

Knowledge, attitude and practice towards osteoporosis among primary health care physicians in Riyadh, Saudi Arabia

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Abstract: *Background:* It is generally believed that osteoporosis is the most common metabolic disease affecting bone worldwide and the Kingdom of Saudi Arabia is not an exception. Awareness among physicians is essential for early detection and timely treatment and hence fractures prevention. *Aim:* We aimed to assess knowledge, attitude and practices for osteoporosis among Primary Health Care Physicians in Saudi Arabia and to identify its determining factors. *Methods:* the survey was a cross-sectional survey of physicians of all specialties who are currently working in one of the primary care units in the Kingdom. We used self-administered questionnaire to identify the levels of Knowledge, Attitude and Practice. Means, standard deviations and percentages along with the 95% Confidence Interval were calculated. *Results:* Responses were obtained from 364 physicians (30% female, 70% male). The majority was resident physicians (81%) and thought that osteoporosis was an important clinical problem. About 84% were unaware of the presence of any clinical guidelines for osteoporosis. A high proportion of respondents believed in the preventive role of physical activity and cessation of smoking. There were good levels of knowledge regarding Dual-energy X-ray absorptiometry (DXA) scan as a diagnostic tool and bisphosphonate drug therapy. *Conclusions:* Gaps in knowledge of physicians about bone health were identified. There is a need to extend medical knowledge regarding the contemporary management of osteoporosis and its risk factors. The results of the Knowledge, Attitude and Practice study could be used to improve physicians' performance; hence it should be implemented on regular basis as part of the osteoporosis prevention strategy.

Keywords: Osteoporosis, KAP, PHC, Physician

1. Introduction

It is generally believed that osteoporosis (OP) is the most common metabolic disease affecting bone worldwide (1) and the Kingdom of Saudi Arabia (KSA) is not an exception (2). It was also considered as one of the major contributors of mortality and morbidity among elderly people (1). The prevalence of OP among Saudi population was estimated at 34% in a review of the published articles up to 2011 (2). The etiology for this high prevalence among Saudis is multi-factorial and possible causes include; lifestyle malpractices, vitamin-D deficiency and genetic factors (3-5). The impact of OP and its sequel on health sector recourses can be quiet

immense (6). It was claimed that hip fracture consequences either psychosocial or economic impact will increase markedly worldwide, particularly in Asia (7).

General Practitioners (GPs) are considered to play principle roles for implementing preventive measures, early detection and management of chronic disease within any health care system (8). Also, screening for disease, identifying the most prevalent risk factors and maintaining follow-up practices could be applied easily within the process of general practice (8). However, some chronic diseases such as OP are more likely to be misdiagnosed and undertreated in general practice (9). This could be attributed to its prolonged course, lack of warning signs prior to fracture, cross-diagnosis and insufficient knowledge about

the disease pathway (9).

Knowledge, attitude and practice (KAP) surveys can assess communication processes and sources that are essential for defining effective activities in prevention and control. KAP studies may be used to evaluate needs, problems and barriers in health care program, as well as solutions to improve quality and accessibility of services (10). In order to plan for OP national (screening, awareness, prevention or control) programs, information regarding knowledge, health beliefs and practice of OP in GPs is necessary so that adequate strategies can be formulated accordingly.

Although there is an increased interest in the level of knowledge and believes among GPs about OP, it remains a sidelined issue in the clinical practice field (11). Moreover, OP prevention and control needs multi-disciplinary team effort because up till now it is still unlinked to a single specific medical subspecialty. Orthopedics, endocrinologists and rheumatologists seems to be in charge of OP management (12). Various clinical guidelines (both national and international) for OP prevention and treatment diagnostic have been inaugurated which varied widely regarding details and outlines (11-17). Proper diagnosis has been long linked to better disease outcome especially risk of fracture (18), notwithstanding the fact that OP risk reduction depends mainly on the knowledge and attitudes of PHC physicians toward detection of cases, early proper diagnosis and management (19).

Recently, there is a steady increase in the number of studies investigating the KAP of PHC and other physicians worldwide (20-24). In spite of the consistent evidence of the increased OP incidence and prevalence (4, 5, 25-30), there still is shortage in the available data on KAP of physicians regarding prevention and treatment of OP.

Aim

The main objectives of this KAP study were:

- To assess the level of knowledge, attitude and practices regarding OP among Primary Health Care Physicians in the KSA
- To identify the determining factors of PHC physician's KAP related to OP in the target population

2. Methods

Study Type: Cross sectional study

Study Site: Primary Health Care Units in different regions in the KSA

Study Population: Data were collected from Primary Health Care Physicians in all medical specialties, currently working in one of the PHC units in the KSA

Sample size: It was calculated according to the WHO sample size calculator for descriptive study designs (31). The resulting "n" was multiplied by the design effect (DEFF) to compensate for non-simple random sampling (31). It was estimated that a sample of 364 PHC physicians was needed to give 90% power of calculation with 95% confidence level and an error of 0.05.

Procedure: OP National Project Coordinators, in different regions of the KSA, were sent details about the study (study information sheet) and a copy of the study questionnaire to be printed, photo-copied and distributed to the PHC physicians worked at their areas. The information sheet contained full information about the study, i.e. the aim of the study, why they were approached, the study methodology, benefits of participation, and their right to opt not to take place. The survey extended from April to June 2014. Multiple reminders via e-mails and phone calls were sent to the project coordinators to boost the GPs response rate. The survey took on average 5-10 minutes to be completed.

Instrument: Data were collected using a self-administered questionnaire divided into 4 sections; socio-demographic and professional questions (age, sex, nationality and qualification data); knowledge (what people know); attitude (how they feel) and practice (what they do).

Statistical analysis: Data were verified, recoded and analyzed using SPSS version 21 software (32). Descriptive statistics: means, standard deviations and percentages along with their 95% CI were calculated. We have used the entire sample for the final analysis as the missing data did not exceed 10% in any of the questions.

Ethical Considerations: This study was approved by the Medical School Institutional Review Board, King Saud University, KSA. The survey was anonymous and all information was identified using a study identification number and confidentiality was assured.

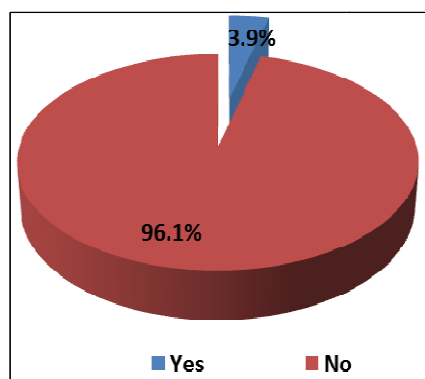
3. Results

Table 1. Socio-demographic and professional characteristics of the participating physicians

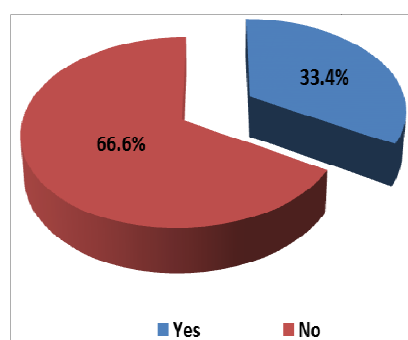
n=364			
Age in years	Mean \pm SD	39.5 \pm 9.1	
	Range	25-63	
	Mean \pm SD	11.7 \pm 8.1	
Years of Experience	Range	1-35	
	Category	Frequency	Percentage
	Male	258	70.9%
Sex	Female	106	29.1%
	Saudi	47	12.9%
Nationality	Non Saudi	317	87.1%
	Bachelor of Medicine	226	62.1%
Professional qualification	Postgraduate Qualification	113	31.0%
	Missing	25	6.9%
	Resident	296	81.3%
Professional Grade	Specialist	52	14.3%
	Consultant	8	2.2%
	Missing	8	2.2%

A total 364 completed questionnaires were included for the final analysis. The respondents' age ranged between 25 and 63 years with a mean of 39.5 years (Table 1). About two-thirds of the samples were males (70%). The majority of the physicians were non-Saudis (87%). Regarding the professional data; less than one third of participants have postgraduate studies (31%) with a mean experience time of

11.7 years and most of them were recruited as residents (81%) (Table 1). Moreover, for sources of Knowledge; almost all respondents (96%) reported that they don't have specialized OP program at their institution and only one-third have access to the World Wide Web at work (33%).



Presence of Specialized OP Program at Institution



Internet Access at Work

Fig. 1. Frequency of responses for presence of Knowledge sources

Table 2 illustrated the participants' knowledge about OP risk factors, signs and symptoms and diagnostic modalities. The majority of respondents (90%) were aware that the T-score cut-off for OP screening was < 2.5 standard deviation (SD) as recommended by the WHO. Regarding OP risk factors, the percentage of awareness among physicians ranged between 36.5% and 92.2%. The highest percentages were; female sex (92%), low dietary calcium (89%) and current cigarette smoking (88.5%) while the lowest scores (below 50%) were; OP family history, old age, bilateral ovariectomy and low diet salt.

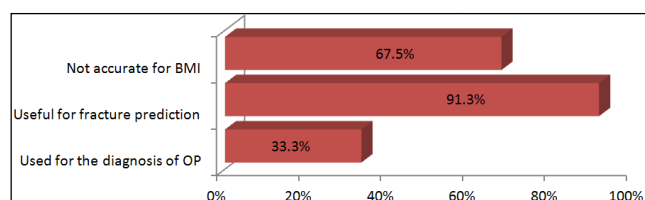


Fig. 2. Knowledge regarding plain radiography

As regards OP signs and symptoms; about 90% and only half of the participants knew that bone pain and fatigue is an important symptom of OP, respectively. Moreover, three

quarters were aware that kyphosis is one of the signs of OP and 70% reported loss of height too. With respect to radiological methods for OP screening and diagnosis; about two-thirds acknowledged that plain x-ray can be used; of those the highest percentage (91%) was aware that it is useful for fracture prediction (Fig. 2).

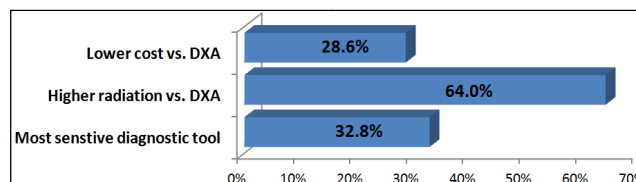


Fig. 3. Knowledge regarding qualitative CT scan imaging

Also, only half of the sample identified CT as a diagnostic tool for OP. Furthermore, 67% were aware that DXA scan is an important diagnostic method, the majority of them knew that it is the best diagnostic tool, it can predict fracture risk and it accurately determine the BMD (Fig. 4).

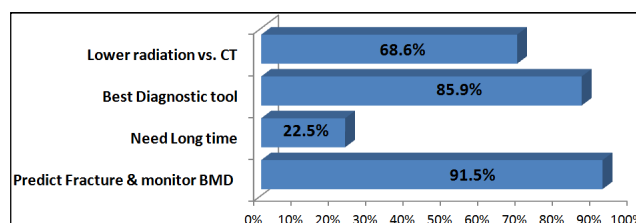


Fig. 4. Knowledge regarding DXA scan

In relation to bisphosphonates as treatment remedy, only 60% were aware that it is the most commonly used drug for treatment of OP; of those 75% knew that bisphosphonates is the first line treatment, 70% believe that it is already approved by the FDA and only 31% were aware that it can reduce the fracture risk. In addition, only 16% of the participants had the knowledge that there are any clinical guidelines for OP in the KSA.

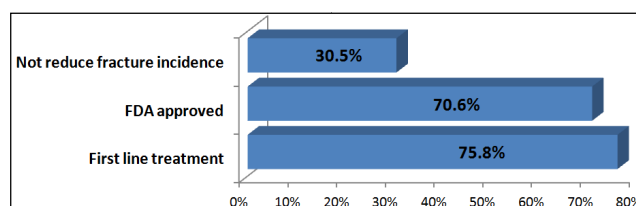


Fig. 5. Knowledge regarding bisphosphonates

The participant's attitude toward OP prevention and management was depicted in table 3. The majority of participants believed that the main serious diseases have major impact on the health of individuals as well as the community with a lower percentage for osteoarthritis (76%) followed by OP (83%). Referring to risk factors with major impact on OP; the participants believed in most of the risk factors with high percentages ($> 80\%$) except for family history of OP and low body weight (77% and 71%, respectively). Respecting the principle preventive strategies;

respondents place confidence with high rates (> 85%) in most of the OP preventive measures but for avoiding underweight and hormonal therapy (73% and 79%).

Likewise, about two thirds (68%) believed that OP should

be diagnosed and followed up by PHC physician. Additionally, about 81% thought that OP is a preventable disease. However, less than one third (30%) of the participants believed that their patients were not aware of OP.

Table 2. OP related Knowledge among PHC physicians

	Percentage (95% CI)*
WHO criteria defines osteoporosis as T score less than 2.5 SD	90.2 (86.3-93.7)
Risk Factors	
Current cigarette smoking	88.5 (84.6-90.2)
Low salt diet	47.3 (45.7-49.1)
Low body weight	70.9 (68.8-71.9)
Early menopause	52.2 (50.3-54.2)
Bilateral ovariectomy	46.4 (43.7-49.1)
Low calcium in diet	89.0 (86.3-91.5)
Old age	44.8 (41.9-45.3)
Female gender	92.2 (89.3-95.1)
Family history of osteoporosis	36.5 (34.7-39.9)
Signs or symptoms	
Bone pain	86.5 (84.3-87.8)
Kyphosis	78.2 (76.6-80.1)
Loss of height	71.4 (69.3-73.4)
Fatigue	53.8 (51.1-55.5)
Knowledge regarding plain radiography	64.3 (62.8-67.1)
Knowledge regarding qualitative CT scan imaging	54.2 (52.3-56.4)
Knowledge regarding DXA scan	67.1 (65.7-69.4)
Knowledge regarding bisphosphonates	59.0 (56.8-61.5)
Awareness of any guideline for treatment of OP in the KSA	16.3 (14.6-18.3)

*95% CI=95% Confidence Interval

Table 3. Attitude towards OP among PHC physicians

	Percentage (95% CI)*
Impact of the following diseases on health of the community and individuals?	
Coronary heart disease	91.2 (90.1-94.4)
Diabetes mellitus	93.2 (91.7-96.8)
Cerebrovascular diseases	88.5 (85.9-91.7)
Osteoarthritis	76.2 (75.3-78.5)
Osteoporosis	83.2 (80.9-86.5)
Risk factors with a major influence on osteoporosis?	
Family history of osteoporosis	76.7 (74.3-77.8)
Higher age	87.9 (84.4-89.6)
Female Sex	87.9 (84.4-89.6)
Estrogen deficiency	86.4 (84.5-88.9)
Lack of physical exercise	84.8 (81.3-85.7)
Poor calcium diet	91.7 (89.7-94.3)
Vitamin D deficiency	93.2 (91.6-96.8)
High alcohol consumption	82.6 (79.6-84.1)
Cigarette smoking	85.7 (83.3-86.7)
Low body weight	71.4 (70.1-74.5)
Effectiveness of various tools regarding osteoporosis prevention?	
Regular physical exercise	87.9 (85.3-89.4)
Calcium rich diet	91.8 (90.2-94.5)
Hormone replacement	78.9 (72.8-81.8)
Calcium supplementation	88.9 (85.6-91.3)
Vitamin D supplementation	87.4 (85.3-89.6)
Avoiding underweight	73.1 (70.9-75.2)
OP should be diagnosed and followed up by PHC physician?	68.3 (65.9-70.1)
OP is preventable disease?	81.4 (80.6-83.2)
Your patients are aware of osteoporosis?	30.2 (28.5-34.7)

*95% CI=95% Confidence Interval

Tables 4 showed the participants' responses in respect to practices of OP management. Only 31% follow any clinical guidelines. Also, less than 40% have access to one of the sources of evidence-based medicine that could help them in their practices. With regard to history taking practices; three quarters inquire about back pain and current cigarette smoking and about two thirds ask about daily calcium intake. Again, only about half of them investigate the history of

fracture and family history of OP.

Regarding examination of cases; around 60% of the respondents reported that they examine their patients for kyphosis, loss of height and loss of weight. For the main tools of investigations; only 13% declared that they have access to perform BMD and only 20% can ask for biochemical marking testing for their clients.

Table 4. Practice of PHC physicians regarding OP management

	Percentage (95% CI)*
Following any guideline for treatment of osteoporosis?	30.5 (29.1-32.4)
Having any subscription in any medical journal or website?	38.6 (35.5-40.7)
How often do you ask about the following?	
Back pain	74.6 (75.1-78.4)
History of fracture	56.5 (53.3-58.5)
Family history of osteoporosis	52.0 (50.9-55.1)
Current cigarette smoking	72.1 (70.4-76.8)
Daily calcium intake in diet	64.3 (63.1-66.6)
How do you often look for the following in your examination?	
Kyphosis	61.9 (60.0-67.5)
Loss of height	59.7 (54.4-60.4)
Low body weight	65.8 (64.3-67.6)
Do you have accessibility to perform BMD?	12.8 (11.1-14.7)
Do you have accessibility to biochemical marking testing?	20.1 (19.3-22.6)

*95% CI=95% Confidence Interval

4. Discussion

Osteoporosis is considered to be the most common bone disease afflicting humans. More than 200 million people are affected annually worldwide and it represents a significant health and economic burden (1). OP is not only a major cause of fractures, it also ranks high among diseases that cause people to become bedridden with serious complications. These complications may be life-threatening in elderly people (1). The knowledge level, attitude and practice of health care provider are important factors in the prevention and control of all chronic diseases and OP is not an exception.

The current study was carried out to assess the level of knowledge, attitude and practices regarding OP among PHC Physicians in the KSA. It was cross sectional survey of 364 PHC physicians working in different PHC units in the KSA. A convenience sampling technique was used to recruit participants and self-administered questionnaire was used..

For the knowledge of OP among participants, the percentage of awareness among physicians ranged between 36.5% and 92.2%. This was in consistent with a study in Abha, KSA in 2013 which found similar results with an average level of knowledge of 67% (22). Another study on the German Primary Care Doctors' Awareness of OP and Knowledge of National Guidelines in 2007 concluded that 83% had good knowledge regarding OP (33).

With respect to the radiological methods for OP screening and diagnosis; about two-thirds acknowledged that plain x-ray can be used. Also, only half of the sample identified CT as a diagnostic tool for OP. Furthermore, 67% were aware

that DXA scan is an important diagnostic method, the majority of them knew that it is the best diagnostic tool, can predict fracture risk and accurately determine the BMD. This was consistent with a study conducted in Malaysia in 2013 and found that Less than one third of participants were aware about screening tools or Clinical decision rules (34).

In relation to bisphosphonates as treatment remedy, only 60% were aware that it is the most commonly used drug for treatment of OP. In relation to this a study in Kuwait in 2011 reported that the majority of the physicians agreed correctly that hormonal replacement therapy is effective in prevention of osteoporosis (87.3%) (35).

In addition, only 16% of the participants had the knowledge that there are any clinical guidelines for OP in the KSA. This was in agreement with Chenot, et al., who found that about 50% reported knowing the national osteoporosis guideline (33). Likewise, a study in the UAE in 2013 reported that more than 75% of the hospital and primary care physicians were unaware of the presence of regional guidelines on osteoporosis (36).

For the participant's attitude toward OP prevention and management, the majority of participants believed that the main serious diseases have major impact on the health of individuals as well as the community with a lower percentage for osteoarthritis and OP (76% & 83%, respectively). This was in agreement with the German study which noticed that only 11.2 % did not consider osteoporosis an important problem (33). It was also consonant with Beshyah et al., who claimed that that the majority of the respondents thought that OP was an important clinical

problem, and appreciated the fact that women in the Middle East are at an increased risk of OP (36).

Referring to risk factors with major impact on OP; the participants believed in most of the risk factors with high percentages (> 80%). A study in Abha, KSA found that more than 80% of participants had good, very good or excellent knowledge about OP risk factors (22). Other previous researchers assessing KAP of OP among GPs found similar results (36, 37). Respecting the principle preventive strategies; respondents place confidence with high rates (> 85%) in most of the OP preventive measures. The Abha study revealed that about 88% had good knowledge for the main preventive tools (22). Chenot et al., proposed that 83% were competent in OP prevention and control (33). Likewise, about two thirds (68%) believed that OP should be diagnosed and followed up by PHC physician. Additionally, about 81% thought that OP is a preventable disease. However, less than one third (30%) of the participants believed that their patients were not aware of OP. This was agreeable with many previous studies carried out on PHC physicians (22, 33, 35).

In regards to participants responses in respect to practices of OP management. Only 31% follow the clinical guidelines. In agreement with our findings, around 40% of the German primary care doctors abide with the guideline in their practice (33). Also, less than 40% have access to one of the sources of evidence-based medicine that could help them in their practices and could explain the finding that only 16% are aware of any guidelines in the KSA. With regard to history taking practices; three quarters inquire about back pain and current cigarette smoking, about two thirds ask about daily calcium intake. Again, only about half of them investigate history of fracture and family history of OP. Regarding examination of cases; around 60% of the respondents reported that they examine their patients for kyphosis, loss of height and loss of weight. For the main tools of investigations; only 13% declared that they have access to perform BMD and only 20% can ask for biochemical marking testing for their clients.

5. Strengths and Limitations

Up to our knowledge, this is the first KAP study for OP among GPs from different regions in the KSA, with a fairly large sample size (n=364). However, it encountered several limitations. The cross-sectional design jeopardized the study value. The issues with convenience sampling are generally negative and focus on the lack of representative people within the study. However, the appointment strategy of the Saudi primary care system ensured randomization in distribution of GPs all over the kingdom.

6. Conclusion

As far as we know this is the first study to evaluate the level of knowledge, attitude and practice of PHC physicians regarding OP prevention and control in the KSA. The

findings of the current work demonstrated that the knowledge of OP risk factors was satisfactory among respondents. However, only 16% of the respondents knew and only 31% of them used the national guideline. This may explain deficits in diagnosis and treatment of OP in the Kingdom. Since guideline knowledge and frequency of consultations for osteoporosis strongly correlate, proper dissemination of the guideline may further enhance awareness of OP. The study suggested that better training and motivation may improve cooperation between primary and secondary care, which will consequently lead to methods of breaking down barriers to change in clinical practice and promoting the fully integrated care of patients with OP.

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