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Awareness and Lifestyles of Persons with Osteoporosis



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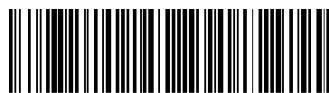
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ABSTRACT

Osteoporosis is defined as systemic, progressive and metabolic disease of bones that are characterized of loss of bone mass, damaged micro-architecture of bone mass, increased fragility of bones, which consequently increase the risk of formation of fractures. The onset and intensity of disease progression is highly dependent on changing risk factors, that is, lifestyle. These include alcohol and coffee consumption, cigarette smoking, lack of physical activity, deficiency and insufficient intake of calcium and vitamin D and malnutrition. Lifestyle changes and non-pharmacological measures are paramount to bone health. The survey was conducted in early October 2019 over a seven-day period where 58 respondents were interviewed. All interviewed persons were women diagnosed with osteoporosis. The patients answered on a simple questionnaire which consisted of three parts: demographics, lifestyle and awareness. The most common risk factor is coffee consumption and cigarette smoking. A great number of patients do not take adequate care of calcium and vitamin D intake and are not physically active, which ultimately increases the risk of osteoporosis progression and adversely affects bone health. The smallest percentage of patients consumes more than one glass of alcohol daily. By comparing the lifestyle of younger and older than 50 years, it is concluded that people younger than 50 are more physically active but also consume more coffee. Patients were highly informed about the importance of calcium and vitamin D intake. The results of the survey showed that the patients did not adhere to the appropriate lifestyle of osteoporosis patients.

INTRODUCTION

Osteoporosis is defined as systemic, progressive and metabolic disease of bones that are characterized of loss of bone mass, damaged micro-architecture of bone mass, increased fragility of bones, which consequently increase the risk of formation of fractures. This “quiet disease” from which 200 millions of people suffering, represent one of the leading public health and social-economic problems of modern world (1).

Osteoporosis is divided into primary and secondary. Primary osteoporosis is the most common form of the disease and includes postmenopausal osteoporosis (type 1) and senile osteoporosis-associated with aging (type 2). Type 1 is associated with loss of estrogens and androgens which increases bone turnover in such a way that desorption dominates bone formation and leads to a predominant loss of trabecular bone compared to cortical bone. Its incidence in the population is about 80% (2). Senile osteoporosis, type 2, occurs in persons of both sexes who are over 70 years of age, and in this case, loss of both trabecular and cortical bone occurs. Its incidence in the population is 20%. Secondary osteoporosis occurs as a result of other diseases and is associated with hyperparathyroidism, diabetes, hyperthyroidism, scurvy, immobility, chronic kidney disease, Cushing's disease or growth hormone deficiency in adults (3). The disease is more common at women than men at the same age, and the difference is further increased after the age of 50 due to fall in estrogen at women (4).

According to statistics, approximately 500,000 women over 50 live in Bosnia and Herzegovina, and if the global trend is applied, the estimated number of patients with osteoporosis or osteopenia is 160,000 (5).

The onset and intensity of disease progression is highly dependent on changing risk factors, that is, lifestyle. These include: alcohol and coffee consumption, cigarette smoking, lack of physical activity, deficiency and insufficient intake of calcium and vitamin D, and malnutrition (6).

Lifestyle changes and non-pharmacological measures are paramount to bone health. The prevention strategy is aimed at the optimal development of the bone system and the prevention of bone loss due to secondary causes.

Calcium; Calcium intake is one of the many factors that influence the development and preservation of adult bone mass. Calcium is a bone component with a content of 30 to 35%

by weight. The contribution of calcium intake from the diet to bone mass is the best observed in the period when it changes most rapidly, and one such period is in the elderly population, where about 1% of bone mass or 15 g of calcium is lost annually (7).

The recommended daily amounts of calcium vary between countries. In 2010, the Institute of Medicine of the US National Academy of Sciences (IOM) issued the following recommendations:

Table No. 1: Recommended daily intake of calcium for women (6)

Women	Calcium (mg/ day)
19-50 years	1000
Post-menopauza (51+ years)	1200
Pregnancy /lactation; 14-18 years	1300
Pregnancy /lactation; 19-50 years	1000

The best way to meet your daily nutritional needs for calcium is by eating food which is full of calcium. Along with the intake of calcium-rich food, it is also recommended to consume those that are high in Vitamin D, which are primarily fish oils. In this way, bone loss in people with osteoporosis can be prevented and bone density increased by as much as 20% annually (5).

Vitamin D; The primary role of Vitamin D is to maintain calcium and phosphate homeostasis in the body and to ensure the function of numerous organs, tissues and cells. Vitamin D deficiency in adults can cause osteomalacia, increase the risk of fracture in osteoporosis, and cause cardiovascular disease (8).

Table No. 2: Recommended daily intake of Vitamin D (6)

Man and women	Vitamine D
Under 50 years	400-800 IU/day**
50 years and older	800-1000 IU/day**
<i>**Some persons need more vitamin D. According to the report IOM, the safe upper level of vitamin D is 4000 IU/ daily for the most adults</i>	

Lifestyle; The two basic components of a postmenopausal strategy to maintain the bone mass of women are healthy eating and healthy lifestyle habits. Daily physical activity is

recommended with smoking cessation and excessive drinking (9). Smoking cigarettes is one of the factors that we associate with lower BMD and an increased risk of fracture-independent BMD. A meta-analysis conducted by Guang Sie Sheng et al showed a significant association between smoking and a high risk of hip fracture. The risk is statistically the same for people who are current smokers compared to those who quit smoking 5 years ago (10). Alcohol consumption is one of the risk factors for osteoporosis, which is based on the fact that alcoholics often have low bone mass, decreased bone formation rate and increased fracture frequency. Alcohol has been shown to reduce bone formation in both healthy humans and animals and reduce the proliferation of cultured osteoblasts (11). Physical activity increases bone mass in the period of growth and development and is especially important for achieving peak bone mass. It has a milder effect at elderly persons and can slow or stop bone loss. In addition, the importance of physical activity is reflected in the fact that it favorably affects muscular and neuromuscular coordination and reduces the risk of falls and fractures (12). Aerobic exercise is the most appropriate type of training for people with osteoporosis due to bone fragility and years that still do not allow for great physical exertion. Literature data indicate that in most clinical trials the aerobic type of training is applied which involves primarily walking, or walking, and then jogging, stair climbing, and stepping (13).

Nutrition; The most important recommendation for the prevention and treatment of osteoporosis is to adhere to the principle of proper nutrition. Optimal nutrient intake is required to maintain bone health (14).

Table No 3: Nutrients with positive and potentially harmful effect on bone health (14)

NUTRIENTS WITH POSITIVE EFFECT		POTENTIAL DAMAGED NUTRIENTS	
Ca, Zn, P, Mg, fluoride		Excess alcohol	
Vitamins C, D, K; complex of Vitamines B		Excess of caffeine	
Fitoestrogens		Excess Na, P	
Proteins		Less / excess protein	
n-3 fat acids		Excess of fluoride	
Biological active components of Food		Excess/ deficit of vitamin A	

Consumption of caffeine-containing beverages has been reported to be associated with decreased bone mass and an increased risk of fracture.

MATERIALS AND METHODS

The survey was conducted in early October 2019 over a seven-day period where 58 respondents were interviewed. All interviewed persons were women diagnosed with osteoporosis.

The patients answered on a simple questionnaire which consisted of three parts:

1. Demographics
2. Lifestyle
3. Awareness

In the demographic section, the questions included the following: age, body weight, height, height loss in relation to youth and education (secondary education, higher education...). The second part of the questionnaire relates to the lifestyle of people with osteoporosis. Patients answered questions related to the main risk factors for osteoporosis, such as physical activity, calcium and vitamin D intake, cigarette smoking, coffee consumption, and alcohol consumption. In the third part of the questionnaire, patients were informed about the importance of calcium and vitamin intake and their recommended daily intake. The empirical part of the paper is based on statistical methods and covers the collection, processing and presentation of data obtained through the *Microsoft Excel* computer program.

A. Demographic information

The youngest patient was 33 years old and the oldest 81 years old. The average age is 53 years. The survey included 23 women under 50 and 35 women over 50. 39 patients, or 67.24%, were found to have lost height compared to their youth. The average height loss was 2 cm.

RESULTS

B. Lifestyle

In the second part of the survey related to patients' lifestyle, the parameters that represent the risk factor for the onset and development of osteoporosis were examined. Each of the factors examined belongs to a group of patients that can be influenced and modified. Patients answered questions about their physical activity, calcium and vitamin D intake, cigarette smoking, and coffee and alcohol consumption. In the chart, these risks are shown by category.

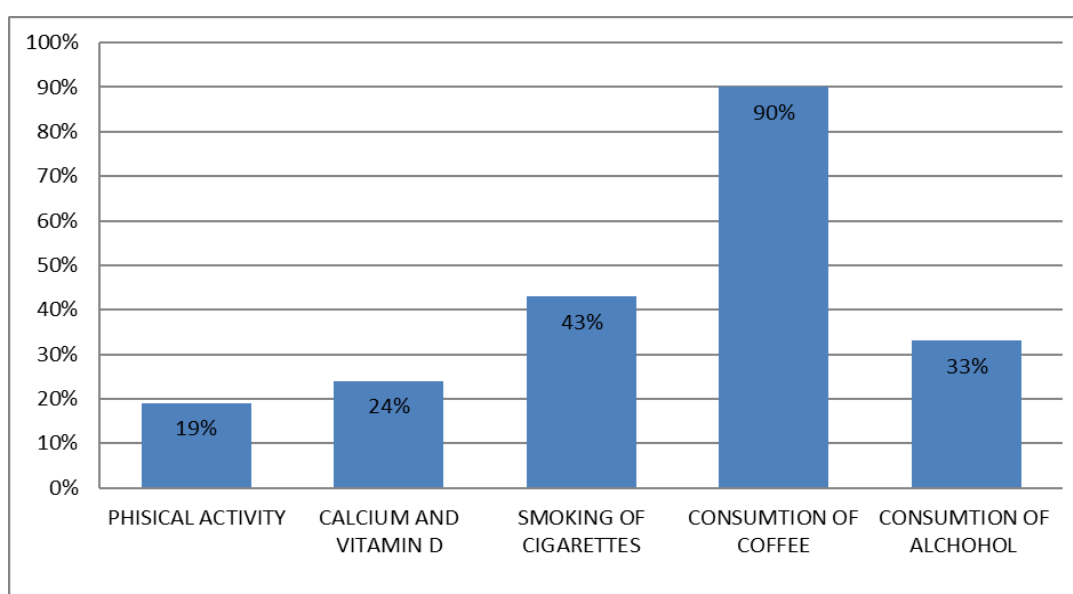


Figure No. 1: Percentage of risk representation for the listed categories

After all the parameters had been tested, coffee consumption shows the highest percentage, with as many as 90% of respondents declaring themselves coffee consumers. Only 10% said they did not consume coffee. The results show that in terms of frequency, cigarette smoking is in second place, where 43% of women answered yes to the question whether they consume cigarettes, and 57% said they did not smoke. Chronic alcohol consumption is a risk factor for people with osteoporosis. Alcohol has negative effects on bone health directly or indirectly through cells, hormones and growth factors. In this survey, 33% of respondents said they consume alcohol every day, and 67% do not consume alcohol to any extent. Calcium is one of the most important nutrients for bone metabolism and vitamin D maintains its homeostasis and participates in the functions of numerous cells, tissues and organs. In this survey, 24% of patients stated that they do not take account for adequate daily intake of calcium and vitamin

D. Physical activity is important in every period of life, whether it was the phase of growth and development phase where it is possible to achieve peak bone mass or the older age where it slows and stops bone loss. 19% of the surveyed patients are physically inactive.

A detailed analysis of each of these lifestyle issues has yielded in the following results:

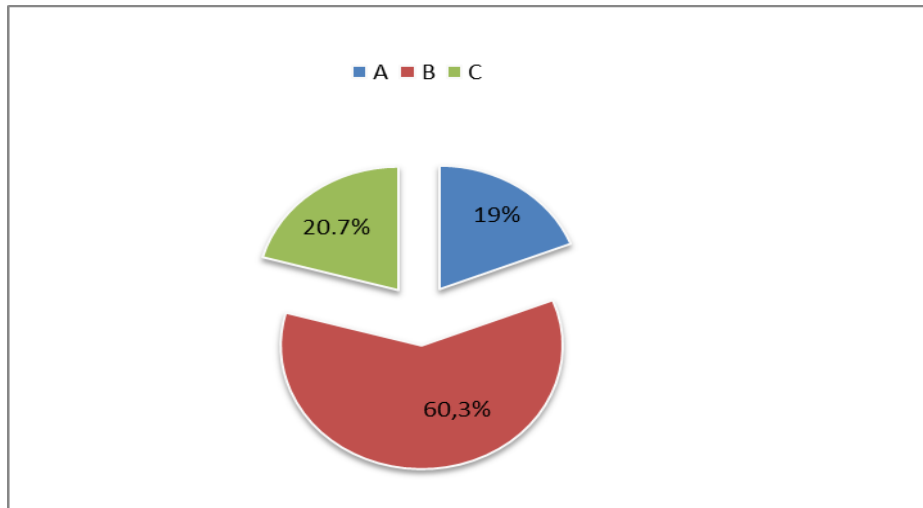


Figure No. 2: Analysis of answers about physical activity

A- I am not physically active person;

B- Every day I walk 20-30 minutes;

C- I devote myself daily to aerobic exercise 20- 30 minutes (walk, brisk walking and running) and other moderate hard physical activities;

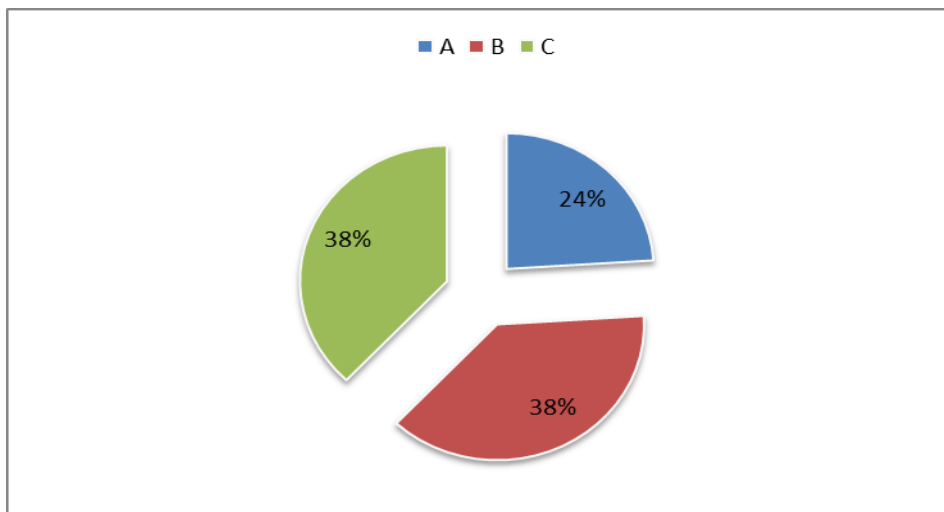


Figure No. 3: Analysis of answers about calcium and vitamin D intake

A-I do not take care about daily intake of calcium and vitamin D;

B-I intake exclusively through food the adequate amount of calcium and vitamin D;

C-I intake adequate amounts of calcium and vitamins D through food and supplements;

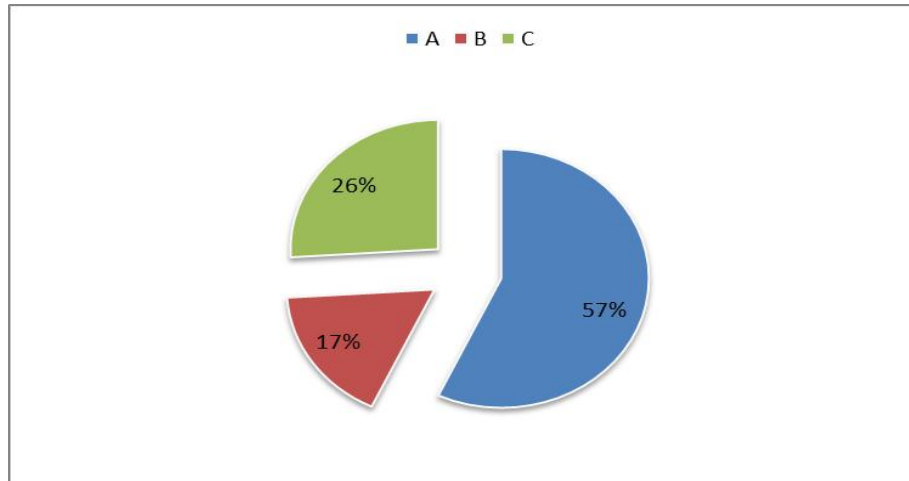


Figure No. 4: Analysis of answer about smoking the cigarettes

A-I do not smoke cigarettes;

B-I smoke less than 5 cigarettes daily;

C- I smoke more than 5 cigarettes daily;

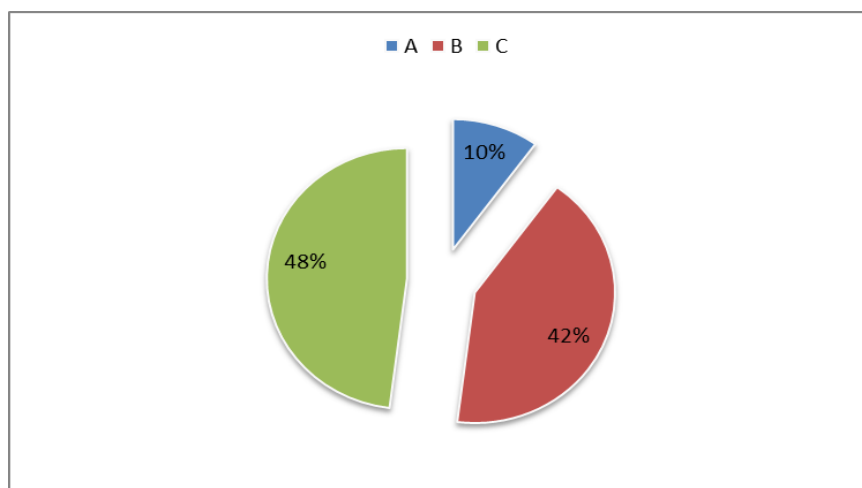


Figure No 5: Analysis of answers about consuming coffee

A-I do not drink coffee;

B- I drink one cup of coffee daily;

C- I drink more than two cups of coffee daily;

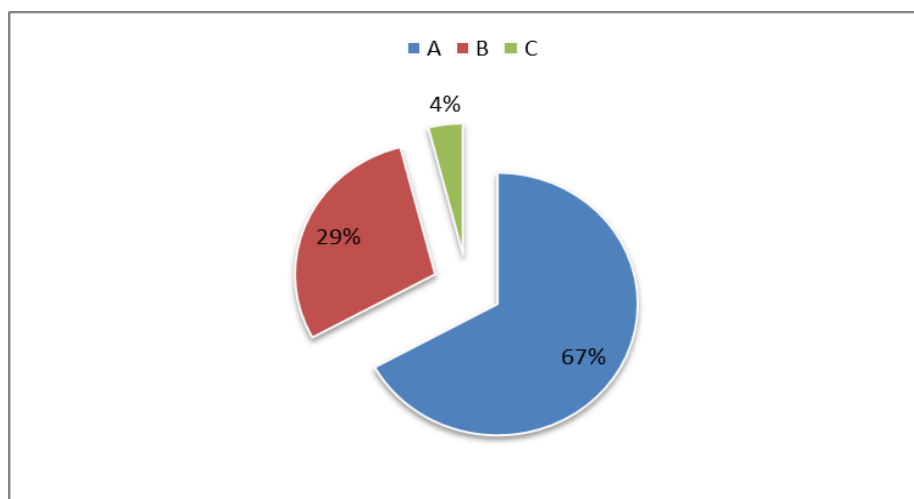


Figure No. 6: The analysis of answers about consumption of alcohol

A- I do not consume alcohol ;

B- I consume one glass of alcohol in average, daily;

C- In average I consume more than one glass of alcohol daily;

The survey included 23 women under 50 and 35 women over 50. If we compare their lifestyles of these two groups of patients for each of mentioned parameters, we got the results which are shown in Figure number 7.

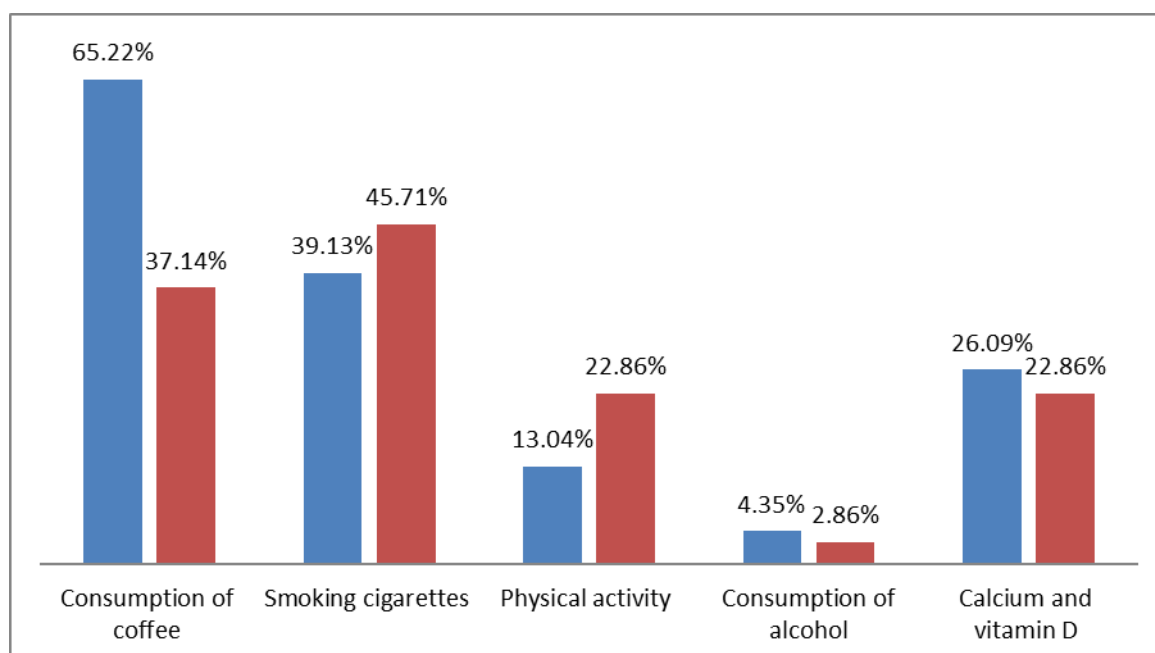


Figure No. 7: Comparison of lifestyles of younger and older than 50 years

The answers indicated by the respondents who are under 50 years old are indicated in blue and the answers in the age group of 50 years and over are indicated in red. Statistically, the biggest difference in answers is observed when it comes to coffee consumption. 65.22% of patients under the age of 50 drink more than one cup daily, and 37.14% of patients over 50 have the same opinion. Based on the results, it is also concluded that persons under 50 are more physically active than the older population. 22.86% of menopausal women stated that they did not perform any type of physical activity. For the remaining risk factors: cigarette smoking, alcohol consumption, and adequate calcium and vitamin D intake, no statistically significant difference was observed.

On the same topic “Awareness and Lifestyle of Persons with Osteoporosis in Sarajevo Canton”, a survey was conducted in 2010 by Nermina Žiga et al. Thirty menopausal women were interviewed and the average age was 63 years. Patients answered questions related to coffee consumption, cigarette smoking, physical activity, and alcohol consumption. The results of that survey are shown in chart number 8 in red, compared with the answers of persons over 50 (survey from October this year), which are shown in blue.

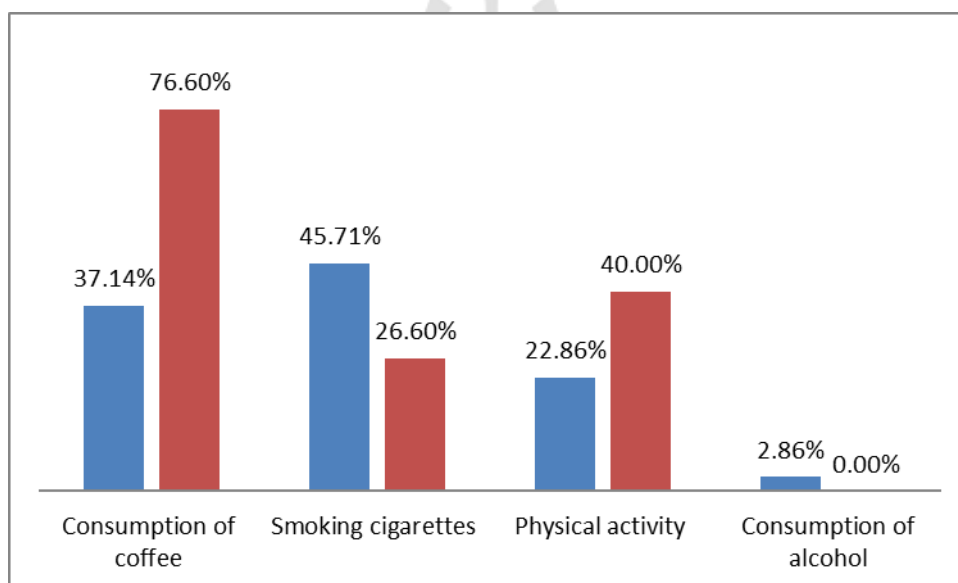


Figure No. 8: Comparison of the results of two surveys

The least common risk factor in both groups is alcohol consumption. Other high risk factors were present in both groups. If we compare the answers related to coffee consumption, 76.6% of the respondents from the first survey stated that they drink more than one cup of coffee a day, and that same answer in October gave 37.14%. Cigarette smoking and insufficient

physical activity -risk factors are present in both groups. The results of both surveys show that patients do not adhere to the appropriate lifestyle of osteoporosis patients.

C. Awareness

The last part of survey curriculum was regarding on patients awareness about the importance of intake of calcium and vitamin D. Six claims had been submitted with marked letters from A- F:

A-Nutrients with positive effects on bone health are: calcium, magnesium, zinc and phosphorus

B-The recommended daily intake of calcium for women over 50 is 1200 mg

C-The recommended daily intake of vitamin D for women over 50 is 800-1000 IU

D-Calcium is important for blood coagulation and normal heart function

E-The best source of vitamin D is sunlight

F-Milk and dairy products, dark green vegetables, sardines and nuts are good sources of calcium

Patients rounded down propositions which they considered that are correct.

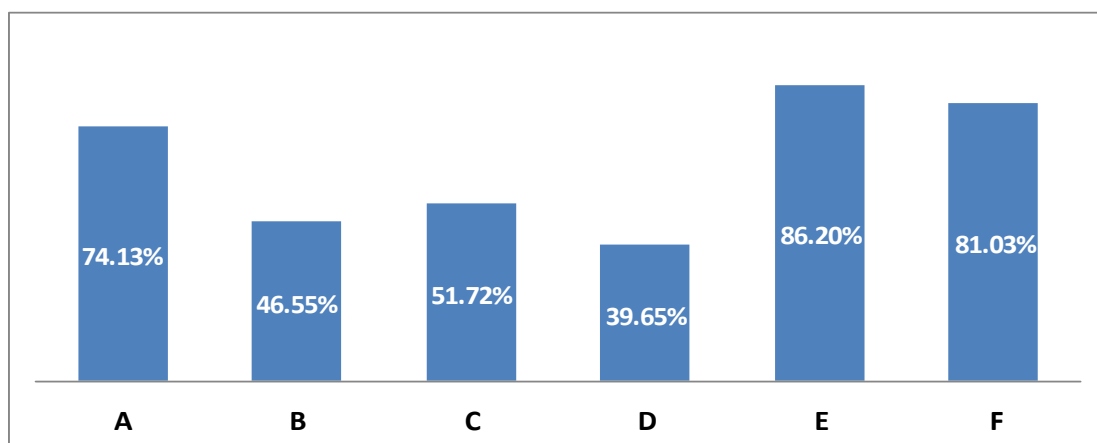


Figure No. 9: Patients' awareness of the importance of calcium and vitamin D

In this part of the questionnaire, the patients also had commented on the extent to which they were aware of the recommended daily intake of calcium and vitamin D. If a statistical

analysis of data related to the information on the recommended daily intake of calcium and vitamin D is obtained, the results are shown in Figure 10.

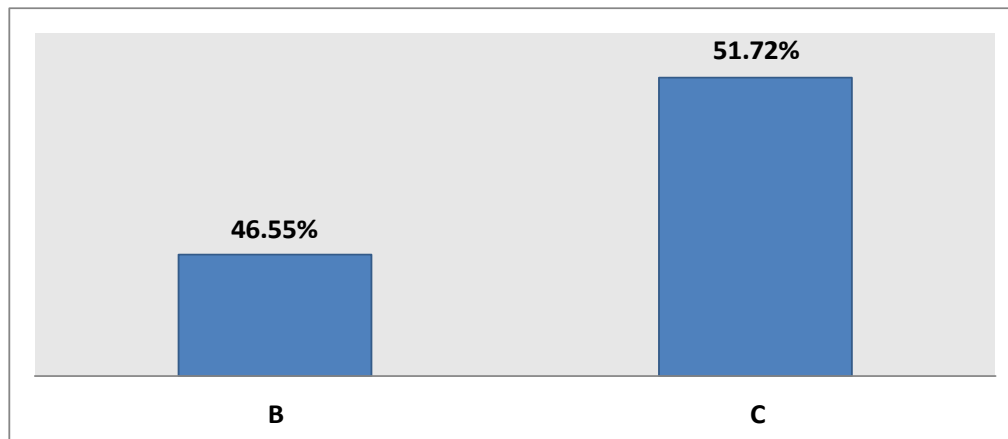


Figure No. 10: Awareness of patients about recommended daily intake of calcium and vitamin D

B-Recommended daily intake for women over 50 is 1200 mg;

C-Recommended daily intake of vitamin D for women over 50 years is 800-1000IU

DISCUSSION

In addition to drug therapy, great importance is given to external factors in the treatment of osteoporosis. This paper examines the lifestyle and information of women with osteoporosis and considers the following risk factors: physical activity, calcium and vitamin D intake, cigarette smoking, coffee and alcohol consumption.

Physical activity: Physical activity should be continuous and adapted to the patient's physiological abilities since inactivity promotes bone resorption and moderate daily exercise encourages bone formation. The survey shows that 19% of respondents are not physically active. 79.3% said they were engaged in some form of physical activity. 60.3% of the patients answered that they walk for 20-30 minutes each day, and only 20.7% stated that they devote 20-30 minutes daily to aerobic exercise (walking, walking, and running) and other moderately strong physical activities. Elderly people suffering from osteoporosis due to bone fragility are recommended aerobic exercise, i.e. medical gymnastics and controlled exercise with individual approach for each patient. Moderately strong physical activities are also

recommended to strengthen the muscular strength of the body's balance and to improve proprioception to prevent falls and breaks.

Calcium and Vitamin D intake: Suggestion for all persons diseased from osteoporosis to take care about balanced diet that gives intake of all necessary nutrients and the most important are calcium and vitamin D. On this way it can be prevented the loss of bone marrow for 20 % annually and increase bone density by 20% annually. Survey results show that 24% of women do not take care about their intake of calcium and vitamins, and 76% of them say they pay attention. 38% of patients surveyed provide adequate amounts of calcium and vitamin D exclusively through food and the same percentage of them provide adequate amounts of food in combination with supplements.

Consuming coffee: The survey shows that coffee consumption is the most common risk factor at people with osteoporosis in Sarajevo Canton. 90% of patients said they consume coffee daily. Of these, 42% drink a cup of coffee a day, for which there is no evidence that it is still a risk factor. Still, 48% of patients surveyed said they drink more than one cup of coffee a day.

Smoking cigarettes: Carbon monoxide, tar and nicotine found in cigarettes are risk factors for people with osteoporosis. Clarifying the mechanism of action requires specific clinical research, but it is indisputable that the effect on bone depends on the amount of cigarettes smoked on a daily basis and the amount of time a person smokes and their body weight. In the survey, 57% of respondents said they did not consume cigarettes, and 43% smoked cigarettes every day. 17% of them smoke less than 5 cigarettes a day, which presents a moderate risk, and 26% of respondents smoke more than 5 cigarettes every day.

Alcohol consumption: Alcohol consumption was found to be the least common risk factor among the surveyed patients. 67% of them denied drinking alcohol, and 29% said they consumed one glass of alcohol a day, which posed a minimal risk. Only two respondents said they consumed more than one glass of alcohol per day.

Awareness: Patients were highly informed about the importance of calcium and vitamin D intake. They knew which food they had to consume in greater quantities and they were familiar with the main sources of calcium and vitamin D. However, not all patients were informed about the recommended daily intake of calcium and vitamin D for women over 50.

The smallest percentage of respondents recognized the importance of calcium for blood coagulation and cardiac function.

CONCLUSION

Women over the age of 50, due to estrogen decline, should be aware of the risks and take precautionary measures as soon as possible to slow down bone loss or prevent disease progression and complications. The intensity of the disease's progress depends largely on the patients' lifestyle.

The results of the survey showed that the patients did not adhere to the appropriate lifestyle of osteoporosis patients. The most common risk factor is coffee consumption and cigarette smoking. A great number of patients do not take adequate care of calcium and vitamin D intake and are not physically active, which ultimately increases the risk of osteoporosis progression and adversely affects bone health. The smallest percentage of patients consumes more than one glass of alcohol daily. By comparing the lifestyle of younger and older than 50 years, it is concluded that people younger than 50 are more physically active but also consume more coffee.

Patients were highly informed about the importance of calcium and vitamin D intake. They knew which food should be consumed in greater quantities, that is, they were familiar with the main sources of calcium and vitamin D. However, not all patients were informed about the recommended daily intake of calcium and vitamin D for women over 50. The smallest percentage of respondents recognized the importance of calcium for blood coagulation and cardiac function.

REFERENCES

1. Lane N. Epidemiology, etiology and diagnosis of osteoporosis. *American Journal of Obstetrics and Gynecology*. 2006;194(2): S3-S11.
2. Dobbs M.B., Buckwalter J., Saltzman C. Osteoporosis: the increasing role of the orthopaedist. *The Iowa orthopaedic journal*. 1999;19:43-52.
3. Magaš M. Rizični čimbenici osteoporoze. *Medix*. 2003;104/105:241-244.
4. Lorentzon M. And Cummings S. (2015). Osteoporosis: the evolution of a diagnosis. *Journal of Internal Medicine*. 2015;277(6):650-661.
5. Tursunović A., Jašić M., Mutapčić L., Selmanović S., Pranjić N. Prehrana i dodaci prehrani u prevenciji osteopenije i osteoporoze kod žena u menopauzi. *Hrana u zdravlju i bolesti, znanstveno-stručni časopis za nutricionizam i dijetetiku*. 2016;5(2):67-72.
6. International Osteoporosis Foundation (2017). *Osteoporosis & Musculoskeletal Disorders: Epidemiology*. 8/10/2019. Available from: <https://www.iofbonehealth.org/epidemiology>.

7. Balk E., Adam G., Langberg V., Earley A., Clark P., Ebeling P., Mithal A., Rizzoli R., Zerbini C., Pierroz D., Dawson-Hughes B. Global dietary calcium intake among adults: a systematic review. *Osteoporosis International*. 2017;28(12):3315-3324.
8. Marcinowska-Suchowierska E., Walicka M., Tałała M., Horst-Sikorsk W., Ignaszak-Szczepaniak M., Sewerynek E. Vitamin D supplementation in adults-guidelines. *Polish Journal of Endocrinology*. 2010;61(6):723-729.
9. Lobo R., Davis S., De Villers T., Gompel A., Henderson V., Hodis H., Mack W., Shapiro S., Baber R. Prevenција bolesti u postmenopauzi. *International Menopause Society issue of Climacteric*. 2014;17
10. Shen G., Li Y., Zhao G., Zhou H., Xie Z., Xu W., Chen H., Dong Q., Xu Y. Cigarette smoking and risk of hip fracture in women: A meta-analysis of prospective cohort studies. *Injury*. 2015;46(7):1333-1340.
11. Turner R. Skeletal Response to Alcohol. *Alcoholism: Clinical and Experimental Research*. 2000;24(11):1693-1701.
12. Šimić P., Giljević Z., Šimunić V., Vukičević S., Koršić, M. Treatment of Osteoporosis. *Archives of Industrial Hygiene and Toxicology*. 2007;58(1):55-71.
13. Castrogiovanni P., Trovato F., Szychlinska M., Nsir H., Imbesi R., Musumeci G. He importance of physical activity in osteoporosis. From the molecular pathways to the clinical evidence. *Histology and Histopathology From Cell Biology to Tissue Engineering*. 2016;31:1183-1194.
14. Alibabić V., Mujić I. Pravilna prehrana i zdravlje. Rijeka: Veleučilište u Rijeci. 2016;153-154.

