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A study to evaluate the effectiveness of video assisted teaching regarding preventive strategies of osteoporosis on knowledge, attitude and lifestyle practices among premenopausal women at selected areas, Puducherry

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Abstract:

Background: The Osteoporosis is a major global public health concern, particularly in developing countries, driven by rising levels of obesity, poor nutrition, and physical inactivity. **Methodology:** The study used a quantitative quasi-experimental pretest–posttest control group design. It was conducted among 100 premenopausal women aged 35–50 years in Orleanpet and Lawspet, Puducherry, with 50 participants each in the experimental and control groups. **Results:** At baseline, 62% of women in the experimental group and 70% in the control group had inadequate knowledge, with most exhibiting neutral attitudes and poor osteoporosis preventive practices. After Video Assisted Teaching, 54% attained adequate knowledge, 88% developed a positive attitude, and adequate practices increased to 94% for sunlight exposure, 92% for calcium intake, and 72% each for vitamin D intake and physical activity. Post-test differences between groups were highly significant for sunlight exposure ($t = 9.646$), calcium intake ($t = 5.588$), vitamin D intake ($t = 3.964$), and physical activity ($t = 4.272$) at $p = 0.0001$, confirming the effectiveness of Video Assisted Teaching. **Conclusion:** The study concluded that Video Assisted Teaching was highly effective in improving knowledge, attitude, and lifestyle practices regarding prevention strategies of osteoporosis among premenopausal women.

Keywords: Osteoporosis, Knowledge, Attitude, Lifestyle.

INTRODUCTION

The Osteoporosis is a major global public health concern, particularly in developing countries, driven by rising levels of obesity, poor nutrition, and physical inactivity. The World Health Organization defines osteoporosis as a bone mineral density that is 2.5 standard deviations or more below the young adult mean. It is characterized by reduced bone mass and deterioration of bone tissue, leading to increased fragility and risk of fractures. Often referred to as a “silent disease,” osteoporosis usually remains undetected until a minor fall results in a fracture.

Common fracture sites include the hip, spine, and wrist, with incidence increasing with age. The condition is classified as primary (age-related and postmenopausal) and secondary (caused by diseases or medications). Menopause plays a significant role due to decreased estrogen levels, resulting in accelerated bone loss in women.

Risk factors are categorized as modifiable (such as poor diet, smoking, alcohol use, physical inactivity, and low calcium intake) and non-modifiable (including age, gender, genetics, and ethnicity). Preventive strategies focus on adequate calcium and vitamin D intake, balanced nutrition, regular weight-bearing exercise, and healthy lifestyle practices. Nutrients like vitamins C, B12, K, omega-3 fatty acids, and proteins also support bone health.

Since osteoporosis-related fractures contribute to increased morbidity, mortality, and economic burden, early prevention is essential. Enhancing awareness, promoting healthy behaviors, and encouraging early diagnosis can significantly reduce disease impact. Video-assisted teaching has been identified as an effective method to improve knowledge and motivate individuals to adopt preventive practices.

NEED FOR THE STUDY

Osteoporosis is a significant global health concern, with approximately one in three women and one in five men over the age of 50 expected to experience a fragility fracture during their lifetime. The global burden is increasing rapidly, with projections indicating that by 2050, hip fracture incidence will rise by 310% in men and 240% in women compared to 1990 levels. Currently, osteoporosis accounts for over 8.9 million fractures annually, occurring approximately every three seconds worldwide, and is estimated to affect nearly 500 million individuals.

Evidence from a cross-sectional study among postmenopausal women in India revealed moderate levels of knowledge, attitude, and practices related to osteoporosis. However, gaps remain, highlighting the need for improved awareness and preventive strategies.

Given the increasing burden and early onset of osteoporosis, especially among women, there is a need to promote awareness and encourage healthy lifestyle practices before menopause. Enhancing knowledge, attitudes, and preventive behaviors during the premenopausal period may help reduce the future incidence of osteoporosis. Therefore, video-assisted teaching is considered a useful educational approach to improve understanding and promote preventive practices among premenopausal women.

METHODOLOGY

The study used a quantitative quasi-experimental pretest–posttest control group design. It was conducted among 100 premenopausal women aged 35–50 years in Orleanpet and Lawspet, Puducherry, with 50 participants each in the experimental and control groups.

A self-structured questionnaire, Likert scale, and observational checklist were used to assess knowledge, attitude, and lifestyle practices regarding osteoporosis prevention. The intervention was a 15-minute video-assisted teaching program, and data were collected before and after the intervention.

The tools were validated by experts and found reliable. Ethical approval, informed consent, and confidentiality were ensured. Data were analyzed using descriptive and inferential statistics, including chi-square, unpaired t-test, and Pearson correlation.

RESULT

The majority of premenopausal women in the experimental group were aged 46–50 years, while in the control group they were aged 35–40 years. Most participants in both groups were Hindu, housewives, and married. In the experimental group, many had studied up to SSLC, whereas in the control group, many had no formal education.

Most women in the experimental group and control group had a family income below ₹15,000. The majority were non-vegetarian and had no known medical illness. In the experimental group, most had two or more deliveries, while in the control group, many had fewer than two deliveries. Regarding family history of osteoporosis, many women in the experimental group did not know their status, and many in the control group reported no family history. Chi-square analysis showed homogeneity only for food habits, while other demographic variables were not homogeneous.

Table 2 compares the pretest and post-test levels of knowledge, attitude, and lifestyle practices regarding osteoporosis prevention among premenopausal women in the experimental and control groups. At pretest, most women in both groups had inadequate knowledge, neutral attitude, and inadequate lifestyle practices. Following Video Assisted Teaching, the experimental group showed marked improvement: 54% attained adequate knowledge, 88% developed a positive attitude, and adequate lifestyle practices increased substantially in sunlight exposure (94%), calcium intake (92%), vitamin D intake (72%), and physical activities (72%). In contrast, the control group showed little or no change in knowledge, attitude, and lifestyle practices.

Table 3 demonstrates the effectiveness of Video Assisted Teaching (VAT) on lifestyle practices related to osteoporosis prevention among premenopausal women. For sunlight exposure, both groups were comparable during the pretest (Experimental: 2.22 ± 0.42 ; Control: 2.32 ± 0.55) with no significant difference ($t = 1.022$, $p = 0.310$). In the post-test, the experimental group showed a marked improvement (3.60 ± 0.78) compared with the control group (2.30 ± 0.54), and the difference was highly significant ($t = 9.646$, $p = 0.0001$). For calcium food intake, there was no significant difference between the groups at pretest ($t = 0.294$, $p = 0.769$). After the intervention, the experimental group obtained a substantially higher mean score (22.00 ± 4.58) than the control group (16.56 ± 5.14), with a highly significant difference ($t = 5.588$, $p = 0.0001$).

For vitamin D food intake, the pretest scores did not differ significantly between groups ($t = 1.275$, $p = 0.205$). In the post-test, the experimental group showed significant improvement (19.32 ± 5.56) over the control group (15.28 ± 4.59), yielding a highly significant difference ($t = 3.964$, $p = 0.0001$). For physical activities, both groups were similar at pretest ($t = 0.392$, $p = 0.696$). Following VAT, the experimental group demonstrated a considerable increase in activity scores (8.96 ± 1.82) compared with the control group (4.18 ± 2.32), and the difference was highly significant ($t = 4.272$, $p = 0.0001$).

Post-test correlation analysis showed a significant positive relationship between knowledge and lifestyle practices among premenopausal women. Knowledge was positively correlated with sunlight exposure ($r = 0.345$, $p = 0.014$), calcium food intake ($r = 0.303$, $p = 0.033$), vitamin D food intake ($r = 0.416$, $p = 0.003$), and physical activities ($r = 0.317$, $p = 0.025$). These findings indicate that higher knowledge scores were associated with better osteoporosis preventive practices.

DISCUSSION

The present study revealed that both the experimental and control groups were comparable at baseline, with most premenopausal women demonstrating inadequate knowledge, neutral attitude, and inadequate lifestyle practices regarding prevention strategies of osteoporosis. In the pretest, 62% of women in the experimental group and 70% in the control group had inadequate knowledge, while the majority exhibited a neutral attitude and poor practices related to sunlight exposure, calcium intake, vitamin D intake, and physical activities.

Following the Video Assisted Teaching intervention, the experimental group showed substantial improvement in all outcome variables. More than half (54%) of the women achieved adequate knowledge, and 88% developed a positive attitude toward osteoporosis prevention. Lifestyle practices also improved markedly, with adequate sunlight exposure increasing from 22% to 94%, calcium food intake from 34% to 92%, vitamin D food intake from 40% to 72%, and physical activities from 6% to 72%.

In contrast, the control group demonstrated minimal changes in post-test scores, with the majority continuing to have inadequate knowledge and relatively unchanged attitudes and lifestyle practices. Statistical analysis further confirmed that post-test differences between the experimental and control groups were highly significant in all domains of lifestyle practices, including sunlight exposure ($t = 9.646$), calcium food intake ($t = 5.588$), vitamin D food intake ($t = 3.964$), and physical activities ($t = 4.272$), all at $p = 0.0001$.

These findings establish that Video Assisted Teaching was highly effective in improving knowledge, attitude, and lifestyle practices regarding prevention strategies of osteoporosis among premenopausal women.

CONCLUSION

The study concluded that Video Assisted Teaching was highly effective in improving knowledge, attitude, and lifestyle practices regarding prevention strategies of osteoporosis among premenopausal women. Premenopausal women who received the intervention demonstrated significant gains in adequate knowledge, more positive attitudes, and healthier lifestyle practices related to sunlight exposure, calcium intake,

vitamin D intake, and physical activities compared with those in the control group. Therefore, Video Assisted Teaching is an effective, practical, and economical educational strategy that can be used by nurses and other health professionals to promote osteoporosis preventive behaviors among premenopausal women.

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Table 1: Percentage distribution of demographic variables of the premenopausal women in the experimental and control group.

Demographic Variables	Experimental Group (n=50)		Control Group (n=50)		Chi-Square (χ^2) for homogeneity
	N	%	N	%	
Age in years					$\chi^2=3.019$ p=0.221 N.S
35 – 40	17	34.0	22	44.0	
41 – 45	13	26.0	12	24.0	
46 – 50	20	40.0	16	32.0	
Religion of the mother					$\chi^2=1.128$ p=0.569 N.S
Hindu	39	78.0	43	86.0	
Christian	9	18.0	6	12.0	
Muslim	2	4.0	1	2.0	
Education level					$\chi^2=4.937$ p=0.294 N.S
No formal education	14	28.0	12	24.0	
SSLC	16	32.0	11	22.0	
HSC	6	12.0	8	16.0	
Graduate	13	26.0	13	26.0	
Post graduate	1	2.0	6	12.0	
Occupation					$\chi^2=1.114$ p=0.573 N.S
Housewife	38	76.0	41	82.0	
Govt. employee	6	12.0	3	6.0	
Private employee	6	12.0	6	12.0	
Marital status					$\chi^2=1.846$ p=0.397 N.S
Single	10	20.0	7	14.0	
Married	37	74.0	42	84.0	
Divorced	3	6.0	1	2.0	
Income of the family					$\chi^2=2.645$ p=0.266 N.S
Below 15000	33	66.0	26	52.0	
15000 – 25000	10	20.0	17	34.0	
Above 25000	7	14.0	7	14.0	

Food habits					$\chi^2=5.316$ p=0.021 S*
Vegetarian	11	22.0	3	6.0	
Non-vegetarian	39	78.0	47	94.0	
Medical illness					$\chi^2=6.836$ p=0.145 N.S
Endocrine disease	5	10.0	3	6.0	
Cardiac disease	4	8.0	0	0	
Gastrointestinal disease	0	0	1	2.0	
Bone and joint disease	2	4.0	5	10.0	
No medical illness	39	78.0	41	82.0	
Number deliveries					$\chi^2=1.449$ p=0.229 N.S
≤2	24	48.0	30	60.0	
>2	26	52.0	20	40.0	
Family history of osteoporosis					$\chi^2=3.323$ p=0.190 N.S
Yes	6	12.0	2	4.0	
No	18	36.0	25	50.0	
Don't know	26	52.0	23	46.0	

Table 2: Comparison of Pretest and Post-test Levels of Knowledge, Attitude, and Lifestyle Practices on Prevention Strategies of Osteoporosis

Variables	Categories	Experimental Group Pretest n (%)	Experimental Group Post-test n (%)	Control Group Pretest n (%)	Control Group Post-test n (%)
Knowledge	Inadequate (0–6)	31 (62.0)	0 (0.0)	35 (70.0)	29 (58.0)
	Moderately adequate (7–13)	19 (38.0)	23 (46.0)	15 (30.0)	21 (42.0)
	Adequate (14–20)	0 (0.0)	27 (54.0)	0 (0.0)	0 (0.0)
Attitude	Negative (10–20)	2 (4.0)	0 (0.0)	0 (0.0)	0 (0.0)
	Neutral (21–30)	27 (54.0)	6 (12.0)	24 (48.0)	24 (48.0)
	Positive (31–50)	21 (42.0)	44 (88.0)	26 (52.0)	26 (52.0)

Lifestyle Practices	Sunlight Exposure				
	Inadequate (≤ 2)	39 (78.0)	3 (6.0)	32 (64.0)	33 (66.0)
	Adequate (> 2)	11 (22.0)	47 (94.0)	18 (36.0)	17 (34.0)
	Calcium Food Intake				
	Inadequate (≤ 15)	33 (66.0)	4 (8.0)	35 (70.0)	31 (62.0)
	Adequate (> 15)	17 (34.0)	46 (92.0)	15 (30.0)	19 (38.0)
	Vitamin D Food Intake				
	Inadequate (≤ 15)	30 (60.0)	14 (28.0)	30 (60.0)	35 (70.0)
	Adequate (> 15)	20 (40.0)	36 (72.0)	20 (40.0)	15 (30.0)
	Physical Activities				
	Inadequate (≤ 7)	47 (94.0)	14 (28.0)	50 (100.0)	48 (96.0)
	Adequate (> 7)	3 (6.0)	36 (72.0)	0 (0.0)	2 (4.0)

Table 3: Effectiveness of VAT on level of lifestyle practices regarding prevention strategies of osteoporosis among premenopausal women.

Lifestyle Practices	Test	Experimental Group (n = 50) Mean \pm SD	Control Group (n = 50) Mean \pm SD	Mean Difference Score	Unpaired t Value	p Value	Significance
Sunlight Exposure	Pretest	2.22 \pm 0.42	2.32 \pm 0.55	0.10	1.022	0.310	NS
	Post-test	3.60 \pm 0.78	2.30 \pm 0.54	1.30	9.646	0.0001	S***
Calcium Food Intake	Pretest	16.14 \pm 5.69	16.46 \pm 5.16	0.32	0.294	0.769	NS
	Post-test	22.00 \pm 4.58	16.56 \pm 5.14	5.44	5.588	0.0001	S***
Vitamin D Food Intake	Pretest	14.48 \pm 5.44	15.78 \pm 4.73	1.30	1.275	0.205	NS
	Post-test	19.32 \pm 5.56	15.28 \pm 4.59	4.04	3.964	0.0001	S***
Activities	Pretest	4.18 \pm 2.29	4.00 \pm 2.30	0.18	0.392	0.696	NS
	Post-test	8.96 \pm 1.82	4.18 \pm 2.32	4.78	4.272	0.0001	S***

Table 4: Correlation between post-test level of knowledge, attitude and lifestyle practices among premenopausal women.

Variables	Mean	SD	r	P-Value
Knowledge	13.98	3.22	r= 0.345	p=0.014, S*
Sunlight exposure	3.60	0.78		
Knowledge	13.98	3.22	r= 0.303	p=0.033, S*
Calcium food intake	22.00	4.58		
Knowledge	13.98	3.22	r= 0.416	p=0.003, S*
Vit-D Food intake	19.32	5.56		
Knowledge	13.98	3.22	r= 0.317	p=0.025, S*
Activities	5.96	1.82		

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