The Pharmaceutical and Chemical Journal, 2021, 8(2):57-67

Available online www.tpcj.org

Research Article

ISSN: 2349-7092
CODEN(USA): PCJHBA

Health Behavioral Attitudes, Awareness and Risk of Osteoporosis in Individuals Working at the University

Nuriye Degirmen[1], Filiz Ozyigit[2]

[1]Kütahya Health Sciences University Faculty of Health Sciences Midwifery Department, Kütahya, Turkey
[2]Kütahya Health Sciences University Faculty of Medicine Department of Medical Pharmacology
Kütahya, Turkey

Abstract Aim of study was to determine awareness and risk of osteoporosis (OP) in working individuals. Materials Methods: cross-sectional research, sample selection in the survey application, consists of the staff of one üniversity Turkey province between October and December 2018. 125 volunteer were participate in study. Socio-demografic questions, One-minute OP risk test was applied. Mean, standard deviation, chi square, t-test, variance analysis were used. Results: %59.2 of the participants are male. %35.2 of the individuals between the ages of 30-39. 44.8% is above the ideal weight. Men have % 43.5 diabetes and men were found to have more disease than women (p=0.002), it was determined that men % 42.4 use drugs continuously, men were found to more use drugs than women (p=0.037). % 45.6 of men used drugs without doctor's advice. It was determined that % 43.2 of men had information about OP on the internet and this rate was determined to be higher than women (p:0.009). The question-based mean values of the yes responses given to the one-minute risk test ranged from 0.0080 to 0.3120, the highest average value was in Question 10. *Conclusion:* Men were at higher risk group for OP and had no awareness. There has need education about awareness of OP and reduce risks.

Keywords Osteoporosis, Female, Male, Risk Awareness

Introduction

The definition of osteoporosis (OP) was first described as porous bone, later described as too little bone in bone and nowadays, osteoporosis is defined as a structural and metabolic bone disease characterized by low bone mass and the deterioration of the microstructure of bone tissue. While OP causes an increase in bone fragility and fracture risk in a developing bone, it also causes an increase in morbidity and mortality [1,2].

Today, it is estimated that 200 million people are affected by the disease. Researches indicate that one in every two white women and every five men will encounter fractures related to OP in their lifetime [3].

When the risk factors for OP are examined, such medical conditions as white race, gender, low body mass index (BMI), occupation, socioeconomic status, history of broken fractures in person, dietary habits, habits like tea, coffee, smoking, sedentary life, chronic diseases present, additional medication use are accepted as the first things that should be considered primarily. The elimination of etiologic risk factors is important in the development and prevention of OP. The concept of OP risk factors is predictive of early recognition of individuals at risk of OP [4].

Today, researches indicate that OP is seen in both genders, and they point out that men are at significant risk [5].

In the OP-related studies, it is emphasized that the risk factors for OP should be determined in terms of preventive treatment and the importance of prevention of OP-related morbidity and mortality with early diagnosis by

identifying especially risky patients and ethical sensitivity should be established in the society. This practice in the form of a survey has no economic burden. Whether the individuals at risk are truly OP can be clarified by advanced diagnostic tests. The aim of this study was to determine the awareness and risk of osteoporosis in working individuals.

Nowadays, in medical ethics and pharmacology, having a chronic disease, gender problems and old age problems are the subjects that are discussed with importance. Because of the high proportion of these individuals in the world and in Turkey, they are seen as specific individuals with unjust treatment among the groups receiving health care services. However, due to the limited health services offered to these individuals, the situations of problems of the principle of justice of medical ethics are increasing and it is emphasized that these individuals should be provided with access to service as a priority [6].

Materials and Methods

The study planned cross-sectional was carried out between October and December 2018 in Turkey.

Sample/participants and settings

The target population of the study consisted of academic and administrative staff working in different faculties and units of the university. The study was briefly explained to the participants before the study.

Data collection

"The one-minute test of the risk of osteoporosis" and the questionnaire prepared by the researchers using the literature were applied by face-to-face interviews with the participants. In this questionnaire, the participants were asked about their sociodemographic and biodemographic characteristics as well as nutrition and alcohol habits.

Instrument

The one-minute risk test of osteoporosis

The one-minute risk test of the osteoporosis: One-minute risk test form developed by the International Osteoporosis Foundation (IOF) was translated into Turkish in 2000. It is valuable in determining the risk factors for early diagnosis of OP. In addition to the standard 7 questions for women and men, this form consists of 2 more questions for women and 1 for men. Each yes response given corresponds to the risk level [7, 24-26].

BMI

Weight measurement was done by means of a weighing instrument with adjustment control and height measurement by meter fixed to the wall. The body mass index (BMI) was calculated and classified according to the World Health Organization (WHO) criteria [27].

Classification	BMI (kg/m^2)	Risk of comorbidities
Underweight	<18.5	Low (but risk of other clinical problems increased)
Normal range	18.5–24.9	Average
Overweight (preobese)	25.0–29.9	Mildly increased
Obese	≥30.0	
Class 1	30.0–34.9	Moderate
Class 11	35.0–39.9	Severe
Class 111	≥40.0	Very severe

Individuals were classified as four groups according to BMI. The majority of participants (44.8%) were found on the ideal weight.

Data Analysis

The data obtained in our study were analysed with the statistical program. Descriptive criteria (frequency, percentage, mean, standard deviation) were used in the analyses. The chi-square test was used to compare the data. p values below 0.05 were considered significant.

Ethical considerations

Necessary permissions were obtained from Dumlupınar University Publication Ethics Board.

Results

Demographic characteristics

The mean age of the 125 (M/F =74/51) participants in the study and was n: 44 participants, 35.2% between 30-39 years. N: 51, 40.8% of the participants were female, n: 90, 72% were the university. When marital status was examined, 67.2% were married. In terms of occupational groups, n: 111, 88.8% were administrative staff., n: 52, 65% above 3000 TL economic status (Table 1).

Table 1: Participants' sociodemographic characteristics

		N	%
Gender	Male	74	59.2
	Female	51	40.8
Age Groups	Below 20 Ages	8	6.4
	Between 20 - 29 Ages	33	26.4
	Between 30 - 39 Ages	44	35.2
	Between 40 - 49 Ages	30	24.0
	50 Ages and above	10	8.0
Marital Status	Married	84	67.2
	Single	36	28.8
	Divorced	5	4.0
Educational Status	Primary School	9	7.2
	Secondary School	6	4.8
	High School	20	16.0
	University	90	72.0
Body Mass Index Groups	Below Ideal Weight	6	4.8
	İdeal Weight	49	39.2
	Above Ideal Weight	56	44.8
	Very Much Over Ideal Weight	14	11.2
Economic Status	Below 1300TL	20	16.0
	Between 1300 and 3000 TL	40	32.0
	Above 3000 TL	65	52.0
Occupation	Academician	14	11.2
	Administrative staff	111	88.8

N=125

When the whole group is considered, in terms of BMI, 4.8% of the participants had the below Normal range (n=6) 39.2% had the normal range (n = 49), and 44.8% had the above normal range (n = 56). 11.2% of the Very Much Over Ideal Weight was classified as too high (n = 14) (Table 1).

When the gender of the patients with the existing disease was examined, there was a difference between men and women (p = 0.002). Diabetes was the most common disease in males (n: 54, 43.5%) and females (n: 24, 19.5%) (Table 2).

n:21 16.8% of men and n:24 19.2% of women answered yes to the question of "Do you have regular health checks?". There were differences between the two genders (p = 0.037). Regular health checks were often seen in women (Table 2).

There were male (5.6%) and female (9.6%) who received help with the diagnosis of depression. When depression and gender were compared, it was found that there was a difference between women and men (p = 0.045) and depression was frequently seen in women (Table 2).

13.6% of males and 4% of females answered yes to the question of drug use without a prescription and without a physician recommendation. When drug use without a prescription and without a physician recommendation comparison were done, there was a significant difference between men and women (p = 0.044) and drug use without a prescription and without a physician recommendation was frequently seen in the males (Table 2).

In the answers to the question of "Where did you learn the information about OP?", n: 54, 43.2% of males and n: 22, 17.6% of females gave the internet as the most common source of information, and gender was compared with the source of information (p = 0.009) and it was found that male gender had internet information about OP (Table 2).

Table 2: Health information of the participants

		Male		**Female**		**P**
		N	**%**	**N**	**%**	
Name of the Disease	Diabetes	54	43.5	24	19.4	0.002
	Hypertension	5	4.0	2	1.5	
	Epilepsy	0	0.0	0	0.0	
	Cancer	0	0.0	0	0.0	
	Thyroid	1	0.8	4	3.2	
	Other	6	4.8	4	3,2	
	No	9	6.5	15	12.1	
	Muscular rheumatism	0	0.0	1	0.8	
Do you have any medication you use all the time?	Yes	53	42.4	27	21.6	0.037
	No	21	16.8	24	19.2	
Do you have regular health checks?	No	53	42.4	27	21.6	0.037
	Yes	21	16.8	24	19.2	
Have you been diagnosed with depression and treated?	No	67	53.6	39	31.2	0.045
	Yes	7	5.6	12	9.6	
Do you have a habit of using drugs without a prescription and without a physician's recommendation?	No	57	45.6	46	36.8	0.044
	Yes	17	13.6	5	4.0	
Where did you learn the information about Osteoporosis?	Internet	54	43.2	22	17.6	0.009
	Newspaper	6	4.8	6	4.8	
	Doctor	4	3.2	10	8.0	
	Pharmacist	0	0.0	0	0.0	
	Immediate surroundings	5	4.0	8	6.4	
	Training form an institution	5	4.0	5	4.0	

The most common yes response was the response to impotence and libido loss in the testosterone level of male subjects and the response to fracture and range of smoke cigarettes mean 0.14 (Table 3).

When the existing diseases were compared with the age groups, there were differences between the groups (p = 0.007). Over 50 aged (n=28, %60) individuals have more disease. The fact that individuals over 50 years of age have more diseases is more compatible with the literature (Table 4).

When the answers given to the question of "Do you carry out regular health checks?" were compared according to the marital status, there were differences between the groups (p = 0.012). The divorced individuals had more regular health checks (n=45, 60%) (Table 5).

When the health checks were compared according to their income levels, as the level of income increased, the importance given to the health of individuals increased. There was a statistically significant difference between the groups (p = 0.004). Remarkable finding, the group that performed regular health checks was the group with an income level over 3000 TL (Table 6).

When the continuous drug use status of the study group was examined, in the gender comparison, n: 53, 71.6% of the males have used more continuous medication than female, and there was a difference between the groups (p= 0.032) (Table 7).

Table 3: Average scores of the answers given to the questions of the One minute risk test

		Mean
Question 1	Have any of your family members experienced hip fracture after a slight impact or fall?	0.13
Question 2	Has any bone fractures occurred after a slight impact or fall?	0.17
Question 3	Have you used corticosteroids (cortisone, prednisone, etc.) for more than three months?	0.06
Question 4	Have you shortened more than three centimetres?	0.02
Question 5	Do you take alcohol regularly (more than 2 glasses a day)?	0.02
Question 6	Do you smoke more than 20 cigarettes a day?	0.14
Question 7	Do you often diarrhoea?	0.01
Question 8	Have you had menopause before the age of 45?	0.13
Question 9	Has your period been disrupted for 12 months or longer due to reasons other than pregnancy or menopause?	0.15
Question 10	Did you have any loss of impotence or libido due to a decrease in testosterone level?	0.31
N:125		

Table 4: Comparative age groups and disease

			Diseases		**Total**
			No	**Yes**	
Age Groups	Under 20 Age	Count	7	1	8
		Age Groups % with in	87.5%	12.5%	100.0
		Diseases %with in	7.2%	3.6%	6.4%
	Between 20 - 29 Age	Count	31	2	33
		Age Groups % with in	93.9%	6.1%	100.0%
		Diseases % with in	32.0%	7.1%	26.4%
	Between 30 - 39 Age	Count	33	11	44
		Age Groups % with in	75.0%	25.0%	100.0%
		Diseases % with in	34.0%	39.3%	35.2%
	Between 40 - 49Age	Count	22	8	30
		Age Groups % with in	73.3%	26.7%	100.0%
		Diseases % with in	22.7%	28.6%	24.0%
	Over 50 Age	Count	4	6	10
		Age Groups % with in	40.0%	60.0%	100.0 %
		Diseases % with in	4.1%	21.4%	8.0%
Total		Count	97	28	125
		Age Groups % with in	77.6%	22.4%	100.0%
		Diseases % with in	100.0%	100.0%	100.0%
P			0.007		

Table 5: Marital status and compare to regular health control

			Regular health control		Total
			No	**Yes**	
Marital status	Married	Count	48	36	84
		% within Marital status	57.1%	42.9%	100.0%
		% within regular health control	60.0%	80.0%	67.2%
	Single	Count	30	6	36
		% within Marital status	83.3%	16.7%	100.0%
		% within regular health control	37.5%	13.3%	28.8%
	Divorced	Count	2	3	5
		% within Marital status	40.0%	60.0%	100.0%
		% within regular health control	2.5%	6.7%	4.0%
Total		Count	80	45	125
		% within Marital status	64.0%	36.0%	100.0%
		% within regular health control	100.0%	100.0%	100.0%
p			0.012		

Table 6: Regular health control compare with Economic status

			Economic status			Total
			1300TL under	**Between 1300-3000**	**Over 3000**	
Regular health control	No	Count	17	30	33	80
		% within Regular health control	21.2%	37.5%	41.2%	100.0%
		% within Economic status	85.0%	75.0%	50.8%	64.0%
	Yes	Count	3	10	32	45
		% within Regular health control	6.7%	22.2%	71.1%	100.0%
		% within Economic status	15.0%	25.0%	49.2%	36.0%
		Count	20	40	65	125
		% within Regular health control	16.0%	32.0%	52.0%	100.0%
Total		% within Economic status	100.0%	100.0%	100.0 %	100.0%
P			0.004			

Table 7: Genders compare with continuous medication

		Are there any medications you use continuous?		Total
		Yes	**No**	
Male	Count	53	21	74
	% within Genders	71.6%	28.4%	100.0%
	% within continuous medication	66.2%	46.7%	59.2%
Female	Count	27	24	51
	% within Genders	52.9%	47.1%	100.0%
	% within continuous medication	33.8%	53.3%	40.8%
Total	Count	80	45	125
	% within Genders	64.0%	36.0%	100.0%
	% within continuous medication	100.0%	100.0%	100.0%
P		0.032		

The question-based mean values of the yes responses given to the one-minute risk test ranged from 0.0080 to 0.3120, the highest average value was in Question 10, and the lowest average value was in Question 7. The 85 individuals in the group did not give a yes response to "the one-minute OP risk test" (Figure 1).

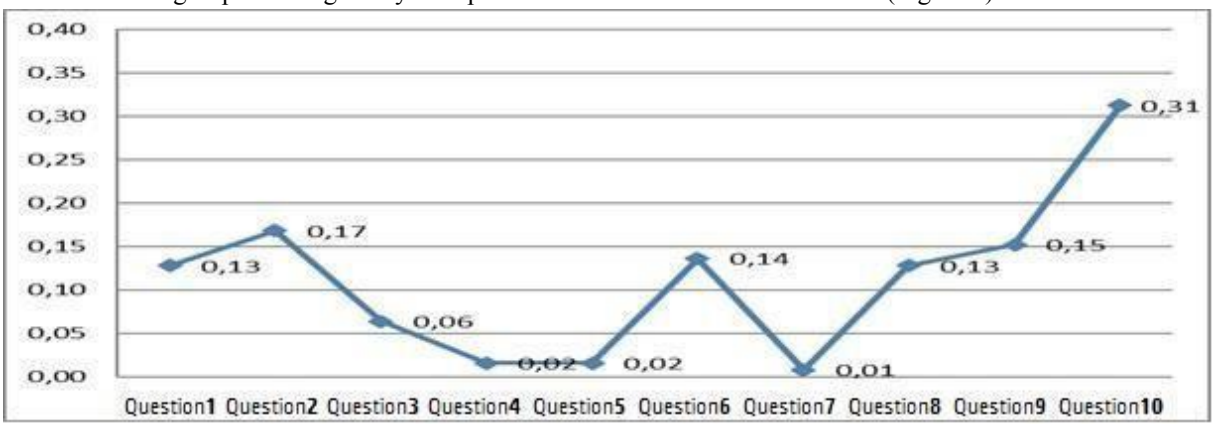

Figure 1: Distribution of yes responses to the one-minute OP risk test

OP and recommendation; health, education, media as a stakeholder should be seen as a solution to the problem of OP. In the diagnosis of OP, there is a need for studies to increase the prevalence of one-minute Osteoporosis test, which is one of the simplest scanning tests. This test is a risk-free, non-invasive, simple, easy to use test. It has the ability to be applied in every institution and organization in the health sector. As far as current risks are concerned, early prevention is important in preventing, delaying and eliminating complications. İn this study; it is known that as the answer to the one-minute OP risk test increases, the risk increases. The male individuals who did identify risk factors were OM 4 level risk factor (Figure 2).

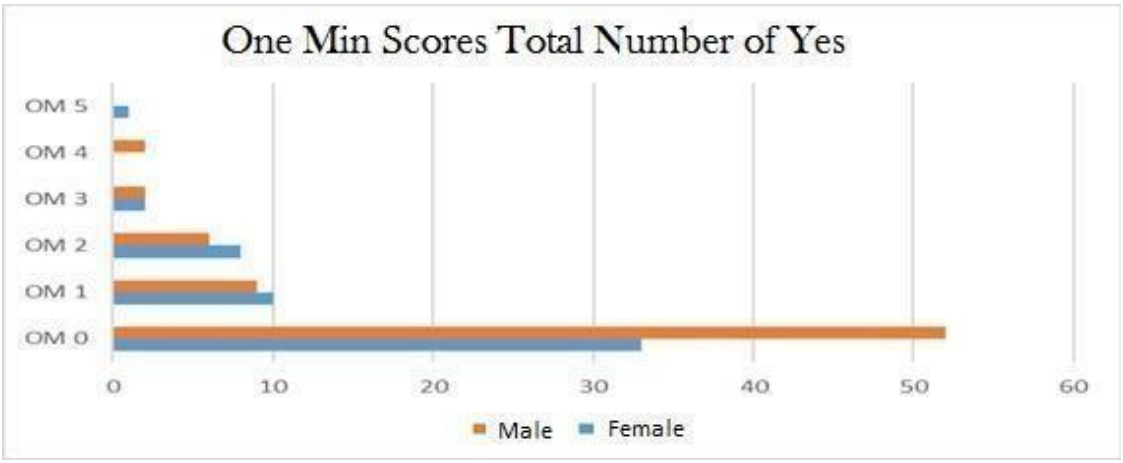

Figure 2: Gender comparison of yes responses to the one-minute OP risk test

Discussion

Currently, the most common method for screening and diagnosis of OP is dual-energy X-ray absorptiometry (DXA). Bone mineral density (BMD) is measured from the hip and lumbar region by DXA method. According to the WHO diagnostic criteria, a diagnosis of OP can be made if the BMD contains a value of 2.5 or less. The BMD and T-scores obtained by DXA measurements guide the diagnosis and treatment. Within the scope of health policies treatment expenses applied in Turkey, the reimbursement system is also referred to as OP treatment DXA results [8,9].

The one-minute OP risk test questions have features that are easily understandable and easily implemented by all physicians. One-minute osteoporosis risk test results are important in determining risk in OP scans. Bone mass loss increases with menopause. In the study of Özdemir and et al., in which one-minute osteoporosis risk test was

applied, they found a correlation between post-menopausal OP risk test results and BMD [10,11]. This results similar our finding in figure 1and figure 2; the question-based mean values of the yes responses given to the one-minute risk test ranged from 0.0080 to 0.3120, the highest average value was in Question 10. İn this study; it is known that as the answer to the one-minute OP risk test increases, the risk increases.

OP is considered to be a serious public health problem that is commonly seen all over the world. In the world, it poses problems with all dimensions for all societies. It causes an increase in the risk of mortality and morbidity in individuals, especially in the development of fractures. It constitutes a serious burden on national economies. Awareness about OP; the surveyed employees declared that they wanted to receive comprehensive training during the survey. The use of over-the-counter medications and corticosteroids were more common in those with lower levels of education. In the study group, the most common disease was Diabetes Mellitus. It is thought that implementation of one minute Osteoporosis risk test in all health institutions and organizations, which are non-invasive, easy, simple, understandable and practicable by all health personnel, will be of great benefit in OP risk screening. In the etiology of OP, there are systemic diseases such as diabetes, hypogonadism, endocrine, chronic liver or kidney disease, and drug use. The most common diseases in our study group were diabetes, hypertension and thyroid disease, respectively (Table 2). The results obtained are similar to the literature [12].

OP is a disease that has psychological and social consequences and affects social-family-work communication. There is a high likelihood of pain, limitation in daily activities, even disability. It causes a decrease in the quality of life in individuals with depression and bone loss. Low level of education and decreased physical activity in the OP are considered as risk factors for depression. It is indicated that OP risk factors such as vertebral compression fracture, family history of fracture, the tendency to fall and osteopenia predispose to the development of depression [13]. Depression and OP coexistence have attracted the attention of many scientists, and different ideas have been put forward about which is the reason and which is the result. In 15.6% of our study group, patients with depression were found. The majority of these were women and individuals separated from their spouses. In the studies of Bianchi and et al., 40% of patients with OP were showed to have symptoms of depression [14].

Calcium and vitamin D have important functions in maintaining bone health. 1000 mg of calcium and 600 IU of vitamin D are recommended to prevent OP. In recent years, there have been various views regarding calcium supplementation and safety, the appropriate dose of calcium and vitamin D. The ratio of Ca and vit D in the study group was found to be as low as 17.6%. In the studies aimed at diagnosing OP risks, the level of Ca use was found to be low and the obtained results were similar to these studies [15,16].

Non-Rational drug use (N-RDU) is the most basic health problem in the world, especially in developing countries. Among the main problems identified in the studies investigating N- RDU samples, such cases as excessive drug prescription (polypharmacy), drug use without association with the diagnosis, inappropriate use of antibiotics, very expensive drug use, improper treatment of the people by themselves with over-the-counter drugs or with non-prescription drugs in spite of being prescription drugs were observed. In N-RDU, which is within the limits of the concept of patient incompliance, incorrect or non-false drug knowledge as an individual factor, false beliefs and obsessions, improper expectations and demands, and self-treatment (self-medication) in a common way were identified as problems with the patient. In the study group, the rate of drug use without a prescription and physician recommendation (17.6%) which could be evaluated within the scope of N-RDU was found. N-RDU behaviour was higher in males. This was more common in individuals with lower secondary education, in other words in individuals with low levels of education [17,18].

With regard to OP, females were more getting information from doctor than males. Men (43.2%) and women (17.6%) responded to the question of the source of information as the internet. In the studies conducted, radio, television, internet, mass communication tools, health professionals were mentioned as an information source of OP. This study has similarities with the literature [19].

Regarding the drug use characteristics, when the education level of those who answered yes to the question of whether you used Cortisone for more than three months in the 3rd Question, those who were at primary level ($p = 0.003$), in other words, those with low health literacy were more frequently using it.

As an example of N-RDU, the use of painkillers at frequent intervals can be illustrated. Relatively few participants (13.6%) were using painkillers at frequent intervals.

However, there are some risks involved when DXA measurement is handled both economically and health. Countries' shares of health with varying degrees of development may vary and it is not always easy to reach places where DXA is located. When OP is considered as a chronic disease and public health problem, it can be thought that it will benefit all aspects of early diagnosis and early treatment. What is essential in the fight against OP disease is primary protection. Strategies for early identification and identification of risks covering all segments of society mean gain in every aspect. Multidisciplinary approaches facilitate the solution of the problem. Official authorities, local authorities, education, media cooperation are the main stakeholders, especially in the health sector. In the early diagnosis of OP, "the one- minute OP risk test" has an important role in early diagnosis tests. Another case which was evaluated pharmacologically and ethically was to examine the results of the study group for non-pharmacological treatment. İn our study 60% over 50 ages individuals have chronic diseases. This results similar literatures.

Smoking cessation treatment is important in the treatment of OP. It is applied to improve the quality of life, reduce the side effects of OP symptoms, and provide physical and psychological support. In our study, the average frequency of smoking was more (mean: 0.14). The results were similar to the literature [20].

According to studies of Yılmaz and et al., drug compliance was found to be higher in the ones who are married than the ones who are single/divorced, in the ones who worked in the white collar professing groups than the ones were in the other groups, in the ones have health literacy than ones have low health literacy, in the ones who have information about the drugs that they use than the ones who do not [21, 22].

The study group consisted of Academic and Administrative staff. The level of education was generally in the university level. The internet knowledge of OP was higher in males and in participants aged 20-29 and in single participants. It was composed of participants with low OP risk. İn our study when the health checks were compared according to their income levels, as the level of income increased, the importance given to the health of individuals increased.

Identifying individuals with risk groups for osteoporosis, handling the issues of the need for information, education, treatment, care, benefit, not to have gender discrimination, not damaging patient autonomy, and not harming this are expected from the health care services and from the point of treatment and care, these should be designed accordingly [6,23,28,29].

Conclusions

Rational drug use is a form of behaviour that can universally be applicable to all ages and communities. Osteoporosis risk factors are mainly used for the identification of people at risk of developing osteoporosis. Individuals exposed to these risk factors may develop osteoporosis after a certain period of time. In order to be protected from OP, it is necessary to increase the awareness level of individuals through comprehensive training. Importance should be given to the fact that the training, primarily from the family, will be inclusive of individuals with different levels of education. Although OP is seen as a female disease, it carries a significant risk for both genders. "The One-Minute Osteoporosis Risk Test" to fight against OP disease can be planned for all sections of the society; its implementation can be started and made widespread. In this study we have presented, we aimed to draw more attention to osteoporosis awareness today. We think that it will contribute to future studies.

Organizing and implementing OP treatment and developing ethical sensitivity in the community related to the point in line with the principles of rational drug use will be positively contributed to the success of treatment.

Conflict of Interest

None declared.

Authorship Statement

ND and FO conceived the study, designed the research. All Authors drafted and revised the manuscript.

References

[1]. Leslie, W.D., Morin, S.N. (2014). Osteoporosis epidemiology 2013: implications for diagnosis, risk assessment, and treatment. Curr Opin Rheumatol, 26(4):440–6. doi:10.1097/bor.0000000000000064.

[2]. Kanis, J.A., Mc.Closkey, E.V., Johansson, H., Cooper, C., Rizzoli, R., Reginster, J.Y. (2013). European guidance for the diagnosis and management of osteoporosis in postmenopausal women. Osteoporos Int; 24:23-57. doi: 10.1007/s00198-008-0560-z

[3]. Yavuz, D. (2011). Osteoporosis: Epidemiology, Clinic and Diagnosis. Turkiye Klinikleri J Endocrin Special Topics, 4(2): 28-32.

[4]. Dinçer, G., Kars, E.Y. (2008). Clinic of Osteoporosis and Risk Factors Turkiye Klinikleri J Orthop & Traumatol-Special Topics, 1(3):27-31.

[5]. Agrawal, N.K., Sharma, B. (2013). Prevalence of osteoporosis in otherwise healthy Indian males aged 50 years and above, Arch Osteoporos 8:116. doi: 10.1007/s11657- 012-0116-x.

[6]. Ogenler, O. (2016). Yaşlılara Yönelik Evde Bakım hizmetlerinde Etik Sorunlar. Turkiye Klinikleri J Med Ethics Law Hist-Special Topics 2(2):54-60.

[7]. Wong, C.P., Lok, M.K., Wun, Y.T., Pang, S.M. (2014). Chinesemen's knowledge and risk factors of osteoporosis: compared with women's. American Journal of Men's Health; 8(2):159-66.doi.org/10.1177/1557988313503981.

[8]. Aslan, A., Sargın, S., Özmeriç, A., Yağcı, Ş. (2014). Treatments of patients with postmenopausal osteoporosis: a comparative study. OA Musculoskeletal Medicine, 2(1): 4.

[9]. Lewiecki, E.M., Binkley, N., 284 Morgan, S.L., Shuhart, C.R., Camargos, B.M., Carey, J.J. (2016). Best Practices for Dual-Energy X-ray Absorptiometry Measurement and Reporting: International Society for Clinical Densitometry Guidance, J Clin Densitom 19:127-40. doi:org/10.1016/j.jocd.2016.03.003. 287

[10]. Montalcini, T., Gallotti, P., Coppola, A., Zambianchi, V., Fodaro, M., Galliera, E. (2015). Association between low C peptide and low lumbar bone mineral density in postmenopausal women without diabetes. Osteoporosis International Journal, 26(5):163946.doi: 10.1007/s00198-015-3040-2.

[11]. Ozdemir, F., Demirbağ, K. D., Süt, N., Kurtoğlu, K.D., Demir Y. Ş, Uzunali, M. (2009). Osteoporoz Risk Testi Sonuçlarının Kemik Mineral Yoğunluğu ile İlişkisi. Türk Osteoporoz Dergisi.15:75-8.

[12]. Eryavuz, M., Akyüz, G., Kut sal, Y.G., Ardıç, F. (2002). Osteoporozu olan Türk kadınlarında karakteristik özellikler: Çok merkezli çalışma. Osteoporoz Dünyasından, 8:21-26.

[13]. Onat, S.S., Delialioğlu, S.Ü., Biçer, S., Özel, Ö. (2013). Depression in Osteoporosis and Effects on Quality of Life. Türk Os teoporoz Dergisi; 19: 58-62 doi:10.4274/tod.25238.

[14]. Bianchi, M.L.,Orsini, M.R., Saraifoger, S., Ortolani, S., Radaelli, G., Betti, S. (2005). Quality of life in postmenopausal osteoporosis. Health Qual Life Outcomes, 3:78. doi.org/10.1186/1477-7525-3-78.

[15]. Sindel, D. (2013). Osteoporosis Treatment at Present and in the Future, Turk J Phys Med Rehab 59:330-7. doi: 10.4274/tftr.08455.

[16]. Altın, E., Karadeniz, B., Türkyön, F., Baldan, F., Akkaya, N., Atalay, N.Ş., Şahin, F. (2014). Kadın ve erkek yetişkinlerde osteoporoz bilgi ve farkındalık düzeyinin karşılaştırılması. Türk Osteoporoz Dergisi, 20: 98-103.doi: 10.4274/tod.42650.

[17]. Sürmelioğlu, N., Kıroğlu, O., Erdoğdu, T., Karataş, Y. (2015). Measures for Prevention of Irrational Drug Use. Archives Medical Review Journal, 24(4):452-462.

[18]. Aydın, B., Gelal, A. (2012). Ratıonal Drug Use: Promotıon and the Role of Medıcal Educatıon. DEÜ Tıp Fakültesi Dergisi, 26:57-63.

[19]. Puttapitakpong, P., Chaikittisilpa, S., ,Panyakhamlerd, K., Nimnuan, C., Jaisamram, U., Taechakraichana, N. (2014). Inter-correlation of know- ledge, attitude, and osteoporosis preventive behaviors in women around the age of peak bone mass. BMC Women's Health, 14(1):35. doi: 10.1186/1472-6874-14-35.

[20]. Tascilar, M., De Jong, F.A., Verweij, J., Mathijssen, R.H. (2006). Complementary and alternative medicine during cancer treatment: beyond innocence. The Oncologist, 11:732-41. doi: 10.1634/theoncologist.11-7-312 732.

[21]. Yılmaz, F., Çolak, M.Y. (2018). Evaluation of Beliefs about Medicines and Medication Adherence among Elderly People with Chronic Diseases. Turkiye Turkiye Klinikleri J Health Sci, 3(2):113-21. doi: 10.5336/healthsci.2017-58835.

[22]. Etemadifar, M.R.,Nourian, S.M., Fereidan., E. M., Shemshaki, H., Nourbakhsh, M.,, Zarezadeh, A. (2013). Relationship of knowledge about osteoporosis with education level and life habits. World J Orthop, 318 4(3):139-43. doi: 10.5312/wjo.v4.i3.139.

[23]. Xu, Ni .C.,Yu, R., Gu, G., Wang, Z., Zheng, G. (2017). Risk factors for distal Radius fracture in postmenapausal women. Der Orthopade, 46:447-50. doi: 10.1007/s00132- 017-3403-9.

[24]. Povoroznyuk V. V., Dzerovych N. I., Evaluatıon of the Valıdıty of The of One-Mınute Osteoporosıs Rısk Test For Postmenopausal Women, Gerontologija 2008; 9(1): 15–20.

[25]. Üstündağ N, Korkmaz M, Öksüzkaya A., ve ark, Osteoporozun Sınıflandırılması, Risk Faktörlerinin Belirlenmesi ve Bir Dakikalık Osteoporoz Risk Testi, Euras J Fam Med 2013; 2(3):107-114.

[26]. Özdemir F, Kabayel DD, Süt N, DK Koçan, ŞD Yazıcı, M Uzunali. Osteoporoz Risk Testi ve Kemik Mineral Yoğunluğu. Osteoporoz Dünyası 2009; 15(8):75-8.

[27]. Classification of Overweight and Obesity by BMI, Waist Circumference, And Associated Disease Risks," http://www.nhlbi.nih.gov/health/public/heart/obesity/lose wt/bmi dis.htm. Date of Access 25.09.2020.

[28]. Aydın T. Awareness of Osteoporosis in Orthopaedic Surgeons. Turk J Osteoporos 2020; 26: 63-9. DOI: 10.4274/tod.galenos.52533.

[29]. Kanis JA, Cooper C, Rizzoli R, Reginster JY; Scientific Advisory Board of the European Society for Clinical and Economic Aspects of Osteoporosis (ESCEO) and the Committees of Scientific Advisors and National Societies of the International Osteoporosis Foundation (IOF). European guidance for the diagnosis and management of osteoporosis in postmenopausal women. Osteoporos Int 2019; 30: 3-44. (3) (PDF) Awareness of Osteoporosis in Orthopaedic Surgeons.