Research Article

Effectiveness of structured educational program on knowledge of middle-aged women regarding prevention of osteoporosis

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Abstract

Background: Osteoporosis is a skeletal disease characterized by low bone mass and microarchitectural deterioration of bone tissue, leading to bone fragility and consequent increase in fracture risk.

Objective: To determine the effectiveness of structured educational program on the knowledge of middle-aged women and to determine the association between demographic variables and knowledge score.

Materials and Methods: A preexperimental design with one group pretest and posttest approach was selected to carry out the study. A total of 108 middle-aged women were selected by using nonprobability, purposive sampling technique. Structured questionnaire was used for data collection. Data were collected by interview method. The posttest was conducted after 7 days of intervention.

Result: The pretest mean knowledge score was 10.44 ± 2.26, which was increased to 19.66 ± 2.28 in posttest. The knowledge of middle-aged women was statistically significantly and it was not associated with their age, marital status, number of children, education, occupation, socioeconomic status, previous knowledge about osteoporosis, and source of information.

Conclusion: The structured educational program was effective in increasing the knowledge of middle-aged women regarding prevention of osteoporosis.

KEY WORDS: Effectiveness, structured educational program, knowledge, prevention of osteoporosis, middle-aged women

Introduction

There are many disease conditions that affect the bone, one among them is osteoporosis. "Osteo" means bone and "Porosis" means porous. Bones become progressively porous, brittle, and fragile because of osteoporosis.[1] Recent Indian census shows that there are 163 million people above 50 years of age and the scientific reports suggest that 30% of the women and 15% of the men are suffering from osteoporosis.[1]

Women are at two to three times higher risk than men for primary osteoporosis. The rapid phase of bone loss at menopause because of loss of estrogen is the rationale behind the difference in the prevalence between genders.[2] Osteoporosis has numerous medical implications and a huge economic impact. So it is of almost great importance that we take immediate steps to create awareness and treatment for this disease.[3]

As a preventable disease, encouraging osteoporosis preventive behavior is cost-effective, for example, adequate calcium intake, optimal exposure to sunlight to induce vitamin D production in skin, regular weight-bearing exercise, smoking cessation, and avoidance of excessive caffeine drinking.[4,5] Before raising disease awareness, we need to have baseline

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information concerning general knowledge and osteoporosis preventive behavior of our population.[6]

The investigator hypothesized that there will be a gain in the knowledge of middle-aged women regarding the prevention of osteoporosis after giving the intervention and also that demographic variables will be associated with pretest knowledge.

Materials and Methods

A quantitative research approach with one group pretest and posttest design was selected to carry out the study. This study was conducted at Lacchiwala Village under Doiwala Block, Dehradun, Uttarakhand, India. The setting was selected randomly of the 10 villages of Doiwala Block. Nonprobability purposive sampling technique was used for the selection of 108 middle-aged women. The inclusion criteria were (1) woman who could understand and speak Hindi language, (2) women who were willing to participate, (3) women who were available at the time of data collection, (4) women aged between 35–55years, and (5) women residing in Lacchiwala, Doiwala. The exclusion criteria were women diagnosed with osteoporosis and those who were taking treatment for the same. Data were collected by using structured interview schedule on questionnaire regarding osteoporosis. Informed written consent was obtained from all the study participants. Ethical permission was taken from the ethical committee of concerned university.

The data were entered in Microsoft Excel, and further analysis was done using the software SPSS, version 20.0, and for explaining demographic variable frequency, percentage was used. For testing the effectiveness of structured educational program "paired *t* test" was used and for testing association, one-way analysis of variance (ANOVA), Mann–Whitney *U* test, and Kruskal–Wallis test were used. The *p*-value for level of significance was <0.05.

Result

The frequency and percentage distribution of demographic variables of sample revealed that maximum (34.3%) subjects were between the age group of 36–40 years. Majority (99.1%) of the participants were married. Most (53.7%) of them were having two and three children. Most (50.9%) of them were educated up to secondary level and no one was uneducated. Majority (88%) of the women were homemakers. Most (78.7%) of the participants were from upper lower class. Most (75.9%) of them had heard about osteoporosis and only (24.1%) had no information about osteoporosis. Less than half (28.7%) of the women heard about osteoporosis through television.

Comparisons of Pretest and Posttest Mean Knowledge Scores of the Study Subjects

The pretest mean was 10.44 ± 2.26, which was increased to 19.66 ± 2.28 in posttest. The mean difference was 9.21 ± 2.88. Paired sample *t* test was calculated to find the difference between pretest and posttest knowledge scores. Calculated $t = 33.19$ was greater than the table value at $p = 0.05$ and df = 107. Thus, it could be inferred that gain in knowledge was not by chance but because of intervention.

Therefore, the null hypothesis was rejected and research hypothesis was accepted.

Comparison of Domain of Pretest and Posttest Mean Knowledge Score Regarding Prevention of Osteoporosis

Regarding comparison of knowledge domain in the pretest and posttest knowledge scores, the maximum gain in the knowledge was in the prevention of osteoporosis followed by risk factors and causes of osteoporosis. Thus, it could be inferred that gain in knowledge was because of intervention and not by chance. Therefore, the null hypothesis was rejected and research hypothesis was accepted.

Association of Pretest Knowledge Score and Selected Sociodemographic Variables

One-way ANOVA was used to find out the association between pretest knowledge score and demographic variables such as age, number of children, education, source of information, and socioeconomic status of middle-aged women. Mann–Whitney *U* test was used to find out the association between knowledge scores and occupation and previous knowledge about osteoporosis. Kruskal–Wallis test was used to find out the association between knowledge score and socioeconomic status. There was no significant association between pretest knowledge score and demographic variables.

Discussion

Findings of this study showed that 34.3% of the middle-aged women were between the age group of 36–40 years. Of them, 99.1% were married, 53.7% were having 2–3 children. These findings were supported by the study by Agrawal and Verma,[7] which found that the majority (68%) of sample were in the age group of 35–45 years. Most (87.97) of them were having more than two children. A total of 50.9% were educated up to secondary level, 88% were homemakers, 78.7% were from upper lower class, 75.9% had heard about osteoporosis, and only 24.1% had no information about osteoporosis. The sources of information were identified as books and magazines (16.7%), television (28.7%), other people or friends (14.8%), and newspaper (15.7%). These findings were consistent with the findings of the study conducted by Patil et al.[8] in Mumbai, and it was observed that the main sources of information identified were television/radio (55%), family and friends (23%), newspapers (22%), and doctors (20%). However, another study carried out by Mervat et al.[9] in King Saud University showed that majority of the studied group (63%) had heard about osteoporosis mostly through television (35%).

Findings of this study showed increase in the posttest mean (19.66 ± 2.28) as compared with pretest (10.44 ± 2.26 with $t = 33.19$ at p-value <0.001). Results were consistent with

Table 1: Frequency and percentage distribution of the study subjects (*N* = 108)

Demographic characteristics	Frequency (*N*)	Percentage (%)
Age		
36–40	37	34.3
41–45	30	27.8
46–50	23	21.3
51–55	18	16.6
Marital status		
Married	107	99.1
Widow	1	0.9
No. of children		
0–1	13	12
2–3	70	64.8
4–5	25	23.2
Education		
Primary	27	25.0
Secondary	30	27.8
Higher secondary	25	23.1
Graduate and postgraduate	26	24.1
Occupation		
Working	13	12
Homemaker	95	88
Socioeconomic status		
Upper middle class	4	3.7
Lower middle class	16	14.8
Upper lower class	85	78.7
Lower class	3	2.8
Ever heard about osteoporosis?		
Yes	82	75.9
No	26	24.1
Source of information		
Books or magazines	18	16.7
Television	31	28.7
Other peoples or friends	16	14.8
Newspaper	17	15.7

Table 2: Comparisons of pretest and posttest mean knowledge scores of the study subjects (*N* = 108)

Knowledge scores	Mean ± SD	Mean difference	Standard deviation	*t*-Value	*p*-Value
Pretest scores	10.44 ± 2.26	9.21	2.88	33.19**	**<0.001**
Posttest scores	19.66 ± 2.28				

SD, standard deviation.
Paired sample *t* test, df = 107, table *t*-value = 1.98, $p < 0.001$.

an experimental study conducted by Zhang et al.[10] on the evaluation of educational program for osteoporosis awareness and prevention among nursing students in China. Pretest mean was 9.78 ± 3.13, which was increased to 14.04 ± 2.48 in the posttest. There was a significant increase in the knowledge level ($t = 13.42$, $p < 0.001$).

There was no significant association between knowledge score and demographic variables such as age, number of children, education, source of information, socioeconomic status, occupation, and previous knowledge about osteoporosis of middle-aged women. A study conducted by Puttapitakpong et al.[11] showed that there was a significant association between

Table 3: Comparison of domain of pretest and posttest mean knowledge score regarding prevention of osteoporosis (*N* = 108)

Domain	Maximum score	Pretest	Posttest	Mean difference
		Mean ± SD	Mean ± SD	
Meaning of osteoporosis	3	2.00 ± 0.45	2.69 ± 0.46	0.69
Causes of osteoporosis	5	0.84 ± 0.67	2.16 ± 1.10	1.32
Risk factors	4	0.66 ± 0.72	2.08 ± 0.96	1.42
Symptoms of osteoporosis	1	0.06 ± 0.24	0.70 ± 0.45	0.64
Diagnosis	1	0.29 ± 0.45	0.57 ± 0.49	0.28
Prevention of osteoporosis	16	6.62 ± 1.94	11.58 ± 1.68	4.96

SD, standard deviation.

Table 4: Association of pretest knowledge score and selected sociodemographic variables (*N* = 108)

Demographic characteristics		*N*	Knowledge score (Mean ± SD)	[a]*F*-value	df	*p*-Value
Age	36–40	37	10.78 ± 2.474	0.865	3	0.462
	41–45	30	10.23 ± 2.17			
	46–50	23	10.65 ± 2.14			
	51–55	18	9.83 ± 2.12			
No. of children	0–1	13	10.85 ± 2.44	0.326	2	0.723
	2–3	70	10.33 ± 2.38			
	4–5	25	10.56 ± 1.82			
Education	Primary	27	10.33 ± 2.51	2.084	3	0.107
	High school	30	09.73 ± 2.18			
	Higher secondary	25	10.64 ± 1.55			
	Graduate and postgraduate	26	11.19 ± 2.49			
Source of information	None	26	10.04 ± 3.01	1.671	103	0.162
	Books and magazines	18	10.11 ± 2.02			
	Television	31	11.26 ± 2.03			
	Friends and other people	16	9.81 ± 1.94			
	Newspaper	17	10.54 ± 1.50			

[a]One-way analysis of variance, *F* = table value = 2.29.

Table 5: Association between pretest knowledge score with occupation and previous knowledge about osteoporosis (*N* = 108)

Demographic characteristics		*N*	Knowledge score (median)	Range	*Z*-value[a]	*p*-Value
Occupation	Homemaker	95	11	9–12	0.75	0.45
	Working	13	10	8.5–11.5		
Heard about osteoporosis	Yes	82	11	9–12	1.45	0.145
	No	26	9.5	8–12		

[a]Mann–Whitney test and $p < 0.05$.

Table 6: Association between pretest knowledge score with socioeconomic status (*N* = 108)

Demographic characteristics		*N*	*H*-value[a]	df	*p*-Value
Socioeconomic status	Upper class	4	4.98	3	0.17
	Lower middle class	16			
	Upper lower class	85			
	Lower class	3			

df = 3.
[a]Kruskal–Wallis test and table value = 7.82.

knowledge toward osteoporosis and educational level and there was no statistical significant association between knowledge and socioeconomic status. The reason for wide difference might be the difference in the educational level of the participants.

Limitation

As the study was conducted among middle-aged women residing in rural area; therefore, it will be difficult to generalize the finding among women residing in urban area.

Conclusion

Educational program was effective in increasing the knowledge of middle-aged women regarding the prevention of osteoporosis.

References

1. Smeltzer SC, Bare BG. *Brunner & Suddarth's Textbook of Medical-Surgical Nursing*, 10th edn. Philadelphia, PA: Lippincott Williams & Wilkins, 2004. p. 2058.
2. Riggs BL, Khosla S, Melton LJ 3rd. Sex steroids and the construction and conservation of the adult skeleton. Endocr Rev 2002;23(3):279–302.
3. Ashwini BG, Ashok KS. Evaluation of BMD of women above 40 years of age. J Obstet Gynecol India 2005;55(3):265–7.
4. Harris L. *Healthy Lifestyles–Unhealthy Lifestyles: A National Research Report of Behavior, Knowledge, Motivations, and Opinions Concerning Individual Health Practices*. New York, NY: Garland Publishing, 1984. p. 2.
5. Limpaphayom K, Taechakraichana N, Jaisamran U, Bunyavejchevin S, Chaikittisilpa S, Poshyachinda M, et al. Prevalence of osteopenia and osteoporosis in Thai woman. Menopause 2001;8(1):65–9.
6. Wolf RL, Zmuda JM, Stone KL, Cauley JA. Update on the epidemiology of osteoporosis. *Curr Rheumatol Rep* 2000;2(1):74–86.
7. Agrawal T, Verma AK. Cross sectional study of osteoporosis among women. Med J Armed Forces India 2013;69(2):168–171.
8. Patil S, Hasamnis A, Jena SK, Rashid AK, Narayan KA. Low awareness of osteoporosis among women attending an urban health centre in Mumbai, Western India. Malaysian J Public Health Med 2010;10(1):6–13.
9. Mervat MAE, Fadia YAM. Osteoporosis-related life habits, knowledge and attitude among group of female employees in King Saud University. World Appl Sci J 2013;22(7):919–25.
10. Zhang YP, Li XM, Wang DL, Guo XY, Guo X. Evaluation of educational program on osteoporosis awareness and prevention among nurse students in China. Nurs Health Sci 2012;14(1):74–84.
11. Puttapitakpong P, Chaikittisilpa S, Panyakhamlerd K, Nimnuan C, Jaisamrarn U, Puttapitakpong NT. Inter-correlation of knowledge, attitude, and osteoporosis preventive behaviors in women around the age of peak bone mass. BMC Women's Health 2014;14(1):35.

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