KNOWLEDGE, ATTITUDES AND PRACTICES OF THE POPULATION REGARDING OSTEOPOROSIS

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Introduction. Introduction. Osteoporosis is a skeletal disease characterized by compromising the mechanical strength of the bone and increasing the risk of fractures. Osteoporosis conditions the increase in illness and disability in the elderly and, respectively, leads to an increase in health expenses.

Material and methods. A cross-sectional descriptive epidemiological study was designed, which included surveying 423 respondents and interviewing representatives of health decision-makers (6 in-depth interviews), during 2020-2022.

Results. In the section on knowledge about osteoporosis, a dissociation of responses was recorded according to the gender criterion – women in 65.4% of cases know better about this problem ($\chi2=3.898$, $p=0.273$). Knowledge about the fact that osteoporosis can occur during menopause was demonstrated by 45.9% of respondents, of whom women in 76.3% of cases ($\chi2=36,136,183$, $p<0.001$). The attitude of the respondents was analyzed according to the biological gender. It was found that women show concern about osteoporosis in 63.6% of cases, and men – 35.2%. In the practices chapter, it was found that the respondents consume little milk and cottage cheese, but they usually take calcium food supplements (54%).

Conclusions. Osteoporosis is a current public health problem. Females possess more knowledge about osteoporosis and show a more expressive attitude compared to males.

CUNOŞTINŢE, ATITUDINI ŞI PRACTICI ALE POPULAŢIEI PRIVIND OSTEOPOROZA

Introducere. Introducere. Osteoporoza este o boală a scheletului caracterizată prin compromiterea rezistenţei mecanice a osului şi creşterea riscului de fracturi. Osteoporoza condiţionează creşterea îmbolnăvirii şi a dizabilităţii persoanelor de vârstă înaintată şi respectiv, duce la creşterea cheltuielilor în sănătate.

Material şi metode. A fost proiectat un studiu epidemiologic descriptiv transversal, care a inclus chestionarea a 423 de respondenţi şi intervievarea reprezentanţilor factorilor de decizie din domeniul sănătăţii (6 interviuri în profunzime), în perioada 2020-2022.

Rezultate. La capitolul cunoştinţe despre osteoporoză s-a înregistrat o disociere a răspunsurilor după criteriul de gen – femeile, în 65,4% cazuri, cunosc mai bine despre această problemă ($\chi2=3.898$, $p=0.273$). Cunoştinţe despre faptul că osteoporoza poate apărea în perioada de menopauză au demonstrat 45,9% dintre respondenţi, dintre care femeile în 76,3% cazuri ($\chi2=36.136.183$, $p<0.001$). A fost analizată atitudinea respondenţilor în funcţie de genul biologic. S-a constatat că femeile manifestă îngrijorare faţă de osteoporoză în 63,6% cazuri, iar bărbaţii – 35,2%. La capitolul practici s-a constatat că, respondenţii consumă puţin lapte şi brânză de vaci, însă obişnuiesc să administreze suplimente alimentare cu calciu (54%).

Concluzii. Osteoporoza este o problemă actuală de sănătate publică. Persoanele de gen feminin posedă mai multe cunoştinţe despre osteoporoză şi manifestă o atitudine mai expresivă în raport cu bărbaţii.

INTRODUCTION

Osteoporosis presents a problem of global importance and was placed by the WHO in the list of diseases related to the aging of the population. According to the WHO definition, "osteoporosis is a systemic disease characterized by a low bone mass and the alteration of the microarchitecture of the bone tissue that causes an increase in bone fragility and consequently an increase in the risk of fracture" (1, 2, 3). The social importance of osteoporosis is assessed through its consequences – fractures of the vertebrae and the bones of the peripheral skeleton, it conditions the increase of illness, invalidism and mortality of the elderly and, respectively, the increase of expenses. Thus, it is certain that osteoporosis is a public health problem (4). The most recent statistics speak of a mortality rate of about 20% of patients with hip fractures, who die in the first 6 months after the fracture. About 1/2 of hip fracture survivors have a poor quality of life, and about 1/3 become dependent and require long-term care. Vertebral fractures cause severe pain and immobilization and increase direct costs. Vertebral fractures also cause deformities, kyphoscoliosis, limitation of movements and height loss, all of which have an impact on daily life, self-esteem and quality of life (5, 6).

In Europe (2017), there were an estimated 162,000 new hip fractures, 574,000 forearm fractures, 250,000 proximal humerus fractures, and 620,000 clinical vertebral fractures in men and women aged 50 years and older (7). These fractures represented 34.8% of such fractures worldwide. Osteoporotic fractures also occur at many other levels including the pelvis, ribs, distal femur and tibia. In total, all osteoporotic fractures account for 2.7 million fractures in men and women in Europe, at a direct cost of €36 billion (8). An estimate from the last decade calculated the direct costs at 29 billion euros in the five largest European countries (France, Germany, Italy, Spain and the United Kingdom) and 38.7 billion in the 27 member states of the European Union. It is widely recognized that osteoporosis and subsequent fractures are associated with increased mortality, with the exception of forearm fractures. The number of deaths causally related to osteoporotic fractures was estimated at 43,000 in the European Union. Approximately 50% of fracture-related deaths in women were due to hip fractures, 28% to clinical fractures, 7% to verte

bral fractures, and 22% to other fractures. In case of hip fracture, most deaths occur in the first 3-6 months after the event, of which 20-30% are causally related to the fracture event itself. Life expectancy in menopausal women after a hip or vertebral fracture is lower than in women with breast cancer (approximately 12%). Also, the probability of a fracture at any of these levels is 40% or more in Western Europe, a figure close to the probability of coronary heart disease. In Europe, osteoporosis accounted for more disability and years of life lost than rheumatoid arthritis, but less than osteoarthritis. By comparison with neoplastic diseases, disability due to osteoporosis was greater than for all types of cancer except lung cancer (9, 10). These figures can also be extrapolated for the Republic of Moldova, probably with a more severe impact (11).

The aim of the study was to assess the knowledge, attitudes and practices of the population regarding osteoporosis and the opinions of decision-makers in the field of health, in order to develop the set of recommendations for the prevention of this condition among the adult population.

MATERIAL AND METHODS

In order to achieve the purpose of the research, a cross-sectional descriptive epidemiological study was designed, which included a survey of the general population and in-depth interviews of representatives of health decision-makers, during the years 2020-2022. The following methods were used: historical, descriptive, comparative, sociological, mathematical and statistical. The target population was rural and urban adults. People from the three geographical areas of the Republic of Moldova participated in the survey. Ocnita and Glodeni districts were selected from the Northern area, Chisinau municipality, Anenii-Noi and Ungheni districts from the Central area, and Cantemir and Cimislia districts from the Southern area.

In the study, 423 respondents (adult population) were interviewed, from the Republic of Moldova, urban and rural areas. To determine the number of respondents, the calculation formula $n=P(1-P)(z/e)^2$ was used, where the significance of the results was 95%, and the non-response rate – 10%. The criteria for inclusion in the study were: (i) the age of the persons (over 18); (ii) consent to

participate in the study. As part of the research, the "Knowledge, Attitudes and Practices of the population regarding osteoporosis" questionnaire was developed and applied. The questionnaire was structured in four sections and included 69 questions.

For the in-depth interview, 6 people were selected (representative of the CNAM, the National Public Health Agency, the Ministry of Health, the Department of Family Medicine of USMF "Nicolae Testemiţanu", managers of the urban and rural Primary Health Care institutions). In the course of the interview, the interviewees were given questions, aimed at the topic addressed, to which they were answered either with short answers: yes, no, I don't know, or extensive, reasoned and exemplified answers were given. The data were processed by: SPSS 27.0.

RESULTS

Socio-demographic characteristic

The researched sample consisted of 423 adults. The age of the respondents was between 18 and 82 years, with an average of 46.2±14.44 years (M±SD). The structure of the sample by age category was: people aged 18-30 constituted 15.1% (64 people), 31-60 years – 64.5% (273 people) and 61 years and over – 20.3% (86 people). In the study, female participation prevailed, which constituted 64% (270 women), compared to 36% (153 men). More than half of the participants in the survey - 53% (225 people) came from rural areas, and 47% (198 people) lived in urban areas. Out of the total number of people included in the research sample, most – 41% (171 people) declared that they have specialized secondary education, followed by 36% (153 people) with higher education. Without education, 11% (48 people) were identified with a secondary education level, and respectively, 8% (34 people) with a high school education. It is curious that 4% (17 people) selected another level of education, this can be explained by the fact that the respondent did not identify with any category of studies proposed by the researcher. Depending on the marital status, the majority of respondents – 71% (299 people) declared that they were married, and 12% (51 people) – not married. A small number of respondents – 8% (35 people) declared that they were widowed, 5% (21 people) – divorced and 4% (17 people) lived in cohabitation. A relevant aspect of the study was the questioning of the re

spondents regarding the specifics of the work performed. Thus, for 45.4% (192 people) the specifics of professional or household activities were characterized as predominantly sedentary (sitting), and 54.6% (231 persons) characterized the nature of professional or household activities as predominantly standing (moving).

Assessment of respondents' knowledge of osteoporosis

When asked whether osteoporosis can be caused by a diet low in dairy products, most respondents (42.3%) answered "probably", which proves that they have knowledge about the association of the disease and dairy products, and only 4% did not know. The dissociation of the responses by gender demonstrated that women in 65.4% of cases know better about this problem ($\chi2=3.898$, $p=0.273$). Knowledge about the fact that osteoporosis can occur during menopause was demostrated by 45.9% of respondents, of whom women in 76.3% of cases ($\chi2=36,136,183$, $p<0.001$). Regarding the diet rich in green leafy vegetables and the development of osteoporosis, here the respondents were undecided in their answer, thus showing the lack of a unipolar position. Contrary to what was mentioned, the majority of respondents (44.4%) agreed with the statement that the disease is more widespread in families with a family history. A noticeable connection between removed ovaries and the development of the disease was not observed by 34.5% of respondents. Respondents who agree (32.4%) and who do not agree (32.6%) with the fact that the administration of cortisone for a long period of time can lead to the development of the disease were in practically equal positions. It should be noted that 47.8% of people do not consider that physical exercise plays an important role in the development of osteoporosis. Resulting from the above statement, a characteristic of the respondents was made according to their perception about the role of exercise in reducing the chance of getting the disease. Most respondents stated that brisk walking is more important compared to swimming, and housekeeping activities are not essential ($\chi2=20.183$, $p=0.017$).

The aim was to see what knowledge the respondents possessed about calcium, as one of the elements that the human body needs to maintain strong bones. Respondents expressed themselves on the question by giving preference to certain food products, which in their opinion have a

higher calcium content (tab. 1).

Thus, preference was given to cottage cheese (83.2% cases), canned sardines (57.2%), broccoli (47.3%), yogurt (65.5%), ice cream (34.5%). At the opposite pole are the following products: cucumbers and apples (7.1% each), watermelon (8.5%), grapes (7.3%), strawberries (5.4%), radishes (14.2%).

Assessing respondents' attitudes about osteoporosis
People in the 18-30 and 31-60 age groups have a more neutral than affirmative attitude and believe that the chances of developing osteoporosis are minimal, compared to people in the over 60 age group, who show a strongly convinced attitude towards this issue. The majority of respondents in the age group 31-60 years are of the opinion that they are more likely to have osteoporosis compared to the age group 18-30 years (6.3%) ($\chi 2$=46.181, p<0.001).

The attitude of the respondents was analyzed according to sex (fig. 1). It was found that the manifestation of concern about osteoporosis was higher in women (63.6%) than in men (35.2%).

Table 1. Rate of respondents' preferences for a particular food product.

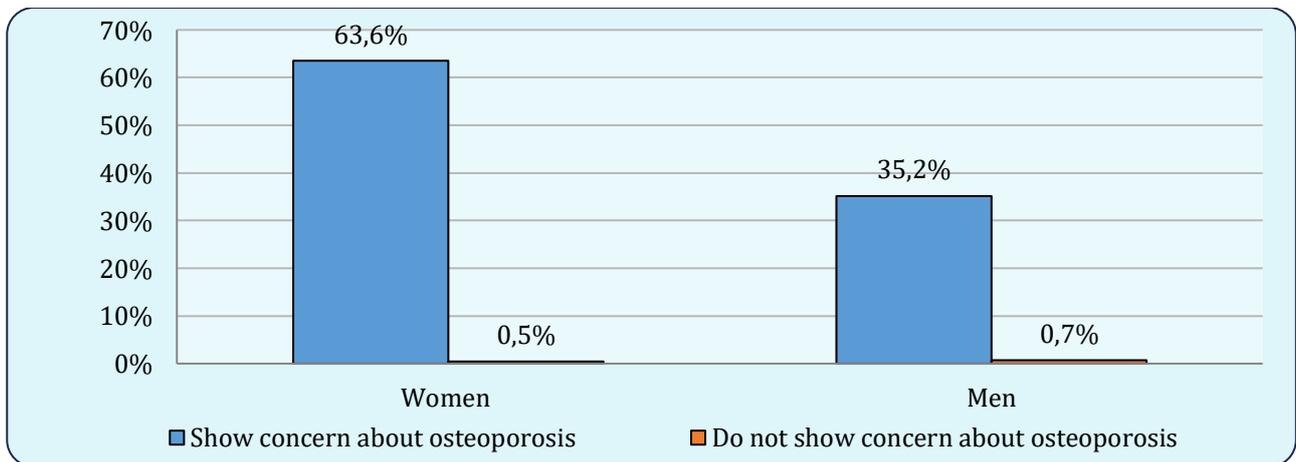| Food product	Rate	The nutritional content of calcium per 100 g
Cottage cheese	83.2%	400 mg
Canned sardines	57.2%	382 mg
Broccoli	47.3%	47 mg
Yogurt	65.5%	125 mg
Ice cream	34.5%	142 mg
Cucumber	7.1%	16 mg
Apples	7.1%	6 mg
Watermelon	8.5%	7 mg
Grapes	7.3%	19 mg
Strawberries	5.4%	16 mg
Radish	14.2%	25 mg

Figure 1. Respondents' attitude towards osteoporosis according to sex.

Another studied aspect, which aroused curiosity, was highlighting the character of the respondents' attitudes towards osteoporosis depending on the level of education. In all cases, concern prevailed. The majority are respondents with secondary education – 40%, followed by respondents with higher education – 35.7%, secondary school – 11.1% and high school – 8.1%. The lack of concern was practically not reported.

Assessment of respondents' practices regarding osteoporosis
Another aspect, which was one of the objectives of the research, was the evaluation of the prac-

tices of the people questioned regarding the problem of osteoporosis. It was aimed to quantify the results about some healthy practices that the respondents adopted during their life. These practices are directly proportional to the level of knowledge about osteoporosis and to the attitudes shown by the respondents towards this disease.

Taking into account the general recommendations regarding the prevention of osteoporosis, respondents were asked the question about the habit and frequency of milk consumption during

their lifetime (fig. 2).

Respondents consume little milk, which does not correspond to the recommendations of specialists regarding the consumption of food products rich in calcium.

The analysis of the frequency of consumption of cottage cheese allowed to highlight that the majority of respondents fall into the category of those who consume cottage cheese 1-2 servings a week. At the same time, the number of those who do not consume cottage cheese is high (fig. 3).
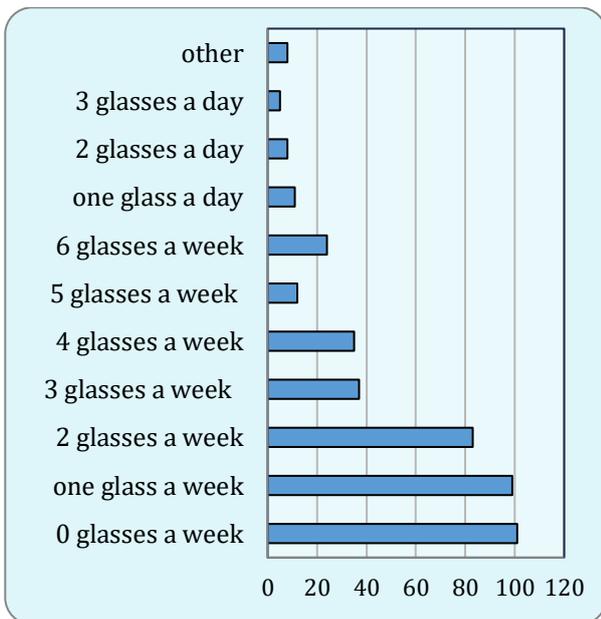

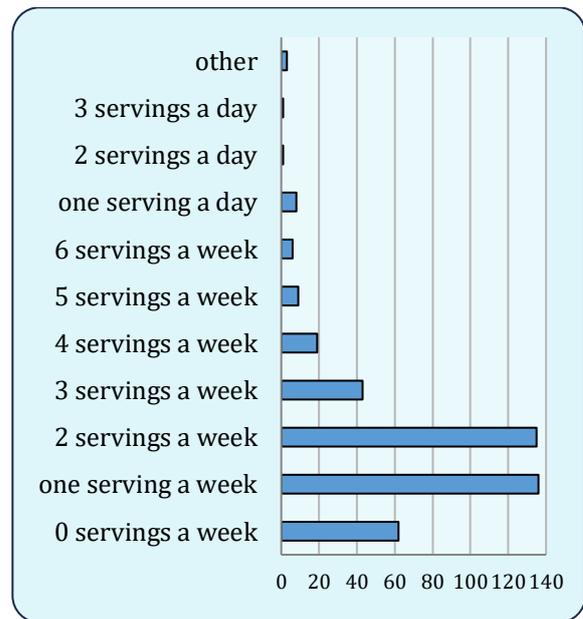Figure 2. Frequency of milk consumption by respondents (abs.).

Figure 3. Frequency of consumption of cottage cheese by respondents (abs.).

At the opposite pole of consuming food products rich in calcium and supplying the body with the necessary amount of calcium naturally, is the administration of food supplements with a calcium content. These supplements are administered to supplement the body's calcium needs, for prophylactic or treatment purposes. It found that 54% of respondents take calcium supplements and 46% do not use such supplements. The majority of respondents who administer calcium supplements are those with specialized secondary education – 20.8%, with higher education – 15.1%, with secondary education – 4.5% and with high school education – 4%.

Analysis of health policy makers' views on osteoporosis
In-depth interviews were conducted to assess health policy-makers' views on their capacity and

contribution to strengthening the population's knowledge, attitudes and practices regarding osteoporosis. This qualitative method is used when it is desired to avoid distortion of individual opinion through interaction in a focus group. An in-depth interview is usually recorded, has a discussion topic with predetermined questions, and is conducted by a moderator. The most relevant opinions expressed were: *"Osteoporosis is a Public Health problem in our country, being a degenerative and metabolic disease"; "The problem of osteoporosis in our country is ignored, ...as long as it is not in the top 5 causes of mortality..."; "I don't consider osteoporosis as a Public Health problem, as long as we don't know the number of people with osteoporosis in the country".* The people interviewed reported that „....*at the national level, a Strategy for the prevention and reduction of non-*

communicable diseases was developed for the years 2012-2020, ... osteoporosis as a non-communicable disease was not included in the list...".

The respondents came up with some recommendations on the improvement of the situation regarding osteoporosis: *"...we should follow protocol and assess all risk factors..."; "...reducing risk factors among the population..."; "...investigations should be more accessible, and included in the unique program, covered by the medical insurance policy".*

DISCUSSIONS

It is certain that osteoporosis is a public health problem (12, 13) and there are premises that the challenges it poses to us will increase in the near future. The fact is mainly due to the increase in population on a global scale and the increase in the share of elderly people within it. The risk of osteoporosis increases with age, especially in women (14, 15). After the age of 30, bone tissue begins to break down, bone consistency decreases (the phenomenon of bone resorption), and bone development is reduced (16).

The most recent statistics speak of a mortality rate of about 20% of patients with hip fractures, who die in the first 6 months after the fracture. The greatest impact on the daily life, self-esteem and quality of life of people suffering from osteoporosis are vertebral fractures that cause severe pain, deformities, kyphoscoliosis, limitation of movements, height loss and immobilization, which causes increased direct costs (5, 8).

The PREVOSS (Prevalence of Postmenopausal Osteoporosis) study, conducted in Romania, included 2,881 postmenopausal women from 6 large cities of the country and allowed the calculation of a standardized prevalence of the disease of 18.4%, to which 15.8% women with osteopenia is added. The standardized rate of fragility fractures was 5.97% (7). The statistics of the EU countries, as well as from Romania, are worrying. These figures can be extrapolated for the Republic of Moldova, probably with a more severe impact (11). Despite its impressive medical and socio-economic impact, osteoporosis does not seem to be taken too seriously by society. If 93% of women in the European area are well informed about the severity of the disease and the consequences arising from it, 80% do not think that they are personally at risk. More than 75% of women who have already suffered a forearm fracture did not undergo densitometry and did not receive drug treatment. In Norway, only 1.5% of women with osteoporosis are on sustained drug treatment, and continent-wide only 19% of those who have suffered a fracture receive prophylaxis for those likely to follow. In Romania, only 12.4% of women with osteoporosis are included in treatment and compliance with it is poor. Such negative attitudes are the combined result, in varying proportions, of poor allocation of funds and lack of treatment adherence.

CONCLUSIONS

1. As a result of the research, a higher level of knowledge was attested, with reference to osteoporosis, in women in 63.8% of cases, compared to men – 36.2%. The knowledge deficit in men may be associated with a lack of information and awareness of the symptoms and pathologies associated with osteoporosis.

2. Women showed interest in 63.6% of cases, while disinterest was observed more frequently among men. A more responsible and caring attitude towards osteoporosis was shown by people with specialized secondary education (40%) and higher education (35.7%), followed by those with secondary education (11.1%) and high school education (8.1%).

3. In the Republic of Moldova, the problem of osteoporosis and its consequences is not among the priority diseases, which causes this disease to be underdiagnosed.

RECOMMENDATIONS

For the Ministry of Health and the National Agency for Public Health:
1. Launch of information and education campaigns for the population regarding the risk of osteoporosis by distributing informative materials.
2. Policy and National Programs development aimed at reducing osteoporosis morbidity rate.
3. Development of educational programs for the population, focusing on the acquisition of know-

ledge and practical skills regarding osteoporosis.

4. Training specialists in the management and prevention of osteoporosis.

5. Adopting the practices of other countries regarding the management and prevention of osteoporosis.

For the National Health Insurance Company:

1. Directing financial funds towards preventive measures to reduce risk factors in the development of osteoporosis.

2. Increasing physical and economic accessibility of the population to DXA investigation for the pupose of diagnosing osteoporosis.

For Primary Health Care:

1. Identifying and monitoring the population with risk factors in the development of osteoporosis.

2. Current application of the FRAX tool.

3. Increasing the number of people benefiting from compensated antiresorptive treatment.

For the population:

1. Exercising 30-40 minutes, 3-4 times a week.

2. Adopting a rational diet that includes enough calcium.

3. Discovering calcium-rich alternatives for vegetarians and those with dairy intolerance.

4. Supplementing the body with vitamin D, through outdoor walks.

5. Avoiding smoking and drinking alcohol.

6. Encouraging the limitation of consumption of products with a negative impact (coca-cola, coffee, sausages, processed products, fast food, etc.).

CONFLICT OF INTERESTS

The authors have no conflict of interest to declare.

ETHICAL APPROVAL

The article was not approved by the Ethics Committee because it does not contain ethical risks. The research consists of a survey of adults that maintains all rigors to anonymize the data and preserve the confidentiality of the participants.

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