Awareness and Knowledge of Osteoporosis among Saudi Females in Riyadh

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Abstract—Osteoporosis, a silent major health problem and the contributor of morbidity and mortality among postmenopausal women, is a systemic metabolic skeletal disease characterized by low bone mass and deterioration of bone tissue. The current study aimed to evaluate the level of knowledge and awareness on osteoporosis and to determine the factors affecting this level among Saudi females in Riyadh, in 2015\2016. This is a quantitative cross-sectional study. Questionnaires were distributed randomly on 500 female aged 18 and above at different locations in Riyadh city. Over three quarters of participating females (82%) have excellent knowledge regarding osteoporosis. This study revealed a significant difference, (P=<0.05), in the level of osteoporosis awareness among "marital status", "college sector" and "if heard about osteoporosis" subgroups. However, this study found that osteoporosis-related knowledge is independent of educational level, social level and age. The majority of participant women were knowledgeable of osteoporosis, with variation among marital status and college sector subgroups. Raising the importance to increase awareness campaigns especially among non-health colleges and the unmarried females is a significant and powerful tool that contributes in the prevention of osteoporosis.

Key words— Osteoporosis, Awareness, Females, Postmenopausal, Riyadh

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INTRODUCTION:

Osteoporosis, a silent major health problem, is a systemic metabolic 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, defined by the World Health Organization with high incidence of morbidity and mortality among postmenopausal women. In year 2000, it was estimated that about 9.0 million fractures occurred and many were due to osteoporosis [1].

Approximately 80% of bone density is determined by heredity and 20% by lifestyle. Osteoporosis is considered a multi factorial disease with many possible risk factors such as: female gender, higher age, lack of sun exposure, low calcium intake, sedentary lifestyle, low body weight, low sex hormone and having low bone density. Also, having a non-O blood group was associated with an increased severity of osteoporosis [2]. Osteoporosis seems to be running in families. History of fractures increases the risk of osteoporosis. Recent studies show that smoking lowers the bone densities and decrease the estrogen levels in the body, so it increases the chance of getting osteoporosis. Some medication such as, long use of steroids, thyroid drugs and antacids can increase the risk as well [3]. Vitamin-D deficiency is a major risk for osteoporosis and found to be high in Saudi population [1] and its prevalence is estimated to be 82% in Saudi women [4]. Most of the factors are modifiable, except for gender, age and genetics. So, by awareness, knowledge and early assessment we can avoid these risk factors [5].

Commonly, Osteoporosis does not have obvious symptoms. Decrease height or a hump called Dowager's hump may be noticed. The common sites of the fracture are in the back and hips [3].

Definite diagnosis of osteoporosis is based on Bone Mineral Density (BMD) tests. BMD shows how dense the bones are. The most important osteoporosis test is DEXA Scan (Dual X-ray Absorptiometry) [6]. DEXA is used to measure spine, radius and hip bone density [7]. Other Bone Mineral Density Tests include ultrasound and quantitative computed tomography (QCT) [6]. They provide clues about the disease and the progress of treatment [8]

Unfortunately, there is no cure for osteoporosis. The goal of treatment is to protect, strengthen the bones and prevent fractures. Treatment usually includes a combination of medications and lifestyle changes to help slow the rate of bone resorption by the body. Bisphosphonates are the most common osteoporosis medication treatments. Hormonal therapy, Lifestyle changes, enough calcium, Vitamin-D and physical activity [9].

The estimated prevalence of osteoporosis among Saudi women is 34%, and its incidence is 31% [5]. According to the International Osteoporosis Foundation (IOF), 8768 out of 1,461,401 Saudi persons aged 50 years or more, would suffer femoral fractures yearly at a cost of $1.14 billion [5]. Making osteoporosis a real challenge to the Saudi

community that needs to be treated and most importantly prevented by education and good knowledge. Hence, in this study we focused on awareness towards potential risk factors of osteoporosis among Saudi females in Riyadh city, Saudi Arabia for preventing its occurrence rather than treating it**.**

MATERIAL AND METHODS:

A quantitative cross-sectional study was conducted to evaluate the knowledge towards potential risk factors of osteoporosis among Saudi females in Riyadh city from May, 2015 to April, 2016. The study protocol followed the principals of the Helsinki Declaration, and was approved by the Research and Ethical Committee at PNU.

A convenient sample of 500 females who aged 18 and above has participated in the study after explaining the objective of the study and a verbal consent was taken from them. The study was conducted in different destination of Riyadh city such as Princess Nourah bint Abdulrahman University (PNU) which located in the north of the city, and another two of the most crowded centrally located malls in Riyadh; Hayat Mall and the Female section of Kingdom Mall.

A close ended questionnaire that contained 23 questions were obtained from a previous study done by Zhang R F and Chandran M in Singapore [10]. It was translated to Arabic for better understanding. First, we distributed 20 pilot questionnaires for testing and validating the questions. It helped to identify confusing/unclear questions, for example there was a question about the relation between alcohol and osteoporosis and after the pilot questionnaire it was modified to the relation between osteoporosis and Soda instead of alcohol, since alcohol is illegal in Saudi Arabia. We have also added the "I don't know" Column. The questionnaire was composed of 2 sections, the first section contained socio-demographic data such as, Age, gender, college and personal income and the second section included 23 questions assessing the awareness of the participants about osteoporosis. The answer to these questions was either (yes, no, I don't know).

Data was collected and analyzed using SPSS program. Results were conducted through Tables and charts, they showed: socioeconomic variables, the knowledge score, frequency of the correct answer of each question and the factors affecting the knowledge about osteoporosis. The knowledge score represents the sum of the correct answers out of the 23 questions in the second section of the questionnaire. The correct answer was given a value of 2, 0 for the wrong answer, and 1 for I don't know answer. The total score was 40, while the poor knowledge score was set at values below 15 of the total score. ANOVA test was used at comparing the knowledge scores among different subgroups, and a P-value < 0.05 was considered statistically significant.

RESULT:

The study included 500 females with an average age of 26.58 ± 10.19 years old. Their socio-demographic data was shown in **Table (1).** Knowledge category among study participants according to their correct answers score was shown in **Figure (1).** Majority of them (410) got high excellent knowledge score (>26 out of 40). Good knowledge score (from 16 to 25 out of 40) was obtained from 89 participants and only one female got poor knowledge score <15 out of 40. Most of the questions were answered correctly with a percentage > 50% as shown in **Table (2).** Only three questions were below this percentage, which revealed the knowledge regarding the bone strength (question 6), walking effect (question 14) and children calcium intake (question 19). Question 16 (Osteoporosis affects men and women?) scored the highest percentage (96.2%), while question 14 (Walking has a great effect on bone health?) scored the lowest percentage (5.4%). Significant difference in the knowledge score was found among marital status, college sector, and among females who heard about osteoporosis before their participation in this study. Inequality of knowledge score among married and single females was evident in this study (P=0.032) where married female had the highest knowledge score (29.5 ± 3.66), while unmarried had the lowest score (28.7 ± 4.08). Also, significant difference between field of study was found (P=0.01), as participants who worked in health filed showed a higher knowledge score than those who worked in non-health field (P=0.01). Unsurprisingly, the participants who have heard about osteoporosis got a higher knowledge score than those who has not (P=0.024) **(Table 3).**

Table 1: Socio-demographic data of the studied sample.

	Number (n)	Percentage (%)
Age groups		
<25	355	71%
26 – 45	115	23%
>46	30	6%
Marital status		
Married	139	27.8%
single	361	72.2%
Social class		
< 5000 SR	354	70.8%
5000 – 10,000 SR	61	12.2%
10,000 – 15,000 SR	54	10.8%
>15,000 SR	31	6.2%
Educational level		
elementary school	5	1%
middle school	11	2.2%
high school	62	12.4%
college	407	81.4%
higher	15	3%
College		
Health college	123	24.6%
Non-health college	300	60%
Haven't been to college	77	15.4%

**Table 3: Knowledge on osteoporosis:
Risk factors, prevention & treatment.**

No.	Items for knowledge assessment	Correct answer	Frequency of correct answer (n)	Percent (%)
1	Physical activity increased risk of osteoporosis	No	414	82.8%
2	Weight training improves bones health	Yes	305	61%
3	Most people gain bone mass after 30	No	318	63.6%
4	Lower weight women have osteoporosis more than heavy women	Yes	438	87.6%
5	Drinking soft drinks linked to occurrence of osteoporosis	Yes	407	81.4%
6	The most important time to build bone strength is between 9 and 17	Yes	146	29.2%
7	Normally, bone loss speeds up after menopause	Yes	426	85.2%
8	High caffeine combined with low calcium intake increase the risk for osteoporosis	Yes	435	87%
9	There are many ways to prevent osteoporosis	Yes	475	95%
10	Without preventive measures, 20% of women older than 50 years will have fracture due to osteoporosis in their lifetime.	Yes	441	88.2%
11	There are treatments for osteoporosis after it develops.	Yes	320	64%
12	A lifetime of low intake of calcium and vitamin D increases the risk of osteoporosis.	Yes	466	93.2%
13	Smoking reduces the risk of osteoporosis.	No	441	88.2%
14	Walking has a great effect on bone health.	No	27	5.4%
15	After menopause, women not on estrogen need about 1,500 mg of calcium (for example, 5 glasses of milk) daily.	Yes	335	67%
16	Osteoporosis affects men and women.	Yes	481	96.2%
17	Early menopause is a risk factor for osteoporosis.	Yes	334	66.8%
18	Replacing hormones after menopause slow down bone loss.	Yes	330	66%
19	Children 9 to 17 years of age get enough calcium from one glass of milk each day to prevent osteoporosis.	No	167	33.4%
20	Family history of osteoporosis is a risk factor for osteoporosis.	Yes	370	74%

Figure 1: knowledge category of the studied sample. Excellent knowledge score (26/40). Good Knowledge score (16-25 out of 40). Poor Knowledge score (<15 out of 40).

	Knowledge Score Average ± SD	P value
Age group		
<25	28.8± 4.06	0.46
26 – 45	29.2 ± 3.83	
>46	29.5 ± 3.47	
Marital status		
Married	29.5 ± 3.66	0.032
Single	28.7 ± 4.08	
Social class		
< 5000 SR	28.7 ± 4.11	0.181
5000 – 10,000 SR	29.5 ± 3.11	
10,000 – 15,000 SR	29.5 ± 3.85	
>15,000 SR	29.7 ± 3.95	
Educational level		
Elementary school	27 ± 4.12	0.872
Secondary school	29 ± 3.55	
High school	29 ± 2.99	
College undergraduate	28.9 ± 4.13	
Postgraduate	28.8 ± 4.04	
College		
Health college	30.5 ± 3.8	0.01
Non-health college	28.3 ± 4.1	
If heard about osteoporosis		
Yes	29.0 ± 3.9	0.024
No	25.8 ± 4.9	
Diagnosed with osteoporosis		
Yes	28.8 ± 5.38	0.834
No	28.9 ± 3.89	
Diagnosed friends or relatives		
Yes	28.9 ± 3.70	0.447
No	28.9 ± 4.31	

Table 4: Knowledge category among various subgroups in the studied sample.

DISCUSSION:

The aim of our study is to evaluate the awareness of osteoporosis among Saudi females. Osteoporosis has been known to be a major public health problem by healthcare providers in Saudi Arabia, since it has a prevalence of 34% between 29 to 56 years of age. A questionnaire was chosen to be the tool of assessment in this research, as it showed to be effective in measuring the awareness in several previous studies.

The present results indicated that married females have significantly better knowledge of osteoporosis than unmarried females. Similarly, in a previous study conducted in Jeddah, Saudi Arabia (1), married students knew more about osteoporosis compared to single students. This highlights the fact that married women are seeking medical advice more often, due to their bone health concerns, oral contraceptive pills and conceiving. However, that study (1), revealed that students of low economic status had higher awareness regarding osteoporosis. On the other hand, our study showed insignificant difference between different social classes. It is suggested to be a result of growing number of public universities in the capital city, which contributed in raising the chances of getting educated about osteoporosis regardless of the social status.

On the same study, they found that 77% of their participants had an excellent knowledge, where 82% of our participants had also an excellent knowledge about osteoporosis. In conclusion, knowledge about osteoporosis in Saudi Arabia is fairly good, but we aspire to make it reach a 100% of an excellent knowledge.

Our study revealed no significant difference among various age groups. Two previous studies conducted in the US [11], and Pakistan [12] has likewise found that osteoporosis-related knowledge is independent of age.

A percentage of only 5.4% correctly answered question 14 (Walking has a great effect on bone health). Similarly, another study also had a correct response rate of only 1.8% to the same questions [10], which confirms a huge misunderstanding concerning walking impact on bone. This could be due to the misconception of walking as a potent exercise for general health. However, it has to be highlighted that no previous studies showed positive effect of walking on bone density. This can also be explained through the fact that 61% of participants had correctly answered Question 2 (weight training improves bone health).

Another study was conducted among rural Turkish women revealed that television was the main source of knowledge about osteoporosis with percentage of 55%, while doctors were the second source [13]. On the other hand, our study showed that family relatives were the first source of information about osteoporosis with a percentage of 46%, and the internet was the second source. This explains the fact that educational level had no impact on raising the awareness, therefore, it showed no significant difference among various subgroups. Also it can be explained by the difference between the city and the rural areas. Overall, this study revealed that rural Turkish women generally had a low knowledge score compared with the knowledge score of our study, in which 82% of women had an excellent knowledge.

A significant difference between health and non-health colleges' students was evident. Where health colleges' students showed a higher knowledge score than non-health colleges' students. Nonetheless, no comparison of different college sectors has been carried out in the population of Saudi Arabia.

Our study has some limitations such as using convenient sampling method, which may not represent the majority of the female population. Also, there are dissimilar proportions of the numbers of respondents in different colleges. 81% of our participants were college students, we need to include more participants of different educational levels to show a similar result of the actual knowledge of women in Riyadh. Nevertheless, our justification is the adequate number of our sample. This study gives a highlight on the items needed in order to plan a future educational campaign to bridge the awareness gaps of different socio-demographic background in Riyadh city.

CONCLUSION:

The majority of Saudi females in this study have the highest knowledge about osteoporosis with no significant difference among different age groups or educational level. However, females who are relevant to health field have a significantly better knowledge about osteoporosis than others who are relevant to non-health sector. Raising the importance of increase awareness campaigns especially among unmarried and who are relevant to non-health field is a significant and powerful tool that may contribute in the prevention of osteoporosis.

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