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Women's knowledge concerning osteoporosis at Al Diwaniyah State, Iraq: A cross-sectional design study

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Abstract:

BACKGROUND: Osteoporosis is a growing epidemic that threatens the health of people all over the world. Unfortunately, many women still do not take the necessary precautions to avoid osteoporosis, and many have incorrect ideas about the disease. The current study aimed to assess women's knowledge of osteoporosis.

MATERIALS AND METHODS: This cross-sectional descriptive-analytical study was performed by purposive sampling on 383 menopausal women aged 45–65 years covered by all health centers from November 8, 2023 to April 20, 2024 in Diwaniyah Iraq. The osteoporosis knowledge assessment tool was used to evaluate participants' knowledge. Data were analyzed using descriptive and analytical statistics in SPSS version 27 software.

RESULTS: In this study, a significant proportion of participants demonstrated poor knowledge (13.5%), while 64.4% had average knowledge, and 22.1% exhibited good knowledge. The study did not find statistically significant differences in participants' knowledge based on employment status, marital status, or residence ($P = 0.062$, $P = 0.403$, $P = 0.192$, respectively). However, there is a statistically significant correlation between participants' knowledge and their level of education ($P = 0.010$).

CONCLUSIONS: The participants exhibit average knowledge regarding osteoporosis. This finding underscores the importance of increasing osteoporosis knowledge to reduce the risk of harm and healthcare costs. Consequently, a comprehensive women's health program should incorporate various components of osteoporosis prevention.

Keywords:

Iraq, knowledge, osteoporosis, women

Introduction

The World Health Organization (WHO) defines osteoporosis as a gradual degeneration of the skeletal system, leading to decreased bone density and structural degradation of bone tissue.[1] According to WHO criteria, a T-score greater than or equal to 1 indicates a normal state, while a T-score between -1 and -2.5 indicates osteopenia. A T-score less than or equal to -2.5 signifies osteoporosis.[2] Osteoporosis is a widespread issue affecting millions globally and has emerged as a silent epidemic.[3] The term 'silent thief' is used because symptoms are typically absent until a fragility fracture occurs.[4] Osteoporosis is more common in the Asian population compared to Western countries due to their lower body mass index and shorter height.[5]

Current gaps in women's understanding of osteoporosis include deficiencies in several areas, such as the concept and epidemiology of osteoporosis, appropriate diet, and overall knowledge levels.[6,7] Studies reveal that a significant proportion of women lack adequate knowledge about osteoporosis, emphasizing the need for educational interventions to enhance awareness and preventive practices.[8] Additionally, there exists a treatment gap in osteoporosis

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management, with many individuals being undertreated or untreated due to concerns about medication side effects and insufficient information on treatment benefits.[9] Despite advancements in diagnostic methods and treatment options, ongoing knowledge gaps persist regarding fracture risk factors and the global burden of osteoporosis.[10] Addressing these gaps through targeted educational programs and improved access to information is crucial for enhancing women's understanding of osteoporosis.[11] Promoting education on preventive strategies represents a highly desirable and economically efficient approach.[12] Social Identity Theory suggests that individuals receive a portion of their self-concept from the social groups they are affiliated with. Based on this theory, individuals tend to classify themselves and others into different social groups, including gender, ethnicity, nationality, or socioeconomic status.[13] Social Identity Theory posits that individuals' attitudes, beliefs, and behaviors can be influenced by their social identities when assessing knowledge and relationships. Individuals may develop stereotypes and biases based on the social groups they are a part of or believe others to be a part of. The presence of stereotypes and biases can have a significant influence on how individuals assess information and engage with others.

In Iraq, limited access to healthcare resources and educational programs about osteoporosis often result in lower levels of osteoporosis knowledge among women.[14] This study can help healthcare professionals in Iraq create focused interventions that emphasize health education among women by evaluate knowledge and examining the relationship between osteoporosis knowledge and their demographic information. The study aims to assess women's knowledge of osteoporosis and to identify differences in women's knowledge of osteoporosis based on their educational level, marital status, employment status, and residence.

Materials and Methods

Study design and setting

A cross-sectional study was conducted to assess women's knowledge of osteoporosis. The study was carried out in the primary health care centers in Al Diwaniyah, Iraq, which were divided into five sectors: Al Diwaniyah Health Care Sector I, Al Diwaniyah Health Care Sector II, Shamiya Sector, Afak Sector, and Hamza Sector. From each sector, two centers were randomly selected by placing all the center names in a beaker and drawing them. Data were collected from December 26, 2023 to February 28, 2024.

Search strategy

The cross-sectional study assesses osteoporosis knowledge search in electronic databases: PubMed, Cochrane, and Scopus for English-language literature published using the following search terms in the title, without exclusion criteria: "menopausal," "osteoporosis," "fracture," "Knowledge," and "Prevalence".

Study participants and sampling

The study was a sample of 383 women who attended primary health care centers in Al Diwaniyah city, Iraq. These women were aged between 45 and 65 years and had given consent to participate in the study. Those below 45 or above 65 years of age as well as those who refused to participate were excluded from the sample.

A purposive nonprobability sample of 383 women was involved in this study. Nonprobability sampling enables the selection of specific groups within a population and is most suitable for populations with particular health issues. The sample size for this study was determined using the Morgan Table (Krejcie and Morgan, 1970),[15] based on the probability proportional to size sampling of women between the ages of 45 and 65 who attended health centers, according to Diwaniyah Health Department's statistics for the year 2023. The population of the study was 71,468 (N). Therefore, the number of samples was 383 (n) at a confidence level of 95% and alpha (α) = 0.05 (margin of error).

Data collection tools and technique

The data were collected through interviews and self-reports with participants using a questionnaire consisting of three sections: The initial section encompassed sociodemographic attributes such as employment status, monthly income, education level, residence, and marital status. The second component of the study focused on the osteoporosis profile, including duration of sun exposure, personal and familial history of osteoporosis and fractures, and the source of information about osteoporosis. The third section of the questionnaire assesses women's knowledge of osteoporosis. We employed the Osteoporosis Knowledge Assessment Tool (OKAT), a self-administered questionnaire that has been validated and proven reliable.[16] The OKAT assesses knowledge about osteoporosis symptoms, fracture risk, risk factors, preventive measures, and treatment options. Participants have the option to categorize each statement in the survey as either true, false, or I don't know. The research was granted authorization to utilize the Arabic version formed by a study conducted in Saudi Arabia.[17]

The items in the OKAT are evaluated using a set of 20 questions presented in true, false, and I don't know formats. A correct answer is assigned a score of "1", an incorrect answer is assigned a score of "0", and if the answer is unknown, it is also assigned a score of "0". The OKAT score ranged from 0 to 20, where a higher score indicated much better knowledge.[16] The Arabic version

of OKAT indicates a high level of internal consistency, with a coefficient of 0.824.[18]

Ethical consideration

The study obtained ethical approval from The College of Nursing Scientific Research Ethical Committee on November 8, 2023, and the Research and Ethics Committee of Diwaniyah Health Directorate (Department of Training and Human Development) on 25\12\2023 (number 48). The health sectors ensure their agreement and cooperation in data collection by permitting the conduct of the research. The participants were provided with a detailed explanation of the study objectives, and their consent was obtained to ensure their voluntary participation, and data were kept confidential.

Statistical analysis

The data were analyzed using IBM Statistical Package for the Social Sciences (SPSS) version 27 for Windows. Descriptive statistical measures, including frequency and percentage, were employed. Measures of central tendency, specifically the arithmetic mean and dispersion, specifically the standard deviation, were also utilized. The Mann-Whitney U test assessed the difference in the dependent variable when the independent variable consists of two distinct categories. The Kruskal-Wallis test evaluated the variation in the dependent variable when the independent variable includes three or more categories.

Results

Demographic information

The demographic data of the participants are presented in Table 1. This table indicates that the majority of the women's subgroups fall within the age range of 49 to 57 years (41.5%). Additionally, 78.1% of the participants are housewives, 31.3% have graduated from primary school, and 38.9% have a monthly income between 301,000 and 600,000 IQD. Furthermore, 77% of the participants are married, and 84.1% reside in urban areas.

Table 1:Descriptive statistics (frequency and percentage) for the demographic data of women

Demographic data	Subgroups	Frequency (*n*=383)	Percentage
Age/years	40-48	137	35.8
	49-57	159	41.5
	58-66	87	22.7
Employment status	Government sector	64	16.7
	Private sector	2	0.5
	Housewife	299	78.1
	Student	1	0.3
	Retired	17	4.4
Monthly income	Less than 300000	87	22.7
	301000-600000	149	38.9
	601000-90000	74	19.3
	901000-1200000	51	13.3
	1201000-150000	17	4.4
	> 1500000	5	1.4
Educational level	Illiterate	67	17.5
	Read and write	68	17.8
	Primary school	120	31.3
	Intermediate school	59	15.4
	Secondary school	18	4.7
	Diploma	34	8.9
	Bachelor's degree	15	3.9
	Higher studies	2	0.5
Marital status	Single	12	3.1
	Married	295	77.0
	Separated	6	1.6
	Divorced	6	1.6
	Widowed	64	16.7
Residence	Rural	61	15.9
	City	322	84.1

Assessment and mean of scores of women's knowledge about osteoporosis

The responses to knowledge questions revealed poor knowledge about osteoporosis for items 1, 3, 5, 8, 13, 15, 16, and 18. However, participants demonstrated moderate knowledge regarding osteoporosis for items 2, 6, 7, 9, 12, 14, 17, 19, and 20. Overall, women's knowledge was categorized as moderate, with a mean score of 1.85. This assessment employs a statistical scoring system: An item is considered 'poor' if the mean score falls between 1 and 1.66, 'moderate' if between 1.67 and 2.33, and 'good' if between 2.34 and 3 [see Table 2].

Women's subgroups, according to their knowledge assessment about osteoporosis

The study results present the percentage of women in different subgroups based on their overall knowledge of osteoporosis assessment. The data reveal that approximately 13.5% of women exhibit poor knowledge, 64.4% demonstrate moderate knowledge, and 22.1% have good knowledge. See Figure 1 for details.

Differences in participants' knowledge of osteoporosis between employment status, level of education, marital status, and residence groups

According to Table 3, no statistically significant differences were observed in participants' knowledge about osteoporosis across employment status ($P = 0.062$). Table 4 highlights a statistically significant difference across education levels ($P=0.010$), whereas no significant differences were noted for marital status ($P = 0.403$, Table 5) or residence ($P = 0.192$, Table 6).

Discussion

The purpose of this study was to assess women's knowledge

Table 2: Assessment and mean of scores of women's knowledge about osteoporosis

Items	MS	SD	Assessment
Osteoporosis leads to an increased risk of bone fractures.	1.29	0.59	Poor
Osteoporosis usually causes symptoms (e.g., pain) before fractures occur.	2.14	0.76	Moderate
Having a higher peak bone mass at the end of childhood gives no protection against the development of osteoporosis in later life	1.54	0.80	Poor
Osteoporosis is more common in men.	2.62	0.66	Good
Cigarette smoking can contribute to osteoporosis.	1.39	0.70	Poor
White women are at highest risk of fracture as compared to other races	1.75	0.74	Moderate
A fall is just as important as low bone strength in causing fractures.	1.97	0.95	Moderate
By age 80, the majority of women have osteoporosis	1.43	0.79	Poor
From age 50, most women can expect at least one fracture before they die.	1.78	0.95	Moderate
Any type of physical activity is beneficial for osteoporosis	2.60	0.74	Good
It is easy to tell whether I am at risk of osteoporosis by my clinical risk factors	2.51	0.84	Good
Family history of osteoporosis strongly predisposes a person to osteoporosis.	1.85	0.90	Moderate
An adequate calcium intake can be achieved from two glasses of milk a day	1.42	0.78	Poor
Sardines and broccoli are good sources of calcium for people who cannot take dairy	1.76	0.50	Moderate
Calcium supplements alone can prevent bone loss.	1.62	0.86	Poor
Alcohol in moderation has little effect on osteoporosis.	1.38	0.55	Poor
A high salt intake is a risk factor for osteoporosis	2.33	0.81	Moderate
There is a small amount of bone loss in the 10 years following the onset of menopause	1.34	0.61	Poor
Hormone therapy prevents further bone loss at any age after menopause.	2.03	0.52	Moderate
There are no effective treatments for osteoporosis available in Iraq.	2.17	0.90	Moderate
Overall Knowledge	1.85	0.75	Moderate

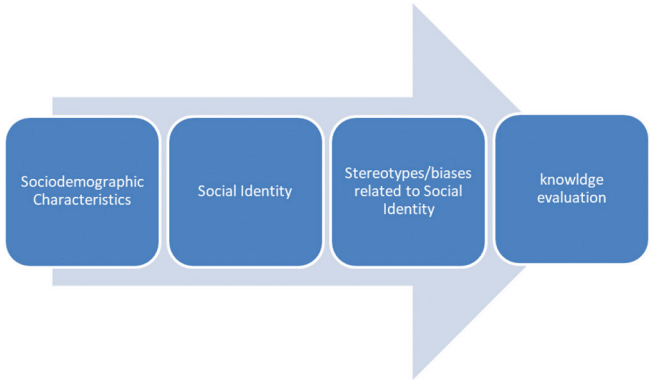

Figure 1: Diagram explaining how social identity and sociodemographic characteristics can influence the evaluation of knowledge

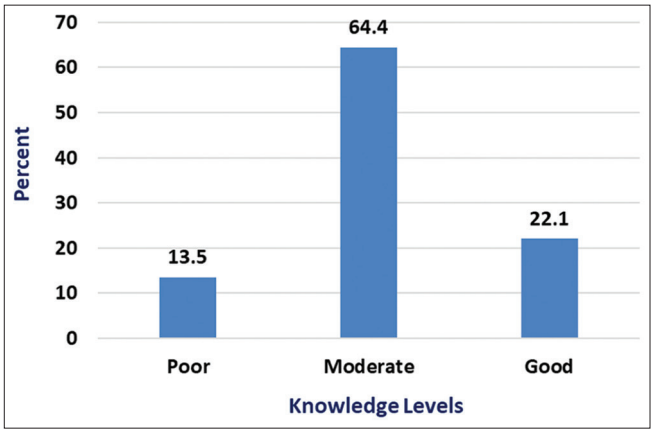

Figure 2: Percentage of women's subgroups according to their knowledge assessment about osteoporosis

regarding osteoporosis and to identify associations between their knowledge and society demographics. The goal was to enhance ongoing global and national initiatives aimed at combating osteoporosis by raising awareness and educating important age groups within the population. Recognizing the public's understanding of osteoporosis is crucial for promotion preventive actions and creating effective prevention measures.[19]

The study results indicate that participants' responses to knowledge questions demonstrated moderate knowledge, with a mean score of 1.85 Figure 2. These findings align with previous studies that reported similar moderate knowledge levels regarding osteoporosis among participants.[20,21] On the other hand, Aladwani *et al*.[22] and Mohammed and Dauod[23] found that participants in Saudi Arabia and northern Iraq had poor osteoporosis knowledge scores; these disparities between studies may be attributed to the use of different tools for assessing osteoporosis knowledge as well as variations in the populations studied.

The study participants lacked knowledge of general and preventive knowledge about osteoporosis, specifically it's potential to increase the risk of fractures, the heightened susceptibility of the elderly population, the risks associated with smoking and alcohol consumption, and its connection to menopause. The subjects were aware that women are more commonly affected by osteoporosis, and engaging in physical activity is beneficial for this condition. The knowledge that

Table 3: Difference in participants' knowledge about osteoporosis among employment status groups

	Ranks		Kruskal-Wallis *H*	df	Asymp. Sig.
Employment status	*n*	Mean rank			
Knowledge					
Governmental employee	64	215.63	8.983	4	0.062
Private employee	2	43.50			
Housewife	299	188.83			
Student	1	30.00			
Retired	17	185.74			
Total	383				

Table 4: Difference in participants' knowledge about osteoporosis among levels of education groups

	Ranks		Kruskal-Wallis *H*	df	Asymp. Sig.
Educational level	*n*	Mean rank			
Knowledge					
Read and write	135	202.11	16.698	6	0.010
Elementary school	120	187.12			
Middle school	59	152.65			
High school	18	212.25			
Diploma	34	195.84			
Bachelor's degree	15	239.97			
Graduate	2	355.75			
Total	383				

Table 5: Difference in participants' knowledge about osteoporosis among marital status groups

	Ranks		Kruskal-Wallis *H*	df	Asymp. Sig.
Marital status	*n*	Mean rank			
Knowledge					
Single	12	235.46	4.022	4	0.403
Married	295	192.41			
Separated	6	237.25			
Divorced	6	197.42			
Widowed	64	177.23			
Total	383				

Table 6: Difference in participants' knowledge about osteoporosis between residence groups

	Ranks			Mann-Whitney *U*	Asymp. Sig. (2tailed)
Residence	*n*	Mean Rank	Sum of Ranks		
Knowledge					
Rural	61	208.93	12745.00	8788.000	0.192
Urban	322	188.79	60791.00		
Total	383				

osteoporosis can be prevented can be employed as a method to motivate women to adopt and follow health education messages concerning osteoporosis prevention.

Employed participants reported a significantly greater level of good knowledge compared to housewives and retired women (P = 0.03). This result is compatible with research conducted in Iraq that found employed participants had a significantly higher proportion of good knowledge, as compared with housewife and free-job women.[14] However, this study's result is inconsistent with other studies in Malaysia reporting that housewives have a significantly higher proportion of good knowledge.[20] The discrepancy may be attributed to the fact that the majority of employed women in this study had attained a significant level of education, resulting in assumed higher knowledge.

The findings reveal a strong correlation between participants' knowledge and their education level (P value = 0.010). The results are compatible with another study in Egypt, Malaysia, and Palestine which found that educational background significantly influences knowledge about osteoporosis.[20,21,24] On the other hand, Alshareef *et al*.[25] reported that education was not a significant determinant of osteoporosis knowledge. This discrepancy may be because highly educated women tend to demonstrate enhanced knowledge and engage in preventive measures for osteoporosis.

Regarding marital status, this study's results align with other Middle Eastern studies, showing no significant variation in osteoporosis knowledge based on marital status.[20,21] This finding contradicts the results of another study, which reported a notable variation in osteoporosis knowledge based on marital status.[14] This difference could be attributed to single and separated women having more time to dedicate to learning and enhancing their knowledge.

Studies comparing knowledge between urban and rural areas have been conducted.[20] In our study, the majority of participants lived in rural areas (84.1%), while only 15.9% lived in urban areas. Respondents from rural areas reported higher knowledge scores (208.93), although the difference was not statistically significant (P = 0.192). A systematic review and meta-analysis in China found slightly higher osteoporosis prevalence among rural residents (23.92%) compared to urban residents (20.87%), but the difference was not statistically significant.[26] Conversely, Aladwani *et al*.[22] reported that respondents from urban areas had higher knowledge scores and considered urban residence a significant determinant of osteoporosis knowledge (P = 0.0001).

Limitations and recommendations

A limitation of this study was due to the cross-sectional design. The study faces challenges in collecting a sample due to the specific target age group (45-65), and the majority of women in health centers express concerns about their limited education level or lack of sufficient time to participate.

Based on the study's findings, it is recommended to prioritize health education about osteoporosis

among women. This education aims to enhance their knowledge and understanding of the disease, its risk factors, prevention strategies, and available treatments. Effective communication between women and healthcare providers is crucial. Encouraging women to ask questions and seek information about the disease can foster better understanding and lead to appropriate responses from healthcare professionals.

Furthermore, researchers should explore other factors that may influence knowledge levels, such as social, cultural, and economic variables. Encouraging additional studies in this area will provide valuable insights.

Conclusion

The level of knowledge about osteoporosis among women in Diwaniyah city is moderate. Women with higher degrees and those who are married demonstrated the highest levels of knowledge. To enhance knowledge, it is essential to support ongoing education for women regarding osteoporosis and its development. This can be achieved through organizing continuous seminars, workshops, and providing educational resources. Encouraging women to participate in ongoing educational and training programs is also crucial.

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Conflicts of interest
There are no conflicts of interest.

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