

Knowledge of osteoporosis in middle-aged and elderly women

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ABSTRACT

الأهداف: تحديد مدى معرفة واحتياج المرأة السعودية في منتصف العمر، وكبار السن في موضوع هشاشة العظام.

الطريقة: أجريت دراسة مقطعية عرضية تحليلية باستخدام استبيان محدد في 368 امرأة حضرن العيادة في مركز الرعاية الصحية الأولية (PHCC) في ديارب - الرياض - المملكة العربية السعودية خلال الفترة من يناير إلى يوليو 2006م.

النتائج: كانت نسبة 76% في مرحلة بعد انقطاع الطمث. سمع 62% عن هشاشة العظام. كانت لدى المرأة الشابة معرفة أكثر عن هشاشة العظام. تراوحت نسبة عوامل الخطر عند المشتركين من ضعيف إلى جيد. ذكر 60% بأن انخفاض نسبة الكالسيوم المتناول هو أحد الأسباب. أرجع 39% السبب إلى قلة الرياضة، بينما أرجع 22% من العينة السبب إلى التاريخ العائلي لترقق العظم. تمكن 48% من المشاركات من التعرف على الأطعمة الغنية بالكالسيوم.

خاتمة: لا يدرك عدد كبير من السعوديات في منتصف العمر وكبار السن عوامل خطر الإصابة بهشاشة العظام. ينبغي أن يكون هناك مصادر للمعلومات التي يمكن الوصول إليها بسهولة للمرضى المعرضين للمخاطر العالية للإصابة بهشاشة العظام.

Objectives: To determine knowledge of osteoporosis in middle-aged and elderly Saudi women, and to identify women in need of education on osteoporosis.

Methods: We conducted this cross-sectional analytical study of 368 women who attended the well-person clinic in a primary health care center (PHCC) in the Dirab area, Riyadh, Saudi Arabia between January and July 2006, using a validated questionnaire.

Results: Seventy-six percent of women were postmenopausal, 62% had heard of osteoporosis, and younger women had more knowledge of this disease. The identification of risk factors by the participants ranged from poor to fair. Sixty percent of women identified low calcium intake, lack of exercise was

identified as a risk factor in 39%, and 22% identified family history of osteoporosis. Only 48% of the participants could correctly identify calcium rich foods.

Conclusion: A considerable number of the Saudi middle-aged and elderly women are unaware of osteoporosis risk factors. Information resources should be easily available for those at high risk.

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Osteoporosis is a systemic skeletal disease characterized by low bone mass and micro architectural deterioration of bone tissue with a consequent increase in bone fragility and susceptibility to fracture.¹ The prevalence of osteoporosis in post menopausal Saudi women was found to be 24.3% in the age group 50-59 years, 62% in the age group 60-69 years, and 73.8% in the age group 70-79 years.² Recently, a prospective clinical study conducted in the orthopedic inpatient ward showed that 46% of postmenopausal Saudi women were osteoporotic, and 31.6% were osteopenic.³ Low bone mineral density (BMD) increases the risk of fractures as noticed at the 12-month follow-up in the National Osteoporosis Risk Assessment study.⁴ Postmenopausal women 50 years and older with no previous diagnosis of osteoporosis, but a T-score of -2.5 or lower had an adjusted fracture risk 2.74 times higher than the risk in women with a normal BMD.⁴ The U.S. Preventive Services Task Force

(USPSTF)⁵ recommends BMD screening for women 65 years and older without risk factors. Screening should begin at 60 years in women who are at increased risk for osteoporotic fractures. The USPSTF makes no recommendation for or against BMD screening in postmenopausal women who are younger than 60 years or women aged 60-64 years who are not at increased risk for fractures. Prevention is the most cost-effective means of managing osteoporosis. It includes adequate nutrition, weight bearing, exercise, and healthy life styles. The first step in the prevention of osteoporosis in women should be to make them aware of the risk factors.⁶ The objectives of the present study are to determine the awareness and knowledge of risk factors toward osteoporosis in middle aged and elderly women in Saudi Arabia.

Methods. We conducted this cross-sectional analytical study at a well-person clinic in the primary health care center (PHCC) in the Dirab area that is part of King Abdul-Aziz Medical City in Riyadh, Saudi Arabia between January and July 2006. Middle-aged and elderly women (40 years old and above) comprised the study population. Candidates were defined as any woman eligible for treatment in the clinic who presented at the time of data collection. Employees working at the Dirab PHCC were excluded. The formula $N = (Z)^2 \times p(1-p) / d^2$ was applied to calculate the study sample where (d) means precision and was estimated at 0.05, and Z indicates the confidence interval that is represented as 1.96, and the expected prevalence based on El-Desouki's study² of p is estimated to be 40%. The study sample was calculated to be 368. Simple random sampling of the clinic attendees during the study period was carried out if they met the inclusion criteria. Data were collected using a structured validated questionnaire. It was modified and adopted after review of questionnaires used in previous studies,⁷ and consists of 31 items. The first 7 questions relate to socio-demographic data. Questions 8, 9, and 10 pertain to height, weight, and body mass index (BMI). The remaining questions aimed to determine the awareness and knowledge of risk factors of osteoporosis. Two independent translators translated the original questionnaire into Arabic, and a pilot study was carried out on 10 patients to ensure accuracy and simplicity. Questionnaires were completed during face-to-face interviews conducted by an expert Arabic nurse. Another nurse measured height, weight, and BMI. This process was carried out during low usage times at the clinic to optimize the accuracy of data collection and documentation. The questionnaires were collected by the researcher to increase the response rate and to save time. Informed consent was obtained from each study participant, and ethical approval was obtained from

the Family & Community Medicine ethics committee. Participant information confidentiality was guaranteed, and all data were used for research purposes only.

All data were verified, coded, and analyzed using the Statistical Package for Social Sciences (SPSS Inc., Chicago, IL, USA) version 16. Data were presented as mean and standard deviation for quantitative variables, and proportions and percentage for qualitative variables. Chi-square was used to evaluate differences in proportions. Independent t-test was used to evaluate differences in means; analysis of variance (ANOVA) was used for comparing more than 2 means. Regression analysis was used to adjust for any confounding variables. $P < 0.05$ was considered significant.

Results. The participant's age ranged between 50-59 years in 32.9% of subjects. Married women represented 77.4%, and postmenopausal women represented 76%. Most women were illiterate (80.4%), and 98.1% listed their occupation as housewife. The mean height of participants was 156 ± 6.2 cm, mean weight was 67.7 ± 13.5 kg, and mean BMI was 27.8 ± 5.6 . Osteoporosis background of participants showed that 62% of women in this study had not heard of osteoporosis before. The sources of osteoporosis-related information included the treating physician (38%), television (32%), and friends (12%). The results of women's knowledge of osteoporosis (KOS) assessed by 12 items in the questionnaire, are summarized in Table 1. The results indicated that women are relatively aware of the elderly as the most commonly affected age group, of the role of sun exposure as protective for osteoporosis, and of the protective role of calcium-rich food, with scores between 54-60%. Women showed poor knowledge on other important topics regarding osteoporosis. The remaining 9 questions in this section scored less than 23%, especially questions related to first

Table 1 - Study populations (N=368) answers to the simplified form of questions on knowledge of osteoporosis.

Question	Correct answer	n (%)*
Osteoporosis is common in which age group?	Elderly	202 (55)
First symptom of osteoporosis is pain?	No	74 (20)
Osteoporosis can lead to loss of height?	Yes	143 (39)
Osteoporosis is more common in males than females?	No	134 (37)
Foods rich with calcium protect from osteoporosis?	Yes	221 (60)
Which of the following foods are rich with calcium?	Milk	176 (48)
Coffee consumption is protective for osteoporosis?	No	143 (39)
Lack of exercise is a risk factor for osteoporosis?	Yes	144 (39)
Sun exposure is protective for osteoporosis?	Yes	198 (54)
Alcohol consumption is a risk factor of osteoporosis?	Yes	85 (23)
Family history of osteoporosis is a risk factor?	Yes	82 (22)
Smoking may be a risk factor of osteoporosis?	Yes	144 (39)

*rounded-off to the nearest whole number

Table 2 - Knowledge score of osteoporosis.

No. of questions answered correctly	Score	n (%)	Cum %
0	0%	54 (14.7)	14.7
1-3	≤25%	94 (25.5)	40.2
4-6	>25-≤50%	89 (24.2)	64.4
7-9	>50-≤75%	105 (28.5)	92.9
10-12	>75%	26 (7.1)	100.0
Total		368 (100)	

Student t-test 28.3, degrees of freedom - 367, $p>0.001$

Table 3 - Relationship between educational level and knowledge of osteoporosis (KOS).

KOS	Illiterate	Primary	Inter	Second	Uni	Total
0%	54	0	0	0	0	54
≤25%	86	5	1	2	0	94
>25-≤50%	81	6	1	0	1	89
>50-≤75%	62	20	13	5	5	105
>75%	13	10	0	1	2	26
Total	296	41	15	8	8	368

Inter - intermediate, Second - Secondary, Uni - University

Table 4 - Relationship between age group and knowledge of osteoporosis (KOS).

KOS	40-49	50-59	60-69	≥70	Total
0%	1	0	33	20	54
≤25%	6	28	47	13	94
>25-≤50%	26	40	21	2	89
>50-≤75%	64	42	16	1	105
>75%	14	11	0	1	26
Total	93	121	117	37	368

Table 5 - Relationship between body mass index and knowledge of osteoporosis (KOS).

KOS	Low (<18.5)	Normal (18.5-24.9)	High (>25)	Total
0%	0	53	1	54
≤25%	11	8	75	94
>25-≤50%	1	26	62	89
>50-≤75%	0	21	84	105
>75%	1	2	23	26
Total	13	110	245	368

Table 6 - Relationship between women with type 2 diabetes mellitus and knowledge of osteoporosis (KOS).

KOS	Diabetic	Not diabetic	Total
0%	1	53	54
≤25%	15	79	94
>25-≤50%	29	60	89
>50-≤75%	38	67	105
>75%	7	19	26
Total	90	278	368

symptom of osteoporosis, alcohol as a risk factor, and role of family history as a risk factor. Items dealing with KOS were scored correctly only 7.1% (Table 2). The most common medical problem encountered in our sample was type 2 diabetes mellitus (T2DM, 24.5%) followed by hypothyroidism in 6.5% of subjects. Loop diuretics were used by 7.3% of participants, thyroxine by 4.9%, heparin by 1.3%, and steroids by 1.6%. There was a positive correlation between the level of education and KOS score. However, the 14.7% of women who scored 0% on KOS belonged to the illiterate group ($p=0.001$) (Table 3). There was an inverse correlation between age and KOS (Table 4). There was a highly significant correlation between low BMI and low KOS. Twelve women out of 13 with a low BMI scored ≤50% on KOS ($p=0.001$, Table 5). Of the 24.5% diabetic women in our study, 50% had a KOS score ≤50% ($p=0.001$, Table 6).

Discussion. In this study, most of the participants were 50 years old or older, and most were postmenopausal and illiterate. This group of women is at a particularly higher risk of developing osteoporosis, and is the most appropriate group to have their osteoporosis knowledge explored. The mean BMI of participants was 27.8 ± 5.9 kg/m², similar to a study carried out among Mexican-American women⁶ with a BMI of 29 ± 5.7 kg/m². The high BMI could be explained by the high prevalence of overweight and obesity in our country. Other probable factors could be due to 98.1% of participants being housewives. Sixty-two percent of the sample had heard of osteoporosis, which is higher than a population-based survey conducted in Singapore,⁸ which included middle aged and elderly women and reported 58% having heard of osteoporosis, with the main sources of information on osteoporosis being the mass media and friends. In our study, the main (39%) source of information was physicians followed by the mass media. Education is known to have a positive influence on public health measures. In our study, 22% of participants were aware of family history of osteoporosis as a risk factor, 37.2% agreed that female gender is a risk factor, 39% identified coffee consumption as a risk factor for osteoporosis, and 64.4% scored 50% or less on the KOS score. These findings showed the significantly low degree of general knowledge of osteoporosis. Although they might not be considered surprising for our population, as 80% are illiterate, and 74% of are menopausal, these findings are alarming.

According to a study carried out in the Family Medicine Department of the Middle East Technical University in Turkey⁷ among 270 women, average age 41.3 years old, 62% of whom were postmenopausal, only 2% were illiterate, and 23.7% scored 50% or less.

The study concluded that more than 65% were unaware that disease is directly responsible for disabling hip fracture, and more than 40% were unable to identify significant risk factors. Only 36% of the respondents could correctly identify the calcium-rich food among the choices, 60.4% of women were aware of family history of osteoporosis as a risk factor, 58.2% of participants agreed that female gender was a risk factor, and 45.6% identified coffee consumption as a risk factor for osteoporosis. Among the women included in our study, 39% were aware of the role of exercise. Differences may be due to differences in education level, the type of questionnaire, and the sample size differences of the 2 studies. In our study, 60% of women identified low calcium intake as risk factor. However, only 48% of participants could correctly identified calcium-rich food among the choices. According to a study among Mexican-American women,⁶ 85.7% of women identified low calcium intake as a risk factor for osteoporosis. Higher level of education and younger age correlated with higher KOS scores. This finding is similar to a study carried out in 1065 women aged 16-72 years attending a Family Medicine Clinic in Poland.⁸ The results of the current study indicate that 92% of women with low BMI, 88% of elderly, and 50% with type 2 DM scored $\leq 50\%$ on KOS. Women with such characteristics are at high risk to develop osteoporosis, and effort is required to improve their knowledge.

A limitation of this study is that the study population came from a small local region, therefore, this may limit the generalizability of our results to all women in Saudi Arabia. We recommend conducting public seminars and designing leaflets on osteoporosis in addition to personal efforts to increase awareness among women at risk while there is a chance of reducing the risk. The facts emerging from this study also have important implications for future planning of health promotion in primary healthcare services in KSA. The high daily workload of family physicians and other primary health care workers indicates the need for other effective promotional instruments such as television programs and newspaper messages organized by the national

health authority. Therefore, this is the responsibility of health policy planners, medical associations, and other non-governmental organizations. Further research needs to be carried out in different areas of KSA to assess the extent of the problem.

In conclusion, according to our study, a considerable number of Saudi women are unaware of the risk factors for osteoporosis. A superficial familiarity with osteoporosis may be giving women a false sense of security about the disease, its severity, and its potential impact on their lives. Thus, the disease should be one of the major topics of health promotion in family practice to meet women's educational needs and thereby enhance the quality of their life in older age.

References

1. NIH Consensus Development Panel on Osteoporosis Prevention, Diagnosis, and Therapy. Osteoporosis prevention, diagnosis, and therapy. *JAMA* 2001; 285: 785-795.
2. El-Desouki MI. Osteoporosis in postmenopausal Saudi women using dual x-ray bone densitometry. *Saudi Med J* 2003; 24: 953-956.
3. Sadat-Ali M, Al-Habdan IM, Al-Mulhim FA, El-Hassan AY. Bone mineral density among postmenopausal Saudi women. *Saudi Med J* 2004; 25: 1623-1625.
4. Zizic TM. Pharmacologic prevention of osteoporotic fractures. *Am Fam Physician* 2004; 70: 1293-1300.
5. Nelson HD, Helfand M, Woolf SH, Allan JD. Screening for postmenopausal osteoporosis: a review of the evidence for the U.S. Preventive Services Task Force. *Ann Intern Med* 2002; 137: 529-541.
6. Orces CH, Casas C, Lee S, Garci-Cavazos R, White W. Determinants of osteoporosis prevention in low-income Mexican-American women. *South Med J* 2003; 96: 458-464.
7. Ungan M, Tümer M. Turkish women's knowledge of osteoporosis. *Fam Pract* 2001; 18: 199-203.
8. Saw SM, Hong CY, Lee J, Wong ML, Chan MF, Cheng A, et al. Awareness and health beliefs of women towards osteoporosis. *Osteoporos Int* 2003; 14: 595-601.
9. Drozdowska B, Pluskiewicz W, Skiba M. Knowledge about osteoporosis in a cohort of Polish females: the influence of age, level of education and personal experiences. *Osteoporos Int* 2004; 15: 645-648.