



# Effect of Education-Based Intervention Using Group Discussion on the Knowledge, Attitude, and Practice of Postmenopausal Women about Osteoporosis Preventive Behaviors

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## ABSTRACT

**Aims** As bone metabolic diseases, osteoporosis is a major threat to health, particularly in postmenopausal women. The aim of this study was to determine effect of education-based intervention on knowledge, attitude and practice of postmenopausal women concerning osteoporosis preventive behaviors.

**Materials & Methods** This research is randomized controlled trial. It was done on 50 postmenopausal women with aged 50-60 years from Nehbandan, South Khorasan Province, Iran, in 2016 that were selected through multistage sampling method. The samples were divided into 2 groups (Control and intervention groups) and researcher-made questionnaire was used. The data were analyzed using independent and paired t-test, repeated measures analysis of variance test and SPSS 19 software.

**Findings** In the intervention group, the mean scores of knowledge, attitude were significantly increased immediately after the intervention ( $p < 0.001$ ). The mean scores of knowledge, attitude, and practice showed significant differences, three months after intervention ( $p < 0.05$ ). The increase in the scores of knowledge due to training was significantly different between the intervention and control groups. Also, there was a significant difference between the two groups three months after the training. The attitude was not significant in the control group. Comparing the two groups, the attitude score was significant ( $p < 0.001$ ). In the Intervention group, daily calcium intake of the subjects showed the significant difference.

**Conclusion** Educational intervention based on group discussion is effective in increasing the knowledge, attitudes and practice of postmenopausal women in terms of osteoporosis preventive behaviors.

**Keywords** Educational Models; Focus Groups; Osteoporosis; Postmenopausal

## CITATION LINKS

- [1] Effect of educational program on osteoporosis preventive behaviors in women over 40 years old referring to Iran rheumatism center in Tehran
- [2] The effect of education based on health belief model on osteoporosis preventive behaviors among pregnant women referred to Arak health centers
- [3] Designing the validity and reliability of osteoporosis prevention instrument based on health belief model in women
- [4] The effect of education based on health belief model on preventive factors of osteoporosis among postmenopausal women
- [5] The effect of health belief model on promoting preventive behaviors of osteoporosis among rural women of Malayer
- [6] Tea drinking and bone mineral density among postmenopausal women referring to bone densitometry center Isfahan, Iran
- [7] Predictors of physical activity to prevent osteoporosis based on extended health belief model
- [8] Preventing of osteoporosis: Applying the health belief model
- [9] Application of health belief model in prevention of osteoporosis in volunteers of Khorramabad city health centers
- [10] Comparison of the effectiveness of two nutrition education methods on the nutritional knowledge, attitude and practice of first-grade school girl student in Tehran
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- [13] Study of knowledge and attitude of Rafsanjani female teachers toward prevention of osteoporosis
- [14] The effectiveness of education about osteoporosis prevention on awareness of female students
- [15] Effects of educational materials concerning osteoporosis on women's knowledge, beliefs, and behavior
- [16] Effectiveness of a community-based osteoporosis education and self-management course: A wait list controlled trial
- [17] Diet quality status of most Tehranian adults needs improvement
- [18] The effects of education on preventive behaviors toward osteoporosis based on Behavior Intention Model (BIM) on female students
- [19] Osteoporosis education programs: Changing knowledge and behaviors
- [20] The impact of an educational intervention on nutritional preventive behaviors in osteoporosis among adolescent girls
- [21] Osteoporosis prevention education: Behavior theories and calcium intake

## Introduction

As the silent epidemic of the century, osteoporosis is the most common of bone metabolic diseases [1, 2]. The World Health Organization has defined osteoporosis as a situation characterized by bone loss and bone fractures. It increases the fragility and the incidence of fracture. Reducing bone mass loss is slow and gradual, and its symptoms do not appear until the first fracture occurs [3]. According to the National Osteoporosis Foundation (NOF) in 2002, the disease affects 44 million Americans (55% of 50-years-old and over) [4], of these, 10 million people are inflicted and 34 million have low bone mass, which it attitudes them at risk for osteoporosis [5]. The University of Tehran's Department of Rheumatology Research, Iran, showed that 6 million Iranians suffered from osteoporosis and that among 5 million postmenopausal women, 2.5 million suffered from osteoporosis. Also, 50% of men and 70% of women over 50 years have osteoporosis or bone loss [5].

The results of several studies show that about the age of 40 years, bone mineral density in both genders decreases gradually but the process of this decline speeds up in women after 50 years during menopause so that a woman at the age of 80 years loses more than 45% to 50% of her bone mass [6]. However, there are many and varied factors that affecting osteoporosis, but various studies have estimated that 20% to 50% of the changes in bone density that is due to the lifestyle and most importantly due to nutrition and physical activity [7]. Changes in lifestyle, the intake of sufficient amounts of calcium and vitamin D through diet, doing weight-bearing exercises are usually recommended for preventing bone loss and subsequent disabilities [8]. Also, the studies that have examined the knowledge, attitude and practice of people at the different age and sex in the context of osteoporosis reflect the fact that the knowledge and attitude of these patients are not at the desired level [9]. Despite preventive advice, studies show that most people, especially women, do not follow this advice [4]. On the other hand, osteoporosis is preventable. Teaching preventive behaviors are the easiest and the cheapest way to deal with osteoporosis [2].

Prevention strategies can include maximizing bone mass and minimizing bone loss through health education and health promotion programs [5]. In the world, a variety of methods are used for instruction, such as self-study (Leaflet or book), lectures, symposium, panels, debates, and group discussions. Among these methods, group discussion and self-learning by using pamphlets, are simple and low-cost. In the studies that were conducted in Iran, different methods have been used such as holding teaching classes, or a combination of different methods such as distributing booklets, handouts, and pamphlets and holding lecture sessions [10].

Teaching through group discussion is one of the methods of teaching and learning. The discussion method helps learners actively participate in educational activities and gives them the opportunity to share their thoughts and experiences with others [11]. Group discussion is one of the most useful and valid ways to change attitudes. Participating in discussions is interesting for people and is one of the best ways to make creative and critical thinking in people and helps them find out their weaknesses and make behavioral changes. This method is very useful when the group has common interests and similar difficulties [12]. On the other hand, considering the prevalence of osteoporosis in women, prevention keys are to focus on changing the way of thinking, lifestyle, and daily routine of people [13].

One of the most important goals of the World Health Organization is to increase the number of women trained in osteoporosis [3]. Women are more vulnerable to osteoporosis and the highest incidence of osteoporosis is at the age of 50 years and over because when menopause begins, the amount of secreted estrogen hormone from the ovary reduces. This hormone plays an important role in bone strength, the shortage of this hormone causes bone tissue degradation. It is possible to prevent the development of osteoporosis and avoid debilitating complications in postmenopausal women, with proper instructional techniques. There is limited information on the impact of group-based training method of promoting osteoporosis preventive behaviors in postmenopausal women.

The aim of this study was to determine effect of the education-based intervention on knowledge, attitude, and practice of postmenopausal women concerning osteoporosis preventive behaviors.

## Materials and Methods

The present research is a randomized controlled trial. It was conducted in Nehbandan city, South Khorasan Province, Iran, in 2016. The statistical population of study was all 50-60-year-old menopausal women living in Nehbandan, who were covered by health centers. The method of sampling was multistage sampling. First of all, among the nine health centers covered by Nehbandan Health Center, two centers were randomly selected, then they were randomly assigned to two groups (Intervention and control groups). In what follows, the lists of research units in these centers were provided separately. Subjects were randomly divided into two groups: Each group with 25 postmenopausal women who have inclusion criteria. Inclusion criteria include women between 50-59 years, being in menopause, willingness to participate in the study, not having an early menopause, not a having history of glucocorticoid use, and not having hormonal problems. Exclusion criteria were: Those who

missed more than two sessions during the training and those who had to take glucocorticoid medication during the intervention. The adequacy of the sample volume of the study was confirmed on the basis of previous studies. The following formula was used to calculate the sample size, and the number of people was determined to be 25 people in each group (Including 10% of the drop):

$$n = \frac{(S1^2 + S2^2)(Z_{1-\frac{\alpha}{2}} + Z_{(1-\beta)})^2}{(\bar{X1} - \bar{X2})^2}$$

The data gathering tool was a researcher-made questionnaire consisting of 4 parts: The first part contained demographic information, the second part consisted 22 questions of knowledge, the third part included 8 questions of attitude, and the fourth part contained 8 questions about osteoporosis-related behaviors and dietary intake of high calcium foods.

The average daily consumption was estimated (Those who consumed an average of 1200mg of calcium per day were put in a desirable group, and those who consumed less than 1200mg per day were put in the undesirable group). The scoring method of the questionnaire was as follows: In the knowledge part, the correct answer had scored 1, and for incorrect answers, the score was 0, the attitude part, was designed based on the 5-level Likert-scale and scoring questions were considered to be 5 to 1 from *completely agree* to *completely disagree*. Osteoporosis-related behaviors were identified as "Yes" or "No", and the point was 1 for "Yes" and 0 for "No". Foods rich in calcium were also ranked in the two desirable and undesirable categories.

Scholars had evaluated and approved the validity of the questionnaire through content validity. The reliability of the questionnaire was measured on 20 women who were referred to one of Nehbandan centers who were similar in terms of the features of the studied population. In all questions of knowledge, Cronbach's alpha was obtained 0.78.

The data from the pilot were used as the required source. After preparing the lesson plan, providing educational tools, pamphlets and conducting a pre-test at the center, 5 training sessions were held by group discussion method. It should be explained that the subjects of the intervention group received information from a day before so that whenever possible, they could get information about osteoporosis or fill out their information. In the classroom, individuals talked and discussed general information on osteoporosis (Definition, causative agents, and people at risk, symptoms, complications, and treatment), emphasizing preventive behaviors such as exercise and physical activity, the type of preventative movement, and list of diets rich in calcium and vitamin D.

The researcher supervised the process of these discussions, and whenever necessary, he led the discussion in its desired direction. Educational pamphlets were provided for the intervention group so that they could review the contents at home. The telephone number of the researcher was also given to them to call in case of ambiguity and difficulty. Then, the post-test questionnaires were completed for knowledge and attitude, and three months after, the post-test questionnaires (No 2; follow-up) were used to measure information durability in the three parts of knowledge, attitude, and practice (By telephone call from the research units for attending them at the center). During the study, the control group used typical training centers (Face to face and in the group). However, in order to comply with the ethics of research, in one training session, the educational content of the intervention group was taught and pamphlets were provided for them. In this group, pre-test, post-test 1, and post-test 2 questionnaires were completed along with the intervention group.

The score of practice was measured in two times: Before the training and three months after the training. First, based on 7 questions about the preventive behaviors of osteoporosis, the status of these behaviors was measured in both groups. Then the table of calcium-rich foods was completed before the training and one month after the training.

To examine the demographic factors, the frequency distribution table was used and to assess the knowledge, attitude, and practice in both groups, independent and paired t-test, and analysis of variance with repeated measures were applied. The collected data were analyzed by SPSS 19 software. The test power was 80%.

## Findings

The mean age of participant in the intervention and control group were 57.60±3.65 and 55.00±3.36 years, respectively. The mean of the number of children of the participant in the intervention and control group were 5.52±2.48 and 5.28±2.35 (Table 1).

There were no significant differences in the scores of the studied groups before the intervention ( $p>0.05$ ; Table 2).

In the intervention group, the mean scores of knowledge, attitude were significantly increased immediately after the intervention ( $p<0.001$ ; Table 2).

The mean scores of knowledge, attitude and practice showed a significant difference, three months after the intervention ( $p<0.05$ ; Table 2).

The increase in the scores of knowledge due to training was significantly different between the intervention and control groups. Also, there was a significant difference between the two groups three months after the intervention (Table 2).

The attitude was not significant in the control group. In sum, comparing the two groups, the attitude score was significant ( $p < 0.001$ ).

The changes in practice were significantly in the intervention group ( $p < 0.001$ ).

In the control group, despite increasing in practice score, the result of the statistical test was significant. Comparing the two groups, the total score was significant ( $p < 0.001$ ).

In the Intervention group, daily calcium intake showed a significant difference, three months after the training (Table 3).

**Table 1)** Frequency distribution of demographic characteristics of the samples (The numbers in parenthesis represent percent, n=25 in each group)

Variable	Intervention group	Control group
<b>Education</b>		
illiterate	12 (48.0)	16 (64.0)
Literate	13 (52.0)	9 (36.0)
<b>marital status</b>		
Married	21 (84.0)	24 (96.0)
others	4 (16.0)	1 (4.0)
<b>Job</b>		
Housewife	23 (92.0)	23 (92.0)
others	2 (8.0)	2 (8.0)

**Table 2)** Mean statistical of knowledge, attitude and practice in both groups before, immediately after, and three months after training (n=25)

Variables	Pre-test	Post-test	Follow-up	Effect	P-value	F-value
<b>Knowledge</b>						
Control Group	12.80±4.31	13.93±3.57	11.32±2.70	46.6	0.001	10.02
Intervention Group	12.12±3.65	18.24±3.06	13.28±3.90	82.9	<0.001	55.66
t-Value	0.602	-4.59	-2.06			
p-Value	0.55	<0.001	0.04			
<b>Attitude</b>						
Control Group	19.68±9.00	24.16±6.69	24.88±8.90	22.2	0.06	3.27
Intervention Group	20.76±2.40	37.88±3.46	29.92±5.94	94.7	<0.001	205.51
t-Value	-0.58	-9.11	-2.35			
p-value	0.56	<0.001	0.02			
<b>Practice</b>						
Control Group	1.64±1.04	-	2.28±1.31	0.3	0.02	4.83
Intervention Group	1.36±0.76	-	5.64±1.11	0.92	<0.001	133.66
t-Value	-1.09	-	-9.78			
p-value	0.28	-	<0.001			

**Pre-test:** before intervention; **Post-test:** Immediately after intervention; **Follow up:** Three months after the intervention

**Table 3)** Mean statistical of calcium intake before and three months after intervention in the studied groups (n=25 in each group)

Variables	Pre-test	Three months after the intervention	p-value	t-value
<b>Taking calcium (mg/day)</b>				
Control Group	560.28±395.94	551.91±356.35	0.88	0.16
Intervention Group	620.50±258.32	1123.38±494.37	<0.001	-5.71
t-value	-0.64	-4.69		
p-value	0.57	<0.001		

### Discussion

The aim of this study was to determine effect of the education-based intervention on knowledge, attitude, and practice of postmenopausal women concerning osteoporosis preventive behaviors.

The results of this study showed that educational intervention by group discussion was effective on knowledge, attitude, and practice of postmenopausal women regarding osteoporosis preventive behaviors because people's readiness to practice the right ways of life to avoid illnesses requires forming behaviors and actions; and increasing people's knowledge is a primary step in creating proper behaviors and practices. Also having knowledge about the given subject is considered as a prerequisite for the establishment of correct attitude in that particular subject and to the adoption of appropriate behavior. Therefore, increasing the knowledge of people, especially the knowledge of postmenopausal women about the preventive

behaviors of osteoporosis has great importance.

The results of this study showed that the knowledge level of the intervention group was low before the intervention. The lack of general knowledge about this issue can be attributed to the lack of publicity by mass media, the lack of holding relevant meetings by health authorities, and the ignoring or preventive behaviors. But after the intervention, the mean score of knowledge in the intervention group increased significantly. These findings are consistent with the results of other studies, such as the study done by Kamjoo *et al.*, on the effect of the education of osteoporosis prevention on the level of knowledge of high school girls [14], and the study conducted by Ebadi Fard Azar *et al.* in the field of education of osteoporosis in rural Malayer villages [5]. Also, Blalock *et al.* showed that the test group who received education on osteoporosis had a higher level of knowledge than other groups due to their increased information [15]. Francis *et al.* achieved

similar results [16]. Although the mean score of knowledge increased significantly in the control group, there was also a significant difference between the knowledge score in the intervention and control groups after the intervention. Although the mean score of knowledge increased significantly in the control group, there was a significant difference between the knowledge score in the intervention and control groups after the intervention. However, the reason for increasing the knowledge score in the control group could be the inevitable holding of classes and the implementation of the middle-aged program across health centers. These results are also consistent with the study of Shojaezadeh *et al.*, [9] who based on the Health Belief Model, performed education on osteoporosis in healthy volunteers in Khorram Abad.

The result of the present study indicated the creation of a positive attitude which is significant for the test. One of the most important issues in dealing with health problems is the attitude of people to them. If the people's attitude towards a disease or a health problem be negative and if they consider themselves susceptible to that illness or health problem, it will be easier to deal with it [17]. As Aziz Zadeh Forouzi asserts in his article "Human attitudes and beliefs are caused by certain factors such as thinking and cognition" [13].

In the present study, the attitude score of post-intervention research units increased significantly in comparison to the control group, which is consistent with the results of the studies by Ebadi Fard Azar *et al.*, [5] and Mahamed *et al.* [18]. In a study done by Sedlak *et al.*, three groups of women (84 people) were interviewed. The results showed that in one group of women, the attitude of calcium intake for preventing osteoporosis increased after the implementation of the curriculum, which is consistent with the current intervention [19].

The main goal of health education is behavioral change. The result of this study showed significance concerning preventive behaviors and habits of osteoporosis, namely the abandonment of the habit of putting salt on food, the use of calcium supplements and vitamin D, exercising 5 days per week for at least 30 minutes, spending 15-30 minutes daily in the sun, avoiding smoking, and replacing carbonated drinks with low-salt yogurt-drink, which is consistent with the result of the study done by Amini *et al.* [20]. It is also consistent with the result of the study that performed by Salimi with respect to foods rich in calcium (Increased consumption of milk and other dairy products, dark leafy vegetables, beans, eggs, liver, and the consumption of fish at least twice a week) [1]. Although the required amount of calcium intake of this age group is 1200mg per day and that it still has not reached the desired level of the intervention group, the total practice score of them was significant, which is consistent with the study done

by Tussing *et al.* [21].

**Suggestion:** Osteoporosis is one of the most common bone diseases in Iran, and that the economic and physical losses due to this disease are high for families and society of affected people, and also according to the results of this study, which shows the positive effect of training on changing the levels of knowledge, attitude and practice of people especially postmenopausal women based on performing preventive behaviors of this disease, and considering the implementation of the middle-aged program and the bold presence of postmenopausal women at the level of health centers and health homes, it is recommended that education about this disease be performed with different educational methods, especially with the group discussion which prompts the better interaction between learners and educators.

Also, with respect to the fact that mothers play as an effective role in family planning, and that dietary intake of calcium and modification of bad eating habits such as high salt intake and high consumption of carbonated drinks are of great importance, educating families especially mothers can play a significant role in preventing this disease. It is recommended that educational interventions such as group discussion should be used for postmenopausal women to enhance their interactive and communicative abilities.

Considering the fact that one of the most important ways to prevent this disease is to increase the consumption of calcium-containing foods, and that some people may have high knowledge and attitudes about calcium-based foods, and the fact that it is hard for some people to provide these foods because they are expensive, it seems that supporting interventions of the government such as subsidies on dairy products can be helpful.

Considering that one of the most important ways to prevent this disease is to increase the intake of calcium-based foods, and some people may have a higher awareness and attitude about calcium-based foods, but in practice, they can't buy the food because of the high-cost items or bad economic conditions. Therefore, government support interventions such as subsidies for dairy products in the household basket may seem to be helpful.

## Conclusion

Educational intervention based on group discussion is effective in promoting the preventive behaviors of osteoporosis, especially knowledge, attitude and practice of postmenopausal women in terms of osteoporosis preventive behaviors.

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**Ethical permissions:** After informing about the goals of the research and obtaining informed consent and ensuring the confidentiality of the information and taking into account the vacancies of the participants, the classes were held. It should be noted that no control classes were held for the control group during the study period and, in order to observe ethics in the research, at the end of the three-month follow up, a two-hour training session was held for these individuals and provided with educational materials.

**Conflicts of interests:** The authors declare that there is no conflict of interests.

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