Osteoporosis Knowledge Assessment among Medical Interns

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Abstract

Background: Osteoporosis is a disease that affects bone and causes a low bone density and deterioration of bone micro-architecture. It affects 36.6% of those over age 50 in Saudi Arabia. Osteoporotic patients are likely to get fractures, and thus additional knowledge for screening and prevention is critical.

Method: We conducted a cross-sectional study from May–August 2015 to assess the osteoporosis knowledge among Medical Interns. We used Osteoporosis Knowledge Assessment Tool (OKAT). Those who answered >60% of the questions correctly were considered to be knowledgeable of osteoporosis.

Results: We enrolled 140 interns and 84 (60%) were male; 27% were interested in internal medicine, 24% in general surgery, and 3.6% in orthopedics. 35.7% have a family history of osteoporosis, and 23% had a personal history of fractures. 78.6% are interested in health education, 19% were active smokers and 50.7% exercised >30 minutes/week. The mean of the correctly answered questions was 10.62/20 (53%), and the mean GPA was 3/4. Questions related

to diet and exercise were among the least frequently correctly answered questions. 40.7% were aware of the age specific osteoporosis screening recommendations. A significant relationship was found between a high score with GPA (p=0.002) and those interested in health education (p.001).

Conclusion: Osteoporosis knowledge among interns was poor. Higher OKAT scores were associated with those who are interested in internal medicine, those with a high GPA and those interested in health education. When adjusting for GPA, no significant correlation was found between the area of interest or gender with the OKAT scores.

Keywords: Osteoporosis, Intern, Knowledge, OKAT

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Background

Osteoporosis is a disease that affects bone resulting in low bone density and deterioration of bone micro-architecture [1].Osteoporotic patients are likely to get fragility fractures if left untreated [2]. Over 200 million people are affected worldwide, and nearly 30% of the postmenopausal women have osteoporosis in the USA and Europe according to the International Osteoporosis Foundation (IOF). Osteoporosis prevalence is high in Saudi Arabia with 36.6% of

those aged 50 or older having osteoporosis compared to 10.3% in the USA [3, 4]. Osteoporosis in 30-90 year old men is 23.5% [5].

There are several factors associated with osteoporosis including age, endocrine changes, lifestyles, general health condition, and certain medications [6]. A balanced diet that contains an abundance of fruits, vegetables, protein sources but no cola beverages has shown to support bone status[7]. Sufficient calcium and vitamin D supplements have shown to decrease the risk of fractures [8]. Exercise shows a small but statistically significant positive impact on bone density compared to control group. Exercise is a safe way to prevent bone loss in postmenopausal women [9]. All of the previously mentioned measures can be used with better physicians and patient awareness.

Osteoporosis is a progressive chronic health problem that leads to excess mortality and morbidity [10]. It has been estimated that the one-year mortality after the osteoporotic hip fracture to be around 12.2% with a high mortality found in men compared to women 15.4%, 11.1% respectively[11]. The prevalence of osteoporosis is increasing and affects the economic status of the world [10]. In the Eastern Province of Saudi, the osteoporosis related proximal femur fracture is estimated to cost $12 million annually with an estimated national cost of $1.14 billion annually [12]. Some of the burden can be reduced or prevented with better individual and provider awareness.

One of the IOF goals is to improve the health care provider's osteoporosis knowledge to help deploy preventive and screening measures. A recent study conducted in the outpatient clinic to determine the screening rates for osteoporosis in males and females according to the age specific recommendations found that the DXA scan was performed only for 18.4% of the men and 60% of the women [13]. Similar data from separately published studies showed that the

overall screening rate is not yet optimal. This may reflect the poor knowledge and practice in regards to osteoporosis screening. Thus, we should do research to assess knowledge, practice, and attitudes about osteoporosis among interns.

Methods

This cross sectional study involved medical interns from Saudi Arabia from May–August 2015. We included interns from nine different Medical Schools in Saudi Arabia. We excluded medical students and residents. Total enrollment was 140 interns from 9 Medical Schools in Saudi Arabia.

Demographic data about the gender, area of interest, the intern personal interest in health education, and GPA were self-reported. Lifestyle habits include smoking (active and passive) and exercise was collected. Information about personal history of fractures and family history of osteoporosis were recorded. We also assessed the awareness of the interns about the USPSTF age-specific osteoporosis screening recommendations.

To assess knowledge, attitude, and practice about osteoporosis we used the self-reported OKAT questionnaire. The OKAT is a valid and reliable questionnaire to assess knowledge about osteoporosis[14]. The OKAT questionnaire is composed of 20 items to assess knowledge about osteoporosis, and the first 12 questions were to assess knowledge and questions 13-16 were to assess attitude to osteoporosis and last 4 questions assessed practice and perception to prevent osteoporosis. It consists of multiple choices questions with each question having 3 answers: true, false, and I don’t know. We considered those who answered I don’t know to be an incorrect answer. Interns who answered >60% of the questions correctly were considered to be aware about osteoporosis.

The questionnaire was available for an online medical group and interns were invited to participate in the online survey. All respondents who did not complete the questionnaire and the demographic data were excluded.

Data were collected in an Excel sheet and analyzed with SPSS version 20. The mean and the standard deviation (SD) were used to express scale data and frequency and percentage were presented category data. The Chi square to assess the relationship between the variables and the 1-way ANOVA and t test to compare the means were used in the analysis. We considered a p value of 0.05 or less to be significant.

Results

A total of 140 of medical interns participated with 59.7% of them male (Table 1). The mean GPA was 3/4 (SD 0.53). Most participants were interested in internal medicine and surgery and 82.7% were interested in health education; 19% were active smokers, 19% were passive smokers, and 50.7% exercised at least 30 minutes per week. 36.7% had a family history of osteoporosis and 23% had a personal history of fracture.

The mean correctly answered OKAT questions was 10.4 out of the 20 questions (Table 2). 40% of the interns answered > 60% of the question correctly and were consider aware about osteoporosis. Those who are aware were significantly more likely to have a higher GPA and were more likely to be interested in health education. There were no significant differences between groups in regards to the history of fractures or the lifestyle behaviors.

Table 1: Baseline characteristics for the whole cohort

Variable	Categories	Total (%)
Gender	Male Female	59.7 % 40.3 %
Mean GPA (SD)		3 (.53)
Area of interest	Internal Medicine Surgery Obstetric Pediatric Family Orthopedic Other	37 (26.6) 33 (23.7) 2 (1.4) 17 (12.2) 15 (10.8) 5 (3.6) 30 (21.6)
History of Personal fracture		32 (23)
Family history of fracture		51 (36.7)
Interested in health education		110 (82.7)
Smoking	Active Passive Don't smoke	27 (19.4) 27 (19.4) 85 (61.2)
Exercise at least 30 minutes per week		71 (50.7)
Mean of correct answers (SD)		10.4 (3.2)
Osteoporosis awareness using OKAT questioner	Aware	56 (40)
USPSTF age specific osteoporosis recommendations	Aware	57 (40.7)

96.4% of participants knew that fractures are an osteoporosis related complication (Table 3). More than 80% of the interns correctly answered the gender- and age-related risk factors question. Questions related to diet and exercise were among the least correctly answered questions. Only 32.4% of the interns were aware that osteoporosis is usually asymptomatic.

Only 40.7% were aware of age-specific USPSTF osteoporosis screening recommendations.

Table 2: Sociodemographic characteristics of the participants according to the awareness status

Variable	categories	Aware	Not aware	P value
Gender (%)	Male Female	38 (67.9) 18 (32.1)	45 (53.6) 38 (45.8)	.44
Mean GPA (SD)		3.2 (.38)	2.9 (.6)	.01
Mean of correct answers(SD), total of 20 questions		13.41 (1.27)	8.4 (2.5)	< 0.05
Area of interest (%)	Int. Medicine Surgery Obstetric Pediatric Family Orthopedic Other	20 (35.7) 16 (28.6) 2 (3.6) 4 (7.1) 4 (7.1) 2 (3.6) 7 (12.5)	17 (21.8) 17 (24.4) 0 13 (14.1) 11 (12.8) 3 (3.8) 23 (27.4)	.19
History of Personal fracture		12 (21.4)	20 (24.1)	.81
Family history of fracture		20 (35.7)	31 (37.3)	.71
Interested in health education		49 (90.7)	61 (77)	.007
Smoking	Active Passive Don't smoke	9 (12.9) 9 (19.4) 38 (67.6)	18 (21.7) 18 (21.7) 47 (56.6)	.3
Exercise at least 30 minutes per week		26 (46.4)	43 (51.2)	.88
USPSTF age specific osteoporosis recommendations	Aware	21 (37.5)	36 (44.4)	.35

Among all variables, only those who were interested in health education (p=0.007) and who had high GPA (p=0.03) were significantly associated with awareness.

When we compared those who are interested in internal medicine to those who are interested in other specialties, those who are interested in internal medicine had a higher GPA (p=0.03) and answered more than 60% of the questionnaire correctly (p=0.04) (Table 4).

Table 3: OKAT questionnaire with the correct answers and the percentage of the interns who correctly answered each question

Items	Correct answer	Percentage of correct answer
1. Osteoporosis leads to an increased risk of bone fractures.	True	96.4
2. Osteoporosis usually causes symptoms (e.g., pain) before fractures occur.	False	32.4
3. Having a higher peak bone mass at the end of childhood gives no protection against the development of osteoporosis in later life.	True	33.6
4. Osteoporosis is more common in men.	False	86.4
5. Cigarette smoking can contribute to osteoporosis.	True	70.7
6. White women are at highest risk of fracture as compared to other races.	True	39.3
7. A fall is just as important as low bone strength in causing fractures.	True	50.4
8. By age 80, the majority of women have osteoporosis.	True	84.3
9. From age 50, most women can expect at least one fracture before they die.	True	35.3
10. Any type of physical activity is beneficial for osteoporosis.	False	25.4
11. It is easy to tell whether I am at risk of osteoporosis by my clinical risk factors.	True	57.2
12. Family history of osteoporosis strongly predisposes a person to osteoporosis.	True	59
13. An adequate calcium intake can be achieved from two glasses of milk a day.	True	55.8
14. Sardines and broccoli are good sources of calcium for people who cannot take dairy products.	True	53.2
15. Calcium supplements alone can prevent bone loss.	False	66.9
16. Alcohol in moderation has little effect on osteoporosis.	True	37.7
17. A high salt intake is a risk factor for osteoporosis.	True	23.4
18. There is a small amount of bone loss in the 10 years following the onset of menopause.	False	31.6
19. Hormone therapy prevents further bone loss at any age after menopause.	True	60.1
20. There are no effective treatments for osteoporosis available in “Saudi”.	False	52.2

Compared to male interns, female interns had a higher GPA ($p=0.009$), were more interested in health education ($p=0.05$) and were non-smokers ($p <0.05$) (Table 5). Nonetheless, male interns have an insignificant higher mean of correct answer.

Table 4: Characteristics of the participants according to the area of interest

Variables	Internal Medicine	Other Specialties	P value
Mean GPA(SD)	3.33 (.40)	3.0 (.54)	.03
History of Personal fracture	10 (27.8)	20 (21.4)	.43
Family history of fracture	12 (33.3)	39 (37.9)	.62
Osteoporosis awareness using OKAT questioner	20 (54.1)	36 (35)	.04
USPSTF age specific osteoporosis recommendations.	12 (32.4)	45 (45)	.18

Table 5: Characteristics of the participants according to gender

Variables	categories	Male (%)	Female (%)	P value
Gender		83 (59.7)	56 (40.3)	
Mean GPA (SD)		2.9 (.54)	3.3 (.38)	.009
Area of interest	Inter. Med Surgery Obstetric Pediatric Family Orthopedic Other	20 (24.4) 23 (28) 1 (1.2) 8 (9.8) 10 (12) 4 (4.8) 16 (19.3)	16 (28.6) 10 (17) 1 (1.8) 9 (16.1) 5 (8.9) 1 (1.8) 14 (25)	.61
Interested in health education		62 (77.5)	47 (90.4)	.05
Smoking	Active Passive Don't smoke	27 (32.5) 21 (25.3) 35 (42.2)	0 6 (10.7) 49 (89.1)	.000
Exercise at least 30 minutes per week		39 (47)	29 (51.8)	.57
mean of correct answers(SD)		10.6 (3.1)	10.2 (3.2)	.42
USPSTF age specific osteoporosis recommendations	Aware	38 (46.9)	19 (34.5)	.15

Partial correlation adjusting for smoking, exercise, GPA, and interest in health education showed no significant correlation between gender, personal/family history of fractures, or specialty interest and OKAT score.

Discussion

Osteoporosis complications are leading causes of morbidity and mortality. There are 9 million estimated osteoporosis fractures annually worldwide. In Europe, disability due to osteoporosis is greater than disability due to cancer. This is comparable or greater than non-communicated disease [15]. A strong knowledge about osteoporosis among newly graduated medical students regardless of their future career interest should be a goal of Medical Societies.

Our finding showed that 40% of interns were aware of osteoporosis, and awareness was associated with a high GPA and interest in health education. There were no significant differences among those who were aware and those who are not in terms of personal history of fracture, family history and lifestyle behaviors (smoking and exercise). Female interns had a significantly high GPA and were more likely to be interested in health education; there was no significant difference between awareness and gender.

Few studies have been conducted on this topic, and these were done in different populations with different instruments. This makes it difficult to frame our finding. We used a valid survey (OKAT) to assess knowledge. This tool was published in 2003 by Winzenberg, T.M., et al [14]. The mean corrected answer in our study was 10.4 (3.2). One study used a similar screening instrument among junior and senior nursing students in Damascus, Syria and showed that the mean number of correctly answered questions was 7.9 (SD 2.7). They also found that the score regarding seriousness of osteoporosis in Osteoporosis Health Belief Scale (OHBS) increased from 14.6 to 17.2 in those whom had a history of maternal fracture with low trauma.

Other studies were conducted in the general population and showed poor awareness about osteoporosis and awareness associated with high education [10, 16, 17, 18]. A recent study in Saudi Arabia was done among primary health care physicians. This showed awareness about

osteoporosis is between 36.5-2.5%. Another study conducted in Germany among primary health physician doctors showed that 83% were aware of osteoporosis[19].

International smoking among health professionals shows various results: 32% of male interns were active smokers. This is considered among the highest prevalence of smoking worldwide in the medical profession along with China, Italy, Estonia, and Japan at 32%, 32%, 25%, 27%, respectively [20].

The strengths of our study include a valid tool (OKAT) to assess knowledge about osteoporosis. We also collected information about the factors that might affect awareness and might use it to encourage education in general. This problem is related to osteoporosis specifically.

Limitations in our study include a small number size, the use of an online survey that might lead to selection bias. Thus, we could not generalize our findings to all medical interns. The self-reported GPA might also be a limitaion.

We recommend larger studies to assess the osteoporosis awareness among the health care providers and medical students in particular. Intervention studies like promoting extra lectures for medical students/interns as well as encouraging them to carry osteoporosis education campaigns to the general population might improve awareness about osteoporosis.

Conclusion

Osteoporosis knowledge among interns was poor. Higher OKAT score was associated with those who are interest in internal medicine, those with a high GPA and those interested in health education. When adjusting for GPA, there was no significant correlation between the area of interest or gender with the OKAT scores. There was no impact on lifestyle habits, personal fractures or a family history of osteoporosis on the osteoporosis knowledge score.

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