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A STUDY TO ASSESS THE EFFECTIVENESS OFSTRUCTURED TEACHING PROGRAMME ON KNOWLEDGE REGARDING OSTEOPOROSIS AND ITS PREVENTION AMONG PERI MENOPAUSAL WOMEN AT SELECTED URBANCOMMUNITY AREA, BANGALORE, KARNATAKA.

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ABSTRACT

Osteoporosis is a disorder characterized by decreased bone strength which is common and it is related with a few important risk factors including smoking and being overweight. In India women between the age group 40 to 55 years women suffer from osteoporosis. The objective of the study is to evaluate the effectiveness of Structured Teaching Programme on knowledge regarding osteoporosis and its prevention among peri-menopausal women in an urban community in Bangalore. A quantitative, pre-experimental research design was used with a purposive sample of 50 peri-menopausal women. The data was collected using structured questionnaires to assess their knowledge. Later intervention was provided regarding the management of osteoporosis. The pre-test results showed that most participants (70%) had inadequate knowledge, 30% had moderately adequate knowledge, and none had adequate knowledge about osteoporosis. Following the STP, a significant improvement in knowledge was observed, with 74% of participants demonstrating adequate knowledge in the post-test. The study concluded that the STP was highly effective in improving the knowledge of peri-menopausal women regarding osteoporosis and its prevention. This highlights the importance of community-based educational programmes to empower women with knowledge and promote healthy lifestyle practices to prevent osteoporosis.

INTRODUCTION

Osteoporosis was first discovered by John Hunter, a British surgeon who introduced the process of remodelling[2]. Jean Lobstein, a French pathologist during the 1890s, found that there are normal holes in every bone, but bones in people with specific age and diseases have holes of larger than normal size. He named this kind of bone as porous, and the disease was named as osteoporosis[3].

Osteoporosis is a systematic skeletal disease characterized by low bone mass and micro-architectural deterioration of bone tissue, with a consequent increase in bone fragility and susceptibility to fracture (WHO)[1]. Osteoporosis is a skeletal condition characterized by decreased density (mass or volume) of normally mineralized bone. The reduced bone density leads to decreased mechanical strength, thus making the skeleton more likely to fracture. Osteoporosis is called a silent disease because it does not usually cause symptoms.

Osteoporosis is classified as primary or secondary. Primary osteoporosis, more common in women, includes post-menopausal osteoporosis caused by estrogen deficiency and senile osteoporosis occurring with advancing age. Secondary osteoporosis results from medical conditions, nutritional deficiencies, lifestyle factors, or prolonged use of medications such as corticosteroids.

Bone health is maintained through continuous modelling and remodeling, involving bone resorption by osteoclasts and bone formation by osteoblasts. Imbalance in this process leads to bone loss. Genetic factors contribute significantly to osteoporosis risk, along with inadequate calcium and vitamin D intake, physical inactivity, smoking, alcohol use, and hormonal deficiencies.

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Osteoporosis increases susceptibility to fractures, leading to pain, deformities, loss of height, and kyphosis. Bone densitometry (DEXA) is the gold standard for diagnosis, with a T-score of −2.5 or below indicating osteoporosis as per WHO criteria[1].

Management includes calcium and vitamin D supplementation, bisphosphonates, and hormone-based therapies. Pharmacologically, aminobisphosphonates are effective in reducing fracture risk. In the 1940s, American endocrinologist Fuller Albright established the association between osteoporosis and menopause and initiated estrogen therapy to prevent bone loss in menopausal women[4]. Preventive measures such as adequate nutrition, regular weight-bearing exercise, avoidance of smoking and excessive alcohol, and early screening are essential, especially among post-menopausal women who are at higher risk.

NEED FOR THE STUDY

Osteoporosis is a progressive skeletal disorder marked by reduced bone density and micro-architectural deterioration, leading to increased fracture risk. It is termed a silent disease as it often remains undiagnosed until fractures occur[5]. Globally, over 200 million women are affected, and one in three women above 50 years experiences osteoporotic fractures[5]. In India, nearly 50 million people suffer from osteoporosis and osteopenia, with peri-menopausal women being particularly vulnerable due to estrogen deficiency.

The burden of osteoporosis in India is considerable, with about 46 million women at risk. Low awareness, inadequate nutrition, and poor preventive practices significantly contribute to disease progression. Osteoporotic fractures, particularly of the hip and vertebrae, lead to disability, reduced quality of life, and increased mortality. Studies from Karnataka report a rising prevalence of low bone mass among peri-menopausal and postmenopausal women, with lack of knowledge identified as a major contributing factor.

Evidence highlights substantial knowledge deficits. A study in Tamil Nadu (2019) found that only 32% of peri-menopausal women had adequate knowledge regarding osteoporosis and its prevention[6]. Similarly, a Karnataka-based study (2020) reported that over 65% of women lacked awareness of appropriate dietary and lifestyle practices. An interventional study by Priya et al. (2020) demonstrated significant improvement in knowledge following a structured teaching programme, with scores increasing from 35% in the pre-test to 82% in the post-test[7].

Structured teaching programmes are therefore effective in improving awareness and preventive practices. As the peri-menopausal period offers a critical window for prevention before irreversible bone loss occurs, the present study aims to assess the effectiveness of a structured teaching programme on knowledge regarding osteoporosis.

OBJECTIVES

- To assess the level of knowledge regarding osteoporosis and its prevention among peri-menopausal women.
- To assess the effectiveness regarding osteoporosis and its prevention among peri-menopausal women.
- To find out association of knowledge level between scores of peri-menopausal women with selected socio-demographic variables.

MATERIALS AND METHODS

- **Hypothesis:**

H1: There may be a significant difference between mean pre-test and post-test knowledge scores of peri-menopausal women regarding osteoporosis and its prevention.

H2: There may be a significant association between pre-test knowledge scores of peri-menopausal women with selected socio-demographic variables.

Methodology.

- **Research Variables:**
  - **Independent Variables** – Structured Teaching Programme.
  - **Dependent Variables** - knowledge of the peri menopausal women.
  - **Demographic Variables**- age, religion, educational status, marital status, type of diet, monthly income, age of menarche, menstrual cycle, exercise pattern, sources of information.
- **Research Methodology:**
  - **Research Approach-** Quantitative Research approach
  - **Research Design-** Pre-experimental research design
  - **Setting**- Urban areas of Bangalore
  - **Target Population**- Peri-menopausal women
  - **Sampling technique-** Purposive sampling technique
  - **Sample size**-50
  - **Data collection instrument**- Self Structured Questionnaires
  - **Inclusive criteria**- Peri-menopausal women who were available at the time of data collection.
    -Women who were willing to participate in the study the age between 35-50years.
  - **Exclusive criteria-** Peri-menopausal women who were not available during the time of data collection.
    -Women who were not willing to participate in the study the age between 35-50years.
- **Data Collection Tool:**

The data was selected through self-administered questionnaires.

The tool consists of two parts:

- Section A: It consists of socio demographic variables which includes age, religion, educational status, marital status, type of diet, monthly income, age of

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menarche, menstrual cycle, exercise pattern, sources of information.

- Section B: A structured questionnaires were prepared in the form of multiple-choice questions which consists of questions regarding osteoporosis and its prevention among peri-menopausal women.

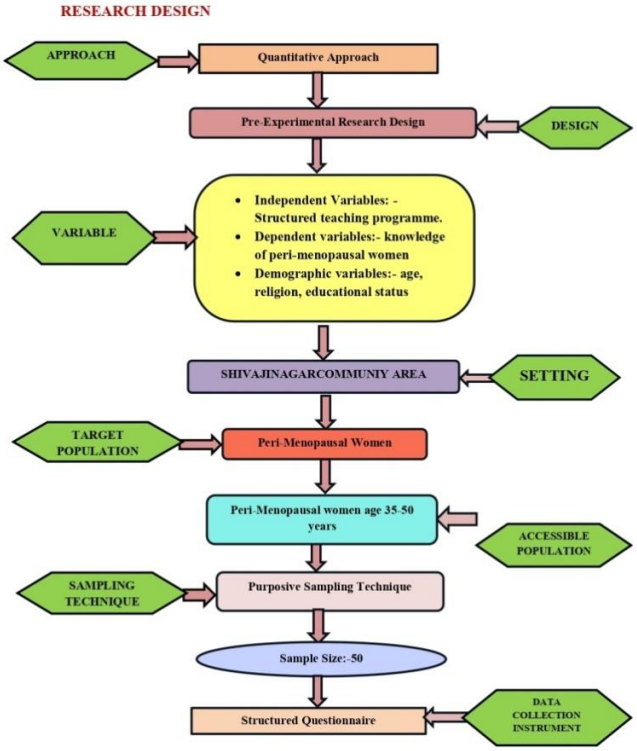

Fig 1: Schematic Representation of Research

RESULTS: -

In the pre-test, 70% of participants had inadequate knowledge and none had adequate knowledge. After the structured teaching programme, 74% achieved adequate knowledge, while the remaining had moderate knowledge, showing a marked improvement of knowledge regarding the prevention and management of osteoporosis.

TABLE-1: Pre-test and post-test knowledge level of peri-menopausal women.

Level of Knowledge	Pre-Test		Post-Test	
	Frequency	%	Frequency	%
a) Inadequate	35	70.00%	0	0.00%
b) Moderate	15	30.00%	13	26.00%
c) Adequate	0	0.00%	37	37.00%
Total	50	100%	50	100%

The table compares pre-test and post-test knowledge levels of 50 participants. In the pre-test, 70% had inadequate knowledge and 30% had moderate knowledge, with none demonstrating adequate knowledge. Following the intervention, no participants remained in the inadequate category; 26% had moderate knowledge, and 74% achieved adequate knowledge, indicating a significant improvement in knowledge after the intervention.

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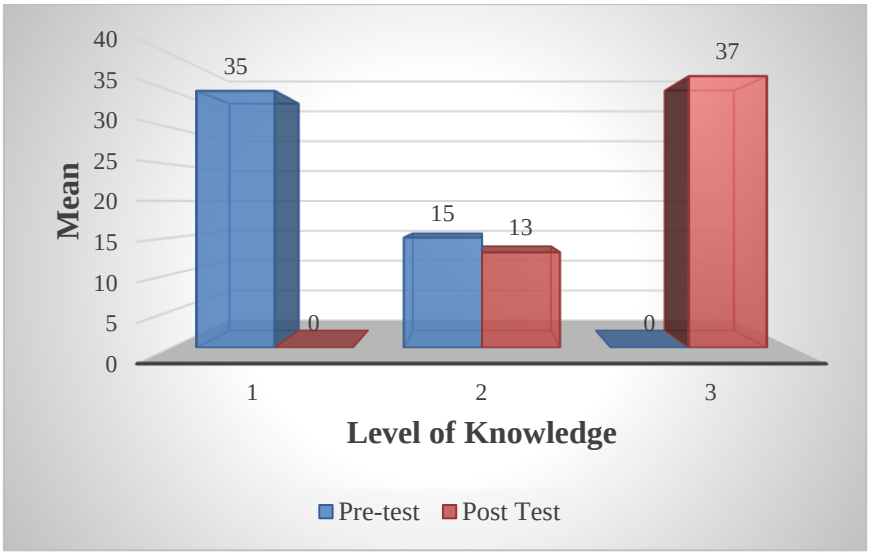

Fig 2:Comparison of pre-test and post-test knowledge level of peri-menopausal women.

TABLE-2: Mean, Mean percentage and standard deviation for the pre-test and post-test knowledge of peri-menopausal women.

Sl. No	Knowledge Aspects	Respondents Knowledge			
		Pre-Test		Post-Test	
		Mean	SD	Mean	SD
1	Anatomy & Physiology of bones	41	13.4	73.4	11.2
2	General information on menstruation	51.7	18.8	88.3	11.3
3	Introduction & definition of osteoporosis	57.3	34.4	94.7	12.3
4	Incidence & risk factors of osteoporosis	39.2	20.6	81.6	12
5	Signs & symptoms & diagnostic evaluation of osteoporosis	20.3	17.6	69	18.1
6	Complications, prevention & management of osteoporosis	45.5	15.6	83.5	10.4
	Combined	41.8	9.5	80.3	5.2

The table shows a significant improvement in osteoporosis knowledge among 50 peri-menopausal women after the structured teaching programme. The overall mean score increased from 41.8% (SD = 9.5) in the pre-test to 80.3% (SD = 5.2) in the post-test, with knowledge gains observed across all content areas.

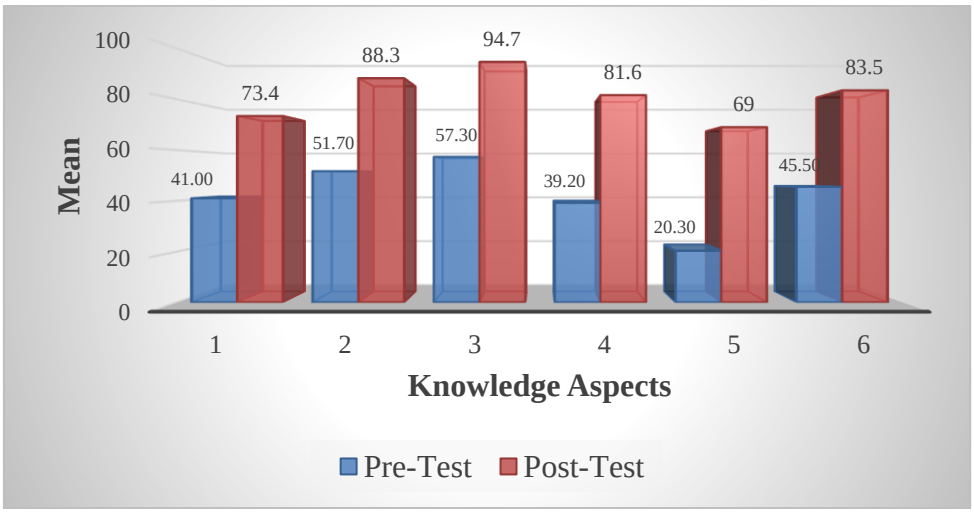

Fig 3: Mean percentage of pre-test and post-test knowledge scores of undergraduate students.

TABLE-3: Comparison of pre-test and post-test knowledge scores of peri-menopausal women regarding prevention and management of osteoporosis.

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Sl. No	Knowledge Aspects	Respondents Knowledge						Paired 't' test
		Pre-Test		Post-Test		Enhancement		
		Mean	SD	Mean	SD	Mean	SD	
1	Anatomy & Physiology of bones	41	13.4	73.4	11.2	32.4	17.6	13.02*
2	General information on menstruation	51.70	18.8	88.3	11.3	36.7	20.5	12.66*
3	Introduction & definition of osteoporosis	57.3	34.4	94.7	12.3	37.3	34.8	7.58*
4	Incidence & risk factors of osteoporosis	39.2	20.6	81.6	12	42.4	21.2	14.14*
5	Signs & symptoms & diagnostic evaluation of osteoporosis	20.3	17.6	69	18.1	48.7	26.3	13.09*
6	Complications, prevention & management of osteoporosis	45.5	15.6	83.5	10.4	38	17.4	15.44*
	Combined	41.8	9.5	80.3	5.2	38.5	9.2	29.59*

The table shows a significant improvement in post-test knowledge scores compared to pre-test scores among 50 respondents following the structured teaching programme. Knowledge gain ranged from 32.4% to 48.7%, with the highest improvement in signs, symptoms, and diagnostic evaluation. The paired t-test ($t = 29.59$, $p < 0.05$) confirms the overall effectiveness of the intervention.

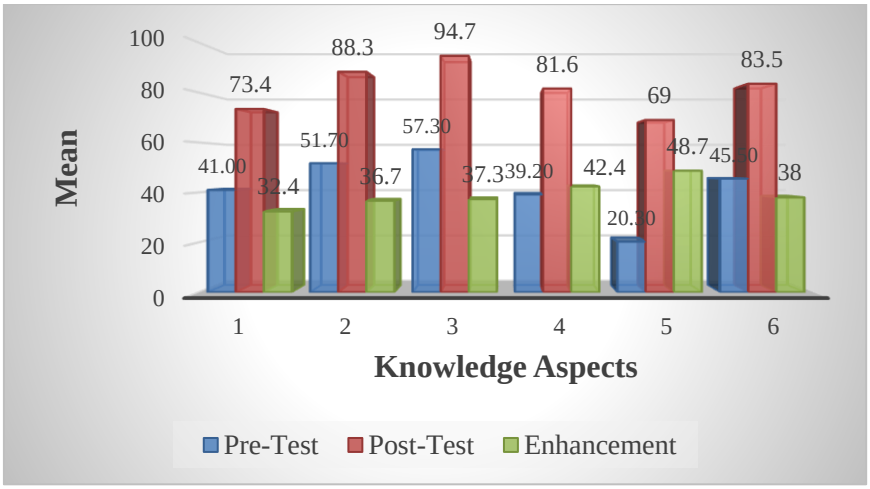

Fig 4: Comparison of pre and post-test knowledge scores of undergraduate Students.

Table-4: Association between the pre-test knowledge scores of peri-menopausal women regarding osteoporosis and its prevention with selected socio-demographic variables.

Demographic Variables	Category	Sample	Knowledge Level				χ^2	P
			Inadequate		Adequate			Value
			N	%	N	%	Value	
Type of Diet	Vegetarian	10	10	100	0	0	5.36*	P<0.05
	Mixed	40	25	62.5	15	37.5		(3.841)
Age at menarche (years)	13	22	19	86.4	3	13.6	5.01*	P<0.05 (3.841)
	14-15	28	16	57.1	12	42.9		
Exercise pattern	Regular	10	4	40	6	60	5.36*	P<0.05 (3.841)
	Irregular	40	31	77.5	9	22.5		
	Often	28	16	57.1	12	42.9		
	Never	15	10	66.7	5	33.3		

***Significantat5%Level**

The above table shows the χ^2(Chi-square) values computed between the pre-test knowledge scores were significantly associated ($p < 0.05$) with type of diet, age at menarche, and exercise pattern among peri-menopausal women.

The major findings of the study were discussed under the following headings:

1. Assess demographic characteristics of peri-menopausal women.
2. Evaluate baseline knowledge regarding management and prevention of osteoporosis.
3. Determine the effectiveness of a structured teaching programme on osteoporosis-related knowledge.
4. Examine the association between pre-test knowledge scores and selected demographic variables.
5. Test the stated hypotheses.

DISCUSSION

The present study assessed the effectiveness of a Structured Teaching Programme (STP) on knowledge regarding osteoporosis and its prevention among peri-menopausal women in a selected community area of Bangalore. The findings revealed that most participants had inadequate knowledge during the pre-test, which significantly improved after the intervention, indicating the effectiveness of the STP. These results are consistent with a quasi-experimental study conducted in Ammapalayam village, Tamil Nadu, where a planned educational programme significantly enhanced premenopausal women's knowledge about osteoporosis and its prevention. Additionally, the present study found a significant association between knowledge scores and selected socio-demographic variables, including diet, age at menarche, and exercise patterns. This is supported by a cross-sectional study conducted in Chennai, Tamil Nadu, which reported significant associations between osteoporosis awareness and demographic factors such as age, education, occupation, diet type, and socio-economic status ($p < 0.05$)[8].

RECOMMENDATIONS

Based on the findings of the study following recommendations have been made:

- A similar may be conducted on a large sample of peri-menopausal women for generalization of the study findings.
- The similar study can be conducted as a descriptive type of study.
- Generalization of the findings is limited to a particular location.
- A similar study can be conducted using control group.
- A similarly study can be conducted through video teaching.

NS: Non-significant

- A comparative study can be conducted between pre-menopausal women and menopausal women.

CONCLUSION

The study concluded that the Structured Teaching Programme was effective in improving peri-menopausal women's knowledge regarding osteoporosis and its prevention. The significant improvement between pre-test and post-test scores indicates that educational interventions enhance community awareness. Participants showed keen interest and gained better understanding of the importance of balanced nutrition, physical activity, and regular health check-ups. The study emphasizes the need for regular community-based educational programmes to promote healthy lifestyle practices and prevent osteoporosis and its complications.

CONFLICT OF INTEREST: None.

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