

# Health beliefs and sense of one's own efficacy and prophylaxis of osteoporosis in peri- and post-menopausal women

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## Abstract

**Introduction and objective.** Osteoporosis constitutes one of the relevant health, social and economic problems of the contemporary world which concerns 200 million women, of whom about 20–25% will experience a bone fracture. The aim of the study was to learn about the health beliefs and sense of self-efficacy in peri- and post-menopausal women regarding the prevention of osteoporosis.

**Materials and method.** A group of 300 randomly chosen women aged 45–65 who were patients of healthcare centres in Chełm, Lublin, and the surroundings of Zamość (eastern Poland), was examined. Own Health Beliefs Scale (OHBS) associated with Osteoporosis and Own Efficacy Evaluation Scale (OSES) were used for the study. The obtained material was subjected to descriptive and statistical analysis. Tukey test, t-student test and variance analysis (ANOVA) were all applied. A *P* value less than 0.05 was considered statistically significant. Results were analysed using the SPSS version 19 software package.

**Results and conclusions.** It was stated that respondents had thought that osteoporosis is an averagely serious health problem, and they did not feel peculiarly exposed to falling ill with the disease. They attached great significance to the benefits of physical activity and correct nutrition. The perception of barriers to calcium intake and everyday exercise was moderate. Health motivation remained at the average level. Socio-demographic conditions influenced the respondents' health beliefs in a statistically significant way. Sense of self-efficacy from the aspect of taking possible action preventing osteoporosis remained on the average level; in addition, respondents more often declared the desire for a change in eating habits than resorting to physical activity.

## Key words

osteoporosis, menopause, prophylaxis, health beliefs, self-efficacy sense

## INTRODUCTION

Osteoporosis constitutes one of the most relevant health, social, and economic problems of the contemporary world. Osteoporosis concerns the entire population at different times during the lifetime, but women in the postmenopausal period are the mostly prone to its devastating consequences [1, 2]. It is estimated that worldwide osteoporosis affects 200 million women, of whom about 20–25% will experience an injury in the form of a bone fracture. In Poland, the problem of osteoporosis affects 2.4 million women [3, 4].

## OBJECTIVE

The aim of the presented study was to discover the health beliefs and sense of self-efficacy in peri- and post-menopausal women regarding the prevention of osteoporosis was. McLeod et al. [5] claim that individual beliefs associated with health remain in close relationship with health behaviour, exerting an influence on the forming of this behaviour. One should understand the sense of self-efficacy as the belief one is given for the effective accomplishment of specific behaviour, essential for achieving an expected health result. Examining

and understanding health beliefs and the sense of self-efficacy of society from the aspect of osteoporosis can be of help in formulating preventive programmes concerning this disease.

## MATERIALS AND METHOD

The study was conducted between 2 January – 30 March 2012, and embraced a group of randomly chosen women aged 45–65, who were patients of the following healthcare centres:

- Specialist Clinic of Independent Public Specialist Hospital in Chełm;
- Municipal Independent Public Healthcare Centre in Chełm;
- Out-patient Specialist Clinic of the Independent Public Research Hospital No. 4 in Lublin;
- Non-Public Healthcare Centre in Łabunie.

Research was conducted among the women willing to participate in the study, who after obtaining complete information about the purpose of the study and assured full anonymity, expressed informed consent for filling out the questionnaires. Standardized questionnaires and an original questionnaire consisting of 13 questions were used. The original questionnaire concerned socio-demographic and economic data, as well as the health behaviour of the respondents from the aspect of preventing osteoporosis. The following standardized questionnaires were used for the study:

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**1. Osteoporosis Health Belief Scale. (OHBS)** A scale by Kim K, Horan M, and Gendler P. [6]. This is a 42-item tool consisting of 7 subscales based on the Health Belief Model (Rosenstock 1966) for the assessment of health beliefs associated with osteoporosis. The tool focuses on calcium intake and physical exercise. Subjects rate each item on a 5 point scale: 1 – strongly disagree; 2 – disagree; 3 – neutral; 4 – agree; 5 – strongly agree. The range of scores for each subscale is 6–30, with a possible total range of 42–210. OHBS was divided in 7 subscales which focus on the following perceptions:

1. the susceptibility to falling ill, i.e. feeling the risk of falling ill with osteoporosis;
2. the seriousness of the disease and threat associated with effects of the illness, or with absence of its curing;
3. the benefits of physical activity as a pro-health behaviour;
4. the benefits of calcium intake;
5. the barriers to initiate physical activity, i.e. potential negative effects which can result from implementing a given pro-health action;
6. the barriers of calcium intake;
7. health motivation, i.e. becoming involved in cases associated with health, implementing principles of a healthier lifestyle, and care of the health [6].

**2. Osteoporosis Self-Efficacy Scale (OSES).** Developed by Horan ML, Kim KK, Gendler P. [7]. A 21-item scale. Subjects circle the number that indicates their confidence in increasing exercise and calcium intake: 0 – least confident, 10 – most confident. The tool has 2 subscales, one for exercise and one for calcium. Scoring is achieved by multiplying the number circled on each item in the subscale by 10, and dividing it the number of items in the subscale. The possible range of scores for each subscale is 0–100, with a possible score range of 0–200 for the total scale [6, 7].

Empirical material collected was subjected to descriptive and statistical analysis. The subscales of both the OHBS and OSES were treated as dependent variables, whereas the socio-demographic variables and chosen health behaviours (drinking strong coffee or tea, smoking cigarettes) were treated as independent variables.

Values of the analysed measurable parameters were described with the average value and the standard deviation, while non-measurable variables were described with the help of the cardinality and the percentage. Tukey test, t-student test and variance analysis (ANOVA) were all applied. A *P* value less than 0.05 was considered statistically significant. Results were analysed using the SPSS version 19 software package.

**Characteristics of the investigated group.** The examined group was represented by women aged 45–65. The majority of respondents were in age range 45–55 (n=231; 77.0%). The remaining women were in age range of 56–65 years (n=69; 23%).

Marital status of respondents: married persons constituted the majority (n=235; 78.3%), a small number of individuals stated that they were divorced (n=33; 11%); widows (n=20; 6.7%) and unmarried women (n=12; 4%) constituted the smallest percentage of the examined. Over a half of the surveyed women lived in small cities (n=168; 56%), while fewer

women came from villages (n=91; 30.3%). The remaining women indicated a small town as their domicile (n=22; 7.3%) and a city with above 100 thousand residents (n=19; 6.3%). Almost 40% of the examined had a secondary education (n=119; 39.6%), whereas 59 (19.7%) of the women had post-secondary education, 43 (14.3%) professional-vocational, and 42 (14%) of the respondents had a higher education. A small number of the examined had only primary school education (n=20; 6.7%) and higher undergraduate education (n=17; 5.7%).

Considering the socio-economic conditions of the respondents, over a half described them as good (n=154; 51.3%), while 30.3% (n=91) described them as average. A considerably lower number of respondents (n=49; 16.3%) stated that they had very good conditions. The scanty percentage determined the above conditions as bad (n=6; 2.0%). Of the total of 300 women, 236 respondents (78.7%) gave a career job as the source of income. A definitely smaller number of women received an invalidity or retirement pension (n=44; 14.7%). A fraction of the women were unemployed (n=16; 5.3%) and/or on husband's support (n=4; 1.3%).

For a fuller depiction of the examined group, the respondents were asked about the use of medicines mitigating manifestations of the menopause. More than three-quarters (n=231; 77%) of the women never took medicines of this type, others (n=37; 12.3%) used the hormone replacement therapy, and a smaller number (n=23; 7.7%) took soya preparations. Moreover it was shown that a significant number of the examined women had never had bone densitometry performed (n=208; 69.3%), and only 3 of 10 respondents (n=89; 29.7%) had had it performed. A scanty percentage of the women did not know what such an examination consisted of (n=3; 1%). Family conditioning constitutes essential risk factors of osteoporosis. It turned out that over 4/5 of persons (n=250; 83.3%) had not experienced falling ill with osteoporosis personally or in the close family, and only a small group of women (n=50; 16.7%) admitted having the above diagnosis by themselves or by their close relatives.

Cigarette smokers constituted 27.7% of the examined women (n=83), whereas the rest of the women declared themselves to be non-smokers. The surveyed women were asked if they drink strong coffee or tea regularly. Over a half (n=156; 52%) admitted to drinking more than 2–3 cups of strong coffee or tea.

## RESULTS

**Health beliefs connected with osteoporosis.** In considering the perceived susceptibility to illness regarding the subjective feeling of the risk of falling ill with osteoporosis, the largest percentage of surveyed women (27.5%) disagreed with the belief that they were burdened with a greater risk of falling ill with the disease. About 40% of respondents did not state an opinion in this subject, while 4 in 10 women (39.3%) disagreed with the belief that family responsibilities can affect illnesses appearing in them.

The perceived seriousness of the disease is a belief referring to the seriousness of effects of falling ill with osteoporosis or abstaining from treatment. Almost one third of the surveyed women (29%) stated that the thought of osteoporosis was horrifying to them, while 48.4% of respondents indicated that falling ill with osteoporosis would be a serious problem

for them. For 43% of the examined women, falling ill with osteoporosis would mean costly treatment. Moreover, 48% of the women were scared of disability as the effect of falling ill with osteoporosis.

Properly comprehended physical activity is a significant component of the prevention of osteoporosis. Perceived benefits from the physical activity are beliefs concerning effectiveness of the strategy aimed at lowering the risk of falling ill with osteoporosis. Over a half of those surveyed agreed with the usefulness of taking up physical exercises or practicing sport. It is worthwhile paying attention to the fact that the largest percentage of women (65.7%) agreed with the statement that exercises preventing osteoporosis help to shape the silhouette. A slightly smaller number of women (54.6%) agreed that regular exercises prevent low-energy bone fractures, and 59.3% noticed the role of physical activity in building bone mass.

The great majority of respondents also noticed the positive effects of applying a calcium rich diet from the aspect of preventing osteoporosis. 74% of women agreed with the fact that delivering a large amount of calcium to the organism prevents osteoporosis. 66% of women confirmed that applying a rich diet was helping to prevent bone fractures in the course of osteoporosis. A considerable percentage of respondents had not noticed any barriers in applying the diet with a large calcium content. Over a half of the women (52%) disagreed with the statement that adding calcium rich foods into expenses meant that it was difficult to accept a change in eating habits, while 14.7% respondents considered that calcium rich products contained a lot of cholesterol, whereas 31.7% recognised that calcium rich food was too expensive.

In the context of the examined women of obstacles to the enforcement principles for the prevention of osteoporosis, it resulted that the majority of respondents had not noticed any big barriers in applying everyday physical activity. However, it is worthwhile emphasizing the fact that 40% of the women did not think they were strong enough in order to cope with regular physical exercises.

Own studies indicated the fact a significant commitment of the examined to their own health. The biggest percentage of women (71.3%) agreed with the statement that keeping healthy is very important; 64.4% of respondents confirmed that they systematically tried to discover health problem early, and 67.7% controlled their health regularly, even if they feel all right, in order to support good health. However, 42% of the examined women did not have an opinion about whether the diet applied by them was correctly balanced (Tab. 1).

To sum up, the surveyed women were characterised by the highest level of perceiving benefits from calcium intake ( $M=22.65$ ) and of physical activity ( $M=22.35$ ). Health motivation remained at an average level ( $M=21.27$ ). Respondents regarded osteoporosis as a moderately dangerous health problem ( $M=17.22$ ) and thought that to a large extent they were not burdened with the risk of falling ill ( $M=15.60$ ). The perception of barriers to calcium intake ( $M=15.44$ ) and everyday exercise ( $M=16.85$ ) was moderate (Tab. 2).

The presented study shows that the level of education of the respondents was diversified in terms of perceiving the seriousness of the disease. It turned out that women with primary or professional-vocational education regarded osteoporosis as a more serious problem than women with the secondary education and, highly significantly, as a more serious health problem than women with college and

higher education. Respondents with primary or professional-vocational education noticed significantly bigger barriers to physical activity and to calcium intake than the respondents with college and higher education. Simultaneously, it was observed that the level of education did not influence the perception and susceptibility for falling ill, or noticing the benefits from practising physical exercises and health motivation (Tab. 3).

Studying the influence of social and economic conditions on health beliefs showed that declaring average or bad conditions caused the perception of osteoporosis as a significantly more serious problem than in good and very good conditions. Next, significantly greater benefits resulting from the practicing sport were noticed by respondents having good and very good social and economic conditions, than women with average or bad socio-economic conditions. The studied women who had good and very good social and economic conditions noticed significantly smaller obstacles in implementing into force education about osteoporosis than respondents with average or bad social and welfare conditions. After analysis, it was observed that social and economic conditions did not influence matters in any significant way as far as health motivation, perception of the benefits of exercise and susceptibility to falling ill with osteoporosis (Tab. 4).

In analysing the influence of age on health beliefs, it should be noted that older women, aged 56–65, assessed their susceptibility to falling ill and acknowledged the seriousness of the disease as highly significantly higher than women aged 45–55. Older women also seemed to be more motivated towards care of own health, although they could see more potential barriers in taking part in physical activity (Tab. 5).

The presented results show that women drinking strong coffee or tea regularly had seemed to notice fewer benefits of applying a calcium rich diet than women who abstained from strong coffee or tea. Respondents drinking strong coffee or tea could also see more potential of essential obstacles as the fundamentals of the prevention of osteoporosis, than the woman not relying on these substances. What is interesting is that non-drinking women had stronger health motivation, than respondents drinking strong coffee or tea regularly (Tab. 6).

Examining the influence of cigarette smoking on the health beliefs of respondents inferred that women smoking cigarettes had considered themselves more susceptible to falling ill, and were conscious that cigarette smoking constituted essential risk factors for osteoporosis. It is also a puzzling fact that it was harder for smoking women to take up practicing sport and introduce calcium rich products into everyday diet expenses, and they demonstrated lower interest in areas concerning health motivation.

**The sense of one own's efficacy related to osteoporosis.** As a result of the analysis with the scale of the sense of self-efficacy, the following conclusions were drawn:

1. The average of points by the surveyed women concerned the sense of self-efficacy with reference to eating products rich in calcium as often as possible remained at a high level ( $M=69.06$ ).
2. Respondents declared the desire to increase the amount of absorbed calcium ( $M=67.24$ ), as well as a preference for products with a high calcium content ( $M=65.87$ ).
3. Results on a slightly lower level were obtained while examining the sense of self-efficacy in physical activity.

**Table 1.** Health beliefs connected with osteoporosis

Health beliefs	I strongly disagree	I disagree	I have no opinion	I agree	I strongly agree
Your chances of getting osteoporosis are high	19.3%	<b>27.4%</b>	26%	23%	4.3%
Because of your body build, you are more likely to develop osteoporosis	15%	<b>33%</b>	29%	18%	5%
It is extremely likely that you will get osteoporosis	14%	24%	<b>40.3%</b>	20%	1.7%
There is a good chance that you will get osteoporosis	15.3%	29.7%	<b>38.3%</b>	14.7%	2%
You are more likely than the average person to get osteoporosis	13%	<b>40.5%</b>	33%	12%	1.5%
Your family history makes it more likely that you will get osteoporosis	16%	<b>39.3%</b>	23.7%	19%	2%
The thought of having osteoporosis scares you	12%	<b>28%</b>	28%	29%	3%
If you had osteoporosis you would be crippled	10.7%	<b>48%</b>	24%	16.3%	1%
Your feelings about yourself would change if you got osteoporosis.	12.3%	<b>37%</b>	34%	15.4%	1.3%
It would be very costly if you get osteoporosis	2%	<b>10%</b>	37.7%	43%	7.3%
When you think about osteoporosis you get depressed	12.3%	<b>36.4%</b>	30.3%	19.3%	1.7%
It would be very serious if you got osteoporosis	4.3%	<b>22%</b>	20%	48.4%	5.3%
Regular exercise prevents problems that would happen from osteoporosis.	1%	<b>6.3%</b>	22%	61.7%	9%
You feel better when you exercise to prevent osteoporosis	3%	<b>5%</b>	25.3%	56.7%	10%
Regular exercise help to build strong bones	0.7%	<b>5.6%</b>	23.7%	59.3%	10.7%
Exercising to prevent osteoporosis also improves the way your body	1.3%	<b>4%</b>	13%	65.7%	16%
Regular exercise reduces the chances of broken bones	2.3%	<b>6.7%</b>	26.7%	54.6%	9.7%
You feel good about yourself when you exercise to prevent osteoporosis	2%	<b>2.3%</b>	32.3%	52%	11.4%
Taking in enough calcium prevents problems from osteoporosis	1.3%	<b>1%</b>	6.7%	74%	17%
You have a lot to gain from taking in enough calcium to prevent osteoporosis	1.3%	<b>3%</b>	4%	73%	18.7%
Taking in enough calcium prevents painful osteoporosis	1%	<b>6%</b>	17%	65%	11%
You would not worry so much about osteoporosis if you took in enough calcium	1.7%	<b>18%</b>	34%	41.3%	5%
Taking in enough calcium reduces your chances of broken bones	0.7%	<b>6%</b>	18.6%	66%	8.7%
You feel good about yourself when you take in enough calcium to prevent osteoporosis	0.7%	<b>3.7%</b>	27%	61.6%	7%
You feel that you are not strong enough to exercise regularly	5.7%	<b>22%</b>	27%	40%	5.3%
You have nowhere where you can exercise	8.7%	<b>39.7%</b>	18.6%	29.4%	3.6%
Your spouse or family discourages you from exercising	12%	<b>50.7%</b>	20%	16.7%	0.6%
Exercising regularly would mean starting a new habit which is hard for you to do	9%	<b>37.7%</b>	23.7%	27%	2.6%
Exercising regularly makes you uncomfortable	8.8%	<b>38.3%</b>	17.6%	32%	3.3%
Exercising regularly upsets your everyday routine	7%	<b>40%</b>	15.6%	35.7%	1.67%
Calcium rich foods cost too much	8.4%	<b>37.3%</b>	20.3%	13%	12%
Calcium rich foods do not agree with you	12%	<b>43.3%</b>	19.7%	24%	18.7%
You do not like calcium rich foods	14.3%	<b>52%</b>	16%	16%	1.7%
Eating calcium rich foods means changing your diet which is hard to do	14.7%	<b>52%</b>	15%	18.3%	0%
In order to eat more calcium rich foods you have to give up other foods that you like	10.3%	<b>42.7%</b>	18.7%	26.7%	1.6%
Calcium rich foods have too much cholesterol	8%	<b>39.3%</b>	37.7%	14.7%	0.3%
You eat a well-balanced diet	1.7%	<b>18.7%</b>	42%	35.3%	2.3%
You look for new information related to health	2.3%	<b>14%</b>	21.3%	58.7%	3.7%
Keeping healthy is very important for you	1%	<b>7%</b>	9.3%	71.3%	11.4%
You try to discover health problems early	1.3%	<b>12%</b>	13%	64.4%	9.3%
You have a regular health check-up even when you are not sick	2.7%	<b>22.4%</b>	16.4%	52.9%	5.6%
You follow recommendations to keep you healthy	1.3%	<b>12.9%</b>	8.4%	67.7%	9.7%

**Table 2.** Osteoporosis Health Belief Scale – subscales

Osteoporosis Health Belief Scale Scores	N	Min	Max	M	SD
Susceptibility	300	6	30	15.60	4.88
Seriousness	300	7	29	17.22	3.95
Benefits exercise	300	11	30	22.35	3.57
Benefits calcium intake	300	6	30	22.65	3.03
Barriers exercise	300	6	30	16.85	4.37
Barriers calcium intake	300	6	26	15.44	4.40
Health motivation	300	10	30	21.27	3.63

**Table 3.** Influence of education level on health beliefs connected with osteoporosis

Health beliefs	Level of education	ANOVA				TUKEY TEST
		N	M	SD	F	
Susceptibility	elementary / vocational (1)	63	16.30	3.13	1.14	0.335
	secondary (2)	119	15.29	5.09		
	post-secondary (3)	59	14.98	5.73		
	higher I / II degree (4)	59	16.12	5.04		
Seriousness	elementary / vocational (1)	63	18.79	3.87	4.87	0.003 **
	secondary (2)	119	17.09	3.91		
	post-secondary (3)	59	16.51	4.02		
	higher I / II degree (4)	59	16.49	3.65		
Benefits exercise	elementary / vocational (1)	63	21.86	3.42	0.62	0.601
	secondary (2)	119	22.34	3.30		
	post-secondary (3)	59	22.59	4.38		
	higher I / II degree (4)	59	22.64	3.40		
Benefits calcium intake	elementary / vocational (1)	63	22.62	3.62	0.53	0.661
	secondary (2)	119	22.88	2.23		
	post-secondary (3)	59	22.29	4.03		
	higher I / II degree (4)	59	22.56	2.60		
Barriers exercise	elementary / vocational (1)	63	18.59	3.42	9.18	0.000 **
	secondary (2)	119	17.40	4.49		
	post-secondary (3)	59	15.51	4.55		
	higher I / II degree (4)	59	15.24	3.95		
Barriers calcium intake	elementary / vocational (1)	63	17.22	4.36	8.04	0.000 **
	secondary (2)	119	15.83	4.69		
	post-secondary (3)	59	14.25	3.61		
	higher I / II degree (4)	59	13.93	3.76		
Health motivation	elementary / vocational (1)	63	20.63	4.68	1.40	0.244
	secondary (2)	119	21.18	3.37		
	post-secondary (3)	59	21.47	2.84		
	higher I / II degree (4)	59	21.93	3.50		

**Table 4.** Influence of social and existential conditions on health beliefs connected with osteoporosis

Health beliefs	Social and existential conditions	ANOVA					TUKEY TEST
		N	M	SD	F	p	
Susceptibility	very good (1)	49	16.04	5.57	0.26	0.773	
	good (2)	154	15.57	4.89			
	average or bad (3)	97	15.43	4.53			
Seriousness	very good (1)	49	15.80	4.16	6.68	0.001 **	
	good (2)	154	17.04	3.77			
	average or bad (3)	97	18.22	3.90			
Benefits exercise	very good (1)	49	23.12	4.01	5.12	0.007 **	
	good (2)	154	22.68	3.50			
	average or bad (3)	97	21.43	3.29			
Benefits calcium intake	very good (1)	49	22.02	3.49	1.61	0.202	
	good (2)	154	22.90	2.42			
	average or bad (3)	97	22.57	3.59			
Barriers exercise	very good (1)	49	15.73	4.47	12.67	0.000 **	
	good (2)	154	16.10	4.08			
	average or bad (3)	97	18.61	4.26			
Barriers calcium intake	very good (1)	49	14.45	4.65	13.94	0.000 **	
	good (2)	154	14.58	4.21			
	average or bad (3)	97	17.30	4.00			
Health motivation	very good (1)	49	21.55	3.42	0.45	0.636	
	good (2)	154	21.35	3.46			

**Table 5.** Influence of age on health beliefs connected with osteoporosis

Health beliefs	Age				t-student test	
	45–55		56–65		t	P
	M	SD	M	SD		
Susceptibility	15.16	4.92	17.07	4.48	-2.883	0.004**
Seriousness	16.66	3.92	19.09	3.48	-4.634	0.000**
Benefits exercise	22.23	3.69	22.74	3.14	-1.040	0.299
Benefits calcium intake	22.50	3.04	23.13	2.97	-1.515	0.131
Barriers exercise	16.51	4.50	17.99	3.70	-2.483	0.014*
Barriers calcium intake	15.23	4.45	16.14	4.16	-1.521	0.129
Health motivation	21.00	3.83	22.16	2.66	-2.340	0.020*

**Table 6.** Health beliefs connected with osteoporosis and drinking strong tea or coffee

Health beliefs	Regular drinking strong tea or coffee				t-student test	
	Yes		No		t	p
	M	SD	M	SD		
Susceptibility	15.88	4.59	15.34	5.15	0.96	0.339
Seriousness	17.51	4.00	16.94	3.89	1.25	0.213
Benefits exercise	22.14	3.71	22.54	3.44	-0.95	0.345
Benefits calcium intake	22.22	3.49	23.05	2.46	-2.37	0.018*
Barriers exercise	17.63	4.17	16.12	4.43	3.05	0.002**
Barriers calcium intake	16.28	4.49	14.65	4.17	3.26	0.001**
Health motivation	20.57	3.90	21.92	3.23	-3.28	0.001**

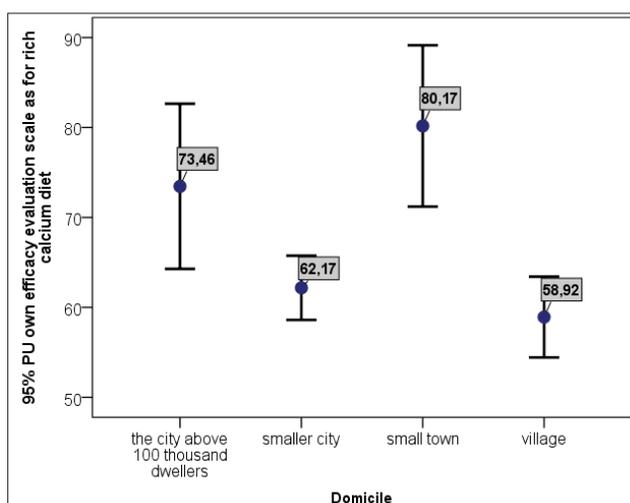
**Table 7.** OSES – Osteoporosis Self-Efficacy Scale

Osteoporosis Self-Efficacy Scale	N	Min	Max	M	SD
Starting a new exercise programme	300	0	100	56.61	28.35
Changes to the fixed programme of exercise	300	0	100	51.62	30.07
Putting a lot of effort into proper exercising	300	0	100	54.14	29.50
Performing difficult exercises	300	0	100	50.86	30.12
Performing exercises for a long, recommended time	300	0	100	55.1	28.86
Performing exercises in a proper way	300	0	100	63.2	27.18
Increasing the amount of consumed calcium	300	0	100	67.24	26.07
Changes in diet so that meals could contain more calcium	300	0	100	65.47	25.13
Consumption of calcium rich products as often as possible	300	5	100	69.06	24.37
Preferring products with a high calcium content	300	0	100	65.87	25.91
Constant application of a calcium rich diet	300	0	100	58.18	28.26
Consuming calcium rich products, even if they are hardly available	300	0	100	53.52	29.25

The average points obtained by respondents concerning the desire to begin a new program of physical exercises was  $M=56.61$ , whereas declaring performing exercises in the correct way continued on the level of  $M=63.2$ . Average result concerning the desire for to devote a strong effort to the normal performance exercises was  $M=54.14$ .

Summing up, the degree of the sense of self-efficacy of the examined women from the aspect of a change in their behaviour concerning the prevention of osteoporosis was on the average level (Tab. 7).

Examining the influence of domicile on the sense of self-efficacy, with reference to desire to use a calcium rich diet, it was observed that respondents who lived in small towns were characterized by a significantly greater sense of self-efficacy; they therefore more often declared the intention to consume products containing calcium than women living in the countryside or in the city (Fig. 1).

**Figure 1.** Impact of domicile on own efficacy evaluation scale as for rich calcium diet

Analysing the obtained findings, it can be stated that the level of self-confidence and the level of sense from the aspect of preventive action associated with osteoporosis, remained for self-confidence on a restrained level; in addition, the

examined women were more prone to changing their eating habits ( $M=63.22$ ) than to declare practicing sport ( $M=55.25$ ).

## DISCUSSION

Because osteoporosis is a serious health problem, and along with the extension of the average life span in developed countries, one should expect that subsequent cases of falling ill, action of employees and of the contemporary medical sector, should be directed, above all, to the prevention rather than only at curing an already existing disease. It should be remembered that women are especially predisposed to low-energy fractures at postmenopausal age; therefore, it is predicted that almost a half of the women over the age of 50 will be affected with a fracture [8, 9]. Therefore, becoming acquainted with the beliefs and sense of self-efficacy of society seems fully justified. Similar conclusions were reached by McLeod et al. [5] who conducted a systematic inspection of the beliefs of women and men in Canada concerning osteoporosis. They maintained that individual health beliefs and degree of the sense of self-efficacy have a significant meaning in the forming of health behaviours with reference to osteoporosis, and that their evaluation is helpful for creating preventive programmes.

From the aspect of perceiving the susceptibility to falling ill ( $M=15.60$ ), the surveyed women claimed that they were not burdened excessively with the risk of falling ill with osteoporosis. 55% of women obtained a result proving a moderate perception of the susceptibility to falling ill. Only 27.3% of the examined considered themselves peculiarly burdened with the risk of falling ill, while Hsieh et al. [10] stated that in their study a similar reply was given by 29% of respondents. Studies by von Hurst et al. [11] indicated that 10.6% of women stated similar views. They also indicated that 21% of respondents felt more exposed to falling ill because of a family history of osteoporosis, which was confirmed in the presented study.

It resulted from the current study that respondents recognised osteoporosis as an averagely dangerous health problem. In the area of the seriousness of the disease, over 70% of women obtained a result that proved the moderate perception of the seriousness of the disease ( $M=17.22$ ). Almost a half of those surveyed thought that falling ill with osteoporosis constituted a serious problem, which confirmed the results obtained by Townsend-Edmond [12], who analysed the knowledge, beliefs and own efficacy of students in Alabama, USA, and stated that the 45% of respondents had demonstrated similar views. After conducting own studies, it turned out that 48% of women were afraid of disability as the effect of falling ill with osteoporosis. Similar conclusions were reported by von Hurst et al. [11] who examined the beliefs of women in Auckland, New Zealand. According to them, 64% of those examined claimed that osteoporosis would be a serious problem for them, but only 28% associated this disease with disability. The problem was described somewhat differently by Hsieh et al. [10] who conducted their study at the Thomas Jefferson University Hospital in Philadelphia, Pennsylvania. These authors demonstrated that the majority of respondents (89%) treated osteoporosis as a serious health problem.

The results obtained in the current study indicate a high level of the perception of benefits from presenting desired

health behaviours from the aspect of the prevention of osteoporosis, such as applying a calcium rich diet ( $M=22.65$ ) and adhering to appropriate physical activity ( $M=22.35$ ). Hsieh et al. [10] also claim that the majority of women in their study expressed similar desired beliefs in this respect.

As far as the results of the presented study are concerned, it can be stated that the perceived obstacles to implementing pro-health behaviours, such as applying a calcium rich diet ( $M=15.44$ ) and everyday physical activity ( $M=16.85$ ) were moderate. 59% and appropriately 71.3% of women obtained results proving the moderate perception of barriers in these areas. Von Hurst et al. [11] maintained that 77% of respondents were afraid to consume milk products on account of the high content of cholesterol, and in own studies only 15% of women had similar anxieties. Over 20% of women participating in an American study avoided physical activity, since they felt discouraged by the spouse from exercises. In the presented study, 16.7% of women expressed such an opinion.

Studying the beliefs concerning health motivation ( $M=21.27$ ), one can attest to a restrained commitment to the issues associated with health. The majority of the women agreed with the statement that the care of health is very important, whereas 64.4% of respondents stated that they were trying systematically to solve problems connected with health. However, this was not confirmed by the study of von Hurst et al. [11] where only 40% of respondents showed significant care of their health.

As a result of the analysis in the current study of the scale of the sense of self-efficacy, it was observed that the degree of the sense of self-efficacy of respondents from the aspect of change in behaviour concerning the prevention of osteoporosis, was on the average level. The degree of self-confidence concerning the change of habits associated with physical activity, was on a little lower level than the degree of the sense of self-efficacy from the aspect of calcium consumption. The average number of points in the area of physical activity averaged 55.25. Similar results were obtained by Townsend-Edmond [12] in a study among students in Alabama, USA.

## CONCLUSIONS

1. Women in the peri- and post-menopausal age perceived osteoporosis as an averagely serious health problem, and did not feel in the special way burdened with the risk of falling ill. They presented the highest level of perceiving

benefits resulting from applying principles for the prevention of osteoporosis, and a restrained degree of noting obstacles in their realization. Matters involving health and the care of the health developed on an average level. Socio-demographic conditions influenced the respondents' health beliefs in a statistically significant way.

2. The sense of self-efficacy from the aspect of taking possible action to prevent osteoporosis remained on an average level; in addition, respondents more often declared a willingness to change their eating habits than planning physical activity.

## REFERENCES

- Grywalska E, Grafka A, Putowski L, Łopucki M, Roliński J. Komórki macierzyste w leczeniu złamań towarzyszących osteoporozie—medyczne *science fiction* czy metoda terapii w przyszłości? *Prz Menopauz.* 2011; 5: 378–382.
- Marcinowska – Suchowierska E. Osteoporoza jako problem społeczny. W: Marcinowska – Suchowierska E. (red.): *Osteoporoza*. Wyd. Lekarskie. PZWL, 2004: 15–17.
- Gmiński J. Znaczenie postępowania leczniczego w leczeniu osteoporozy dla jakości życia kobiet w wieku menopauzalnym. *Prz Menopauz.* 2002; 1: 53–59.
- Roczniak W, Babuška – Roczniak M, Roczniak A. Diagnostyka i farmakoterapia osteoporozy. *Lekarz* 2010; 12: 14–22.
- McLeod K, Johnson C. A systematic review of osteoporosis health beliefs in adult men and women. *J Osteoporos.* 2011; 2011: 17–27.
- Kim KK, Horan ML, Gendler P. *Osteoporosis Knowledge Test, Osteoporosis Health Belief Scale, and Osteoporosis Self-efficacy Scale*. Allendale: MI: Grand Valley State University; 1991a.
- Horan ML, Kim KK, Gendler P, Froman RD, Patel MD. Development and evaluation of the Osteoporosis Self-Efficacy Scale. *Res Nurs Health.* 1998; 21 (5): 395–403
- Miazgowski T. Prospektywna ocena częstości występowania osteoporotycznych złamań kręgow w losowo wybranej próbie populacyjnej. *Endokrynol Pol.* 2005; 2 (56): 154–159.
- Męczkański B, Czyżyk A. Konwencjonalna hormonalna terapia zastępcza w leczeniu osteoporozy. *Pol Merkuriusz Lek.* 2009; XXVII, 157: 72–76.
- Hsieh Ch, Novielli K, Diamond J, Cheruva D. Health beliefs and attitudes toward the prevention of osteoporosis in older women. *Menopause* 2001; 8: 372–376.
- Von Hurst P, Wham C. Attitudes and knowledge about osteoporosis risk prevention: a survey of New Zealand women. *Public Health Nutr.* 2007; 10 (7): 747–753.
- Townsend Edmonds E. *Osteoporosis, beliefs and behaviors of college students: utilization of the health belief model*. Tuscaloosa, Alabama 2009: 1–168. [http://acumen.lib.ua.edu/coctent/u0015/0000001/0000063/u0015\\_0000001\\_0000063.pdf](http://acumen.lib.ua.edu/coctent/u0015/0000001/0000063/u0015_0000001_0000063.pdf) (access 7.09.2012).