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Research Article

Knowledge of Osteoporosis and its Determinants among Iraqi Healthcare Workers

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Abstract

Background: Osteoporosis is a major public health problem. Sufficient osteoporosis knowledge by healthcare workers is essential to guaranteeing that they possess the abilities and skills to treat patients with osteoporosis effectively. ***Objectives***: This study aimed to assess the knowledge and awareness of osteoporosis among medical health workers, in addition to defining associated factors related to knowledge levels. ***Methods***: A cross-sectional study was conducted among healthcare workers in hospitals and primary healthcare centers in Al Najaf Governorate from May 1st, 2022, to March 1st, 2023. A self-structured questionnaire was used to collect data, including the sociodemographic characteristics of the participants and the Osteoporosis Knowledge Assessment Tool (OKAT) score. The collected data were analyzed using SPSS version 25. ***Results***: A total of 343 healthcare workers participated in this study. Their mean age was 32.45 years. Most participants had average and good knowledge (50% and 37%, respectively). Regarding awareness, 51.6% knew that calcium supplements alone cannot prevent bone loss, 16.9% identified that osteoporosis does not cause pain before a fracture, 44.3% knew that not all types of physical activity are useful for osteoporosis patients, and only 19.3% were aware that personal risk factors could predict the occurrence of the disease. ***Conclusions***: Most healthcare workers have average knowledge of osteoporosis. There is a significant gap in knowledge among the participants regarding symptoms, risk factors, and treatment availability.

Keywords: Awareness, Healthcare workers, Iraq, Knowledge, Osteoporosis.

معرفة هشاشة العظام ومحدداتها لدى العاملين في مجال الرعاية الصحية العراقيين

الخلاصة

الخلفية: هشاشة العظام هي مشكلة صحية عامة رئيسية. تعد المعرفة الكافية بهشاشة العظام من قبل العاملين في مجال الرعاية الصحية أمرا ضروريا لضمان امتلاكهم للقدرات والمهارات اللازمة لعلاج مرضى هشاشة العظام بشكل فعال. **الأهداف**: هدفت هذه الدراسة إلى تقييم المعرفة والوعي بهشاشة العظام بين الأطباء والعاملين الصحيين، بالإضافة إلى تحديد العوامل المرتبطة بمستويات المعرفة. **الطريقة**: أجريت دراسة مقطعية مستعرضة بين العاملين في مجال الرعاية الصحية في المستشفيات ومراكز الرعاية الصحية الأولية في محافظة النجف في الفترة من 1 مايو 2022 إلى 1 مارس 2023. تم استخدام استبيان منظم ذاتيا لجمع البيانات، بما في ذلك الخصائص الاجتماعية والديموغرافية للمشاركين ودرجة أداة تقييم المعرفة بهشاشة العظام (OKAT) وتم تحليل البيانات التي تم جمعها باستخدام SPSS الإصدار 25. **النتائج**: شارك 343 من العاملين في مجال الرعاية الصحية في هذه الدراسة. وكان متوسط أعمارهم 32.45 سنة. كان لدى معظم المشاركين معرفة متوسطة وجيدة (50٪ و 37٪ على التوالي). فيما يتعلق بالوعي، عرف 51.6٪ أن مكملات الكالسيوم وحدها لا يمكن أن تمنع فقدان العظام، وحدد 16.9٪ أن هشاشة العظام لا تسبب الألم قبل الكسر، وعرف 44.3٪ أنه ليست كل أنواع النشاط البدني مفيدة لمرضى هشاشة العظام ، و 19.3٪ فقط كانوا على دراية بأن عوامل الخطر الشخصية يمكن أن تتنبأ بحدوث المرض. **الاستنتاجات**: معظم العاملين في مجال الرعاية الصحية لديهم معرفة متوسطة بهشاشة العظام. هناك فجوة كبيرة في المعرفة بين المشاركين فيما يتعلق بالأعراض وعوامل الخطر وتوافر العلاج.

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INTRODUCTION

Osteoporosis (OP) is a systemic skeletal disease characterized by low bone mineral density, increasing the risk of low-trauma fractures [1]. It is the most common cause of bone fractures in the elderly population. Typically, there are no symptoms until a bone breaks. Bones might become so weak that they fracture readily with little pressure or on their own [2]. Global public health experts estimate that osteoporosis affects over 200 million individuals globally. According to the World Health Organization, osteoporosis is the cause of more than 8.9 million fractures worldwide each year [3]. Healthcare professionals directly involved in delivering treatment to patients are expected to have a better understanding and knowledge about osteoporosis [4,5]. Nursing practitioners are the crucial link in the chain of multidisciplinary approaches to educating people about primary and secondary osteoporosis prevention. They are responsible for managing this potentially avoidable disease and educating patients about the different aspects of its evaluation and management [6]. There is a lack of knowledge about osteoporosis among healthcare workers in many countries, as reported by emerging studies using various assessment tools [7–9]. The knowledge deficit of healthcare professionals is considered an important barrier to appropriate risk identification and management of this common health problem [10]. As a result, healthcare workers must have sufficient OP knowledge to ensure that they have the aptitude and skills to treat people with this disease successfully [11]. Therefore, the present study aimed to assess the knowledge and awareness of osteoporosis among medical health workers to gain a clearer insight into how to address this issue rapidly.

METHODS

Study design and setting

An analytic cross-sectional study was conducted in hospitals and primary health care centers in Al Najaf Governorate from May 1st, 2022, to March 1st, 2023. The hospitals and centers were chosen randomly by simple random sampling. The selected hospitals included Al Sadr General Hospital, Al Zahra Hospital, and Al Manathira General Hospital, while the selected primary healthcare centers included Al Hasan Al Mojtaba PHCC and Al Manathira PHCC. The study participants included 384 healthcare workers from the selected hospitals and primary healthcare centers.

Sample size

The minimum sample size was calculated to be 384 with a 95% confidence interval and 5% precision, and the prevalence of good osteoporosis knowledge among healthcare workers was assumed to be 50% to ensure an adequate sample.

Research instruments

A questionnaire was used to collect the data. It contains two parts; the first part is related to sociodemographic data. The second part assessed knowledge about osteoporosis using the self-reported osteoporosis knowledge assessment tool (OKAT) questionnaire. The OKAT is a reliable questionnaire for evaluating osteoporosis knowledge [12]. The OKAT is a 20-item questionnaire with "yes," "no," and "I don't know" options for each item. It was established in 2003 by Winzenberg and coauthors [13]. The OKAT is structured around three major themes: knowledge of osteoporosis symptoms and risk factors; knowledge of osteoporosis protective factors such as nutrition and exercise; and availability of treatment.

OKAT score calculation

The responses are categorical (yes, I don't know, and no) and will be applied with an item score of '1', for the correct response and '0', for the incorrect response, a cumulative score of twenty, followed by a summation of the degree of the question answers and giving a score as follows: poor knowledge (< 8), average knowledge (8–12), and good knowledge (> 12). A pilot study was conducted approximately two weeks before data collection, with a sample of 10 participants who were excluded from the study, to test the questionnaire for any difficulties and to determine the time needed for the collection of data.

Ethical consideration

The research protocol was officially approved by AL Najaf Health Directorate. Each participant was told they were free to participate in this study with no names or identities. We verbally assured participants about the study's purpose, voluntary nature, anonymity, and lack of technical requirements.

Statistical analysis

SPSS (Statistical Package for Social Sciences) version 25 was used for data entry and analysis. Tables and figures were used for the summarization of the data. Continuous variables are presented as means and standard deviations. Categorical variables are presented as frequencies and percentages. The chi-square test was used to test associations between knowledge scores and the sociodemographic features of participants. A p-value < 0.05 indicates statistical significance.

RESULTS

This study included 384 Iraqi healthcare workers, whose mean age was 32.45 years, 48.7% of whom were male, 83.1% were urban, and nearly half (48.9%) of the participants had an educational degree higher than high school. Table 1 provides further details. Concerning personal and family history of osteoporosis and previous personal and family history of fracture, most of the participants (91.7%, n= 352) did not experience osteoporosis in their lives.

Table 1: Sociodemographic variables of the participants

Variable	Frequency (%)
Age group (year)	
20 -29	190(49.4)
30-39	102(26.5)
40-49	70(18.2)
≥ 50	22(5.7)
Gender	
Male	187(48.7)
Female	197(51.3)
Residence	
Urban	319(83.1)
Rural	64(16.7)
Job	
Physician	37(9.6)
Dentist	19(4,9)
Pharmacist	19(4.9)
Medical Staff	304(79.2)
Others	5(1.3)
Qualification	
Post Graduate	32(8.3)
University	156(40.6)
Diploma	124(32.3)
High school	72(18.8)
Workplace	
Hospital	333(86.7)
PHCC	51(13.2)
Marital status	
Married	273(71.1)
Unmarried	111(28.9)

In contrast, more than half (53.9%, n= 207) had a history of fracture, either personally or in their families, as shown in Table 2. Regarding the osteoporosis knowledge assessment tool, the majority (94.5%) of participants were aware that osteoporosis leads to an increased risk of bone fractures; more than half of them (51.6%) knew that calcium supplements alone can't prevent bone loss, and less than half (39.3%) of them knew that elevating peak bone mass at the end of childhood protects against osteoporosis development later in life.

Table 2: Distribution of participants according to their personal and family history of fracture and osteoporosis

Variable	Yes n(%)	No n(%)
Personal history of fracture	63(16.4)	321(83.6)
Personal history of osteoporosis	32(8.3)	352(91.7)
family history of osteoporosis	73(19)	311(8.1)
Family history of fracture	144(37.5)	240(62.5)

Respondents' knowledge of osteoporosis symptoms was worse, and only 16.9% thought that osteoporosis usually causes no symptoms before fractures occur. More than one-third (40.1%) of participants believed that Iraq did not offer any effective osteoporosis treatment, as shown in Table 3. As shown in Figure 1, the vast majority of participants had average and good knowledge (50.26% and 36.72%, respectively). Table 4 reveals that those aged 30–39 had the highest percentage of knowledge (52%; p= 0.012). Rural inhabitants had greater knowledge about osteoporosis (43.1%) than those living in urban areas (35.4%); however, there was no statistically significant difference (p=0.157). Diploma holders exhibited the highest level of good knowledge (39.5%). Doctors had the highest level of good knowledge (51.4%), followed by dentists (47.4%), pharmacists (36.8%), and medical staff (34.5%); however, statistical analysis revealed no association (p= 0.450).

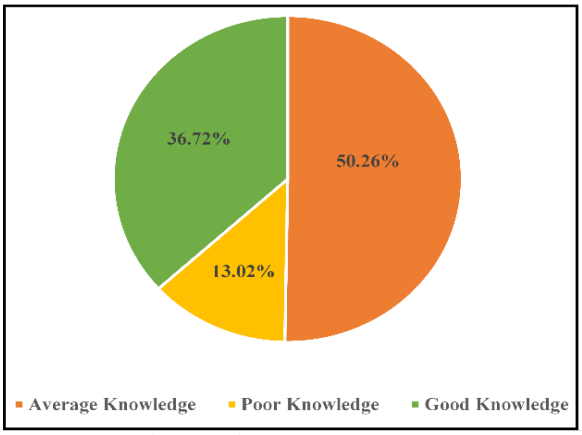

Figure 1: Classification of healthcare workers according to their osteoporosis knowledge score.

As shown in Table 5, there was no significant association between knowledge and personal history of fracture (p=0.343), family history of fracture (p= 0.592), personal history of osteoporosis (p= 0.603), or family history of osteoporosis (p= 0.472).

DISCUSSION

Osteoporosis is a significant health concern, especially with the increasing aging population [14]. Researchers from various countries have highlighted the lack of osteoporosis knowledge, risk factors, and prevention among the general population and healthcare workers [15,16]. The current study was conducted to evaluate the level of knowledge regarding osteoporosis among Iraqi health workers. The majority of participants demonstrated average and good knowledge (50% and 37%, respectively), while only 13% demonstrated poor knowledge. This finding is similar to those of previous Saudi studies conducted among primary care physicians and physical therapists, which reported that approximately 19% and 19.5% of participants, respectively, expressed poor knowledge [16,17]. However, the current result surpasses an earlier Iraqi study among women in Al Najaf city, which reported that 62% of the participants had poor knowledge [18]. An Indian study among medical professionals revealed participants' suboptimal knowledge regarding various aspects of osteoporosis diagnosis and management [19]. The results showed that the group aged 30–39 years had the highest percentage of good knowledge (52%; p= 0.012). These results were analogous to those of an earlier Indian study [19], which reported better knowledge with more up-to-date information regarding osteoporosis among younger and less experienced physicians. However, previous studies have shown no significant differences in osteoporosis knowledge between diverse age groups [17,20]. This discrepancy in the results could be due to differences in the sample

attributes and study tools. The present study revealed no significant differences in osteoporosis knowledge among different health professionals (p>0.05); similarly, Alghamdi *et al*. (2018) reported no significant differences in the degree of knowledge among the different health professionals' subgroups [21].

Table 3: Osteoporosis knowledge assessment tool according to participants' answers

OKAT questions	Correct answer *n*(%)	Incorrect answer *n*(%)	I don't know *n*(%)
Osteoporosis leads to an increased risk of bone fractures.	363(94.5)	10(2.6)	11(2.9)
Osteoporosis typically leads to symptoms such as pain before fractures occur.	65(16.9)	269(70.1)	50(13)
Having a higher peak bone mass at the end of childhood does not necessarily protect against the development of osteoporosis in later life.	151(39.3)	83(21.6)	150(39.1)
Osteoporosis is more common in men.	242(63)	69(18)	73(19)
Cigarette smoking can increase the risk of osteoporosis.	196(51)	100(26)	88(23)
Sun exposure prevents osteoporosis.	338(88)	33(8.6)	13(3.4)
A fall is just as important as low bone strength in causing fractures.	296(77.1)	43(11.2)	45(11.7)
The majority of women have osteoporosis by age 80.	280(72.9)	47(12.2)	57(14.9)
Most women from age 50 can expect at least one fracture before they die.	223(58.1)	79(20.6)	82(21.4)
Any type of physical activity is valuable for osteoporosis.	170(44.3)	138(35.9)	76(19.8)
It is easy to determine if I am at risk of osteoporosis based on my clinical risk factors.	74(19.3)	220(57.3)	90(23.4)
Having a family history of osteoporosis significantly increases a person's likelihood of developing osteoporosis.	303(78.9)	48(12.5)	33(8.6)
You can meet your calcium needs by drinking two glasses of milk per day.	319(83.1)	34(8,9)	31(8.1)
Sardines and broccoli are good sources of calcium for people who cannot consume dairy products.	284(74)	33(8.6)	67(17.4)
Taking calcium supplements by itself can help prevent bone loss.	198(51.6)	125(32.6)	61(15.9)
Soft drinks increase the possibility of osteoporosis.	329(85.7)	29(7.6)	26(6.8)

In contrast, an Egyptian survey reported differences in osteoporosis knowledge regarding the current specialty; the latter study included physicians who mainly manage osteoporosis in their practice [22], whereas the current study included different health professionals, thus explaining the contradictory findings.

Table 4: Association of the participant's level of knowledge about osteoporosis with their sociodemographic characteristics

Variable	Good n(%)	Average n(%)	Poor n(%)	Total n(%)	*p*-value
Age group (year)					
20-29	58(30.)	105(55.3)	27(14.2)	190(100)	0.012
30-39	53(52)	40(39.2)	9(8.8)	102(100)	
40-49	20(28.)	39(55.7)	11(15.7)	70(100)	
≥ 50	10(45.5)	9(40.9)	3(13.6)	22(100)	
Gender					
Male	73 (39)	87(46.5)	27(14.4)	187(100)	0.348
Female	68 (34.5)	106(53.8)	23(11.7)	197(100)	
Marital status					
Married	101(37)	137(50.2)	35(12.8)	273(100)	0.975
Unmarried	40(36)	56(50.5)	15(13.5)	111(100)	
Qualification					
Postgraduate	12(37.5)	13(40.6)	7(21.9)	32(100)	0.205
University	60(38.5)	79(50.6)	17(10.9)	156(100)	
Diploma	49(39.5)	63(50.8)	12(9.7)	124(100)	
Secondary school	20(27.8)	38(52.8)	14(19.4)	72(100)	
Residence					
Urban	113(35.4)	160(50.2)	46(14.4)	319(100)	0.157
Rural	28(43.1)	33(50.8)	4(6.2)	65(100)	
Job					
Physician	19(51.4)	12(32.4)	6(16.2)	37(100)	0.450
Dentist	9(47.4)	9(47.4)	1(5.3)	19(100)	
Pharmacist	7(36.8)	9(47.4)	3(15.8)	19(100)	
Nurse	105(34.5)	160(52.6)	39(12.8)	304(100)	
Workplace					
Hospital	118(35.4)	171(51.4)	44(13.2)	333(100)	0.409
PHCC	23(45.1)	22(43.1)	6(11.8)	51(100)	

Regarding residence, there was a non-significant difference in osteoporosis knowledge between those living in a city and those living in a rural territory (p>0.05). This finding differs from similar studies conducted in Iraq [18] and Egypt [22], which showed a higher level of good and average knowledge among urban participants. The current result could be due to the fact that all of the participants were employed and highly educated, even though they lived in rural areas. Al-Adwani *et al*. (2019) showed that education is a significant attribute of osteoporosis knowledge [23]. Similarly, qualification was associated with increased

knowledge of osteoporosis, as reported by a Saudi study among physical therapy providers [17]. Despite the high level of education of most of our participants, we observed no statistically significant difference in OP knowledge based on their qualifications (p>0.05).

Table 5: Association of the level of knowledge about osteoporosis with a personal and family history of fracture and osteoporosis among participants

Variable		Good n(%)	Average n(%)	Poor n(%)	Total n(%)	*p*-value
Personal history of fracture	Yes	25(39.7)	27(42.9)	11(17.5)	63(100)	0.343
	No	116(36.1)	166(51.7)	39(12.1)	321(100)	
Family history of bone fracture	Yes	52 (36.1)	70(48.6)	22(15.3)	144(100)	0.592
	No	89 (37.1)	123(51.2)	28(11.7)	240(100)	
Personal history of osteoporosis	Yes	11 (34.4)	15 (46.9)	6 (18.8)	32 (100)	0.603
	No	130(36.9)	178(50.6)	44(12.5)	352(100)	
Family history of osteoporosis	Yes	30 (41.1)	32(43.8)	11(15.1)	73 (100)	0.472
	No	111(35.7)	161(51.8)	39(12.5)	311(100)	

In this study, most participants had average osteoporosis knowledge. However, only 16 % of them reported that osteoporosis is usually asymptomatic. This result is lower than that reported in a study conducted in Saudi Arabia, as 24.4% of healthcare workers knew that osteoporosis is generally asymptomatic [17]. Another study revealed that 40% of healthcare workers knew that osteoporosis was typically asymptomatic [21]. The higher percentages compared to this study suggest variations in osteoporosis knowledge across different regions or populations. Less than half of healthcare workers (39.3%) knew that having a higher peak bone mass protects against osteoporosis development later in life. This finding is consistent with that of Almaddah *et al*., who reported that 33% of physical health providers were aware of this fact [17]. In contrast to a study conducted in China, 54% of orthopedic nurses knew the importance of having a greater bone mass for protection from subsequent osteoporosis [24]. The discrepancy in the specialty of the studied sample between these studies could potentially account for this inconsistency. Currently, half of the participants (51%) think that smoking cigarettes is a risk factor for osteoporosis. These findings are lower than those of Almaddah *et al*., who reported that 71.4% of physical therapists recognized smoking as an osteoporosis risk factor [21]. In a Chinese study, 76% of orthopedic nurses recognized smoking cigarettes as a risk factor [24]. According to the current results, less than half (44.3%) of the participants stated that physical activity helps prevent osteoporosis. This is similar to the findings of a Saudi study in which 47% of participants reported the importance of exercise for osteoporosis prevention [17]. This percentage is lower than that reported by other studies, in which 59% and 85.5% of healthcare workers demonstrated that physical activity is beneficial for the prevention of osteoporosis [21,24]. The current results indicate a substantial deficiency in knowledge about osteoporosis among healthcare workers. More than half of the healthcare workers (51.6%) thought that calcium supplements alone could not prevent osteoporosis, which is similar to the findings of Penga et al., who reported that 51% of orthopedic nurses in China believed that calcium supplements alone could not prevent osteoporosis [24]. In contrast, 92% of Saudi physicians and nurses reported that calcium supplements and vitamin D can prevent osteoporosis [21]. Moreover, Almaddah *et al*. reported that 62% of physical therapists recognized that calcium alone could not prevent osteoporosis [17]. Only one-third (35.7%) of the participants knew that hormone therapy prevents further bone loss at any age after menopause. This figure is nearly 41%, according to a study conducted in Saudi Arabia [17]. Moreover, this percentage is higher than the 24% reported by Chinese nurses [24]. Surprisingly, regarding osteoporosis treatment, 33.6% of the study participants recognized that there is an effective line of treatment available; this percentage is better than the 13% reported by Chinese orthopedic nurses [24]. Other studies report that 52% to 55% of participants believed that an effective line of treatment exists for osteoporosis [17,21]. There is some variability in the knowledge of healthcare workers across different regions and studies regarding symptoms, risk factors, prevention, and the availability of effective treatments for osteoporosis. However, approximately half of the respondents across various studies had incorrect knowledge about some factors related to osteoporosis. We should encourage healthcare professionals to engage in ongoing medical education programs and short-term courses to ensure their knowledge and treatment plans remain current with the latest evidence.

Study limitations

The convenience of sample selection in a single city limits this study's generalizability. However, to our knowledge, this is the first Iraqi study assessing osteoporosis among a large sample of healthcare workers from primary and secondary health institutions.

Conclusions

Healthcare workers have an average awareness of osteoporosis. The younger age group was more knowledgeable than the older age groupings. Healthcare workers had a considerable knowledge gap about symptoms, risk factors, and treatment options.

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Conflict of interests

No conflict of interests was declared by the authors.

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Data sharing statement

Supplementary data can be shared with the corresponding author upon reasonable request.

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