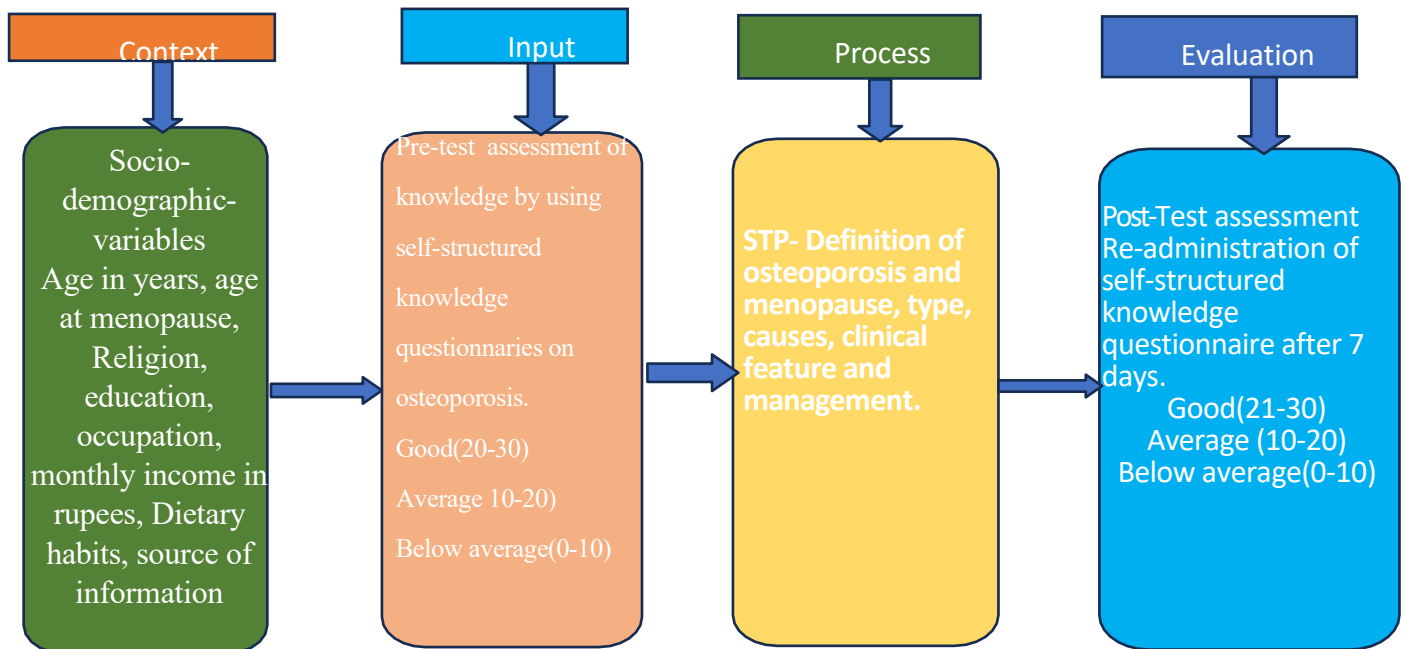
Sampling: 100 post-menopausal women selected via purposive sampling. Pre-test assessment: Baseline knowledge on osteoporosis.

Process Evaluation Purpose: To monitor the implementation and fidelity of the teaching program.

Activities: Pre-test conducted. o Structured Teaching Program delivered in small groups. Methods: Visual aids, demonstrations, interactive sessions. Timeframe: 1–2-hour sessions; post-test after 1–2 weeks.

Documentation: Session reports, attendance records, participant feedback. **Product Evaluation Purpose:** To assess the outcomes and effectiveness of the intervention.

Post-test: Conducted using the same



Statistical Significance: Paired t-test showed a significant difference ($t = 14.28$, p value = 0.00001*).

Conclusion: Structured teaching program was effective. Recommendations: Scale similar programs in rural areas to reduce osteoporosis risk.

2. MATERIAL AND METHODS

Research approach and design: To accomplish the objective of the present study a quantitative approach, pre-experimental research design/ non purposive sampling was used to assess the knowledge among women.

2.1 Research Setting

The present study conduct in selected areas at Distt. Mandi H.P .Present study was conducted among Post-menopausal women of village Janed and Marathu District Mandi (H.P.).

2.2 Sampling Criteria

Inclusion criteria

Study included those who

1. Were in age between 45-60years
- 2.Were is present at the time of study
- 3.have attained menopause from at least 1 year.

Exclusion criteria:

The study excluded those women who:

- 1.who had already participated in similar study.
- 2.Were not willing to participates.

2.3 Research Variables

Independent Variables: Independent variable in this study structured teaching programme.

Dependent Variables: Dependent variables in the study knowledge regarding osteoporosis among post-menopausal women.

Development and Description of the tool: The tool was develop from various source like textbook, journals and discussion with experts in field of medical surgical nursing.

Section-A: Socio-Demographic Variable: Socio-demographic profile sheets include: age in years, age at menopause, religion, educational status, occupation, monthly income, type of family, area of residence, knowledge regarding osteoporosis, source of knowledge, family history of osteoporosis, dietary patterns, durations of menopause.

Criteria measure for knowledge;

Category	Score
Good	(21-30)
Average	(11-20)
Below Average	(0-10)

2.4 Pilot Study

The study was conducted in the month of june, 2025 to determine the reliability of the tool and feasibility of the study. The study

The study was conducted in Janed panchyat at distt. Mandi (H.P) after seeking the permission from panchyat prdhan of the village. Pilot study was conducted on 10 sample. Pre-test knowledge were asses by self-structured knowledge questionnaires. Structured teaching programme were given . After seven days, post-test knowledge were assessed with the help of self-structured questionnaires.

2.5 Reliability of the Tool

It is degree of consistency or accuracy with which an instrument measures the attributes its designed to masure. Reliability was obtained by test retest method and was calculated by Karl's Pearson formula of co-efficient of co-relation formula. The reliability of tool was 0.81, which indicate tool was reliable.

2.6 Data Collection Procedure

Data collection is a systematic approach to gathering and measuring information from a variety of source to get a complete and accurate picture of areas of interest. The main study was conducted in Janed and Marathu area of distt. Mandi (H.P) take permission from pardhan of panchyat. The investigator introduced her and develop rapport with the subjects. The investigator explained the purposes of the study and resassured that the data collected would be kept condifidential. The investigator obtained consent from the subjects prior to the study. The data collection was done in two phase:

Phase 1: After obtaining permission from the significant authority's pre-test schedule for demographic data of women age, age at menopause, religion, education, income, occupation, knowledge of osteoporosis.

Phase 2: Structured questionnaires was administered to assess the knowledge of menopausal women regarding osteoporosis.

Post-test: Post test was conducted on the 7th day after administration of structured teaching programme. The same tool used for the post test.

2.7 Ethical Consideration

Written permission were taken from

- Principal of Abhilashi College of Nursing Tanda, Mandi H.P.
- Ethical committee of Abhilashi College of Nursing Tanda Mandi (H.P)
- Panchyat Pardhans from selected areas of Distt. Mandi (H.P)

An written consent taken from women of selected area of distt. Mandi (H.P)

Confidently and anonymity of each study sample was maintained throughout the study.

3. ORGANIZATION AND PRESENTATION OF DATA

Section I : Distribution of socio-demographic data

Section II : Knowledge regarding osteoporosis among post-menopusal women in selected areas of Distt. Mandi (H.P)

Section II : Evaluation of structured teaching programme.

Section IV: Association of knowledge score regarding osteoporosis among post-menopausal women with their selected Socio-demographic Variable in group.

3.1 Section-I

Distribution of socio demographic variables

Table -1: Showing the frequency and percentage of distribution of selected socio-demographic variables.

Srno.	Socio-demographic variables	(f)	(%)
1.)	Age (in year)		
1.1	40-45	10	10.0%
1.2	46-50	65	65.0%
1.3	51-55	20	20.0%
1.4	56-60	5	5.0%
2.)	Age at menopause		
2.1	40-45	10	10.0%
2.2	46-50	65	65.5%
2.3	51-55	25	25.0%
3.)	Religion		
3.1	Hindu	95	95.0%
3.2	Muslim	0	0.0%
3.3	Sikh	5	5.0%
3.4	Christian	0	0.0%

Table -2: Showing the frequency and distribution of socio-demographic variables in the group (n=100).

4.)	Educational status		
4.1	No formal education	10	10.0%
4.2	Primary education	36	36.0%
4.3	Higher Secondary education	30	30.0%
4.4	Graduation and above	24	24.0%
5.)	Occupation		
5.1	Home maker	48	48.0%
5.2	Govt employed	26	26.0%
5.3	Private employed	19	19.0%
5.4	Self-employed	7	7.0%
6.)	Monthly family income (in rupees)		
6.1	≤ 10,000	8	8.0%
6.2	10,001-20,000	43	43.0%
6.3	20,001-30,000	31	31.0%
6.4	≥30,001	18	18.0%

4.)	Educational status		
(7)	Type of family		
7.1	Nuclear family	37	37.0%
7.2	Joint family	52	52.0%
7.3	Extended family	11	11.0%
(8)	Dietary Habits		
8.1	Vegetarian	59	59.0%
8.2	non-vegetarian	41	41.0%
(9)	Area belongs to		
9.1	Rural	100	100.0%
9.2	Urban	0	0.0%
(10)	Knowledge regarding osteoporosis		
10.1 yes		68	68.0%
10.2 No		32	32.0%
11)	Source of information(if yes teh mention)		
11.1	Mass media	35	35.0%
11.2	Health care worker	10	10.0%
11.3	Family and friends	11	11.0%
11.4	Others	3	3.0%
12)	Fmaily history of osteoporosis		
12.1	Yes	42	42.0%
12.2	No	58	58.0%
13.)	Duration of menopause		
13.1	1 year	19	19.0%
13.2	2 year	28	28.0%
13.3	3 year	38	38.0%
13.4	4year	15	15.0%
14.)	Any Bone releated problem		
14.1	Yes	52	52.0%
14.2	No	48	48.0%

The demographic data of the participants reveals that the less than half (65%) were in the age group of 46–50 years, followed by 20% in the 51–55 years age group, 10% in 40–45 years, and a small proportion (5%) in 56–60 years. Most participants (65%) experienced menopause between 45–50 years of age, while 25% had menopause between 51–55 years, and 10% between 40–45 years. Regarding religion, the majority were Hindus (95%) and a small proportion were Sikhs (5%). In terms of educational status, 36% had completed primary education, 30% had higher secondary education, 25% were graduates or above, while 10% had no formal education. Nearly half of the participants (48%) were homemakers, 26% were government employees, 19% were privately employed, and 7% were self-employed. Regarding monthly family income, 43% earned between ₹10,001–20,000, 31% between ₹20,001–30,000, 18% more than ₹30,000, and 8% less than ₹10,000. When looking at the family type, the majority lived in joint families (52%), followed by nuclear families (37%), extended families (10%), and blended families (1%). All participants (100%) were from rural areas. Concerning knowledge of osteoporosis, 68% reported awareness, while 32% had no knowledge. Among those aware, the main sources of knowledge were mass media (35%), health care workers (19%), family and friends (11%), and others (3%). Family history of osteoporosis was present in 42% of participants, while 58% reported no such history. In terms of dietary habits, 59% were vegetarians, and 41% were non-vegetarians. Regarding the duration of menopause, 38% had experienced menopause for 3 years, 28% for 2 years, 19% for 1 year, and 15% for more than 3 years. Bone-related problems were reported by 52% of participants, while 48% had no such issues.

3.2 Section-II

Pre-test knowledge score regarding osteoporosis among post-menopausal women.

Table -3: Showing frequency & percentage of pre-test knowledge regarding osteoporosis.

Level of knowledge	Pre-test	
	F	%
Good (21-30)	5	5%
Average (11-20)	66	66%
Below average(0-10)	29	29%

Maximum=30

Manimum=0

Table no:3 Illustrates the distribution of pre-test knowledge levels among post-menopusal women majority of participants, 66% have average knowledge. This was followed by 29% participants who had below average knowledge and 5% participants had good knowledge.

Table -4: Mean, Median, Standard deviation, Maximum Score, range and mean knowledge score regarding Osteoporosis

Group	Mean score	S.D	Median score	Max. score	Min.score	Range
Pre-test	13.56	4.7	7	30	0	30

Table 4: In experimental group (pre-test), mean score and S.D score of knowledge score among subjects i.e. mean score $\pm$ S.D 13.56 ± 4.7 , indicating low knowledge level before the intervention. The median score was 7 and range is 30. This result reflecting a need for intervention. The maximum score was 30 and the minimum was 0, resulting in a range of 30, which further supports the observation of diverse knowledge levels in the group before the structured teaching program was implemented.

Table -5: Showing frequency & percentage of post-test knowledge regarding osteoporosis.

Group	Post –test	
	F	%
Good (21-30)	62	62%
Average(11-20)	38	38%
Below average(0-10)	0	0%

Maximum=30

Minimum=0

Table no 5: In experimental group (post-test), showing (62%) Participants have good knowledge, 38% participants have average knowledge and (0.0%) participant having below average. After intervention the post-test result showed markable progress.

Table -6: Mean, Median, Standard deviation, maximum score, range and mean knowledge score regarding osteoporosis.

Group	Mean Score	S.D	Median Score	Max score	Min.score	Range
Post-test	22.20	3.43	29.50	30	12	18

Table no.6: In experimental group (post-test), mean score and S.D score of knowledge score among subjects i.e. mean score $+ 22.20 + 3.43$, indicating high knowledge levels with variability among participants. The median score was 29.50, range is 18. The result showing strong results of structured teaching programme.

3.3 Section-III

Table -7: Evaluate the effectiveness of structured teaching programme regarding osteoporosis.

Group	Mean	S.D.	t-value	P-value
Pretest	13.56	4.7		
Post-test	22.20	3.43	14.28	0.00001

Table no. 7: Showing the paired t-test was conducted to assess the effectiveness of the structured teaching program by comparing the pre-test and post-test scores. The mean score before the intervention was $+13.56$ with a standard deviation of $+4.7$, whereas the post-test mean score increased to $+22.20$ with a standard deviation of $+3.43$. The calculated t-value was 14.28, and the p-value was 0.00001^* , which is highly significant ($p < 0.05$). This statistically significant improvement indicates that the structured teaching program was effective in enhancing the participants' knowledge regarding osteoporosis.

3.4 Section-IV

Table -8: Showing Association Between Knowledge Scores and Selected Socio-Demographic Variables in experimental groups.

N=100

SOCIO-DEMOGRAPHIC VARIABLES ASSOCIATION OF KNOWLEDGE SCORE WITH

DEMOGRAPHIC VARRIABLES IN EXPERIMENTAL GROUP

Variables	Options	Below average	Average	Good	df	Chi-square	p-value
(1) Age in year	40-45	2	6	2	6	8.508	0.203 NS
	46-50	22	42	1			
	51-55	5	13	2			
	56-60	1	4	0			
(2) Age at Menopause	40-42	2	6	2	4	10.136	0.038*
	43-45	24	40	1			
	46-48	4	19	2			
(3) Religion	Hindu	28	5	62	2	5.459	0.795 NS
	Muslim	0	0	0			
	Sikh	2	3	0			
	Christian	0	0	0			
(4) Education	Non-formal Education	3	7	0	6	2.701	0.845 NS
	Prim. Edu.	9	24	3			
	High. Edu	11	17	1			
	Graduate and above	7	17	1			
(5) Occupation	Home maker	13	35	0	6	18.598	0.004*
	Govt. employed	10	11	5			
	Private employed	6	13	0			
	Self-employed	1	6	0			
(6) Monthly Income (in rupees)	≤10,000	2	6	0	6	3.335	0.766 NS
	10,001-20,000	12	29	2			
	20,001-30,000	10	18	3			
	> 30,001	6	12	0			
(7) Type of Family	Nuclear	15	22	0	2	18.251	0.006*
	joint	14	36	2			
	Extended	1	7	3			
(8) Dietary Habits	Vegetarian	16	41	2	2	1.591	0.145 NS
	Non-vegetarian	14	24	3			
(9) Areas belongs	Rural	30	65	5	NA	NA	NA
	Urban	0	0	0			
(10) Knowledge regarding osteoporosis	Yes	22	44	2	2	2.196	0.335 NS
	No	8	21	3			
(11) Source of information	Mass media	13	20	2	8	12.046	0.149 NS
	Health worker	5	14	0			
	family	3	8	0			
	Others	2	0	1			
(12) Family history Of osteoporosis	Yes	14	28	0	2	3.920	0.141 NS
	No	16	37	5			
(13) Duration of menopause	1 year	6	13	0	6	4.708	0.581 NS
	2 years	6	19	3			
	3 years	13	23	2			
	Above 3 years	5	10	0			
(14) Any bone related diseases	Yes	19	30	3	2	2.562	0.277 NS
	No	11	35	2			

Table no 8: This table depicts that the association between knowledge score and various socio-demographic variables revealed that occupation, type of family ,and age at menopause had a significant influence on the participants understanding of osteoporosis.

4. DISCUSSION

The Discussion section interprets the study's findings, situates them within the context of existing literature, and explores their implications for health education and osteoporosis prevention. This study, titled "A study to assess the effectiveness of a structured teaching program on knowledge regarding osteoporosis among post-menopausal women of selected areas of District Mandi, H.P.," evaluates the impact of a structured teaching program on knowledge levels among post-menopausal women. By comparing pre- and post-intervention knowledge scores and analysing associations with socio-demographic variables, the study provides insights into addressing the public health challenge of osteoporosis in rural settings.

4.1 Regarding Socio-Demographic Findings

The majority of participants were between 46–50 years of age (10%), followed by the 40–45 age group (65%). A significant portion of women had experienced menopause between 40–42 years (63%), which is consistent with findings from previous Indian studies showing early onset menopause in rural areas. Most participants were Hindus (79%) and had completed at least higher secondary education (38%). Despite educational attainment, many women lacked sufficient knowledge about osteoporosis, reflecting the need for targeted health education irrespective of formal education level.

Most participants (48%) were homemakers, and 71% lived in rural areas, indicating that limited exposure to health-related information could have contributed to poor baseline knowledge. The prevalence of bone-related issues (52%) among participants further supports the importance of raising awareness and promoting preventive strategies.

5. CONCLUSION

This study demonstrated that a structured teaching program significantly improved knowledge about osteoporosis among post-menopausal women in District Mandi, H.P., with the proportion of participants with good knowledge increasing from 5% to 62% and poor knowledge eliminated entirely. The mean knowledge score rose from 13.56 to 22.20, with a statistically significant improvement ($t = 14.28$, $p\text{-value} = 0.00001^*$), confirming the intervention's effectiveness. Significant associations between knowledge and occupation, family type, and source of knowledge highlight the influence of socio-cultural factors on health literacy. These findings underscore the value of structured, culturally relevant educational interventions in addressing knowledge gaps in rural settings, where osteoporosis prevalence is high (40–50% among post-menopausal women in Himachal Pradesh) and awareness is low.

6. RECOMMENDATION

On the basis of the study that had under taken been conducted certain suggestion are given for future

1. A similar study can be undertaken on a large sample to generalize the finding of the study.
2. Regular structured teaching programme should be conducted by health professionals to enhanced knowledge regarding osteoporosis among women.
3. A comparative study can be done to assess the knowledge regarding osteoporosis among post-menopausal women.

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