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KNOWLEDGE OF PHYSICIANS IN AGE-FRIENDLY PHC ABOUT OSTEOPOROSIS PREVENTION AND MANAGEMENT OF ELDERLY IN DIYALA

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ABSTRACT

Background: Older adults are highly susceptible to the adverse effects of osteoporosis due to age-related comorbidities, such as cognitive decline and gait disturbances, which elevate their risk of falls and fragility fractures. This study aimed to evaluate the level of knowledge among physicians in age-friendly primary healthcare (PHC) centers in Diyala regarding osteoporosis prevention and management in elderly patients. **Method:** A cross-sectional study was conducted in 42 age-friendly PHC centers in Diyala from September to October 2024. Physicians working in these centers during the study period participated. Data were collected through a self-administered questionnaire covering osteoporosis prevention, management, and demographic and professional characteristics of the physicians. **Results:** Out of 135 physicians, 33 (24.4%) exhibited good knowledge, 70 (51.9%) had moderate knowledge, and 32 (23.7%) demonstrated poor knowledge. The mean knowledge score was 8.53 ± 2.70 (range: 1-13). A significant association was observed between years of medical practice and knowledge level, while qualifications and specialties did not significantly impact knowledge scores. **Conclusion:** The findings indicate that most physicians in Diyala's age-friendly PHC centers possess moderate knowledge regarding osteoporosis. The study highlights the critical need for continuous medical education and training to improve the knowledge and skills of PHC physicians, ensuring better prevention and management of osteoporosis in elderly patients.

KEYWORDS: knowledge, physicians, age-friendly PHC, osteoporosis, prevention, management, elderly.

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INTRODUCTION

Osteoporosis is a skeletal disorder characterised by decreased bone strength, which results in fragility and susceptibility to fractures. Bone strength depends on bone mineral density (BMD) and quality. Globally, 1 in 3 women and 1 in 5 men over 50 experience osteoporotic fractures. With a T-score of less than -2.5 SD, the World Health Organisation (WHO) says that a person has osteoporosis if their bone mineral density (BMD) is less than 2.5 SD below their peak bone mass as a young adult. With a T-score of 1.0 to -2.5 SD, they are said to have osteopenia.^[1,2] Approximately 6.3% of men and 21.2% of women over 50 have osteoporosis, translating to 500 million affected individuals globally.^[3] While low BMD increases fracture risk, most fractures occur in individuals without a densitometry diagnosis of osteoporosis.^[4] Nearly 75% of hip, spine, and distal forearm fractures occur in individuals aged 65 or older.^[5] Dual-energy x-ray absorptiometry (DXA) is the standard

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for assessing BMD, offering excellent precision and accuracy.^[6] In Iraq, the population aged 60+ was 1.12 million in 2012 (4% of the population) and is projected to reach 4.72 million by 2050, significantly impacting healthcare and socioeconomic development.^[7] Fragility fractures rank as the fourth most burdensome condition in disability-adjusted life years (DALYs) among noncommunicable diseases in six EU countries.^[8] Over a quarter of older adults fall annually, with only half reporting it to their doctor.^[9] The lifetime fragility fracture risk in men surpasses that of prostate cancer.^[10] Fragility fractures, a clinical outcome of osteoporosis, typically result from low-energy trauma, such as falls from standing height or less.[11] Reduced BMD, glucocorticoid use, age, sex, previous fractures, and family history are key risk factors.^[12] The prevalence of osteoporosis rises sharply with age, from 2% at 50 years to over 25% at 80 years in women.^[12] Effective treatments for osteoporosis exist, yet it remains

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underdiagnosed and undertreated worldwide, including in Asia.^[13] Primary healthcare (PHC) plays a vital role in managing chronic conditions like osteoporosis through preventive care, early detection, and personalised treatment. Age-friendly PHC centres in Diyala must address the needs of an ageing population amid demographic changes. This study evaluated physicians' knowledge of osteoporosis prevention and management in Diyala's PHC centers. Using a questionnaire, the research identified knowledge gaps, offering insights to enhance training programs and clinical guidelines. Updated and adequate knowledge is crucial for improving osteoporosis care and optimising outcomes for elderly patients in age-friendly PHC settings. The aim of study is to Established baseline data to assess physicians' knowledge of senior patients' osteoporosis prevention and management in age-friendly PHC in Iraq and use it to design training program extension and treatment goals. Assess the knowledge of doctors in agefriendly primary health care centres in Diyala about osteoporosis prevention and management and the barriers they face in treating this condition in the elderly. Find any correlation between these knowledge and physician characteristics.

METHOD

A cross-sectional research was conducted at forty-two age-friendly primary healthcare centres out of seventyfive in Divala, utilising a convenience-based sampling method across eight distinct health sectors in the region, from September 1 to October 31, 2024. A selfadministered survey was employed for data gathering. Direct interviews with the physicians were conducted, they completed a pre-constructed validated and questionnaire. The questionnaire consisted of two sections: Part I: Socio-demographic factors, including age, sex, highest academic qualification, speciality (general practitioner, family specialist, other speciality), duration since graduation from medical college, and duration of employment as a physician in age-friendly primary healthcare centres. Part II comprises a set of 14 questions assessing physicians' understanding of the prevention and treatment of osteoporosis in geriatric patients. The Osteoporosis Knowledge Assessment Tool (OKAT)^[14] served as the primary basis for 14 questions aimed at evaluating knowledge responses. The erroneous

response was "zero," whereas the accurate response was "one," culminating in a total possible score of fourteen. Subsequently, we classified the overall score into three categories: a knowledge score below 7 was deemed poor, a score between 7 and 10 was classified as moderate, and a score of 11 or above was considered high (excellent) knowledge. The data analysis was conducted utilising the SPSS statistical software version 26, employing frequency and percentage for categorical data, and mean and standard deviation (SD) for continuous data. A chisquare test was employed to evaluate the relationship between category variables. A p-value of 0.05 or below was deemed significant. Ethical considerations: Verbal agreement will be obtained from each participant following an explanation of the study's objectives. Official letters of facilitation will be provided to the agefriendly primary healthcare centres and health sectors of the Diyala Health Directorate from the Arab Board for Medical Specialisations. The Research Ethics Committee of the Diyala Health Directorate accepted the study (No. 38213 /17-9-2024).

RESULTS

A cross-sectional study was conducted, and out of 172 physicians working in age-friendly PHCs, 135 physicians participated in the study, giving an overall response rate of 78.4%. The mean age of the participants was 35.22 years (Standard Deviation: ±8.546), with a minimum age of 25 and a maximum age of 59. The majority of participants were under 40 years (n = 105), while 30 were over 40 years of age. In terms of gender, the majority were females (n = 81) and males (n = 54), with a female-to-male ratio of 60.0% to 40.0%. A large number of physicians held a Bachelor's degree (MBChB) (n = 99), followed by those with a Diploma (n = 28) and Board certification (n = 8). Most of the physicians were general practitioners (n = 97), followed by family medicine specialists (n = 31) and others (e.g., community medicine, internal medicine) (n = 7). Regarding years of experience after graduation, the distribution of physicians was as follows: less than 5 years (n = 56), 5– 10 years (n = 38), 11–20 years (n = 25), and more than 20 years (n = 16). The distribution of study participants according to socio-demographic and qualification characteristics is presented in Table 1.

Variables	Frequency		Percentage
Age	<u><</u> 30 years	52	38.5%
	31 - 40	53	39.3%
	41 - 50	20	14.8%
	>50	10	7.4%
Gender	Female	81	60.0%
	Male	54	40.0%
Academic degree	Board	8	5.9%
	Diploma	28	20.7%
	Bachelor (MBChB)	99	73.3%
Specialty	General practitioner	97	71.9%
specially	Family medicine	31	23.0%

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Table 1: s	socio-demographic Data.
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	Others (community medicine,		
	internal medicine)	7	5.2%
Years practice medicine	Less than 5 years	56	41.5%
	5-10 years	38	28.1%
	11-20 years	25	18.5%
	More than 20 years	16	11.9%

Responses to osteoporosis questions are shown in Table 2

Table 2: shows the responses to osteoporosis-related questions.

Question	correct	incorrect
1- the recommended daily intake of calcium for osteoporosis prevention in elderly people?	67(49.6%)	68(50.4%)
2- what age should routine osteoporosis screening begin for women?	37(27.4%)	98(72.6)
3- cause (s) of the primary osteoporosis?	119(88.1%)	16(11.9%)
4- a risk factor for osteoporosis	61(45.2%)	74(54.8%)
5- the most common type of osteoporosis in elderly people?	85(63.0%)	50(37%)
6- drugs associated with an increased risk of osteoporosis?	98(72.6%)	37(27.4%)
7- the prevention of osteoporosis?	123(91.1%)	12(8.9%)
8- common complication of osteoporosis in elderly people?	82(60.7%)	53(39.3%)
9- the WHO guidelines, regarding T-scores for bone density	90(66.7%)	45(33.3%)
10- indication for referring a patient with osteoporosis from primary healthcare to a hospital	90(66.7%)	45(33.3%)
11- the first-line treatment for senile osteoporosis?	76(56.3%)	59(43.7%)
12- about the use of FRAX tool?	62(45.9%)	73(54.1%)
13- the recommended frequency for bone density measurement (DXA) in elderly people for follow up?	67(49.6%)	68(50.4%)
14- osteoporosis and changes in height?	94(69.6%)	41(30.4%)

In the current study, there was no significant relationship between socio-demographic variables (age, gender, academic degree, specialty) and physicians' knowledge regarding the prevention and management of osteoporosis in the elderly (P-value < 0.05). However, there was a significant association between years of medical practice and physicians' knowledge (P-value = 0.001). as in table 3.

Variables	Knowledge			P- value
	Poor	Moderate	Good	
Age ≤ 30 years	18(13.3%)	20(14.8%)	14(10.4%)	
31-40	12(8.9%)	28(20.7%)	13(9.6%)	
41 - 50	1(0.7%)	14(10.4%)	5(3.7%)	0.063
>50	1(0.7%)	8(5.9%)	1(0.7%)	
Gender Female	18(13.3%)	39(28.9%)	24(17.8%)	0.220
Male	14(10.4%)	31(23.0%)	9(6.7%)	0.229
Academic degree board	2(1.5%)	2(1.5%)	4(3.0%)	
Diploma	4(3.0%)	18(13.3%)	6(4.4%)	0.23
Bachelor (MBChB)	26(19.3%)	50(37.0%)	23(17.0%)	0.23
Specialty General practitioner	24(17.8%)	50(37.0%)	23(17.0%)	
Family medicine	5(3.7%)	18(13.3%)	23(17.070) 8(5.9%)	
Others (community medicine, internal	3(3.770) 3(2.294)	2(1.5%)	2(1.5%)	0.226
medicine)	5(2.270)	2(1.3%)	2(1.370)	
Years practice medicine				
Less than 5 years	22(16.3%)	23(17.0%)	11(8.1%)	
5-10 years	7(5.2%)	16(11.9%)	15(11.1%)	
11-20 years	2(1.5%)	19(14.1%)	4(3.0%)	0.001
More than 20 years	1(0.7%)	12(8.9%)	3(2.2%)	0.001

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Out of the 135 physicians, 33 (24.4%) had good knowledge, 70 (51.9%) had moderate knowledge, and 32 (23.7%) had poor knowledge regarding osteoporosis prevention and management in the elderly. table-4.

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 Table 4: Knowledge Level Frequency Percentage.

	Frequency	Percent	Cumulative Percent
good	33	24.4	24.4
moderate	70	51.9	76.3
poor	32	23.7	100.0
Total	135	100.0	

Regarding the main sources of information and education about osteoporosis prevention and management in the elderly, 21 (15.6%) of physicians used guidelines from professional organizations, 20 (14.8%) used Continuing Medical Education (CME) activities, 18 (13.3%) used medical journals, 6 (4.4%) used interactions with specialists (e.g., endocrinologists, geriatricians), 2 (1.5%) used pharmaceutical company-sponsored educational resources, and 65 (48.1%) used all of these sources. figur1.



Figur 1: main sources of information.

This study shows the main barriers physicians face in providing osteoporosis care for elderly patients in agefriendly PHCs. 11 (8.1%) of physicians reported a lack of time during patient visits, 10 (7.4%) cited a lack of patient awareness and engagement, 7 (5.2%) mentioned inadequate reimbursement for osteoporosis management, 5 (3.7%) pointed out difficulty coordinating care with specialists, 5 (3.7%) raised concerns about medication adherence and side effects, and 91 (67.4%) cited all of these as the main barriers. figur2



Figure 2: main barrier.

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DISCUSSION

Osteoporosis is a major health issue, especially in light of the increasing elderly demographic. Fractures and their clinical consequences are significant contributors to morbidity and death globally. Although therapies have demonstrated efficacy in lowering fracture risk, difficulties remain in pinpointing people at elevated risk to facilitate prompt interventions.^[15] Osteoporosis not only leads to fractures but also ranks among the disorders that cause extended periods of bed rest, frequently leading in severe, life-threatening problems for the elderly. The foundation of osteoporosis prevention is enhancing the expertise of healthcare providers. In agefriendly primary healthcare environments, where senior patients frequently seek first care, improved facilities and prioritisation of older adults in assessments, diagnostics, and treatments are essential. These centres furthermore offer complimentary healthcare services for senior Enhancing clinicians' understanding of citizens. osteoporosis can substantially decrease morbidity and death. Numerous research has investigated osteoporosis knowledge across diverse populations; yet, results indicate that health professionals' understanding remains insufficient.^[16] This study investigated the knowledge level of primary care physicians in Diyala concerning osteoporosis prevention and therapy, as well as its correlation with demographic characteristics. Of the participants, 103 (76.2%) physicians displayed a good to moderate level of expertise, whereas 32 (23.7%) showed low knowledge. The results align with those from research performed in Saudi Arabia (Mohammed Yehia Saeedi^[17], Al-Musa H, Alassmi M, and AlMoria A.^[18]) and Malaysia (Chai Li Tay and Wei Leik^[19]). This study also revealed a notable correlation between years of medical practice and physicians' understanding of osteoporosis prevention and therapy, aligning with the results of Soffien Chadli Ajmi's research.^[20] No substantial correlation was seen between physicians' knowledge and socio-demographic characteristics, including age, gender, academic degree, or speciality. This conclusion is consistent with Mushabab Ayed Alghamdi's study^[21] but contradicts Chenot's research, which indicated that female family physicians had superior understanding of osteoporosis compared to their male colleagues.^[22] The study emphasised the fundamental obstacles encountered by physicians in delivering osteoporosis therapy to senior patients within age-friendly primary healthcare environments. Physicians identified several substantial challenges, including restricted time during patient consultations (e.g., a high patient influx at primary healthcare centres), inadequate patient awareness and involvement (e.g., patients failing to acknowledge the importance of osteoporosis in the elderly), and apprehensions regarding medication adherence and adverse effects. Ninety-one physicians, representing 67.4%, saw all three variables as important impediments, aligning with the conclusions of Palak Choksi.^[23] Furthermore, 21 (15.6%) physicians said that they depended only on recommendations as their principal source of knowledge for osteoporosis prevention and therapy, whereas 65 (48.1%) utilised guidelines in conjunction with other information sources. This outcome is consistent with the Chenot study.^[22] but contradicts the findings of Derek Shangxian Choong's research.^[24]

CONCLUSION

Most physicians in Diyala's age-friendly primary healthcare (PHC) system have modest awareness of elderly osteoporosis prevention and therapy, according to this study. No significant variations in knowledge were found among physician subgroups by age, gender, academic credentials, or speciality. Less than half of the sample uses clinical recommendations, indicating low awareness. Physicians working in age-friendly PHC settings need tailored education to fill these knowledge gaps. These programs should be tailored to all physician groups and offered from their start. The content must cover osteoporosis care and prevention, including guidelines. Educational programs should combine guideline awareness with practical osteoporosis care practices. To speed screening and diagnosis with DEXA scans, PHC referrals to hospitals should be enhanced. Together, improving this referral procedure and education can improve patient care and minimise osteoporosis disease burden.

REFERENCES

 Kanis, J.A., et al., Long-term risk of osteoporotic fracture in Malmo. Osteoporosis Int, 2000; 11(8): 669-74. https://aurononpme.org/orticle/MED/11095169

https://europepmc.org/article/MED/11095169

- Yasien EM, Kadhem QI. Family Physicians and Osteoporosis in Babylon Governorate. Iraqi Natl J Med [Internet], 2022 Jul 1 [cited 2025 Jan 10]; 4(2): 195-203. Available from: https://iqnjm.com/index.php/homepage/article/view/ 763.
- Kanis, J.A., et al., A reference standard for the description of osteoporosis. Bone, 2008; 42: 467-75. https://www.academia.edu/13982185/A_reference_s tandard_for_the_description_of_osteoporosis
- Szulc, P., et al., Bone mineral density predicts osteoporotic fractures in elderly men: the MINOS study. Osteoporos Int, 2005; 16(10): 1184-92. https://www.researchgate.net/publication/7663197_ Bone_mineral_density_predicts_osteoporotic_fractu res_in_elderly_men_The_MINOS_study
- Melton, L.J., 3rd, C.S. Crowson, and W.M. O'Fallon, Fracture incidence in Olmsted County, Minnesota: comparison of urban with rural rates and changes in urban rates over time. Osteoporos Int, 1999; 9(1): 29-37. https://europepmc.org/article/MED/10367027
- Garg MK, Kharb S. Dual energy X-ray absorptiometry: Pitfalls in measurement and interpretation of bone mineral density. Indian J Endocrinol Metab, 2013 Mar; 17(2): 203-10. doi: 10.4103/2230-8210.109659. PMID: 23776890; PMCID: PMC3683192.

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- 7. World Health Organization (WHO) Part of speech of Iraqi health minister to WHO at 2012, http://www.emro.who.int/irq/iraq-news/worldhealthday-2012-in-iraq-good-health-adds-life-toyears.html accessed at Nov.25.2017
- Borgström, F., Karlsson, L., Ortsäter, G. et al. Fragility fractures in Europe: burden, management and opportunities. Osteoporos, 2020; 15: 59. https://pmc.ncbi.nlm.nih.gov/articles/PMC7166207/
- Bergen, G., et al., Falls and Fall Injuries Among Adults Aged ≥65 Years — United States, 2014. MMWR Morb Mortal Wkly Rep, 2016; 65: 993–998.

https://www.cdc.gov/mmwr/volumes/65/wr/mm653 7a2.htm

- Cooley, H. and G. Jones, A population-based study of fracture incidence in southern Tasmania: lifetime fracture risk and evidence for geographic variations within the same country. Osteoporos Int, 2001; 12(2): p. 124-30. https://www.osteoporosis.foundation/factsstatistics/epidemiology-of-osteoporosis-andfragility-fractures
- 11. National Institute for Health and Care Excellence NICE: Clinical Guideline [CG146] - Osteoporosis: assessing the risk of fragility fracture. 2012 [Accessed 22.02.2019]; https://www.nice.org.uk/Guidance/CG146
- 12. NICE Clinical Guidelines, No. 146 London: National Institute for Health and Care Excellence (NICE); 2017 Feb. ISBN-13: 978-1-4731-2359-5 Osteoporosis: assessing the risk of fragility fracture https://www.ncbi.nlm.nih.gov/books/NBK554920/
- Cheung EYN, Tan KCB, Cheung CL, Kung AWC. Osteoporosis in East Asia: Current issues in assessment and management. Osteoporos Sarcopenia, 2016 Sep; 2(3): 118-133. doi: 10.1016/j.afos.2016.07.001. Epub 2016 Jul 30. PMID: 30775478; PMCID: PMC6372753.
- Winzenberg TM, Oldenburg B, Frendin S, Jones G. The design of a valid and reliable questionnaire to measure osteoporosis knowledge in women: The Osteoporosis Knowledge Assessment Tool (OKAT). BMC Musculoskelet Disord, 2003; 4:17. https://europepmc.org/article/PMC/183834
- 15. Kanis J. on behalf of the World Health Organization Scientific Group (2007). Assessment of osteoporosis at the primary health-care level. Technical Report. World Health Organization Collaborating Centre for Metabolic Bone Diseases, University of Sheffield, UK. 2007: Printed by the University of Sheffield. 2008

https://frax.shef.ac.uk/FRAX/pdfs/WHO_Technical _Report.pdf

16. Werner P. Knowledge about osteoporosis: Assessment correlates and outcomes. Osteoporosis International, 2005; 16: 115–27. https://pubmed.ncbi.nlm.nih.gov/15517187/

L

- 17. Mohammed Yehia Saeedi; Fahd Al-Amri; Ashry Mohamed; Ahmed Khair Ibrahim. Knowledge, Attitude and Practice towards Osteoporosis among Primary Health Care Physicians in Riyadh, Saudi Arabia. *Sci. J. Public Health*, 2014; 2(6): 624-630. doi: 10.11648/j.sjph.20140206.30
- Al-Musa H, Alassmi M, AlMoria A, Alghamdi H, Alfaifi S. Knowledge, practice and barriers in management of Osteoporosis. Biomedical Research, 2013; 24(4): 429-34. https://www.semanticscholar.org/paper/Knowledge %2C-practice-and-barriers-in-management-of-Al-Musa-Alassmi/a2ff33b0e16cd490628645f8310c33791b06 2452
- Tay CL, Ng WL, Beh HC, Lim WC, Hussin N. Screening and management of osteoporosis: a survey of knowledge, attitude and practice among primary care physicians in Malaysia. Arch Osteoporos, 2022 Apr 26; 17(1): 72. doi: 10.1007/s11657-022-01111-y. PMID: 35474021; PMCID: PMC9041673.
- Ajmi SC, Aase K. Physicians' clinical experience and its association with healthcare quality: a systematised review. BMJ Open Qual, 2021 Nov; 10(4): e001545. doi: 10.1136/bmjoq-2021-001545. PMID: 34740896; PMCID: PMC8573657.
- 21. Mushabab Ayed Alghamdi1, Abdel Gaffar AbdelAllah Mohammed Knowledge and Awareness of Osteoporosis among Saudi Physicians and Nurses: A Cross-Sectional Study Open Access Macedonian Journal of Medical Sciences.https://pubmed.ncbi.nlm.nih.gov/29875871
- Chenot, R., Scheidt-Nave, C., Gabler, S., Kochen, M. M. & Himmel, W. German primary care doctors' awareness of osteoporosis and knowledge of national guidelines. Exp. Clin. Endocrinol. Diabetes, 2007; 115: 584–589. Available from: https://pubmed.ncbi.nlm.nih.gov/17943692/
- Palak Choksi, MD1, Brittany L. Gay, BS2, Megan R. Haymart, MD2, Maria Papaleontiou, MD2 Physician-Reported Barriers to Osteoporosis Screening: A Nationwide Survey Endocr Pract. Author manuscript; available in PMC 2023 September https://www.endocrinepractice.org/article/S1530-891X(23)00403-2/ppt
- 24. Choong DS, Tan NC, Koh YLE, Leong CK, Sankari U, Koh KH. Osteoporosis management by primary care physicians in Singapore: a survey on osteoporosis guidelines utilisation and barriers to care. Arch Osteoporos, 2023 May 20; 18(1): 72.

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