

## **Knowledge, practice and barriers in management of Osteoporosis.**

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### **Abstract**

Osteoporosis is one of the commonest silent diseases leading to high morbidity and mortality. The challenge for Primary Health Care (PHC) physicians is to prevent, diagnose, and treat osteoporosis before fractures occur. The lack of knowledge about this disease is considered as an important barrier to appropriate risks identification and management of this common health problem. The objectives were to measure the knowledge of PHC physicians regarding osteoporosis, to determine their practice, and to identify the barriers facing them in management of osteoporosis. A cross sectional study using self-administered validated questionnaire distributed to all PHC physicians working in the Ministry of Health in Abha city was used. The questionnaire contains 47 questions to assess the knowledge. The level of knowledge was calculated as (number of correct answers/total answers×100). A 61% to 75%, and 76% to 85%, were considered as good knowledge and very good knowledge respectively while  $\geq 86\%$  was considered as excellent knowledge. Data were analyzed using Statistical Package for Social Sciences Version 20 (SPSS V.20). The response rate was 92%. A total of 66 PHC physicians were included in this study with mean age  $36\pm 7$  years and 79% were males. A 52% were general physicians followed by 36% family physicians and 12% of other specialties. The main percentage of correct response was 67%. The percentage of correct response was significantly associated with age and reading about osteoporosis. Overall Knowledge was good in 54.5% and poor in 25.8% of participants. But the average overall score of knowledge was 67%, which is considered as good knowledge. Knowledge about risk factors was good in 50.0% of participant and excellent, very good and poor in 9.1%, 22.7% and 18.2% consecutively. Knowledge about DEXA indications was very good in 31.8%, excellent in 30.3%, good in 25.8% and it was poor in only 12.1% of participants. Knowledge about management of osteoporosis was poor in 62.1% of the participants and was good in 33.3% of participants and very good and excellent in only 1.5% and 3.0% consecutively. The high percent of poor knowledge about osteoporosis among PHC physicians needs more attention to find out the reasons and to improve the education and training of physicians especially about the management of this prevalent disease. Also, insignificant association between family medicine specialty and degree of knowledge about osteoporosis needs further improvement of family medicine program in Abha city.

**Keywords:** Primary Health Care Physicians, Osteoporosis, Practice, Diagnosis, Management

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### **Introduction**

Osteoporosis is defined as 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 fractures [1]. The clinical relevance of osteoporosis is derived not only from the increase in morbidity and mortality, but also the pain, physical impairment, and loss of functional ability that have an important impact on patients' quality of life [2]. It also entails significant cost to society: hospitalization

costs are increased as are medical tests, length of stay in nursing homes and consulting rooms, as well as the costs associated with patients' diminished activity [3].

Osteoporosis currently affects more than 75 million in the USA, Europe and Japan [4]. In Saudi Arabia it was reported from different centers that the prevalence of postmenopausal Osteoporosis range between 50-70% [5].

In order to disseminate knowledge about osteoporosis, many international organizations developed guidelines to

aid physicians in diagnosis and management of osteoporosis [6]. The role of general physicians in managing patients with osteoporosis has increased considerably so that researches in Australia and the United States had examined general physicians attitudes and knowledge regarding the diagnosis of osteoporosis and its management [7]. The aim of this study is to measure the knowledge of PHC physicians regarding osteoporosis, to determine their practice toward osteoporosis, and to identify the barriers facing them in management of osteoporosis.

## Methodology

This is a cross sectional study using self-administered validated questionnaire divided into 4 parts; demographic characteristics, assessment of general practice toward osteoporosis, barriers facing physicians in dealing with osteoporosis and knowledge assessment by 47 questions about risk factors of osteoporosis, indications of Dual-energy X-ray absorptiometry (DEXA) and osteoporosis management. The information of the questionnaire was collected from well-published studies. The validity of the questionnaire was assessed by pilot study and it was reviewed by consultant endocrinologist, epidemiologist and family physician.

Questionnaires were distributed to all PHC physicians working in the Ministry of Health in Abha city. Data collected were analyzed using SPSS V20 software. The level of knowledge was calculated as (number of correct answers/total answers×100).

Descriptive data were presented as frequencies and percentages. A 61% to 75% and 76% to 85% were considered as good knowledge and very good knowledge respectively while  $\geq 86\%$  was considered as excellent knowledge.

The association of the overall knowledge to independent variables was tested using T-test and ANOVA tests when applicable. A P value  $\leq 0.05$  was considered significant. This study was approved by directorate of health affairs at Aseer region and by the institutional review board at King Khalid University, College of Medicine Research Center.

## Results

The response rate was 92%. A total of 66 PHC physicians ( $n=66$ ) were included in this study with mean age  $36\pm7$  years and mean period of experience  $7.5\pm5.6$  years. Other demographic characteristics are shown in Table 1.

The general practice of PHC physicians toward osteoporosis is summarized in Table 2.

Barriers toward diagnosis and management of osteoporosis by PHC physicians are shown in Table 3.

PHC physicians' answers to the knowledge assessment questions are shown in Table 4.

**Table 1.** Demographic characteristics

Characteristic	Frequency (n)	Percent (%)
Sex		
Male	52	78.8
Female	14	21.2
Nationality		
Saudi	32	48.5
Non Saudi	34	52.5
Degree		
Diploma	4	6.1
Bachelor	50	75.8
Master	4	6.1
Board/PhD	7	10.6
Job Title		
Resident	58	87.9
Specialist	5	6.6
Consultant	2	3.0
Others	1	1.5
Specialty		
General Physician	34	51.5
Family Medicine	24	36.4
Obstetric & Gynecology	1	1.5
Pediatrics	2	3.0
Dentistry	1	1.5
Others	1	1.5
Have enough information about osteoporosis before graduation		
Yes	32	48.5
No	34	51.5
Attend any course about osteoporosis		
Yes	26	39.4
No	38	57.6
Read about Osteoporosis		
Yes	51	77.3
No	15	22.7
Sources of reading		
Books	37	56.1
Journals	7	10.6
Articles	7	10.6

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**Table 2. General practice**

<b>General practice</b>	<b>Yes % (n)</b>	<b>No % (n)</b>
Diagnose osteoporosis patient in last 3 years	31.8 (21)	66.7 (44)
Follow up osteoporosis patient	19.7 (13)	77.3 (51)
Educate of osteoporosis patient	81.8 (54)	16.7 (11)
Know about Saudi National Osteoporosis guideline	18.2 (12)	77.3 (51)
Use Bone profile (Alkaline phosphatase, Calcium, phosphate) in investigation for osteoporosis	56.1 (37)	33.3 (22)
Use parathyroid hormone in investigation for osteoporosis	54.5 (36)	34.8 (23)
Use 25-hydroxy vitamin D, 1,25-dihydroxyvitamin D3 in investigation for osteoporosis	50.0 (33)	36.4 (24)
Use plain X ray in investigation for osteoporosis	53.0 (35)	34.8 (23)
Use DEXA in investigation for osteoporosis	97.0 (64)	3.0 (2)
Use bone makers (Genetic Workup)	30.0 (20)	48.5 (32)
Counsel male patients about risk factors of osteoporosis	45.5 (30)	18.2 (12)
Counsel female patients about risk factors of osteoporosis	71.2 (47)	1.5 (1)
Counsel postmenopausal patients about risk factors of osteoporosis	71.2 (47)	3.0 (2)
Counsel elderly patients about risk factors of osteoporosis	68.2 (45)	6.1 (4)
Counsel smoker patients about risk factors of osteoporosis	66.7 (44)	7.6 (5)
Counsel steroid used patients about risk factors of osteoporosis	71.2 (47)	4.5 (3)
Counsel patients about physical exercise	75.8 (50)	24.2 (16)
Counsel patients about sun exposure	69.7 (46)	6.1 (4)
Counsel patients about healthy diet	75.8 (50)	24.2 (16)
Counsel patients about smoking	71.2 (47)	3.0 (2)
Counsel patients about supplement of Calcium and Vitamin D	65.2 (43)	10.6 (7)

**Table 3. Barriers facing PHC physicians**

<b>Barriers</b>	<b>Yes % (n)</b>	<b>No % (n)</b>
PHC physicians should not deal with osteoporosis	19.7 (13)	75.8 (50)
PHC physicians don't have enough osteoporosis training to deal with osteoporosis	86.4 (57)	12.1 (8)
No available guideline for osteoporosis	87.9 (58)	9.1 (6)
DEXA is unavailable	92.4 (61)	4.5 (3)
DEXA is unnecessary	9.1 (6)	86.4 (57)
PHC physicians are unfamiliar with interpretation of DEXA	71.2 (47)	24.2 (16)
Empirical treatment for all high risk patients is enough and no need for DEXA	24.2 (16)	71.2 (47)
Antireorptive medications are unavailable	75.8 (50)	19.7 (13)
Antireorptive medications are expensive	65.2 (43)	22.7 (15)
Antireorptive medications have side effects	36.4 (24)	50.0 (33)

Table 4. Knowledge assessment questions

Question	Yes % (n)	No % (n)	DK % (n)
Dietary habits have role in osteoporosis	92.4 (61)	4.5 (3)	1.5 (1)
Exercise is important in prevention of osteoporosis	90.9 (60)	6.1 (4)	1.5 (1)
Exposure to sun light is unnecessary	15.2 (10)	83.3 (55)	1.5 (1)
Under weight is protective of osteoporosis	10.6 (7)	80.3 (53)	6.1 (4)
Osteoporosis can be secondary to some diseases	98.5	1.5 (1)	0.0 (0)
Osteoporosis is unavoidable complication of aging	37.9 (25)	51.5 (34)	6.1 (4)
Osteoporosis if female disease only	1.5 (1)	93.9(62)	1.5 (1)
Osteoporosis is financial issue for patient and community	81.8 (54)	9.1 (6)	7.6 (5)
DEXA is gold slandered in diagnosis of osteoporosis	92.4 (61)	1.5 (1)	4.5 (3)
Low Vitamin D intake is risk factor for osteoporosis	95.5 (63)	4.5 (3)	0.0 (0)
Low Calcium intake is risk factor for osteoporosis	97.0 (64)	3.0 (2)	0.0 (0)
Physical inactivity is risk factor for osteoporosis	98.5 (65)	1.5 (1)	0.0 (0)
Menopausal is risk factor for osteoporosis	100 (66)	0.0 (0)	0.0 (0)
Smoking is risk factor for osteoporosis	97.0 (64)	1.5 (1)	1.5 (1)
BMI<22 is risk factor for osteoporosis	57.6 (38)	27.3 (18)	13.6 (9)
Obesity is risk factor for osteoporosis	31.8 (21)	50.0 (33)	18.2 (12)
Family history of osteoporosis is risk factor for osteoporosis	86.4 (57)	6.1 (4)	6.6 (5)
Previous fragility fracture is risk factor for osteoporosis	86.4 (57)	7.6 (5)	6.1 (4)
Black people are less likely to have osteoporosis	59.1 (39)	18.2 (12)	22.7 (15)
Early menopause is risk factor for osteoporosis	93.9 (62)	1.5 (1)	3.0 (2)
Anticonvulsant is risk factor for osteoporosis	57.6 (38)	12.1 (8)	28.8 (19)
Corticosteroid is risk factor for osteoporosis	95.9 (63)	1.5 (1)	3.0 (2)
GnRH analogue is risk factor for osteoporosis	28.8 (19)	27.3 (18)	40.9 (27)
Methotrexate is risk factor for osteoporosis	50.0 (33)	10.6 (7)	36.4 (24)
Heparin is risk factor for osteoporosis	33.3 (22)	21.2 (14)	42.4 (28)
Cyclosporine is risk factor for osteoporosis	54.5 (36)	9.1 (6)	34.8 (23)
Antacids contains Aluminum is risk factor for osteoporosis	16.7 (11)	10.6 (7)	33.3 (22)
Postmenopausal>65 years is indication of DEXA	87.9 (58)	6.1 (4)	6.1 (4)
Female with multi risk factors is indication of DEXA	95.9 (63)	3.0 (2)	1.5 (1)
Low Calcium intake is indication of DEXA	37.9 (25)	47.0 (31)	13.6 (9)
Patient on steroid for long time is indication of DEXA	90.9 (60)	4.5 (3)	3.0 (2)
Body aches is indication of DEXA	18.2 (12)	68.2 (45)	12.1 (8)
Fragility fracture is indication of DEXA	90.0 (60)	6.1 (4)	3.0 (2)
Calcium and Vitamin D is the only treatment of osteoporosis	53.0 (35)	43.9 (29)	1.5 (1)
Bisphosphonate is treatment of osteoporosis	81.0 (54)	4.5 (3)	12.1 (8)
Raloxifene is treatment of osteoporosis	51.5 (34)	13.6 (9)	30.3 (20)
Hormonal Replacement Therapy is treatment of osteoporosis	69.7 (46)	21.2 (14)	3.0 (2)
Parathyroid hormone is treatment of osteoporosis	39.4 (26)	39.4 (26)	19.7 (13)
Vitamin K is treatment of osteoporosis	15.2 (10)	62.1 (41)	19.7 (13)
Calcitonin is treatment of osteoporosis	68.2 (45)	15.2 (10)	16.7 (11)
Strontium is treatment of osteoporosis	21.2 (14)	19.7 (13)	57.6 (38)
To treat high risk patient start Calcium + Vitamin D without investigation	24.2 (16)	65.2 (43)	7.6 (5)
To treat high risk patient start Calcium + Vitamin D with counseling	66.7 (44)	24.2 (16)	7.6 (5)
To treat high risk patient start Calcium + Vitamin D and refer patient for investigation and treatment	77.3 (51)	12.1 (8)	6.1 (4)
To treat high risk patient start Calcium + Vitamin D + antiresorptive medications with or without DEXA	30.3 (20)	36.4 (24)	31.8 (21)
To treat high risk patient refer hem only	19.7 (13)	72.7 (48)	4.5 (3)
To treat high risk patient just give general advise	15.2 (10)	72.7 (48)	9.1 (6)

**Table 5.** Variables associated with degree of knowledge of osteoporosis

Factor	Mean±SD	P value
Age	36±7	0.024
Years of experience	7.5±5.6	0.100
Number of diagnosed case/Year	10.1±8.5	0.155
	<b>Accuracy (%)</b>	
<i>Gender</i>		0.717
Male	66.8	
Female	67.8	
<i>Specialty</i>		0.210
General Physician	65.9	
Family Medicine	69.4	
Others	64.6	
<i>Degree</i>		0.867
Diploma	69.7	
Bachelor	66.6	
Master	68.6	
Board/PhD	67.8	
Attending any courses		0.830
Yes	67.6	
No	67.8	
Reading about osteoporosis		0.004
Yes	68.6	
No	61.7	
Have enough information before graduation		0.441
Yes	66.2	
No	67.8	

**Table 6.** Levels of knowledge

Knowledge	Poor	Good	Very Good	Excellent
Overall knowledge	25.8 %	54.5 %	19.7 %	0.0 %
Knowledge about risk factors	18.2 %	50.0 %	22.7 %	9.1 %
Knowledge about DEXA indications	12.1 %	25.8 %	31.8 %	30.3 %
Knowledge about management	62.1 %	33.3 %	1.5 %	3.0 %

With Regard to knowledge about osteoporosis, the main percentage of correct response in our study was 67% ± 8. The percentage of correct response was significantly associated with age and reading about osteoporosis but not with years of experience, number of cases diagnosed per year, gender, specialty, degree, attending osteoporosis's courses and enough information before graduation as shown in Table 5.

The levels of knowledge are summarized in Table 6.

### Discussion and conclusion

This study associated with educational efforts to sensitize PHC physician about the important of this topic. The most important barriers facing PHC physicians in our study recounted as physicians don't have enough osteoporosis training to deal with osteoporosis, DEXA is unavail

able and physicians are unfamiliar with interpretation of DEXA results, antireorptive medications are unavailable and no available guideline for osteoporosis. These barriers are similar to what was declared in literature, these barriers include lack of knowledge about osteoporosis and risk factors, inadequate training on osteoporosis during medical school, residencies and fellowships, unfamiliarity with screening guidelines, availability of and cost of DEXA devices, lack of clarity in DEXA reports, failure to implement screening in appropriate populations, cost and possible adverse effects of medications [8-10].

More than 50% of physicians in our study don't have enough information about osteoporosis before graduation and 86% don't have enough post graduation training to deal with osteoporosis that is similar to UK physicians who considered the education on osteoporosis is inadequate and educational initiatives will be important both at

undergraduate and postgraduate levels to increase awareness and knowledge of osteoporosis [11].

The main of correct response in our study was 67% compared to 63% in a cross-sectional survey of primary care practitioners in Spain [10]. In this survey, the percentage of correct responses was inversely associated with age and years of practice, and positively associated with specialty of community and family medicine while in our study the percentage of correct responses was significantly associated with age and reading about osteoporosis but not with family medicine specialty as was suspected from literature.

The high percent of poor knowledge about osteoporosis among PHC physicians needs more attention to find out the reasons and to improve the education and training of physicians especially about the management of this prevalent disease. Also, insignificant association between family medicine specialty and level of knowledge about osteoporosis need further improvement of family medicine program in Abha city.

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