



## Osteoporosis-related knowledge among Serbian postmenopausal women

### Znanje o osteoporozi kod žena u postmenopauzi u Srbiji

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#### Abstract

**Background/Aim.** Osteoporosis mainly affects women in the early years following menopause. The aim of this study was to determine the level of knowledge about osteoporosis and osteoporosis related risk factors in postmenopausal women in Serbia. **Methods.** The study included postmenopausal women regardless if suffering from osteoporosis or not. Assessment of knowledge was carried out by using the Osteoporosis Knowledge Assessment Tool - Shorter Version (OKAT-S) questionnaire that was validated for Serbian population. Answers to the 9 questions were coded as 1 – true, or 0 – false or “do not know”. Also, the following risk factors data for osteoporosis were collected: age, the onset and duration of menopause, body mass index (BMI), data on fractures, the incidence of falls, smoking, lifestyle (active, sedentary), regular sunbathing, calcium and vitamin D supplementation, intake of milk and dairy products. **Results.** A total of 132 postmenopausal women responded to the questionnaire with the response rate of 90.41%. Their knowledge varied from

27.94% to 74.26% of the correct answers, with the average OKAT-S score of 4.5 (SD = 2.55), which was 50% of the maximum possible score. Only 2 participants (1.47%) filled the all OKAT-S items correctly, while 11 (8.09%) of them did not have the proper answer to any question. A reduced bone density (T-score below -1) was registered in 40.91% of the women, previous fractures in 49 (34.51%), and more or less 3 falls registered in 9.59% or 4.79%, respectively. **Conclusion.** The Serbian version of the questionnaire OKAT-S revealed generally poor knowledge on osteoporosis among postmenopausal women in Serbia. Developing effective interventions and public health programmes could be helpful in general education towards understanding osteoporosis and risk factors. Promotion of preventive measures and healthy behaviour may prevent or at least slow down the accelerated bone loss in postmenopausal women.

**Key words:** osteoporosis; osteoporosis, postmenopausal; risk factors; knowledge; attitude to health; serbia.

#### Apstrakt

**Uvod/Cilj.** Osteoporoza uglavnom pogađa žene u ranim godinama posle menopauze. Cilj rada bio je da se proceni znanje o osteoporozi i faktorima rizika kod žena u postmenopauzi u Srbiji. **Metode.** U studiju su bile uključene žene u postmenopauzi nezavisno od toga da li boluju od osteoporoze ili ne. Procena znanja o osteoporozi vršena je pomoću upitnika *Osteoporosis Knowledge Assessment Tool - Shorter Version* (OKAT-S) koji je validiran za srpsku populaciju. Odgovori na 9 pitanja kodirani su sa 1 – pravilan ili 0 – nepravilan odgovor ili „ne znam“. Takođe, sakupljeni su sledeći podaci o faktorima rizika od osteoporoze: starost, početak i dužina

trajanja menopauze, indeks telesne mase [*body mass index* (BMI)], podaci o prelomima, broj padova, pušenje, životni stil (sedeći ili aktivni), redovno sunčanje, dopuna kalcijumom i vitaminom D, korišćenje mleka i mlečnih proizvoda. **Rezultati.** Od ukupno 146 ispitanica, upitnik OKAT-S popunile su 132 ispitanice (nivo odgovora od 90,41%). Nivo njihovog znanja varirao je od 27,94% do 74,26% ispravnih odgovora, sa prosečnim OKAT-S skorom od 4,5 (SD = 2,55), što čini 50% od maksimalno mogućeg skora. Samo dve ispitanice (1,47%) pravilno su odgovorile na sva pitanja, dok njih 11 (8,09%) nije imalo nijedan ispravan odgovor. Snižen T-skor, manje od -1, registrovan je kod 40,91% ispitanica, a prethodni prelom kod 49 (34,51%). Kod 9,59% is-

pitanica registrovano je više od 3, a kod 4,79% manje od 3 pada. **Zaključak.** Srpska verzija upitnika OKAT-S otkrila je generalno loše znanje o osteoporozu kod žena u postmenopauzi u Srbiji. Poboljšano znanje o osteoporozu i faktorima rizika moguće je postići razvojem efikasnih interventivnih i javnih zdravstvenih programa. Promocija preventivnih mera

i zdravog ponašanja može sprečiti ili bar usporiti prerani gubitak koštane mase kod žena u postmenopauzi.

**Ključne reči:**  
**osteoporozu; osteoporozu, posmenopauzalna; faktori rizika; znanje; stav prema zdravlju; srbija.**

## Introduction

Osteoporosis is the most common metabolic bone disease, and one of the main causes of mortality and morbidity in the elderly population. It is characterized by decreased bone mass and structural deterioration of bone tissue, leading to an increased bone fragility and susceptibility to fractures following minimal trauma<sup>1</sup>.

Osteoporosis is a major cause of fracture in elderly, resulting in pain, disability, costly rehabilitation, poor quality of life, and premature death. Osteoporosis predominantly affects women who experience more rapid bone loss in the early years following menopause<sup>2,3</sup>.

Osteoporosis is a major and growing public health problem in developing countries. Knowledge of modifiable risk factors (smoking, lack of physical exercise, dietary habits) and treatment of osteoporosis should be targeted by prevention programmes. A key component in developing successful education intervention by health care professional is understanding what women know about the disease and to what extent they practice preventive behaviours<sup>4</sup>.

The aim of the study was to assess the osteoporosis-related knowledge in Serbian postmenopausal women. Estimation of the level of knowledge of the population can help to guide public health programmes and plan education of patients in the field of osteoporosis.

The aim was also to assess the risk factors for osteoporosis as well as risk factors for osteoporotic fractures. According to the above facts it is possible to successfully plan preventative measures, primarily by influencing on the modifiable-risk factors.

## Methods

### *Patients/participants*

During the meeting "Fair of the Third Age 55+", held in Belgrade on 25–26 May 2015, free and voluntary peripheral bone mineral density (BMD) was measured on the heel, by the PIXY DXA (Dual X-Ray Absorptiometry). Basic demographic data, previous fracture, non-modifiable and modifiable risk factors for osteoporosis were collected. All participants were asked to complete the questionnaire Osteoporosis Knowledge Assessment Tool - Shorter Version (OKAT-S), regardless of whether or not they have osteoporosis. Out of 146 scanned patients, 132 (90.41%) filled the questionnaire.

### *The questionnaire OKAT-S*

The OKAT-S covers knowledge on preventive behaviour, risk factors, and consequences of osteoporosis. It is a 9-item

questionnaire with three possible answers on every item: true, false, and do not know (correct answers were scored as 1, an incorrect or "do not know" as 0). The final score presented the sum of all correct answers and could be in range from 0 to 9 (with the higher scores indicating better knowledge). The questionnaire OKAT-S, presented good psychometric characteristics, was validated for the Serbian population and therefore could be used for knowledge assessment as single underlying factor<sup>5</sup>.

### *Statistical analysis*

The data were analyzed using the descriptive statistics measures (mean values, standard deviations and frequencies). Internal consistency of the questionnaire was tested using Cronbach's coefficient.

## Results

The study included 132 postmenopausal women. The most of them had no osteoporosis or osteopenia. Their characteristics are presented in Table 1.

Osteoporosis screening showed that 78 (59.09%) participants had normal BMD, whereas 54 (40.91%) had osteopenia or osteoporosis. About a third of the patients had a fracture (n = 49, 34.51%). The average number of fractures was 1.47 (SD = 0.95) in all the patients. The most frequent fracture sites were arm (n = 14, 9.59%), and leg fractures (n = 10, 6.85%). There was only one patient with hip fracture and five with vertebral fracture. Only two patients had the history of their parents' hip fracture.

Exactly 9.59% of the patients experienced fall more than three times and 4.79% less than three times. Falls occurred more outdoor (10.27%) than inside the house (4.79%).

From all the patients, 132 answered the questionnaire OKAT-S with a response rate of 93.15%. This questionnaire presented good internal consistency (Cronbach's  $\alpha = 0.70$ ).

Table 2 presents the results from the OKAT-S with the percentage of correct answers for each item. Only four items were answered correctly by more than 50% of the respondents. The most frequent correct answer was about occurrence of osteoporosis according to the gender and the most incorrect answer was about item "there is a small amount of bone loss in the 10-year following the onset of menopause". The levels of knowledge varied between 27.94% (Q8) and 74.26% (Q2).

The mean score was 4.5 (SD = 2.25, range of correct answers 0-9), out of a possible 9 points on the OKAT-S, being 50% of possible maximum score. Only 2 (1.47%) patients filled the all OKAT-S items correctly, while 11 (8.09%) did not have any correct answer (Figure 1).

Table 1

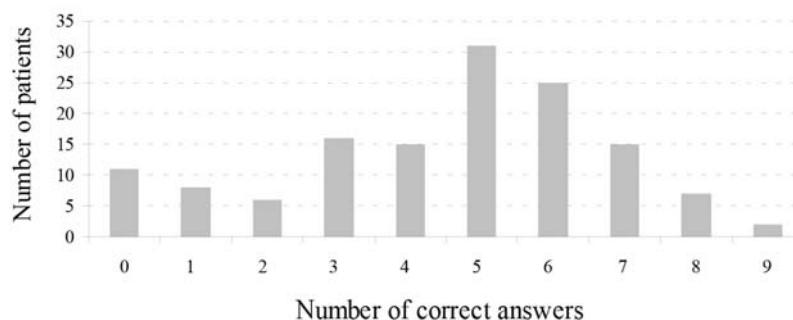
Characteristics of the participants	
Variables	Postmenopausal women (n = 132)
Non-modifiable risk factors	
age (years), $\bar{x} \pm SD$	65.94 $\pm$ 8.04
menopause (missing n = 12), n (%)	120 (90.9)
age when menopause started (years), $\bar{x} \pm SD$	48.97 $\pm$ 4.78
duration of menopause (years), $\bar{x} \pm SD$	9.38 $\pm$ 8.02
height (cm), $\bar{x} \pm SD$	163.48 $\pm$ 6.86
Peripheral BMD > 1	78 (59.09%)
T-score < 1	54 (40.91%)
Modifiable risk factors	
weight (kg), $\bar{x} \pm SD$	70.00 $\pm$ 11.61
BMI (kg/m <sup>2</sup> ), mean value (SD)	26.14 $\pm$ 3.74
BMI categories, n (%)	
underweight	3 (2.27)
normal	37 (28.03)
pre-obese	75 (56.82)
obese	17 (12.88)
smoking, n (%)	
current smoker	17 (12.88)
ex smoker	9 (6.82)
no	106 (80.30)
lifestyle (missing n = 5), n (%)	
active	103 (81.10)
sedentary	24 (18.89)
sunbathing for 15 days a year (missing n = 1), n (%)	82 (62.59)
vitamin D supplementation (missing n = 1), n (%)	33 (25.19)
calcium supplementation (missing n = 2), n (%)	29 (22.31)
milk products intake (missing n = 2), n (%)	91 (70.00)

BMI – body mass index; BMD – bone mineral density; SD – standard deviation.

Table 2

**Knowledge about osteoporosis – analyse results of Osteoporosis Knowledge Assessment Tool - Shorter Version (OKAT-S) questionnaire in postmenopausal women in Serbia**

Questions	Correct answer	Correct answers n (%)
Q1 Osteoporosis usually causes symptoms (e.g., pain) before fractures occur	False	45 (33.09)
Q2 Osteoporosis is more common in men	False	101 (74.26)
Q3 Cigarette smoking can contribute to osteoporosis	True	95 (69.85)
Q4 White women are at highest risk of fracture as compared to other races	True	59 (43.38)
Q5 By age 80, the majority of women have osteoporosis	True	84 (71.76)
Q6 Family history of osteoporosis strongly predisposes a person to osteoporosis	True	91 (66.91)
Q7 Alcohol in moderation has little effect on osteoporosis	True	44 (32.35)
Q8 There is a small amount of bone loss in the 10 years following the onset of menopause	False	38 (27.94)
Q9 Hormone therapy prevents further bone loss at any age after menopause	True	55 (40.44)



**Fig. 1 – Osteoporosis Knowledge Assessment Tool – Shorter Version (OKAT-S) scores (sum of correct answers) in relation to the number of the patients.**

## Discussion

Study subjects were surveyed using a valid and reliable questionnaire OKAT with good psychometric properties<sup>5,6</sup>. OKAT covers the core knowledge about osteoporosis and is very useful as a baseline, as well as follow-up measurement when implementing educational interventions.

The tool had questions that assess four basic themes: knowledge of the symptoms understanding (symptoms and risk of fracture), the knowledge of risk factors for osteoporosis, knowledge of preventive factors such as physical activity and diet relating to osteoporosis, and treatment availability.

Numerous studies have found serious lacks of knowledge about osteoporosis and related risk factors. A worrying deficit of knowledge with 39.6% of possible maximum score on the OKAT was found in Syrian young adult females students at nursing school in Damascus<sup>7</sup>. A sample of 250 female students studying at the Faculty of Pharmacy at the University of Belgrade revealed also poor knowledge about osteoporosis with 41.55% of possible maximum OKAT score<sup>5</sup>. Baseline levels of osteoporosis knowledge measured using the OKAT were low in Australian women where the tool was originally implemented. The average score was 8.8 out of 20, being 44% of the possible maximum score. The average age of Australian participants was 37.8 years<sup>6</sup>.

In fact, without adequate knowledge women will not be able to determine their own risk of developing the disease and changing to health related behaviours. In spite of the fact that the vast majority of respondents in this study were able to identify osteoporosis as an elderly women disorder (Q5, 71.76%), with strong genetic influence (Q6, 66.91%) the most of them did not recognize the nature of osteoporosis. Since osteoporosis is a “silent disease”, most people are not aware of their condition until they experience a fragility fracture. Only a smaller percentage (Q1, 33%) our participants recognized the “silent” nature of the disease. Although this response is unsatisfactory, other authors found a much lower percentage (9.1%) of correct answers to the question Q1. The mean score in Arabic population referring to knowledge of less than 50% of the OKAT questions<sup>8</sup>. Furthermore, our study showed very poor knowledge about the identification of post-menopausal conditions as a period of accelerated bone loss (Q8, 27.94), so as that this bone loss can be prevented by the application of hormone therapy (Q9, 40.44%).

Our investigation showed that multiple risk factors for osteoporosis and fractures were present. Some of the risk factors are unchangeable, such as the Caucasian race, female gender, advanced age, postmenopausal status, as well as prolonged menopause (over 9 years of duration). We revealed a very low percentage of decreased BMI (below 3%) which could be protective factor for osteoporosis. Only 1/4 of postmenopausal women received calcium and vitamin D supplementation, 40% were not regularly exposed to the

sun, around 20% had sedentary, non-active lifestyle, and about 13% of them were current smokers. These are the areas which should focus on educating the population and preventive measures. Furthermore, screening dual energy x-ray absorptiometry (DXA) measurements in this study showed a reduced BMD in 40% of the sample, which requires further diagnostic procedures such as bone scan at the hip and spine by a central DXA. About 1/3 of all postmenopausal women had previous osteoporotic fracture. All the experts agree on the fact that there is evidence that previous osteoporosis-related fractures in both men and women comprise a risk factor for new fractures<sup>1-3</sup>.

Some studies have revealed that education programmes for the elderly are effective in improving health promotion knowledge and behaviours<sup>9</sup>. Previous studies have shown positive results in patient education to improve the use of non-pharmacologic preventive measures for osteoporosis<sup>10,11</sup>. Knowledge of modifiable risk factors (smoking, lack of physical exercise, dietary habits) should be targeted by prevention programmes. Estimation of the level of knowledge in the population can help to guide public health programmes<sup>4</sup>.

Osteoporosis is not curable, but it can be prevented in part by increasing the level of physical activity at all ages, cessation of smoking, reduction of alcohol consumption, adequate calcium and vitamin D intake, and fall prevention<sup>1</sup>.

The current study has a number of potential limitations. It used a relatively small sample and the study was based on urban retired postmenopausal women, so the findings cannot be generalized to the entire postmenopausal women in Serbia.

## Conclusion

The Serbian version of the questionnaire OKAT-S revealed generally poor knowledge on osteoporosis among postmenopausal women in Serbia. Developing effective interventions and public health programmes could be helpful in general education towards understanding osteoporosis and risk factors. Promotion of preventive measures and healthy behaviour may prevent or at least slow down the accelerated bone loss in postmenopausal women.

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