

ORIGINAL RESEARCH

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The effect of osteoporosis knowledge levels and personal characteristics on osteoporosis health beliefs in women in the menopausal period

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Abstract

This cross-sectional study was conducted to determine the correlation between osteoporosis knowledge and osteoporosis health beliefs of menopausal women. The study was conducted in cross-sectional design. The data were collected between 15 August and 15 November 2014. The population of the study consisted of women aged between 40 and 45 years registered in Veli Gündüz Şahin FHC in Mamak region of Ankara. The population of 40-45 year-old women in FHC is 5235 people. The study was completed with 335 women. A socio-demographic questionnaire, Osteoporosis Health Belief Scale (OHBS) and Osteoporosis Knowledge Test (OKT) were used for data collection. This study was conducted by face to face interview technique. In the study, Kr-20 reliability coefficient, Mann Whitney U Test Kruskal Wallis H test, One-Way Anova and Independent t test and Pearson's Correlation were used to investigate. The following results were obtained from this study conducted to determine the effect of osteoporosis knowledge levels on osteoporosis health beliefs in women in the menopausal period. In the study, a statistically significant difference was found between the socio-demographic characteristics of women and OHBS, OHBS and their subscales.

Keywords: Women's health, osteoporosis health belief scale, osteoporosis knowledge test

Introduction

Osteoporosis is a condition characterized by gradually and usually painless reduction of bone mass and is a metabolic bone disease resulting in fractures without being exposed to any power [1-3]. Even though it is not at the top among deadly diseases in the world and in Turkey, osteoporosis has become an increasing social health issue because of affecting the elderly population more and the increase in elderly population with the increased life expectancy [1,4].

Fractures, morbidity, loss of functional independence, chronic complaints and resulting with an increased mortality, losses in the labor and high economic expenses make osteoporosis socially more important. Therefore, the scope, duration and cost of care services also increase [1]. Fragility fracture is estimated to occur every 3 seconds all around the world. This means almost 25 thousand fractures in a day and 9 million fractures in a year. People associated with these widespread and serious injuries suffer greatly and their financial costs are also very high [5].

According to the data of United States of America, there are 10 million people with osteoporosis in the country, 80% of them are women. It is also estimated that the bone density of 18 million people is low [1]. Even though there are not enough and reliable data about the actual prevalence of osteoporosis, which is one of the important problems in women going through menopause in Turkey, there are some local studies [6]. In the study conducted by Tüzün et al., (2012) using study data based on hospital and society in Turkey, it was reported that while the probability of lifelong femur fracture in 50 year-old men is 3.5%, it is 14.6% in women. They also estimated that the femur fracture cases in Turkey are 24 thousand and 73% of them are seen in women [7]. In the study conducted Gölge et al., on 2457 people who received Dual Energy X-Ray Absorptiometry (DEXA) in two regions of Turkey, 927 participants were determined to be diagnosed with osteoporosis and receive treatment of osteoporosis [8].

Osteoporosis is not a preventable disease, but the effects of the disease can be reduced and a better quality of life can be achieved [1,9]. Constant risk factors for osteoporosis include age, sex, race, genetic predisposition, fracture history, hormone levels, number of pregnancies, and long-term use of steroid. In addition, malnutrition, inadequate exercise, sedentary lifestyle, insufficient calcium intake, alcohol and smoking are alterable risk factors for osteoporosis. Constant risks cannot be controlled but control can be ensured by actuating the individual to reduce alterable risks.

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Effective strategies should be developed to provide this control [3,10,11].

Assessment is one of the first things that need to be done to determine these strategies. According to literature data and the studies, women in the menopausal period are seen to be at higher risk for osteoporosis [12]. Nevertheless, there is no effective study for protecting from osteoporosis and early diagnosis and treatment in Turkey [6,13]. Therefore, determining women's knowledge, attitudes, beliefs, and perceptions about osteoporosis will provide an opportunity to make an appropriate and timely intervention on the subject [14]. In the study conducted by Kılıç and Erci (2007) on women, osteoporosis knowledge levels and osteoporosis health beliefs of individuals were determined and a planned training was then given to the experimental group. It was determined as a result of the study that posttest osteoporosis health beliefs were found to be higher in the experimental group than control group [15]. This is important in terms of showing us that the determination of women's knowledge and beliefs about osteoporosis is an important finding in intervening the problem.

The Purpose of the Study

This study was conducted to determine the correlation between osteoporosis knowledge and osteoporosis health beliefs of menopausal women.

Material and Method

Design of the Study

The study was conducted in cross-sectional design.

Population and Sample of the Study

The population of the study consisted of women aged between 40 and 65 years registered in Veli Gündüz Şahin Family Health Center (FHC) in Mamak region of Ankara. The population of 40-65 year-old women in FHC is 5235 people. The sample of the research was calculated by power analysis at a confidence interval of 95%, at a level of error of 0.05, at a magnitude of effect of 0.3, at a bi-directional significance level, at a sample size of 99%. However, the study was completed with 335 women. In order to increase the representative power of the population, the researchers increased the number to 335 with special efforts. Each family medicine unit in FHC was accepted as a cluster. By cluster weighting, individuals were selected from these clusters by using improbable sampling method among probability sampling methods.

Inclusion Criteria of the Study;

Being open to communication and collaboration
Volunteering to participate in the survey
Being a woman between the ages of 40-65

Exclusion Criteria of the Study;

Not volunteering to participate in the research

Data Collection Tools

Questionnaire (ANNEX-I)

The questionnaire prepared by the researcher in accordance with the literature information involved 10 questions. There were questions in the form determining the socio-demographic characteristics, parity, the menopause status and the menopause age of women.

Data Collection

The data were collected between 15 August and 15 November

2014. Data collection tools were collected by the researcher conducting face-to-face interviews with women at FHM between the dates specified by the researcher. It took about 20-25 minutes to fill the data collection tools.

Osteoporosis Knowledge Test (OKT)

The Turkish version of the Osteoporosis Knowledge Test developed by Kim, Horan and Gendler in 1991 was validated by Kılıç and Erci (2004). Osteoporosis Knowledge Test Turkish form; Calcium intake to prevent osteoporosis, and osteoporosis knowledge in a variety of subjects associated with exercise levels. The Osteoporosis Knowledge Test consists of two subscales, 'osteoporosis calcium knowledge test' and 'osteoporosis exercise knowledge test', and four question items with four options [16,17]. Osteoporosis Exercise Information and Osteoporosis Calcium Information Commonly includes items 1 to 9. Marking of 1 to 9 markings on osteoporosis is done on one of the options "Most likely", "Less likely", "Undecided" or "I do not know". For items 1 to 9, I am Dumb and I do not know wrong answers. False answers are scored as "0" and correct answers are "1". I do not know the option for items from 10 to 24 on the scale. Osteoporosis calcium test; 1 to 16 includes the items and scored between 0 and 16. Osteoporosis Exercise test; 1 to 9 and 17 to 24 includes items and is scored between 0 and 17. The osteoporosis knowledge Test is scored between 0 and 24. The increase in the total score from the Test means that the individual's osteoporosis knowledge is at a good level. Kim and colleagues found that the reliability coefficient of the Osteoporosis Knowledge Test ranged from 0.69 to 0.72 [15]. Kılıç and Erci (2004) found reliability coefficient between 0.75 and 0.76 in adapting the Test to Turkish [17]. In this study; were found to be 0.76 for the exercise test, 0.68 for the calcium knowledge test and 0.77 for the osteoporosis knowledge Test.

Osteoporosis Health Belief Scale (OHBS)

The adaptation, validity and reliability of the Osteoporosis Health Belief Test developed by Kim, Horan and Gendler in 1991 was provided by Kılıç and Erci (2004). Osteoporosis The Health Belief Test is a measure of individuals' beliefs about osteoporosis. The OHBS is designed to measure seven constructs: susceptibility, seriousness, calcium benefits, calcium barriers, exercise benefits, exercise barriers, and health motivation. Each item in OHBS is scored from 1 (strongly disagree) to 5 (strongly agree). Six questions constitute one category, and the summary scores are calculated by summing up the scores of each category, which results in the possible score range from 6 to 30. The OHBS comprises 42 items: 1-6: susceptibility; 7-12: seriousness; 13-18: benefits of exercise; 19-24: benefits of calcium intake; 25-30: barriers to exercise; 31-36: barriers to calcium intake; and 37-42: health motivation. The Cronbach's alpha coefficients of subTests developed by Kim and colleagues are between 0.71-0.82 [16]. Kılıç and Erci (2004) found reliability coefficient between 0.79 and 0.94 in adapting the Test to Turkish [17]. In this study; were found in this study, Cronbach alpha values were found between 0.70 and 0.82 for the osteoporosis health belief Test and its subtests.

Variables of the Study

Dependent Variable of the Study

- Score of osteoporosis health belief Test

Independent Variables of the Study

- Score of osteoporosis knowledge Test
- Socio-demographic characteristics of women

Data Assessment

The data obtained in this study were analyzed with the SPSS 20 packaged software. In the study, Kr-20 reliability coefficient, Mann Whitney U Test Kruskal Wallis H test, and Pearson's Correlation were used to investigate the correlation between descriptive characteristics and OKT mean scores of the women. Evaluating the difference between the descriptive characteristics of women and OKT mean scores; Cronbach's α reliability coefficient One-Way Anova and Independent t test, Pearson correlation, and Kruskal Wallis H test were used. Frequency, mean, and percentage were used to examine descriptive characteristics of the women.

Ethical Principles of the Study

Approval was taken from the Malatya Clinical Research Ethics Committee for the study. Before starting the study, written permission was obtained from the Directorate of Family Medicine Training and Development Department of the Directorate of Public Health Institution of Turkey (No: 2014/83). Before starting the study, verbal and written approvals of the women were taken in principle of "Informed Consent" by explaining the purpose of the study.

Limitations and generalizability of the Study

Women who agreed to participate in the study and applied to the Ankara Veli Gündüz Şahin Family Health Center were included in the study. Women who were included in the study were selected by using random sampling method among improbable methods. For this reason, the results can be generalized to the group included in the study.

Results

In this section, the results related to the osteoporosis health belief, osteoporosis knowledge level and socio-demographic characteristics of individuals participating in the study are presented in the tables.

Table 1 shows demographic characteristics of the women included in the study. It was found that 62.6% of women in the study were in the age range of 40-49 years, 54.6% were primary school graduate, and 83.3% were married. In addition, it was found that 57.9% of the women were housewives, 60.6% had 1 or 2 children, and 53.4% were in premenopausal period. The average age of the women who participated in the study was 48.1 ± 6.19 , their mean income was 1629.5 ± 903.4 TL, and their mean menopause age was 47.1 ± 4.93 (min=40, max=65).

When Table 2 was examined, it was found that the mean score of exercise knowledge test was 11.74 ± 0.17 , the mean score of calcium knowledge test was 12.16 ± 0.15 and total osteoporosis knowledge test mean score was 18.31 ± 0.2 .

Table 3 shows mean scores of the women included in the study for the subTests of their osteoporosis health beliefs. It was determined that the women obtained the highest mean score from the subTests of exercise benefits, the benefits of calcium intake, and the health motivation and they obtained the lowest score from subTests of the barriers to exercise and barriers to calcium intake. The total mean score of Women's Health Belief Test was 139.28 ± 0.91 .

Table 1. Distribution of women in terms of their demographic characteristics (n=335)

Features	Number	%
Age		
40-49	210	62.60
50-59	103	30.80
60 and above	22	6.60
Education		
Literate	17	5.10
Primary School	183	54.60
Middle School	35	10.40
High School	51	15.20
Undergraduate education	49	14.60
Marital Status		
The married	279	83.30
Single	56	16.70
Working Status		
Working	94	28.05
Not Working	241	71.95
Number of children		
No children	21	6.30
1-2 children	203	60.60
3 and over children	111	33.10
Menopause Status		
In premenopausal	179	53.40
Menopause transition	16	4.80
period		
postmenopausal	140	41.80
Mean (SD)		
Age	335	48.10 ± 6.19
Income	326	1629.50 ± 903.40
Menopause age	140	47.10 ± 4.93

Table 2. Distribution of osteoporosis knowledge test mean scores (n=335)

Osteoporosis Knowledge Test and	Min-Max	Mean (SD)
Sub-Dimensions		
Exercise Knowledge Test	0-16	11.74 ± 0.17
Calcium Knowledge Test	2-17	12.16 ± 0.15
Total Osteoporosis Knowledge Test Mean Score	2-24	18.31 ± 0.20

Table 3. Distribution of osteoporosis health belief test mean scores (n=335)

Osteoporosis Health Belief Test	Min-Max	Mean (SD)
Susceptibility	6-30	19.16 ± 0.24
Seriousness	6-30	19.95 ± 0.29
Benefits exercise	6-30	24.23 ± 0.23
Benefits calcium intake	6-30	24.01 ± 0.20
Barriers exercise	6-30	15.11 ± 0.27
Barriers calcium intake	6-30	13.71 ± 0.25
Health motivation	6-30	23.08 ± 0.23
Total	6-30	139.28 ± 0.91

OHBS total and subTest mean scores were investigated according to the women's demographic characteristics and their responses to Osteoporosis Health Belief Test. It was determined that the difference between the caring (seriousness perception) mean scores of the women in terms of their age group was statistically significant ($p < 0.05$). According to the educational status groups of women, the difference between the mean scores of caring (seriousness perception), exercise benefits, benefits of calcium intake, barriers

to calcium intake, and OHBS total mean scores was determined to be statistically significant ($p<0.05$). According to the marital status and occupational groups of the women, the difference between barriers to exercise and barriers to calcium intake mean scores was determined to be statistically significant ($p<0.05$). The difference between susceptibility, seriousness perception, benefits of exercise, barriers to exercise, barriers to calcium intake and OHBS total mean scores was statistically significant in terms of the women's status

of having children ($p<0.05$). The difference between susceptibility perception, seriousness perception, barriers to calcium intake, health motivation and OHBS total mean scores was determined to be statistically significant in terms of menopausal status of women ($p<0.05$). There were a positive statistical correlation between income status and the benefits of exercise and a negative statistical correlation between income status and barriers to calcium intake ($p<0.05$).

Table 4. Comparison of the subTest and total mean scores of OHBS According to Demographic Characteristics of the Women

Features		Susceptibility	Seriousness	Benefits exercise	Benefits calcium intake	Barriers exercise	Barriers calcium intake	Health motivation	Total
Age									
40-49	210	18.81±4.34	19.48±5.20	24.29±4.39	23.74±4.39	15.50±3.99	13.36±5.03	22.81±4.36	137.99±16.45
50-59	103	19.85±4.66	20.30±5.60	24.07±4.19	24.07±4.19	24.51±3.09	14.09±4.94	23.82±3.88	140.97±18.20
60 and above	22	19.23±3.25	22.86±4.10	24.45±2.76	24.36±2.38	24.36±2.38	15.36±4.75	22.32±2.71	143.73±10.15
Test and		KWx =1.949	KWx2=9.646	KWx2=0.574	KWx2=1.865	KWx2=3.861	KWx2=5.467	KWx2=5.599	KWx2=5.261
P value		p=0.144	p=0.008	p=0.750	p=0.394	p=0.145	p=0.065	p=0.061	p=0.072
Education									
Literate	17	19.94±1.16	22.06±1.41	22.65±1.41	24.00±1.03	15.65±1.61	13.06±1.15	23.24±1.05	140.50±5.34
Primary School	183	19.20±0.33	20.62±0.39	20.62±0.39	24.26±0.28	15.08±0.37	14.55±0.34	23.09±0.28	140.72±1.24
Middle School	35	20.46±0.75	18.91±0.95	18.91±0.95	24.63±0.63	16.66±0.98	13.17±0.99	24.23±0.88	142.69±3.77
High School	51	18.39±0.49	19.27±0.70	19.27±0.70	23.25±0.49	14.63±0.62	13.33±0.54	22.25±0.60	135.45±1.84
Undergraduate	49	18.63±0.68	18.16±0.67	18.16±0.67	23.49±0.44	15.45±0.56	11.61±0.50	23.10±0.61	135.00±1.70
Test and		KWx2=7.603	KWx2=15.817	KWx2=15.817	KWx2=9.865	KWx2=4.445	KWx2=20.700	KWx2=5.670	KWx2=13.054
P value		p=0.107	p=0.003	p=0.034	p=0.043	p=0.349	p=0.001	p=0.225	p=0.011
Marital Status									
The married	279	19.17±4.28	19.97±5.30	24.27±4.12	24.11±3.65	15.40±4.96		23.11±4.03	140.02±16.87
Single	56	19.11±4.97	19.86±5.47	24.04±4.80	23.54±3.71	13.68±4.68	13.98±4.61	22.98±4.75	135.59±15.73
Test and		t=0.10	z=-0.241	z=-0.081	z=-0.800	z=-2.510	12.39±4.55	z=0.316	z=-1.639
P value		p=0.920	p=0.810	p=0.935	p=0.424	p=0.022	z=-2.510	p=0.752	p=0.101
Job									
Housewife	194	19.30±0.31	20.36±0.39	23.94±0.31	24.04±0.27	15.60±0.37		22.72±0.30	140.53±1.30
Worker	36	20.26±0.55	20.63±0.74	23.37±0.80	23.92±0.59	16.05±0.77	14.48±0.33	23.61±0.81	140.68±2.52
Officer	41	19.38±0.78	18.43±0.80	25.52±0.68	23.81±0.52	14.98±0.59	12.84±0.74	23.38±0.69	137.19±2.25
Retired	22	17.91±0.95	20.32±1.18	25.23±0.70	24.55±0.50	13.14±0.90	11.69±0.60	23.27±0.65	138.36±2.83
Not working	25	17.08±1.02	19.04±1.28	23.92±0.66	22.84±0.89	13.56±1.07	13.95±0.95	25.00±0.61	133.96±3.31
Self-employment	17	19.24±1.17	18.53±1.12	25.47±0.96	25.59±0.65	12.71±1.06	12.52±0.89	22.35±1.04	136.24±3.28
Test and		KWx2=10.241	KWx2=7.851	KWx2=11.034	KWx2=6.423	KWx2=22.860	12.35±1.12	KWx2=10.774	KWx2=8.218
P value		p=0.069	p=0.165	p=0.051	p=0.267	p=0.017	KWx2=22.860	p=0.056	p=0.145
Number of children									
No children	21	19.38±1.08	18.38±1.40	25.71±0.90	23.38±0.88	12.86±0.97		24.00±0.82	134.67±2.62
1-2 children	203	18.53±0.30	19.56±0.36	23.83±0.31	23.74±0.27	14.92±0.34	10.95±0.33	22.77±0.31	136.94±1.26
3 and over	111	20.27±0.40	20.96±0.51	24.69±0.36	24.65±0.31	15.89±0.50	13.58±0.44	23.50±0.35	144.44±1.32
Test and		KWx2=10.408	KWx2=7.350	KWx2=7.256	KWx2=3.681	KWx2=7.385	14.48±0.82	KWx2=2.091	KWx2=17.889
P value		p=0.001	p=0.025	p=0.027	p=0.159	p=0.025	KWx2=12.238	p=0.351	p=0.001
Menopause Status									
In premenopausal							p=0.001		
Menopause transition period	179	18.50±0.31	19.51±0.38	24.28±0.31	23.64±0.29	15.26±0.37	13.02±0.32	22.58±0.30	136.79±1.12
postmenopausal	16	17.25±1.31	18.19±1.15	23.38±0.92	24.13±0.82	16.31±1.19	14.81±1.07	21.56±1.41	135.63±4.23
Test and		KWx2=13.166	KWx2=7.350	KWx2=1.684	KWx2=3.367	KWx2=1.855	KWx2=9.449	KWx2=10.207	KWx2=13.267
P value	140	20.22±0.37	20.72±0.47	24.26±0.37	24.49±0.28	14.79±0.42	14.48±0.41	23.92±0.34	142.88±1.54
Income Status									
	325	r=0.008	r=-0.078	r=0.133	r=-0.009	r=-0.089	r=-0.120	r=0.028	r=0.009
		p=0.879	p=0.158	p=0.017	p=0.877	p=0.109	p=0.031	p=0.613	p=0.876

Table 5. The Correlation between osteoporosis health beliefs and osteoporosis knowledge levels

Osteoporosis Health Beliefs				
OHBS		Calcium Knowledge Test	Exercise Knowledge Test	Total
Susceptibility	r	-0.116	-0.0093	-0.084
	p	0.034*	0.090	0.123
Seriousness	r	-0.054	-0.058	-0.072
	p	0.338	0.289	0.186
Benefits exercise	r	0.173	0.148	0.196
	p	0.002**	0.007**	0.001***
Benefits calcium intake	r	-0.027	-0.021	-0.020
	p	0.629	0.708	0.721
Barriers exercise	r	-0.232	-0.209	-0.224
	p	0.001***	0.001***	0.001***
Barriers calcium intake	r	-0.188	-0.160	-0.156
	p	0.001***	0.003**	0.005**
Health motivation	r	-0.009	0.003	0.017
	p	0.874	0.957	0.759
Total OHBS	r	-0.131	-0.111	-0.107
	p	0.016*	0.043*	0.051

Table 5 shows the correlation between the osteoporosis knowledge and osteoporosis health beliefs of women. It was determined that barriers to exercise and barriers to calcium intake of OHBS had a statistically negative correlation with osteoporosis knowledge test, osteoporosis exercise test and total scores of OKT ($p < 0.001$). A statistically positive correlation was determined between the subTest exercise benefits of OHBS and osteoporosis knowledge test, osteoporosis exercise test and total scores of OKT ($p < 0.01$, $p < 0.001$). A statistically negative correlation was determined between the subTest susceptibility perception of OHBS and osteoporosis knowledge test scores of OKT ($p < 0.05$). It was determined that there was a statistically negative correlation between total score of OHBS and osteoporosis knowledge test and osteoporosis exercise test scores of OKT ($p < 0.05$). There was no statistically significant correlation between total score of OHBS and total score of OKT ($p > 0.05$).

Discussion

This study conducted to determine the effect of osteoporosis knowledge level on osteoporosis health beliefs in women in menopausal period is discussed with the literature information. When the OKT mean scores of the women were examined, it was observed that they obtained a moderate score in exercise knowledge test, calcium knowledge test and they obtained high scores in total osteoporosis knowledge test (Table 2). In the study conducted by Gökşugüzel on 236 people, they were determined to obtain low scores from exercise knowledge test, calcium knowledge test, and total osteoporosis knowledge test [13]. In the study conducted by Ungan and Tümer on 311 women, osteoporosis knowledge levels of women were determined to be low [18]. The data of the present study differ according to the data obtained from the literature [11,13]. The cultural and socio-demographic differences of societies can be regarded among the reasons for the different results in the study.

When the OHBS mean scores of the women were examined, it was determined that while exercise benefits, calcium benefits and health motivation from OHBS subTests were the subTests having the highest mean scores, barriers to exercise and barriers to calcium intake were the subTests having the lowest mean scores (Table 3). In the study conducted by Altın et al. on 147 volunteers, it was determined while susceptibility perception, exercise benefits, calcium benefits and health motivation among the subTests of OHBS were the subTests having the highest mean scores, barriers to exercise and barriers to calcium intake were the subTests having the lowest mean scores. The low susceptibility perception in the study was associated with the fact that individuals from different gender participated in the study [11]. In the study conducted by Ford et al. (2011), susceptibility perception, seriousness, barriers to exercise and barriers to calcium intake are found low and health motivation, benefits of exercise, and benefits of calcium were found to be high. We can say that the results of Ford et al.'s study were based on that the age averages of the individuals included in the study were lower than the age averages of the individuals participating in this study [19]. In the study of Al-Otaibi, it was determined that calcium intake benefits, exercise benefits, and health motivation had the highest mean scores; whereas, barriers to calcium intake, barriers to exercise, and susceptibility perception had the lowest mean scores [20].

When OHBS total and subTest mean scores of women are examined according to age groups, it was found that the seriousness perception scores of the group in the age of 60 and over were higher than the scores of 40-49 age group (Table 5). When OHBS total and subTest scores of the women were compared according to the age groups, a statistically significant difference was found between the seriousness mean scores ($p < 0.05$). In the study conducted by Aydemir on 410 people by using quality of life questionnaire, it was found that physical health was affected more by the age and health-related quality of lives of women in menopausal period was affected negatively [21]. In the study conducted by Gökler et al., on 306 women, it was found that people in the age group of 60 years and over had higher mean scores from susceptibility perception and barriers to exercise subTests; whereas, their mean scores of exercise benefits, calcium intake benefits and health motivation subTests were lower [22]. The matter wanted to be determined with the seriousness perception subTest of OHBS is the status of threat perception containing harmful results related to physical health of the individual [14]. According to these results, it can be asserted that elderly women are aware of osteoporosis related fractures, pain, treatment, health care needs and deaths seen with the age and they perceive this as a threat.

When OHBS total and subTest mean scores were compared according to the educational level of the women, a statistically significant difference was found between seriousness, exercise benefits, calcium benefits, barriers to calcium intake and OHBS total mean scores ($p < 0.05$). In the study conducted by Kılıç and Erci (2007), no significant difference was found between seriousness, susceptibility and barriers to exercise (Kılıç and Erci 2007). High score signifies that the individual will show positive effect on osteoporosis protective behaviors since OHBS includes individual's susceptibility to osteoporosis, risk perception to osteoporosis, and seriousness of the disease [14].

When OHBS total and subTest mean scores of women were

examined according to the marital status, it was found that barriers to exercise and barriers to calcium intake scores of single women were higher than those of married women (Table 5). According to the marital status of women, the difference between mean scores of the barriers to calcium intake was found to be statistically significant ($p<0.05$). According to HBM, the lower the perceived barrier is, the higher the possibility of the individual to start protective behavior for osteoporosis is [14].

In the study conducted by Umay et al. (2011) on menopausal women with low income status, low social status and inadequate calcium intake were found to affect bone mineral density negatively [23]. In their study, Tezcan et al., (2002) determined that 87.7% of teachers consumed milk and dairy products and this is explained with the high socioeconomic and educational levels of teachers. They found that women with high social status could access calcium sources more easily [24]. The educational level and monthly income of people and accordingly their conscious nourishment are affected.

When OHBS total and subTest mean scores of women were examined in terms of their occupational groups, it was found that while scores of workers and housewives for calcium intake barriers were higher than retired, self-employed and unemployed women, calcium intake barriers scores of civil servants were lower than housewives (Table5). There was a statistically significant difference between the mean scores of women for exercise barriers and calcium intake barriers in terms of occupational groups ($p<0.05$). In the study conducted by Saka et al., on women with high school and higher education level in Diyarbakir, they determined that only 38.12% of women who expressed that their calcium needs increased said that its consumption was sufficient and women are not conscious about nutritional practices [25]. In the study conducted by Pamuk et al. on women in the postmenopausal period, a significant correlation was found indicating that employed women had higher quality of life when working status is compared with the quality of life [26]. The women's educational levels were higher associated with their profession. It can be stated that women with low perceived barrier scores will adopt protective behaviors for calcium intake, but women with high perceived barrier will have a lower possibility of starting positive behavior for calcium intake. With this result, an education for housewives and workers could be a good intervention for the problem. When OHBS total and subTest mean scores of the women were examined in terms of the number of their children, it was found that susceptibility perception, seriousness perception, barriers to exercise and OHBS total scores of women were higher in those with 3 or more children have higher scores than those who had 1-2 children (Table 5). It was found that there was a statistically significant difference between the susceptibility, seriousness perception, exercise benefits, barriers to exercise, barriers to calcium intake and OHBS total mean scores in terms of the status of having children ($p<0.05$). The fact that susceptibility mean score of women who have three or more children was higher means that their susceptibility to osteoporosis protection was adequate and they perceived osteoporosis as a threat to their health. However, high exercise perceived barrier perception showed that there were barriers to exercise which has an important place in protection from osteoporosis.

When the OHBS total and subTest mean scores of women were examined according to their menopausal status, susceptibility

perception, seriousness, barriers to calcium intake, health motivation and health belief Test scores of menopausal women were found to be higher than those in the other groups (Table5). According to menopausal status of women, the difference between susceptibility perception, seriousness perception, barriers to calcium intake, health motivation and OHBS total mean scores was found to be statistically significant ($p<0.05$). In In another study conducted by Akalın et al. (2013) on university students, they determined that especially students who had osteoporosis in their first degree relatives develop early awareness [27]. In the study of Al-Otaibi it was found that individuals who had osteoporosis in their family had more knowledge than those who have not and the difference between susceptibility perception, caring perception, barriers to exercise, barriers to calcium intake was statistically significant ($p<0.05$) [20]. Significant increase in osteoporosis and associated fractures and pains in the menopause period and in the following years could be thought to cause women to care osteoporosis more. In addition, it is also known that calcium absorption reduces with the progress of age [1].

It can be stated that as the exercise and calcium intake barrier scores increased, the calcium knowledge test scores decreased. Even though there was no significant correlation between the subTest exercise benefits of OHBS with total score and subTest scores of OKD, a positive correlation was determined. Exercise knowledge scores are stated to increase as the scores of exercise benefit increased. Even though there was no significant correlation between the susceptibility subTest of 24 OHBS and osteoporosis knowledge test scores of OKS, a negative significant correlation was determined. As the susceptibility perception scores increased, exercise knowledge test scores could be expected to decrease. A negative correlation was determined between total score of OHBS with osteoporosis knowledge test and osteoporosis exercise test scores of OKT (Table 6). There was no statistically significant correlation between OSI total score and OSIS total score ($p>0.05$). Although it was not statistically significant, health belief Test scores decreased but osteoporosis scores observed to increase. In the study by Gökler, there were a negative correlation between osteoporosis knowledge level of women with seriousness perception and calcium intake barriers subTest mean scores of OHBS was determined and a positive relationship between the mean scores they obtained from exercise benefits, calcium intake benefits and health motivation subTests. No correlation was found between the susceptibility perception and exercise barriers subTests of OHBS. According to these results, studies had similarities in some aspects. The cause of the differences can be shown as the different Tests used by Gökler to determine the osteoporosis knowledge level [22].

Conclusion and Recommendations

The following results were obtained from this study conducted to determine the effect of osteoporosis knowledge levels on osteoporosis health beliefs in women in the menopausal period. In the study, women's mean scores in OKT and its subTests were found to be higher according to the educational level, marital status, income status, occupation status, the number of their children and transition period to menopause.

A statistically significant difference was found between the socio-demographic characteristics of women and OHBS and its subTests.

In accordance with the study results;

_ Organizing and ensuring continuity of regular training programs including cognitive and behavioral processes to promote and maintain bone health due to the presence of willing to act to protect health and where women are aware of osteoporosis,

_ It is recommended to make preventive, protective and timely interventions regarding osteoporosis by conducting national studies on prevalence of osteoporosis, mortality rates due to osteoporosis, the burden brought by the disease on the country's economy and society in Turkey.

Competing interests

The authors declare that they have no competing interest.

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The financial support for this study was provided by the investigators themselves.

Ethical approval

All procedures performed in this study involving human participants were in accordance with the ethical standards of the Clinical Trials Ethics Committee of Malatya and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

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