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A STUDY TO ASSESS THE EFFECTIVENESS OF INFORMATION, EDUCATION AND COMMUNICATION (IEC) PACKAGE ON LEVEL OF KNOWLEDGE AND ATTITUDE REGARDING IMPROVING BONE HEALTH AMONG POSTMENOPAUSAL WOMEN AT THIRUVALLUR DISTRICT

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Abstract

A pre-experimental one group pre-test post-test study was conducted to assess the effectiveness of Information, Education and Communication (IEC) Package on knowledge and attitude regarding improving bone health among postmenopausal women at Thiruvallur District. A non-probability purposive sampling technique was adopted to select 60 postmenopausal women. Structured questionnaires and attitude scales were used to assess the level of knowledge and attitude regarding improving bone health. The findings revealed that in the pre-test all 60 (100%) postmenopausal women had inadequate knowledge and poor attitude regarding improving bone health. Following administration of the IEC package, 57 (95%) attained adequate knowledge and 56 (93.3%) demonstrated good attitude. The pre-test mean knowledge score was 6.01 ± 1.71 and increased to 18.18 ± 1.18 in the post-test. The paired t-test value ($t=46.122$, $p<0.001$) showed a highly significant improvement. Similarly, the mean attitude score increased from 3.16 ± 0.74 to 9.30 ± 0.88 with a highly significant paired t-test value ($t=42.156$, $p<0.001$). A mild positive correlation ($r=0.462$, $p<0.001$) was observed between post-test knowledge and attitude scores. Significant associations were found between post-test knowledge and attitude with years of

attained menopause and marital status.

Keywords: Postmenopausal women, Bone Health, Osteoporosis, Knowledge, Attitude, IEC Package.

INTRODUCTION

Menopause is a natural biological process characterized by permanent cessation of menstruation resulting from the loss of ovarian follicular activity. The decline in estrogen levels during menopause accelerates bone resorption, leading to reduced bone mineral density and increased risk of osteoporosis and fractures. Osteoporosis is a major public health problem affecting postmenopausal women worldwide. Studies indicate that women lose approximately 2–5% of bone mass annually during the early postmenopausal period. Adequate calcium intake, vitamin D supplementation, regular physical activity, weight-bearing exercises, and healthy lifestyle practices are essential for maintaining bone health and preventing osteoporosis. Lack of awareness regarding preventive measures contributes significantly to poor bone health among postmenopausal women. Information, Education and Communication (IEC) packages can play a crucial role in enhancing knowledge and fostering positive attitudes toward bone health promotion. Therefore, the



present study was undertaken to assess the effectiveness of an IEC package on improving knowledge and attitude regarding bone health among postmenopausal women.

OBJECTIVES

To assess the pre -test and post-test level of knowledge among postmenopausal women regarding improving bone health.

To assess the pre-test and post -test level of attitude among postmenopausal women regarding improving bone health.

To determine the effectiveness of information, education and communication on level knowledge and attitude among postmenopausal women regarding improving bone health.

To associate the selected demographic variables with the post-test level of knowledge and attitude among postmenopausal women regarding improving bone health.

RESEARCH METHODOLOGY

A pre-experimental one group pre-test post-test research design was adopted. The study was conducted among 60 postmenopausal women residing in Arcotkuppam Village, Thiruvallur District. Samples were selected using a non-probability purposive sampling technique.

Data were collected using:

Section A

Demographic variables including age, years of attained menopause, religion, marital status, type of family, educational qualification, occupation, family income, previous knowledge and source of information.

Section B

Structured knowledge questionnaire regarding improving bone health.

Section C

Attitude rating scale regarding improving bone health.

After administration of the pre-test, the IEC package was provided. Post-test assessment was conducted after the intervention. Data were analyzed using descriptive and inferential statistics.

RESULTS

SECTION A: Description of the Demographic Variables of Post Menopausal Women

Majority 23 (38.3%) were aged 40–45 years, 22 (36.7%) had attained menopause for 11–15 years, 56 (93.3%) were married, 38 (63.3%) belonged to nuclear families, and 53 (88.3%) had previous knowledge regarding bone health.

Table 1: Frequency and percentage distribution of demographic variables of post-menopausal women. (N=60).

Demographic Variables	Frequency (f)	Percentage (%)
Age in years		
40 – 45	23	38.3
46 – 50	12	20.0
51 – 55	16	26.7
56 – 60	3	5.0
61 – 65	6	10.0
No. of years of attained menopause		
≤5 years	16	26.7
6 – 10 years	16	26.7
11 – 15 years	22	36.7
16 – 20 years	5	8.3
≥21 years	1	1.7
Religion		
Hindu	60	100.0
Christian	-	-
Islam	-	-
Others	-	-
Marital status		
Unmarried	-	-
Married	56	93.3
Divorced	-	-
Widow	4	6.7
Type of family		
Nuclear family	38	63.3



Demographic Variables	Frequency (f)	Percentage (%)
Joint family	22	36.7
Educational qualification		
Professional degree	3	5.0
Graduate	13	21.7
Intermediate / Diploma	20	33.3
Higher secondary	1	1.7
Secondary school	10	16.7
Primary school	13	21.7
Illiterate	-	-
Occupation		
Professionals	60	100.0
Semi professionals	-	-
Clerk / Shop / Farmers	-	-
Skilled workers	-	-
Semi skilled workers	-	-
Unskilled workers	-	-
Not working	-	-
Family income		
≥2000	29	48.3
Rs.1000 to 1999	24	40.0
Rs.750 to 999	7	11.7
Rs.500 to 749	-	-
Rs.300 to 499	-	-
Rs.101 to 299	-	-
≤100	-	-
No income	-	-
Previous knowledge on bone health		
Yes	53	88.3
No	7	11.7
Source of information on bone health		
Health care professionals	50	83.3
Newspaper / Television / Internet	10	16.7
Relatives / Friends	-	-
Not received	-	-

Table 2: Frequency and percentage distribution of pretest and posttest level of knowledge regarding improving bone health among post-menopausal women (N=60).

Level of Knowledge	Pretest		Post Test	
	Frequency	Percentage (%)	Frequency	Percentage (%)
Inadequate (≤50%)	60	100.0	0	0
Moderately Adequate (51 – 75%)	0	0	3	5.0
Adequate (>75%)	0	0	57	95.0

Table 3: Frequency and percentage distribution of pretest and posttest level of attitude regarding improving bone health among post-menopausal women. N = 60

Level of Attitude	Pretest		Post Test	
	Frequency	Percentage (%)	Frequency	Percentage (%)
Poor (≤50%)	60	100.0	0	0
Moderate (51 – 75%)	0	0	4	6.7
Good (>75%)	0	0	56	93.3



Table 4: Effectiveness of IEC Package on knowledge regarding improving bone health among postmenopausal women. N=60

Knowledge	Mean	S.D	Mean Difference Score	Paired “t” & p-Value
Pretest	6.01	1.71	12.17	t= 46.122 p=0.0001, S***
Post Test	18.18	1.18		

***p<0.001, S – Significant.

Table 5: Effectiveness of IEC Package on attitude regarding improving bone health among postmenopausal women. N=60

Attitude	Mean	S.D	Mean Difference Score	Paired “t” & p-Value
Pretest	3.16	0.74	6.14	t= 42.156 p=0.0001, S***
Post Test	9.30	0.88		

***p<0.001, S – Significant

Table 6: Correlation between post test knowledge and attitude regarding improving bone health among postmenopausal women. N = 60.

Variables	Mean	S.D	Karl Pearson’s Correlation “r” & p-Value
Knowledge	18.18	1.18	r= 0.462 p=0.0001, S***
Attitude	9.30	0.88	

***p<0.001, S – Significant

Table 7: Association of post test level of knowledge regarding improving bone health among postmenopausal women with their selected demographic variables. N = 60.

Demographic Variables	Moderately Adequate		Adequate		Chi-Square Test & p-value
	F	%	F	%	
Age in years					$\chi^2=1.819$ d.f=4 p=0.769 N.S
40 – 45	2	3.3	21	35.0	
46 – 50	0	0	12	20.0	
51 – 55	1	1.7	15	25.0	
56 – 60	0	0	3	5.0	
61 – 65	0	0	6	10.0	
No. of years of attained menopause					$\chi^2=20.164$ d.f=4 p=0.0001 S***
≤5 years	0	0	16	26.7	
6 – 10 years	1	1.7	15	25.0	
11 – 15 years	1	1.7	21	35.0	
16 – 20 years	0	0	5	8.3	
≥21 years	1	1.7	0	0	
Religion					-
Hindu	3	5.0	57	95.0	
Christian	-	-	-	-	
Islam	-	-	-	-	
Others	-	-	-	-	
Marital status					$\chi^2=18.271$ d.f=1 p=0.0001 S***
Unmarried	-	-	-	-	
Married	1	1.7	55	91.7	
Divorced	-	-	-	-	
Widow	2	3.3	2	3.3	
Type of family					$\chi^2=1.828$ d.f=1 p=0.176 N.S
Nuclear family	3	5.0	35	58.3	
Joint family	0	0	22	36.7	
Educational qualification					$\chi^2=1.619$



Demographic Variables	Moderately Adequate		Adequate		Chi-Square Test & p-value
	F	%	F	%	
Professional degree	0	0	3	5.0	d.f=5 p=0.899 N.S
Graduate	1	1.7	12	20.0	
Intermediate / Diploma	1	1.7	19	31.7	
Higher secondary	0	0	1	1.7	
Secondary school	1	1.7	9	15.0	
Primary school	0	0	13	21.7	
Illiterate	-	-	-	-	
Occupation					-
Professionals	3	5.0	57	95.0	
Semi professionals	-	-	-	-	
Clerk / Shop / Farmers	-	-	-	-	
Skilled workers	-	-	-	-	
Semi skilled workers	-	-	-	-	
Unskilled workers	-	-	-	-	
Not working	-	-	-	-	$\chi^2=1.077$ d.f=2 p=0.584 N.S
Family income					
≥2000	1	1.7	28	46.7	
Rs.1000 to 1999	2	3.3	22	36.7	
Rs.750 to 999	0	0	7	11.7	
Rs.500 to 749	-	-	-	-	
Rs.300 to 499	-	-	-	-	
Rs.101 to 299	-	-	-	-	
≤100	-	-	-	-	$\chi^2=1.439$ d.f=1 p=0.230 N.S
No income	-	-	-	-	
Previous knowledge on bone health					
Yes	2	3.3	51	85.0	$\chi^2=0.632$ d.f=1 p=0.427 N.S
No	1	1.7	6	10.0	
Source of information on bone health					
Health care professionals	2	3.3	48	80.0	$\chi^2=0.632$ d.f=1 p=0.427 N.S
Newspaper / Television / Internet	1	1.7	9	15.0	
Relatives / Friends	-	-	-	-	
Not received	-	-	-	-	

***p<0.001, S – Significant, p>0.05, N.S – Not Significant.

Table 8: Association of post test level of knowledge regarding improving bone health among postmenopausal women with their selected demographic variables. N = 60

Demographic Variables	Moderate		Good		Chi-Square Test & p-value
	F	%	F	%	
Age in years					$\chi^2=2.527$ d.f=4 p=0.640 N.S
40 – 45	2	3.3	21	35.0	
46 – 50	0	0	12	20.0	
51 – 55	2	3.3	14	23.3	
56 – 60	0	0	3	5.0	
61 – 65	0	0	6	10.0	
No. of years of attained menopause					$\chi^2=15.712$ d.f=4 p=0.003 S**
≤5 years	0	0	16	26.7	
6 – 10 years	1	1.7	15	25.0	
11 – 15 years	2	3.3	20	33.3	
16 – 20 years	0	0	5	8.3	



Demographic Variables	Moderate		Good		Chi-Square Test & p-value
	F	%	F	%	
≥21 years	1	1.7	0	0	-
Religion					
Hindu	4	6.7	56	93.3	
Christian	-	-	-	-	
Islam	-	-	-	-	
Others	-	-	-	-	
Marital status					$\chi^2=32.162$ d.f=1 p=0.0001 S***
Unmarried	-	-	-	-	
Married	1	1.7	55	91.7	
Divorced	-	-	-	-	
Widow	3	5.0	1	1.7	
Type of family					$\chi^2=0.251$ d.f=1 p=0.616 N.S
Nuclear family	3	5.0	35	58.3	
Joint family	1	1.7	21	35.0	
Educational qualification					$\chi^2=3.070$ d.f=5 p=0.689 N.S
Professional degree	0	0	3	5.0	
Graduate	2	3.3	11	18.3	
Intermediate / Diploma	1	1.7	19	31.7	
Higher secondary	0	0	1	1.7	
Secondary school	1	1.7	9	15.0	
Primary school	0	0	13	21.7	
Illiterate	-	-	-	-	
Occupation					-
Professionals	4	6.7	56	93.3	
Semi professionals	-	-	-	-	
Clerk / Shop / Farmers	-	-	-	-	
Skilled workers	-	-	-	-	
Semi skilled workers	-	-	-	-	
Unskilled workers	-	-	-	-	
Not working	-	-	-	-	
Family income					$\chi^2=0.610$ d.f=2 p=0.737 N.S
≥2000	2	3.3	27	45.0	
Rs.1000 to 1999	2	3.3	22	36.7	
Rs.750 to 999	0	0	7	11.7	
Rs.500 to 749	-	-	-	-	
Rs.300 to 499	-	-	-	-	
Rs.101 to 299	-	-	-	-	
≤100	-	-	-	-	
No income	-	-	-	-	
Previous knowledge on bone health					$\chi^2=0.739$ d.f=1 p=0.390 N.S
Yes	3	5.0	50	83.3	
No	1	1.7	6	10.0	
Source of information on bone health					$\chi^2=0.214$ d.f=1 p=0.646 N.S
Health care professionals	3	5.0	47	78.3	
Newspaper / Television / Internet	1	1.7	9	15.0	
Relatives / Friends	-	-	-	-	
Not received	-	-	-	-	

***p<0.001, **p<0.01, S – Significant, p>0.05, N.S – Not Significant.



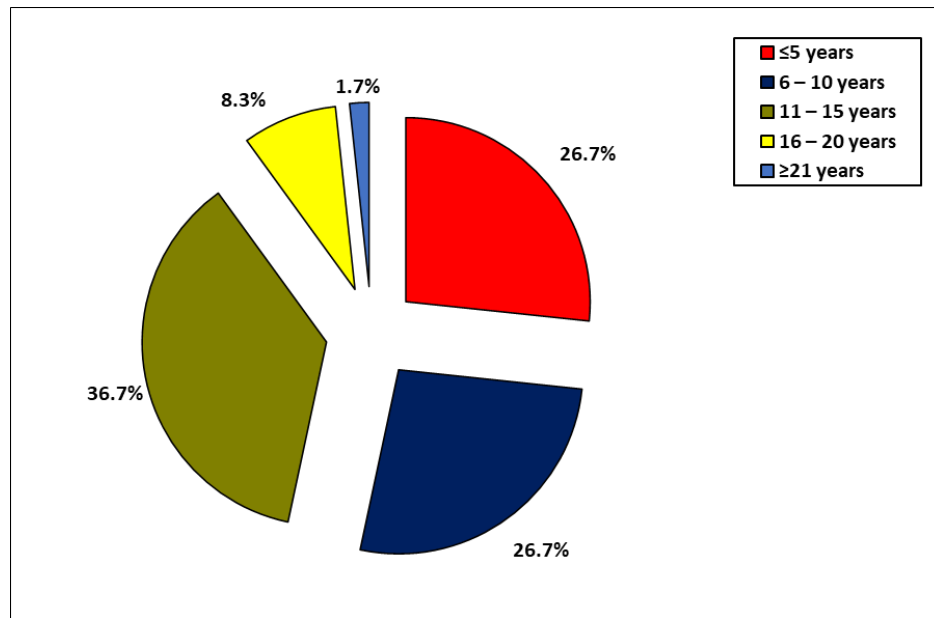
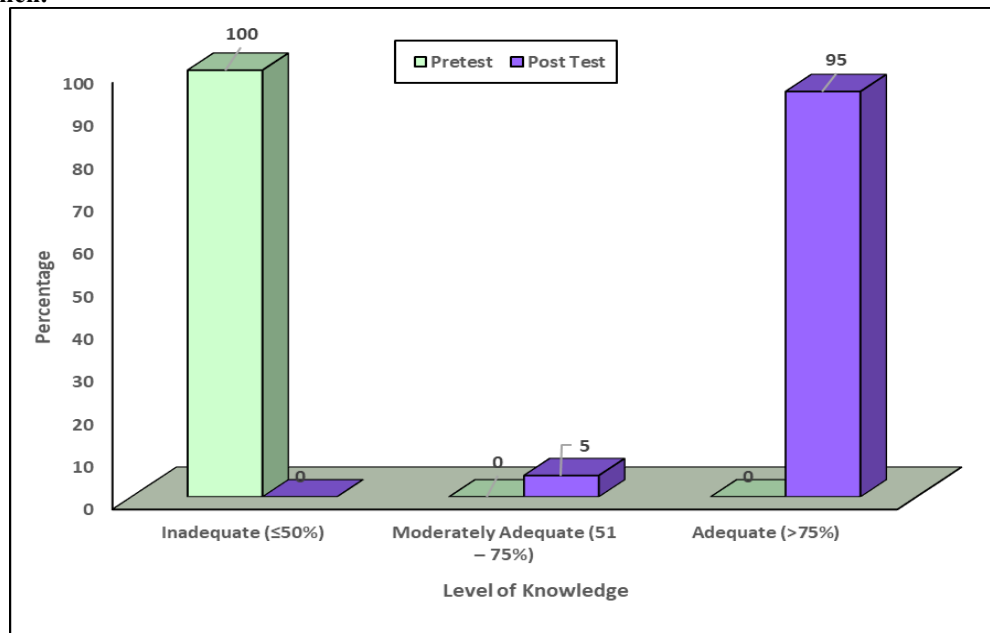


Figure 1: Percentage distribution of no. of years of attained menopause by postmenopausal women.

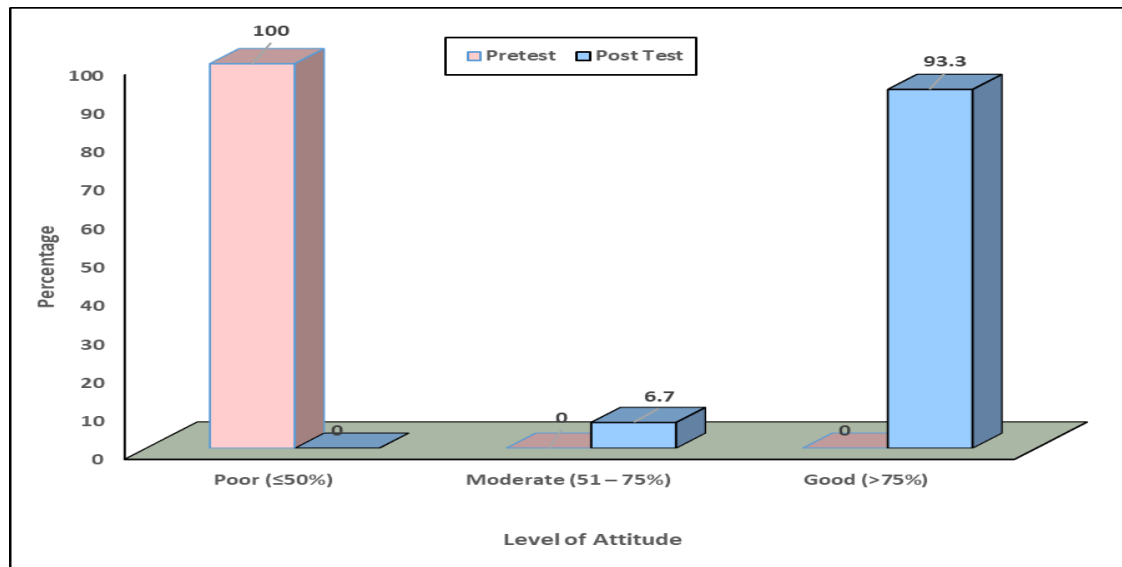
SECTION B: Assessment of Level of Knowledge and Attitude Regarding Improving Bone Health Among Postmenopausal Women.

Percentage distribution of pretest and posttest level of knowledge regarding improving bone health among postmenopausal women.

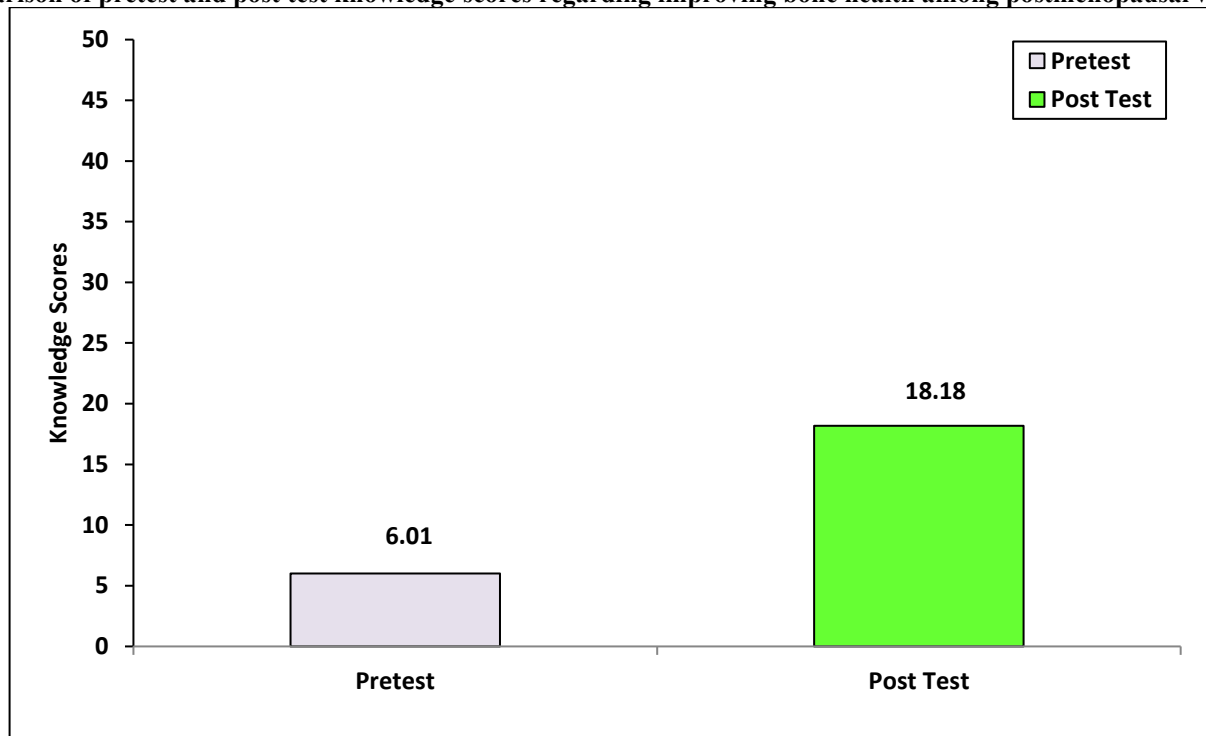


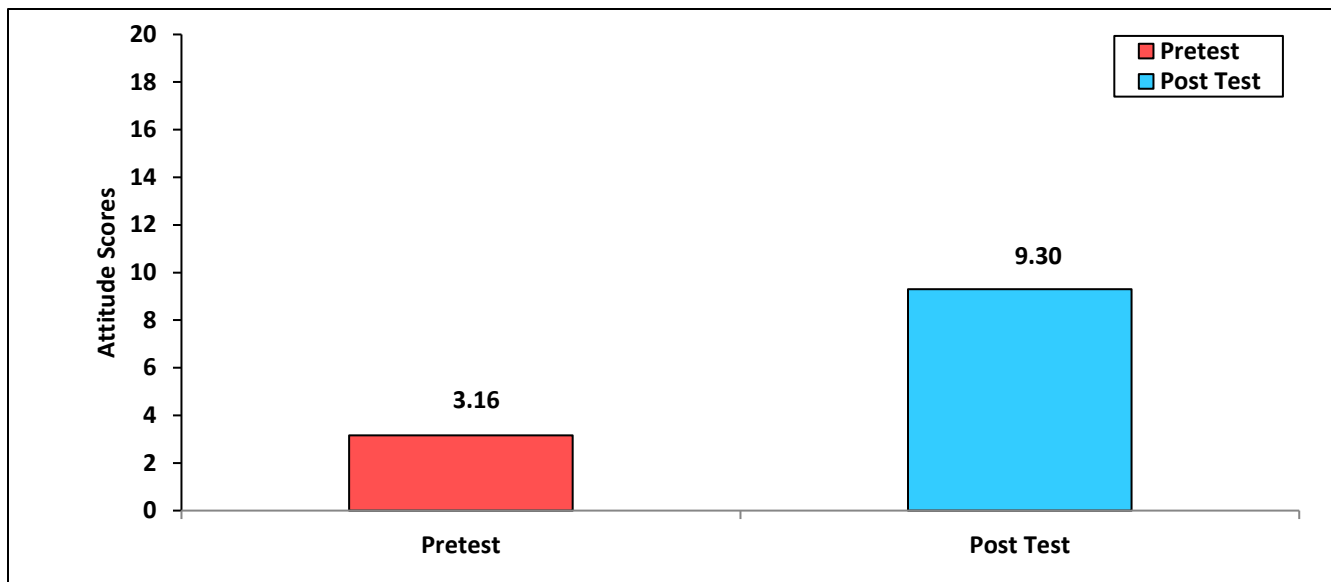
SECTION C: Effectiveness of IEC Package on Knowledge and Attitude Regarding Improving Bone Health Among Postmenopausal Women.

Percentage distribution of pretest and posttest level of attitude regarding improving bone health among post-menopausal women.



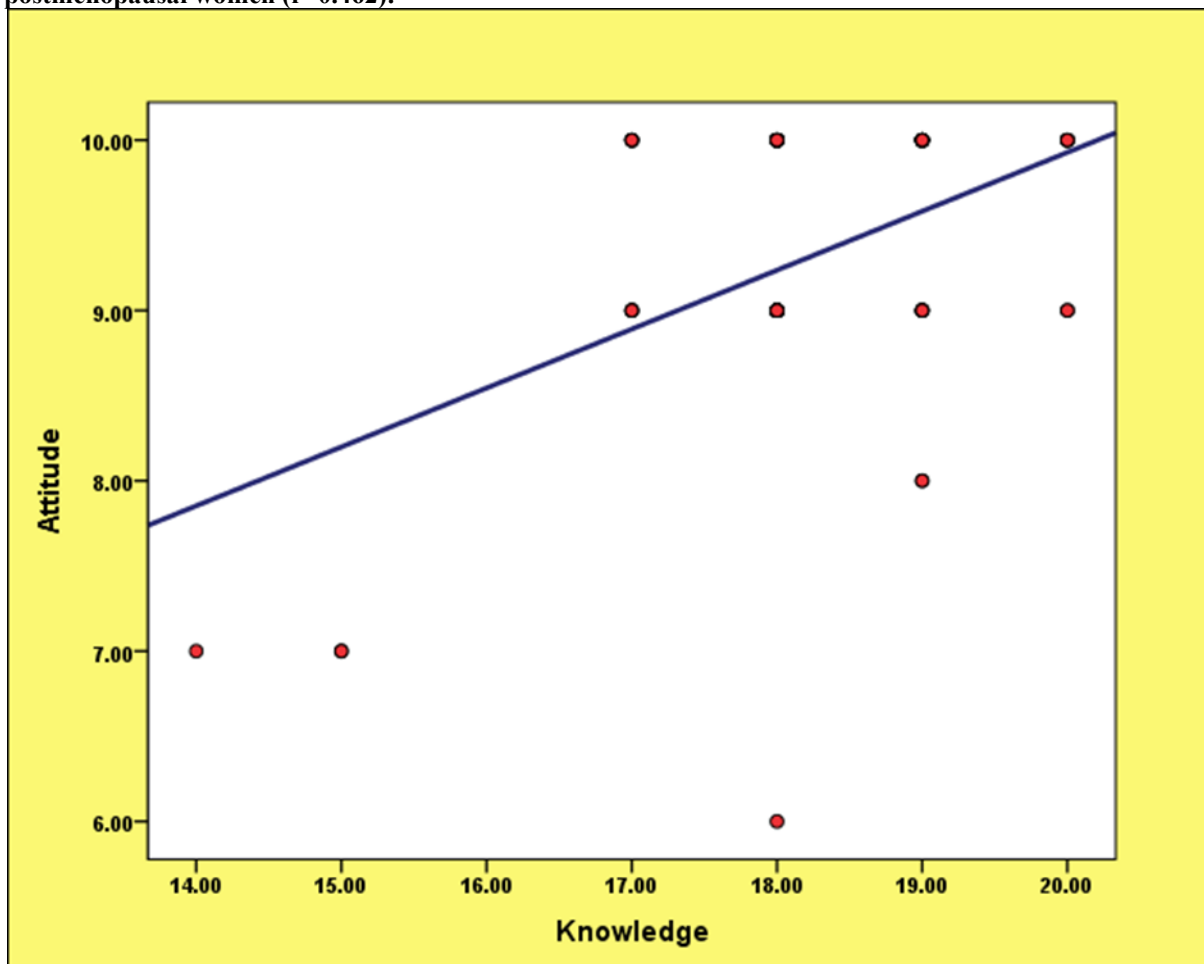
Comparison of pretest and post test knowledge scores regarding improving bone health among postmenopausal women.





Comparison of pretest and post test attitude scores regarding improving bone health among postmenopausal women

Scatter diagram showing the correlation between post test knowledge and attitude regarding improving bone health among postmenopausal women ($r=0.462$).



DISCUSSION

This study was undertaken to assess the effectiveness of an Information, Education and Communication (IEC) package on knowledge and attitude regarding improving bone health among postmenopausal women. Regarding demographic characteristics, the majority of participants were aged 40–45 years, married, belonged to nuclear families, and had attained menopause for 11–15 years. Most participants had previous knowledge regarding bone health through healthcare professionals. The pre-test findings demonstrated inadequate knowledge and poor attitude among all participants. Following administration of the IEC package, substantial improvement was observed. Nearly all participants achieved adequate knowledge (95%) and good attitude (93.3%) regarding bone health. The mean knowledge score increased significantly from 6.01 ± 1.71 to 18.18 ± 1.18 ($t=46.122$, $p<0.001$). Similarly, the attitude score increased from 3.16 ± 0.74 to 9.30 ± 0.88 ($t=42.156$, $p<0.001$). These findings indicate that the IEC package was highly effective.

The findings are supported by studies conducted by Forsyth (2023) and Beura et al. (2023), which reported that educational and lifestyle interventions among postmenopausal women significantly improved awareness, health practices and overall wellbeing. A significant

positive correlation ($r=0.462$) between post-test knowledge and attitude suggests that improvement in knowledge contributes to a more positive attitude toward bone health promotion. Significant associations were observed between years of attained menopause, marital status, and post-test knowledge and attitude scores.

CONCLUSION

The study concluded that the Information, Education and Communication (IEC) package was highly effective in improving knowledge and attitude regarding bone health among postmenopausal women. Enhanced awareness and positive attitudes toward preventive measures can contribute significantly to reducing osteoporosis risk and promoting healthy aging among postmenopausal women.

RECOMMENDATIONS

Similar studies may be conducted with larger samples. Comparative studies may be undertaken in rural and urban settings. Long-term follow-up studies can assess retention of knowledge. Educational interventions may be integrated into community health programs. Health personnel should regularly provide awareness programs regarding bone health.

REFERENCES

1. Park K. Textbook of Preventive and Social Medicine. 25th Edition. BanarsidasBhanot Publishers.
2. Suryakantha AH. Community Medicine with Recent Advances. Jaypee Brothers Medical Publishers.
3. Senthilraja M, Cherian KE, Jebasingh FK, et al. Osteoporosis knowledge and beliefs among postmenopausal women. *Journal of Family Medicine and Primary Care*. 2019.
4. Akyol Y, Ulus Y, Bilgici A, et al. Knowledge level and awareness of osteoporosis among women. *Turkish Journal of Osteoporosis*. 2020.
5. Saltık H, Öztürk F, Emiroğlu C, et al. Knowledge, attitude and behavior levels of postmenopausal women about osteoporosis. *Journal of Bone Metabolism*. 2023.
6. Zhao R, Zhang M, Zhang Q. Combined exercise interventions for preventing postmenopausal bone loss. *Journal of Orthopaedic& Sports Physical Therapy*. 2017.

