ISSN: 2457-0400

Impact Factor: 7.675

WORLD JOURNAL OF ADVANCE HEALTHCARE RESEARCH

www.wjahr.com

Volume: 10, Issue: 2
Page N. 218-223
Year: 2026

Original Article

Coden USA: WJAMA3

KNOWLEDGE AND CLINICAL PRACTICE OF IRAQI FAMILY PHYSICIANS IN THE MANAGEMENT OF OSTEOPOROSIS AMONG THE ELDERLY

***[1]Hiba Waleed Qasim, [2]Batool Ali Hasan**

*[1]Baghdad- Al-Karkh Health Directorate, Baghdad, Iraq.
[2]Public health directorate, Ministry of health, Baghdad, Iraq.

Article Received: 05 January 2026 **Article Revised:** 25 January 2026 **Article Published:** 04 Feburary 2026

***Corresponding Author: Hiba Waleed Qasim**

Baghdad- Al-Karkh Health Directorate, Baghdad, Iraq.
DOI: https://doi.org/10.5281/zenodo.18481747

How to cite this Article: *[1]Hiba Waleed Qasim, [2]Batool Ali Hasan. (2026) Knowledge And Clinical Practice Of Iraqi Family Physicians In The Management Of Osteoporosis Among The Elderly. World Journal of Advance Healthcare Research, 10(2), 218–223.

ABSTRACT

Background: Osteoporosis is a major public health problem among the elderly, leading to increased morbidity, mortality, and healthcare costs due to fragility fractures. Family physicians play a pivotal role in the prevention, early detection, and management of osteoporosis; however, gaps between knowledge and clinical practice have been reported, particularly in low- and middle-income countries, including Iraq. **Objectives:** This study aimed to assess the level of knowledge and clinical practice of Iraqi family physicians regarding osteoporosis in the elderly and to identify demographic and professional factors associated with knowledge and practice. **Methods:** A cross-sectional survey was conducted among 300 family physicians working in different healthcare settings in Iraq. Data were collected using a structured, self-administered electronic questionnaire covering sociodemographic characteristics, knowledge, and practice related to osteoporosis. Knowledge and practice scores were calculated using predefined scoring systems and categorized into poor-to-fair and good levels. **Results:** Overall, 63.3% of participants demonstrated good knowledge, while 59.3% showed good practice. No significant associations were found between knowledge level and demographic or professional variables. In contrast, good practice was significantly associated with age and years of experience with better practice observed among physicians aged 41–50 years and those with 11–20 years of experience. Working in primary health care centers showed a borderline significant association with better practice. **Conclusion:** Although Iraqi family physicians exhibit generally good knowledge about osteoporosis in the elderly, a noticeable gap exists between knowledge and clinical practice. Targeted, practice-oriented training and strengthened primary care strategies are essential to improve osteoporosis management and reduce fracture risk among the Iraqi elderly population.

KEYWORDS: Osteoporosis; Elderly; Family physicians; Knowledge; Practice.

INTRODUCTION

Osteoporosis is a chronic skeletal disorder characterized by low bone mass and microarchitectural deterioration of bone tissue, leading to increased bone fragility and susceptibility to fractures, particularly among elderly individuals.[1] It is often asymptomatic until a fracture occurs, making early detection and prevention crucial components of effective disease control. Globally, osteoporosis represents a major public health concern due to its association with increased morbidity, mortality, functional dependence, and healthcare costs, especially following hip and vertebral fractures.[1,2] In Iraq, demographic shifts toward an aging population, combined with lifestyle and environmental factors such as vitamin D deficiency, physical inactivity, smoking, and limited preventive health awareness, have contributed to a growing burden of osteoporosis.[3] Several Iraqi studies have demonstrated a considerable prevalence of low bone mineral density and osteoporosis among adults undergoing assessment, particularly in postmenopausal women and older age groups.[4,5] Furthermore, fragility fractures—especially hip fractures—are increasingly recognized as a serious clinical and economic challenge. The recent development of an Iraq-specific FRAX model underscores the importance of local epidemiological data for accurate

fracture risk prediction and targeted prevention strategies.[6] Family physicians play a pivotal role in the prevention, early detection, and management of osteoporosis in the elderly. As frontline healthcare providers, they are uniquely positioned to identify individuals at risk, initiate appropriate screening, provide lifestyle counseling, prescribe pharmacological therapy when indicated, and coordinate referrals for dual-energy X-ray absorptiometry (DXA) and specialist care.[7] Effective osteoporosis management at the primary care level can substantially reduce fracture incidence and improve quality of life among older adults. Despite the availability of international guidelines, translating evidence-based recommendations into daily practice remains challenging in many low- and middle-income countries, including Iraq. Limited access to diagnostic tools, time constraints in busy primary care settings, and inconsistent exposure to continuing medical education may negatively influence physicians' clinical performance.[8] Iraqi studies assessing physicians' awareness and clinical behavior toward osteoporosis have reported variable levels of knowledge and practice, suggesting potential gaps that may delay diagnosis and optimal management.[9,10] This study aimed to assess the level of knowledge and practice of family physicians regarding osteoporosis in the elderly population in Iraq, and to identify the demographic and professional factors associated with physicians' knowledge and practice related to osteoporosis.

METHOD

Study design and setting

This study was an observational cross-sectional survey conducted in Iraq to assess the knowledge and practice of family physicians regarding osteoporosis in the elderly. The study was carried out in various healthcare settings, including Primary Health Care Centers, hospitals, and other healthcare facilities, under the umbrella of the Iraqi Ministry of Health.

Study population and sampling

The study included a convenient sample of 300 family physicians working in Iraq. Eligible participants comprised family medicine trainees, board-certified family physicians, consultants of family medicine, family medicine practitioners, and physicians holding a higher diploma in family medicine. There were no exclusion criteria. All physicians who met the inclusion criteria and agreed to participate were enrolled.

Data collection tool and procedure

Data were collected using a structured, self-administered electronic questionnaire distributed online. The questionnaire consisted of three sections:

1. **Sociodemographic and professional characteristics**, including age, gender, years of practice, designation, workplace, and history of training or continuing medical education (CME);
2. **Knowledge items** assessing awareness of osteoporosis risk factors, diagnosis, screening, and management in elderly patients;
3. **Practice items** evaluating clinical behavior related to osteoporosis prevention, screening, and management.

Data coding and scoring

Responses were coded numerically in Microsoft Excel without changing the original column order. Knowledge items were coded using two schemes: for selected columns (11, 14, 15, 16, 17, 19, 20, 22, 24, 25, 26), No = 0, I don't know = 1, and Yes = 2; while reverse-coded items (12, 13, 18, 21, 23, 27) were scored as Yes = 0, I don't know = 1, and No = 2.

Practice items (columns 28, 29, 30, 31, 33, 34) were coded as Never = 0, Seldom = 1, Often = 2, and Always = 3, while one reverse-coded item (column 32) was scored as Never = 3, Seldom = 2, Often = 1, and Always = 0.

The maximum total knowledge score was 34 points and the maximum practice score was 21 points. Knowledge scores ≤ 24 were classified as poor to fair, while scores > 24 indicated good knowledge. Practice scores ≤ 11 were considered poor to fair practice, whereas scores > 11 reflected good practice.[10]

Statistical analysis

Data were analyzed using SPSS version 25. Categorical variables were presented as frequencies and percentages. Associations between knowledge and practice levels and demographic or professional variables were assessed using the Chi-square test. A p-value < 0.05 was considered statistically significant.

Ethical considerations

Ethical approval was obtained from the Ethical Committee of the Iraqi Ministry of Health and the Arab Board of Health Specializations. Participation was voluntary, verbal informed consent was obtained from all respondents, and confidentiality of collected data was strictly maintained.

RESULTS

The study population was predominantly female (83.7%), with most participants aged 30–40 years (51.3%). Nearly half of the physicians had less than 5 years of experience (42.7%), while board-certified family physicians constituted the largest professional group (38.3%). The majority worked in Primary Health Care Centers (58.7%), and only 24.7% reported having received specific training or continuing medical education, indicating limited formal exposure to CME activities. As in table 1.

Table 1: distribution of study sample according to demographic.

Variable	Category	No.	%
Sex	***Female***	251	83.7
	Male	49	16.3
Age (years)	***<30 years***	38	12.7
	30-40 years	154	51.3
	41-50 years	71	23.7
	More than 50 years	37	12.3
Experience years	***<5 years***	128	42.7
	11-20 years	74	24.7
	5-10 years	86	28.7
	More than 20 years	12	4.0
Specialty	***Family Medicine Trainee***	72	24.0
	Board certified in Family Medicine	115	38.3
	Consultant of Family Medicine	33	11.0
	Family Medicine Practitioner	22	7.3
	Higher Diploma in Family Medicine	58	19.3
	Hospital	92	30.7
Working place	***Other***	32	10.7
	Primary Health Care Center	176	58.7
training or	***No***	226	75.3
continuing	***Yes (workshop, course, conference)***	74	24.7
Total		**300**	**100**

Overall, good knowledge was observed in 63.3% of participants, whereas 59.3% demonstrated good practice. Despite relatively higher knowledge levels, a notable proportion still exhibited poor practice (40.7%), suggesting a gap between knowledge acquisition and practical application. As in table 2.

Table 2: distribution of study sample according to knowledge and practice.

Variable	Category	No.	%
Knowledge	***Poor***	110	36.7
	Good	190	63.3
Practice	***Poor***	122	40.7
	Good	178	59.3
Total		**300**	**100**

No statistically significant associations were found between knowledge level and any of the studied demographic variables, including age, gender, years of experience, designation, workplace, or training status ($p > 0.05$ for all). Although better knowledge tended to be more frequent among physicians aged 41–50 years, board-certified family physicians, and those who had received training, these differences did not reach statistical significance. As in table 3.

Table 3: association between variable demographic and knowledge.

	Knowledge		
Age Group (years)	**Poor (No. %)**	**Good (No. %)**	**P-value**
< 30 years	18 (16.4%)	20 (10.5%)	0.2
30–40 years	57 (51.8%)	97 (51.1%)	
41–50 years	20 (18.2%)	51 (26.8%)	
> 50 years	15 (13.6%)	22 (11.6%)	
Gender	**Poor (No. %)**	**Good (No. %)**	**P-value**
Female	91 (82.7%)	160 (84.2%)	0.7
Male	19 (17.3%)	30 (15.8%)	
Experience years	**Poor (No. %)**	**Good (No. %)**	**P-value**
< 5 years	53 (48.2%)	75 (39.5%)	0.5
5–10 years	30 (27.3%)	56 (29.5%)	
11–20 years	23 (20.9%)	51 (26.8%)	
> 20 years	4 (3.6%)	8 (4.2%)	
Specialist	**Poor (No. %)**	**Good (No. %)**	**P-value**

Family Medicine Trainee	32 (29.1%)	40 (21.1%)	0.2
Board-certified in Family Medicine	37 (33.6%)	78 (41.1%)	
Consultant of Family Medicine	9 (8.2%)	24 (12.6%)	
Family Medicine Practitioner	11 (10.0%)	11 (5.8%)	
Higher Diploma in Family Medicine	21 (19.1%)	37 (19.5%)	
Working place	**Poor (No. %)**	**Good (No. %)**	**P-value**
Hospital	38 (34.5%)	54 (28.4%)	0.2
Primary Health Care Center	64 (58.2%)	112 (58.9%)	
Other	8 (7.3%)	24 (12.6%)	
Training / CME	**Poor (No. %)**	**Good (No. %)**	**P-value**
No	86 (78.2%)	140 (73.7%)	0.4
Yes	24 (21.8%)	50 (26.3%)	

Practice level showed a significant association with age ($p = 0.038$) and years of experience ($p = 0.017$). Better practice was more common among physicians aged 41–50 years and those with 11–20 years of experience. Working place showed a borderline significant association ($p = 0.05$), with better practice observed among Primary Health Care Center physicians. No significant associations were found with gender, designation, or training status. As in table 4.

Table 4: association between variable demographic and practice.

	Practice		
Age Group (years)	**Poor (No. %)**	**Good (No. %)**	**P-value**
< 30 years	17 (13.9%)	21 (11.8%)	**0.038**
30–40 years	72 (59.0%)	82 (46.1%)	
41–50 years	19 (15.6%)	52 (29.2%)	
> 50 years	14 (11.5%)	23 (12.9%)	
Gender	**Poor (No. %)**	**Good (No. %)**	**P-value**
Female	101 (82.8%)	150 (84.3%)	0.7
Male	21 (17.2%)	28 (15.7%)	
Experience years	**Poor (No. %)**	**Good (No. %)**	**P-value**
< 5 years	63 (51.6%)	65 (36.5%)	**0.017**
5–10 years	33 (27.0%)	53 (29.8%)	
11–20 years	20 (16.4%)	54 (30.3%)	
> 20 years	6 (4.9%)	6 (3.4%)	
Specialist	**Poor (No. %)**	**Good (No. %)**	**P-value**
Family Medicine Trainee	37 (30.3%)	35 (19.7%)	0.3
Board-certified in Family Medicine	42 (34.4%)	73 (41.0%)	
Consultant of Family Medicine	12 (9.8%)	21 (11.8%)	
Family Medicine Practitioner	10 (8.2%)	12 (6.7%)	
Higher Diploma in Family Medicine	21 (17.2%)	37 (20.8%)	
Working place	**Poor (No. %)**	**Good (No. %)**	**P-value**
Hospital	45 (36.9%)	47 (26.4%)	**0.05**
Primary Health Care Center	68 (55.7%)	108 (60.7%)	
Other	9 (7.4%)	23 (12.9%)	
Training / CME	**Poor (No. %)**	**Good (No. %)**	**P-value**
No	97 (79.5%)	129 (72.5%)	0.1
Yes	25 (20.5%)	49 (27.5%)	

DISCUSSION

This study provides important insight into the knowledge and practice of Iraqi family physicians regarding osteoporosis in the elderly, revealing acceptable knowledge levels but comparatively weaker clinical practice. Although 63.3% of physicians demonstrated good knowledge, only 59.3% reported good practice, highlighting a persistent knowledge–practice gap. This discrepancy has been consistently reported in osteoporosis research and reflects the complexity of translating awareness into routine preventive and therapeutic actions.[1,2,7] The level of knowledge observed in this study aligns with findings from earlier Iraqi studies. Jamil and Salman reported moderate-to-good osteoporosis knowledge among primary healthcare physicians in Baghdad, yet with deficiencies in screening and treatment decision-making.[9] Yasien and Kadhem similarly documented reasonable awareness among family physicians in Babylon Governorate but inadequate clinical practice.[10] Kadhum et al. also found

that while Iraqi healthcare workers were generally aware of osteoporosis risk factors, this did not consistently translate into evidence-based management.[5] Comparable trends have been observed internationally. A study from Saudi Arabia reported that primary care physicians possessed satisfactory osteoporosis knowledge, but less than half routinely assessed fracture risk or prescribed guideline-recommended therapy.[11] In Lebanon, Makarem Y et al. found that physicians' awareness exceeded their practical engagement in osteoporosis prevention, particularly regarding DXA utilization and fall-risk assessment.[12] Likewise, research from Pakistan demonstrated moderate physician knowledge but low adherence to screening guidelines, especially in elderly patients.[13] Similar findings were reported in Turkey and Egypt, where gaps in clinical practice were attributed to time constraints, limited access to diagnostic facilities, and insufficient practical training.[14,15] In the present study, knowledge was not significantly associated with any demographic or professional variable, suggesting relatively uniform theoretical understanding among family physicians. This may reflect standardized medical education and postgraduate training pathways in Iraq. In contrast, practice showed significant associations with age and years of experience, with better practice among physicians aged 41–50 years and those with 11–20 years of experience. This pattern is consistent with regional studies indicating that clinical experience enhances confidence in initiating osteoporosis screening and treatment.[12,14] The lack of a significant association between training/CME and practice is notable, despite a trend toward better outcomes among trained physicians. Similar observations have been reported in Saudi and Egyptian studies, where CME programs were perceived as overly theoretical and insufficiently practice-oriented.[11,15] These findings suggest that osteoporosis education should emphasize case-based learning, fracture risk assessment tools, and practical treatment algorithms.

CONCLUSION

This study demonstrates that Iraqi family physicians have generally good knowledge regarding osteoporosis in the elderly; however, a substantial gap exists between knowledge and clinical practice. Practice was significantly influenced by age and years of experience, highlighting the role of clinical maturity in osteoporosis management. The limited impact of continuing medical education suggests a need for more practical, skills-based training programs. Strengthening primary care–based osteoporosis prevention and management may help reduce the burden of fragility fractures among the Iraqi elderly population.

REFERENCES

1. International Osteoporosis Foundation [Internet]. Nyon (CH): The Foundation; c2024 [cited 2024 May 22]. Available from: https://www.osteoporosis.foundation/
2. Compston JE, McClung MR, Leslie WD. Osteoporosis. Lancet., 2019 Jan 26; 393(10169): 364-376. doi: 10.1016/S0140-6736(18)32112-3. PMID: 30696576.
3. Alkabi, H. R., Alfatlawi, W. R., Aldabagh, M. A. H. Impact of Vitamin D Elements and Osteoporosis Factors in Postmenopausal Iraqi Women with T2DM. *Journal of Applied Sciences and Nanotechnology*, 2022; 2(3): 137-146. doi: 10.53293/jasn.2022.4483.1114
4. Rashid BA. Socio Demographic Factors Associated with Osteoporosis among Female in Baghdad. Diyala Journal of Medicine [Internet]. 2019 Jul. 3 [cited 2026 Jan. 14]; 8(2): 14-21. Available from: https://djm.uodiyala.edu.iq/index.php/djm/article/view/303
5. Kadhum SA, Alhillawy DR, Ghena RA, Al-Sahlawi HM, Taher TMJ, Alfadhul SA. Knowledge of Osteoporosis and its Determinants among Iraqi Healthcare Workers. Al-Rafidain J Med Sci [Internet]. 2024 Aug. 10 [cited 2026 Jan. 14]; 7(1): 115-20. Available from: https://ajms.iq/index.php/ALRAFIDAIN/article/view/1103
6. Abdulbari A, Jassim NA, Motlaq YH, Ismael HA, Al Ani WAT, Nafai CKM, Younis AA, Qaradaghi TA, Mahdi FJ, Rahmah AM, Alameri AH, Alsudany F, Al-Shahwani ZW, Mohammed TJ, AbuKhumrah MKA, Kadum AAR, Adnan A, Yahya MZ, Harvey NC, Lorentzon M, McCloskey E, Kanis JA, Johansson H. Epidemiology of hip fracture in Iraq and development of a country-specific FRAX model. Arch Osteoporos, 2025 Nov 26; 20(1): 145. doi: 10.1007/s11657-025-01631-3. PMID: 41296216; PMCID: PMC12657562.
7. Singer AJ, Sharma A, Deignan C, Borgermans L. Closing the gap in osteoporosis management: the critical role of primary care in bone health. Curr Med Res Opin., 2023 Mar; 39(3): 387-398. doi: 10.1080/03007995.2022.2141483. Epub 2023 Jan 24. PMID: 36597741.
8. World Health Organization. Integrated care for older people (ICOPE) [Internet]. Geneva: World Health Organization; [year of publication/update] [cited 2026 Jan 14]. Available from: https://www.who.int/teams/maternal-newborn-child-adolescent-health-and-ageing/ageing-and-health/integrated-care-for-older-people-icope
9. Jamil NF, Salman SA. Knowledge about Osteoporosis among Primary Health Care Physicians in Baghdad. Iraqi Postgrad Med J [Internet], 2022; 21(2): 138-147.
10. Yasien EM, Kadhem QI. Family Physicians and Osteoporosis in Babylon Governorate. Iraqi Natl J Med [Internet]. 2022 Jul 1 [cited 2026 Jan 14]; 4(2): 195-203. Available from: https://www.iqnjm.com/index.php/homepage/article/view/76
11. Alghamdi MA, Mohammed AGA. Knowledge and Awareness of Osteoporosis among Saudi Physicians

and Nurses: A Cross-Sectional Study. Open Access Maced J Med Sci. 2018 May 15; 6(5): 913-916. doi: 10.3889/oamjms.2018.177. PMID: 29875871; PMCID: PMC5985884.

12. Makarem Y, Sleem B, Chakhtoura MT, El Zein O, El-Hajj Fuleihan G. Knowledge, attitudes, and practices on osteoporosis prevention and treatment strategies in the MENA region: a systematic review protocol. BMJ Open, 2025 Nov 19; 15(11): e105603. doi: 10.1136/bmjopen-2025-105603. PMID: 41263906; PMCID: PMC12636974.
13. Ahmed S, Farooqui AJ, Pradhan NA, Zehra N, Majid H, Jafri L, Khan AH. Assessing the knowledge, attitude and practice of osteoporosis among Pakistani women: A national social-media based survey. PLoS One, 2023 Nov 10; 18(11): e0288057. doi: 10.1371/journal.pone.0288057. PMID: 37948412; PMCID: PMC10637646.
14. Kirazlı Y, Atamaz Çalış F, El Ö, Gökçe Kutsal Y, Peker Ö, Sindel D, Tuzun Ş, Gogas Yavuz D, Durmaz B, Akarirmak Ü, Bodur H, Hamuryudan V, Inceboz U, Öncel S. Updated approach for the management of osteoporosis in Turkey: a consensus report. Arch Osteoporos, 2020 Aug 29; 15(1): 137. doi: 10.1007/s11657-020-00799-0. PMID: 32860546; PMCID: PMC7456410.
15. Elwakil W, El Gaafary M, El Miedany Y. Screening and management of osteoporosis: a survey of knowledge, attitude, and practice among healthcare professionals in Egypt-a study by the Egyptian Academy of Bone Health. Osteoporos Int., 2024 Jan; 35(1): 93-103. doi: 10.1007/s00198-023-06914-4. Epub 2023 Sep 18. PMID: 37721557; PMCID: PMC10786960.