



KNOWLEDGE, ATTITUDE, AND PRACTICE OF OSTEOPOROSIS AMONG PHYSICIANS IN PRIMARY HEALTH CARE CENTERS IN AL-AHSA, SAUDI ARABIA, 2017-2018

Fatimah Mohammed Al-Abed¹., Huda Ibrahim Al Subaie² and Majdi Al -Jasim³

¹Saudi Board of Family Medicine Primary Health care Centre, Al Ahsa, Saudi Arabia

²Saudi Board of Family Medicine King fahad Hospital, Al Ahsa, Saudi Arabia

³Center of Family and Community Medicine Ministry of Health, Eastern region, Al Ahsa, Saudi Arabia

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ABSTRACT

Background: Osteoporosis is a common metabolic bone disease characterized by low bone mass and micro-architectural deterioration of bone tissue which lead to increase the risk of bone fracture.(1)(2)In Saudi Arabia, osteoporosis is very common and the prevalence was estimated at 34% in women and 30.7% in men who their age between 50 years and 79 years.(3)

Aim: To evaluate the knowledge, attitude, and practices of osteoporosis among Physicians in primary health care centers in Al-Ahsa.

Methods: A cross-sectional survey was conducted of 198 PHC physicians (198/280=70.7% response rate) from a total of 280 physicians working in 72 PHC centers scattered all over Al-Ahsa, Kingdom of Saudi Arabia between January to July 2018. Data of the study was collected using an online questionnaire which contains questions to assess knowledge, attitude, and practices of osteoporosis among physicians. SPSS version 21 was used for data analysis.

Results: Themajority of participants 48% in age group 26-30 years. About 82% of physicians were residents and 86% were Saudi. About 56% of the participants have good knowledge and 44% have poor knowledge toward osteoporosis. Majority of participants had shown a positive attitude toward osteoporosis. About 57% of the physicians had followed the guideline for treating osteoporosis and only 39% had a subscription in medical journal or website help them in the management of osteoporosis. Approximately 77% of them had accessibility to biochemical testing and 8% had accessibility to perform DEXA.

Conclusion: There is a big recognized defect in the knowledge and practice of osteoporosis among physicians. We need to develop educational and training programs for physicians in PHCC to improve their approach to osteoporosis.

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INTRODUCTION

Osteoporosis is a common metabolic bone disease characterized by low bone mass and micro-architectural deterioration of bone tissue which leads to increased risk of bone fracture.^[1,2] There are many risk factors for osteoporosis like Excessive alcohol intake, tobacco use, family history of osteoporotic fracture, low level of physical activity, gonadal hormone deficiency, increasing age, personal history of fracture, low body weight and white or Asian race.^[3,4,5] The diagnosis of osteoporosis is done by measuring the bone mass density or by the occurrence of vertebral or hip fracture in the absence of major trauma at adulthood. DEXA scan of hip and spine is used to establish or confirm a diagnosis of osteoporosis.^[6] The world health organization (WHO) set a clinical diagnosis of osteoporosis as bone mineral density at the lumbar spine or hip 2.5 standard deviations (SD) below the mean for young white adult women.^[7] According to

International osteoporosis foundation (2011), Osteoporosis affects 75 million people in the United States, Europe, and Japan. Thirty percent of postmenopausal Caucasian women are estimated to have osteoporosis according to WHO criteria. Globally 9 million of people suffer from fracture due to osteoporosis annually.^[8] Osteoporosis is associated with high morbidity, mortality and financial burden in the community so it is considered a major public health problem .In the United States of America, the financial cost due to osteoporotic fracture was estimated at 19 billion in 2005 and expected to increase by 50% in 2025. In Europe, the osteoporotic fractures cost was estimated at 36 billion euro in 2000 and expected to double by 2050.^[8]

In Saudi Arabia^[9], osteoporosis is very common and the prevalence is estimated to be 34% in women and 30.7% in men in the age group of 50 years to 79 years. Despite an

*Corresponding author: **Fatimah Mohammed Al-Abed**

Saudi Board of Family Medicine Primary Health care Centre, Al Ahsa, Saudi Arabia

increase in the prevalence of osteoporosis and its complication, the condition is still not controlled.

Osteoporosis is a silent disease and there are no warning signs prior to fracture.^[10] So, there are many guidelines for screening of osteoporosis. the most used one is United States preventive service task force (USPSTF) guideline, which recommends Screening for osteoporosis in women at age 65 years and older in men.^[10] Management of osteoporosis divided into pharmacological and non-pharmacological treatment. Non-pharmacological include fall prevention, physical therapy, quit smoking, decrease caffeine intake, sunlight exposure, and vitamin D supplementation. Pharmacological include bisphosphonates, raloxifene, teriparatide, and denosumab.^[4]

Primary health care physicians have a very important role in the control of osteoporosis by the screening of disease, applying preventive measures and management of the patient.^[1-12] Various studies conducted globally have found lacking knowledge and attitude of general practitioners towards the management of osteoporosis. Rome study (2000) conducted on Primary health care physicians has found that one-third of them believed that the osteoporosis is not important when compared to other chronic diseases, and only one-third of physicians could make a diagnosis based on bone densitometry. They found that there were a high number of physicians who were not aware well about osteoporosis.^[13] Similarly a study conducted in Spain (2004), the diagnosis of osteoporosis was made personally in 25.2% of cases. The diagnosis and follow-up of osteoporosis were significantly higher among physicians working in centers with specific programs for osteoporosis. Regarding the knowledge about osteoporosis, the mean percentage of correct responses was 63%.^[14]

In a cross sectional study (2007) in Germany the researchers have discovered that the majority of physicians 82% have a good experience and felt competent in the management of osteoporosis. A minority of physicians believed the osteoporosis is not an important disease comparing to other chronic diseases, and about 50% of physicians had an idea about the national osteoporosis guideline.^[15] In a similar study in Malaysia (2013) the researchers have found that the doctors who work 5 to 10 years and more than 10 years have better awareness in diagnosis and treatment of osteoporosis compared to those below 5 years of working. However, 63.4% of physicians are aware of the guideline in the diagnosis and treatment of osteoporosis in this study.^[16] In Israel study (2016) which was done to know the Knowledge, Attitudes, and Practices toward osteoporosis among Primary Health Care Physicians showed the physicians have a better experience in diagnosis than in management. About one-half of physicians have adequate knowledge about calcium, vitamin D, and main therapeutic medications of osteoporosis which indicate need more effort to improve the knowledge of primary care physicians regarding osteoporosis.^[17]

The study was conducted in Abu Dhabi (2011) has found that more than 75% did have an idea about the presence of regional guidelines on osteoporosis. However this study showed that the level of knowledge was low regarding adequate dosing of several pharmacological treatments. The researchers recommended putting strategies to improve medical knowledge regarding the management of osteoporosis and its risk factors.^[18] As far as Saudi Arabia is concerned three KAP

studies on the general physician for osteoporosis has been conducted recently in three different places such as Abha, Ritadh and Taif. These studies have found mixed results which showed that KAP of the General physicians on the management of osteoporosis must be evaluated in all the cities of Saudi Arabia and suitable suggestions should be forwarded to the ministry of health based on the result of these studies.

This study aims to assess the current knowledge, attitude and practice of osteoporosis among primary health care physicians in Al-Ahsa, Saudi Arabia 2018. To the best of our knowledge no studies have been conducted in Al Ahsa about the assessment of knowledge, attitude, and practice of osteoporosis among primary health care centers physician.

MATERIAL AND METHODS

It was a cross sectional descriptive survey conducted at the Primary Health care Centers of Al Ahsa region of Saudi Arabia during January to July 2018. Al-Ahsa is located in Eastern province of Saudi Arabia. Al-Ahsa has 72 primary health care centers distributed among 3 sectors. These sectors include 3 large cities in AL-Ahsa and its related villages and outskirts. All the Primary Health care physicians working at the Ministry of Health managed PHCs were the study population. The sample size for the study was measured through Open Source Epidemiologic Statistics for Public Health using $[DEFF * Np(1-p)] / [(d2/Z21-\alpha/2 * (N-1) + p * (1-p))]$ formula. It was estimated that 198 physicians would be needed for the study. The proportion of response and knowledge on osteoporosis was taken from the previous study (15) with 95% confidence level, z corresponding to 2-tailed significance level 1.96 and an error of 0.05. The sample size was chosen from the all sectors of PHCCs in Al Ahsa, KSA. The sampling was carried out by random selection of the required GPs from the list of GPs lying at the Health Directorate of the Al Ahsa district. The online questionnaires were sent to those sampled physician working in PHCCs in AL-Ahsa through WhatsApp 4 times.

The questionnaire was designed to collect information on the demographic data (age, sex nationality), professional data (academic qualification, work experience, professional grade) of the study population, current knowledge (20 questions), attitude toward osteoporosis patients (4 questions) and practices when dealing with the patients suffering from osteoporosis (6 questions). The knowledge questionnaires consisted of questions on definition of osteoporosis, risk factors, signs and symptoms, diagnostic criteria of osteoporosis and treatment and guidelines of osteoporosis. The attitude questionnaires included questions on the attitude towards importance of osteoporosis and the impact of disease on the community health, the role of the PHCCs doctors in the diagnosis and management of osteoporosis and prevention of osteoporosis and awareness of the patient toward osteoporosis. The practice questionnaires were related to practice of the general physician following the guidelines for the treatment of osteoporosis, having any subscription in a medical journal or website, asking about symptoms of osteoporosis, accessibility to perform bone mineral density and accessibility to biochemical marking testing. The online questionnaires were distributed by researchers through What-App during the working hours. The researchers' email was attached to the questionnaires to clarify any query. This was done over 2 month's period. The questionnaires were both open ended and with answers of true, false and I don't know. The answer of 'I

don't know' was considered as false. A pilot study was conducted before starting the data collection and internal consistency of the questionnaire was checked by applying Cronbach's alpha. However the participants of the pilot study was excluded from the main study.

Data were entered by investigators into a personal computer and it was analyzed using the Statistical Package for the Social Sciences (SPSS) software version 21. Data were collected, checked for completeness, and verified for inconsistency or outlier readings. All variables of the questionnaire were coded before entry and checked for accuracy before analysis. Continuous variables were presented as mean and standard deviation (SD), categorical variables were presented as frequency and percentage, Chi-square test will be used to compare 2 or more qualitative variables, Student's t-test to compare 2 independent quantitative variables and Analysis Of Variance (ANOVA) test to compare more than 2 independent quantitative variables. Significance was determined at p-value < 0.05 and Confidence interval (CI) of 95%. Other appropriate statistical tests were used as indicated.

Written permission from the Joint Program of Family & Community Medicine was obtained before conduction of the research. Written permission from concerned authority in MOH PHC was obtained too. Individual consent is a prerequisite for data collection. All information was kept confidential and was not accessed except for the purpose of scientific research.

RESULTS

A total of 198 participants completed the questionnaire and were included in the final analysis. The age of respondents was between 20 and 50 with the majority of participants (48%) in the age group between 26 – 30 years. Approximately more than half of the participants 59% were males followed by 41% females.

Table 1 Demographic characteristics

Demographics	Frequency	Percentage
Age		
20 – 25 years	3	2%
26 – 30 years	96	48%
31 – 35 years	53	27%
36 – 40 years	27	14%
41 years & onwards	19	10%
Gender		
Male	116	59%
Female	82	41%
Employment		
< 1 year	47	24%
1 – 5 years	83	42%
6 – 10 years	35	18%
> 10 years	33	17%
Nationality		
Saudi	171	86%
Non – Saudi	27	22%
Post graduate specialty		
Medicine	1	1%
Family Medicine board	20	10%
Family Medicine diploma	22	11%
Occupational Medicine	2	1%
Level of education		
Bachelors	155	78%
Postgraduate specialty	43	22%
Professional ranking		
Resident	163	82%
Specialist	28	14%
Consultant	7	4%

Regarding the professional ranking, 82% were residents followed by 14% specialists and 4% consultants. Almost two-thirds of participants were Saudi (86%) followed by 22% non-Saudi. However, 42% of participants had experience between 1 – 5 years followed by 24% who had less than 1 year experience. 78% had completed their bachelors and 22% had completed their post-graduation. The specialty of who have post-graduate qualification is family medicine in most participants. The details of the demographic characteristics are shown in table 1.

Response to the questions asked in knowledge section

Table 2 summarizes the percentage for the answers correctly identified by the participants. Those who answered (I don't know) were considered as an incorrect answer. There was variation among the responses on knowledge, attitude and practice components of the questionnaire. Ninety nine percent of the participants knew that osteoporosis leads to increase risk of bone fractures, 92% knew that osteoporosis is gender-related, 79% correctly answered for cigarette smoking to be a risk factor of osteoporosis and 87% knew that by age 80, the majority of women have osteoporosis. Approximately, 71% agreed that family history plays a strong role in developing osteoporosis, 85% marked correct for calcium supplements alone can't prevent bone loss, and 86% agree that there are effective treatments for osteoporosis available in Saudi Arabia.

Table 2 Scores for the knowledge part of the questionnaire with correct answers (n and percentage)

Knowledge	Correct Answers	N	%
Osteoporosis leads to an increased risk of bone fractures.	True	197	99%
Osteoporosis usually causes symptoms (e.g. pain) before fractures occur.	False	90	46%
Having a higher peak bone mass at the end of childhood gives no protection against the development of osteoporosis in later life.	True	42	21%
Osteoporosis is more common in men	False	182	92%
Cigarette smoking can contribute to osteoporosis.	True	157	79%
White women are at highest risk of fracture as compared to other races.	True	121	61%
A fall is just as important as low bone strength in causing fractures.	True	140	71%
By age 80, the majority of women have osteoporosis.	True	173	87%
From age 50, most women can expect at least one fracture before they die.	True	85	43%
Any type of physical activity is beneficial for osteoporosis.	False	94	47%
It is easy to tell whether I am at risk of osteoporosis by my clinical risk factors.	True	148	75%
Family history of osteoporosis strongly predisposes a person to osteoporosis.	True	141	71%
An adequate calcium intake can be achieved from two glasses of milk a day.	True	116	59%
Knowledge	Correct answers	N	%
Sardines and broccoli are good sources of calcium for people who cannot take dairy products.	True	123	62%
Calcium supplements alone can prevent bone loss.	False	168	85%
Alcohol in moderation has little effect on osteoporosis.	True	45	23%
A high salt intake is a risk factor for osteoporosis.	True	49	25%
There is a small amount of bone loss in the ten years following the onset of menopause.	False	83	42%
Hormone therapy prevents further bone loss at any age after menopause.	True	122	62%
There are no effective treatments for osteoporosis available in Saudi Arabia	False	170	86%

Table 3 was constructed using the mean score for all the components in the questionnaire and based on the mean score 1.94, awareness scale was calculated which shows that approximately 56% of participants were aware about osteoporosis and 44% had shown poor awareness.

Table 3 Knowledge level of osteoporosis

Level of knowledge	Knowledge score
Good knowledge	110 (56%)
Poor knowledge	88(44%)

Age and gender were found to have an insignificant association with knowledge on osteoporosis.

Table 4 Association between good knowledge and demographic variables

Demographics	Aware	Not aware	P - value	Confidence interval
Age groups				
< 35	<35=53(53.5%),	<35=46(46.4%),	0.89	0.18 - 0.10
>35	>35=42(42.5%)	>35=57(57.5%)		
Experience				
1 – 5 years (1)	1= 67(51.5%),	1= 63(48.4%),	0.00	0.24 - 0.02
>5 years (2)	2= 25(37%)	2= 43(63%)		
Ranking grade				
Resident	R=87(53%),	R=76(46%)	0.00	0.34 – 0.18
Specialist & above	S=12(43%)	S=23(66%)		
Gender				
Male	M= 66(57%),	M=50(43%),	0.37	0.17 – 0.10
Female	F=38(46%)	F= 44(54%)		
Nationality				
Saudi	S=92(54%),	S=79(46%),	0.01	0.36 – 0.15
Non-Saudi	NS=18(40%)	NS27(60%)		

Response to the questions asked in attitude section

Regarding attitude toward osteoporosis, the majority of participants had shown a positive attitude toward osteoporosis. About 99% of the participants consider coronary disease have impact on the health of the community and individuals followed by diabetes, osteoporosis, VA, and osteoarthritis have an impact on the health of the community and individuals with 97%, 95, 93% and 91% respectively. Approximately, 71% of the participants consider osteoporosis as a disease should be diagnosed and followed up by PHC physicians. Majority of the participants consider osteoporosis as a preventable disease. Only 32% of the participants agree that their patients are aware of osteoporosis. The details of the response of the physicians attitude is shown in table 5.

Table 5 Attitude of PHC physicians toward osteoporosis

Attitude of physicians toward OP	Percentage (95% CI)*
Do you consider coronary disease have an impact on the health of the community and individuals:	99 (0.98 – 1.00)
Do you consider diabetes have an impact on the health of the community and individuals	97 (0.95 – 1.00)
Do you consider CVS have an impact on the health of the community and individuals	93 (0.89 – 0.97)
Do you consider osteoarthritis have an impact on the health of the community and individuals	91 (0.87 – 0.95)
Do you consider osteoporosis have impact on health of the community and individuals	95 (0.92 – 0.98)
Osteoporosis should be diagnosed and followed up by PHC physician	71 (0.64 – 0.77)
Do you consider osteoporosis as a preventable disease	91 (0.87 – 0.95)
Your patients are aware of osteoporosis	32 (0.26 - 0.39)

Response to the questions asked in practice section

As regard practice of physicians toward osteoporosis, only 57% had followed the guideline for treatment of osteoporosis. Surprisingly, only 39% had a subscription in any medical journal or website which can help them in the management of osteoporosis. About 88% of participants asked about back pain

during the medical interview followed by asking about current cigarettes smoking, history of fracture, daily calcium intake in the diet, and family history of osteoporosis with 84%, 76%, 67% and 57% respectively. Only 22% of the participants looked for loss of height during examination and only 8% have accessibility to perform DEXA. Approximately 77% had accessibility to biochemical markers

Table 6 Practice of PHC physicians regarding Osteoporosis management

Practice of PHC physicians regarding OP management	Percentage (95% CI)*
Do you follow any guideline for the treatment of osteoporosis	57 (0.50 - 0.64)
Do you have any subscription in any medical journal or website	39 (0.32- 0.46)
During your work, Do you ask about the back pain in the medical interview	88 (0.83 -0.92)
History of fracture	76 (0.70 - 0.82)
Family history of osteoporosis	57 (0.50 - 0.64)
Current cigarette smoking	84 (0.79 - 0.89)
Daily calcium intake in the diet	67 (0.61 - 0.74)
during your examination, do you often look for in your examination loss of height	20 (0.16 - 0.28)
Do you have accessibility to perform DEXA	8 (0.04 - 0.12)
Do you have accessibility to biochemical marking testing	77 (0.71 - 0.83)

Variables related to attitude and practice

To assess the association between demographics and osteoporosis management attitude and practice measure of association was applied. The results show that age and nationality were not significant for any of the components and gender and professional ranking were significant for only one question each i.e. subscription to any medical journal component of practice segment p –value 0.02. However, specialty showed positive association on different components of the questionnaire.

Table 7 Association between demographic characteristics attitude & practice

Variables	Value – df	P – value
Specialty * Do you follow any guideline for the treatment of osteoporosis	8.87 – 3	0.03
Specialty * History of fracture	9.76 – 3	0.02

DISCUSSION

One of the most common metabolic bone diseases affecting the human is Osteoporosis .It has significant health and economic burden. Despite the magnitude of the problem, the condition still not controlled. So the prevention is a very important step in the management. Due to that, the role of primary health care physicians is very important. Our study was a cross-sectional survey of 198. It was conducted to assess the knowledge, attitude, and practice of osteoporosis among primary health care physicians in AL-Ahsa.

Regarding the knowledge of osteoporosis, the results showed that only 56% of the participants were aware of osteoporosis. The level of awareness is measured according to the mean score of 1.94. This finding is consistent with a study in Abha (2013), KSA, which showed an average level of knowledge among participants to be 67%.^[19] However, in Riyadh, the level of awareness of osteoporosis among participants ranged between 36.5% and 92.2% .^[12] As regards the study which was done in other countries, the level of knowledge estimated to be 50% in Israel^[17], 63% in Spain^[14], 82% in Germany^[15], 63.4% in Malaysia^[16].

Our study has shown that lower years of experience significantly associated with higher level of osteoporosis awareness. As the new graduate physicians have more updated information and have more time for reading. This is consistent with other studies in Spain in 2004^[14] and study in Israel^[17]. While other study done in Malaysia showed that the higher years of experience associated with the good level of knowledge.^[16] However, Saudi physicians and resident as ranking grade significantly associated with a higher level of awareness.

Our results indicated that the age and gender were not significantly associated with awareness of osteoporosis. The age is inversely associated with the level of awareness of osteoporosis in Spain study^[14] while the study did in Abhahave revealed the positive association between age and level of awareness.^[19]

Regarding attitude toward osteoporosis, the majority of the participants had shown a positive attitude. About 95% of the participants consider osteoporosis as a major health problem with an impact on the health of community and individuals. This result is consistent with a study done in Riyadh which revealed that 83% of the participants considered osteoporosis important health problem^[12]. This result is also consistent with studies done in United Arab Emirates^[18], Germany^[15] and in Rome^[13] which showed that the majority of physicians considered osteoporosis as a very important health problem. Our results showed that 71% of the participants believed that osteoporosis should be diagnosed and followed up by PHC physicians. About 91% of the physicians considered osteoporosis as preventable disease and 32% of them believed that their patients were aware of osteoporosis. The previous results were consistent with a study in Riyadh.^[12]

As regard of practice of physicians toward osteoporosis, only 57% had followed the guideline for treating of osteoporosis. This result is consistent with other studies done in German^[15], Malaysia^[16]. However in Riyadh study only 31 % of the participants followed the guideline on osteoporosis.^[12]

It was reported in our results that 39% of the participants had access to medical journal and evidence-based sources. A consistent finding was found in Riyadh.^[12] Regarding history taking practice, more than three-quarters of the participants started asking leading question about back pain, history of fracture and history of current cigarette smoking. However, more than 50% of the physicians inquire about family history of osteoporosis and daily calcium intake. A similar result was reported in Riyadh study.^[12] As regard examination, only 20% of the physicians looked for a loss of height. Our study showed that many of the physicians(77%) had access to perform biochemical testing for patients and only 8% of the physicians had access to perform DEXA scan. The previous results are not consistent with a study in Riyadh which shows that only 13% of the physicians have access to DEXA and 20% have access to biochemical testing.

Limitations of the study

The study contained a questioner to assess the knowledge, attitude, and practice toward osteoporosis. This means that there is a possibility for recall bias since it's based on questionnaire. The study was a cross sectional study which can't determine the causal relationship.

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