SJIF Impact Factor: 6.711

WORLD JOURNAL OF ADVANCE HEALTHCARE RESEARCH

ISSN: 2457-0400
Volume: 9.
Issue: 3
Page N. 161-167
Year: 2025

Original Article www.wjahr.com

KNOWLEDGE, ATTITUDE AND PRACTICE IN A SAMPLE OF POST- MENOPAUSAL WOMEN ATTENDING PHCCS REGARDING OSTEOPOROSIS IN BAGHDAD / AL-KARKH 2024

Mayssam Dawood Salman*[1] and Ban Abdul-Ridha Salman[2]

[1]Al-Anbar Health Directorate, Al-Anbar, Iraq.
[2]Al-Hashimi Baghdad Rusafa Health Directorate, Baghdad, Iraq.

Received date: 20 January 2025 **Revised date:** 09 February 2025 **Published date:** 01 March 2025

***Corresponding Author: Mayssam Dawood Salman**
Al-Anbar Health Directorate, Al-Anbar, Iraq.

ABSTRACT

Background: Osteoporosis is a common condition, especially among postmenopausal women, characterized by decreased bone density and increased fracture risk. Despite its significant impact on quality of life and healthcare costs, awareness and preventive measures remain inadequate in many communities. **Objective:** This study aimed to assess the knowledge, attitudes, and practices (KAP) regarding osteoporosis among postmenopausal women and examine the association between KAP levels and sociodemographic factors. **Method:** A descriptive cross-sectional study was conducted in eight primary healthcare centers within two districts of Baghdad (Al-Karkh Health Directorate) from March 1 to August 31, 2024. A total of 400 postmenopausal women participated. Data were collected using a structured questionnaire assessing demographic information and osteoporosis-related KAP. Statistical analysis was performed to explore associations between KAP levels and sociodemographic variables. **Results:** The study found that 74% of participants had fair knowledge, 55.5% exhibited positive attitudes, and 69.8% demonstrated fair practices regarding osteoporosis. Knowledge gaps were identified in key areas, including symptoms, risk factors, and preventive measures. A fair attitude was significantly associated with lower educational levels, while no other demographic factors showed significant associations with KAP levels. **Conclusion:** More than two-thirds of participants had fair knowledge, over half exhibited positive attitudes, and nearly two-thirds had fair practices regarding osteoporosis. The identified gaps in knowledge and practices emphasize the need for targeted health education campaigns to enhance awareness and preventive behaviors.

KEYWORDS: Osteoporosis, postmenopausal women, knowledge, attitudes, practices, primary healthcare, prevention, Baghdad.

INTRODUCTION

Osteoporosis (OP) is an acquired disease characterized by reduced bone mass and deterioration of the micro-architectural structure of bone tissue, leading to increased bone fragility and susceptibility to fractures.[1] Due to the increasing proportions of aging populations in the Asian region; osteoporosis has become more prevalent and increases the health care expenditure in this region.[2] There are two types of risk factors for osteoporosis fixed risk factors:(age, female gender, previous fracture, menopause or hysterectomy, asthma, rheumatoid arthritis, Cushing syndrome diabetes, long-term use glucocorticoid therapy) and modifiable risk factor: (alcohol, smoking, low body mass index, poor nutrition, vitamin D deficiency, eating disorder, estrogen deficiency).[3] Although there is no direct evidence that screening for osteoporosis reduces fractures, there is good indirect evidence that screening is effective in identifying post- menopausal women with low bone mineral density. Health policymakers can also help prevent and reduce osteoporosis in the community through a variety of means, such as moderate physical activity, an appropriate intake of calcium and vitamin D, cessation of smoking, and pharmaceutical intervention in high-risk groups. Also, effective dissemination of findings from research should be used to increase the awareness of osteoporosis, both among the general population and in the health services, to increase early detection of risk factors, and to motivate preventive measures.[4,5] The prevalence of osteoporosis in women around the world was reported to be 23.1%, while the prevalence of osteoporosis among men around the world was found to be 11.7% which was based on 40 studies and sample size of 453,964 men.[6] The lake of knowledge about osteoporosis is a significant barrier to proper risk identification and management, highlighting

the need for increased awareness and education to ensure effective prevention and treatment.[7] The aim of study is to evaluate post-menopausal women's osteoporosis knowledge, attitude, and practice in Baghdad/Al-karkh primary care centers. To examine the relationship between osteoporosis knowledge, attitude, and practice and demographic characteristics.

METHOD

Study Design: A descriptive cross-sectional study with some analytic measurement was conducted.

Study Setting: The study was carried out in eight primary healthcare centers under the Baghdad/Al-Karkh Health Directorate across two districts.

- Al-Karkh Health District: Al-Mansour PHCC, Al-Askan PHCC, Al-Dakhiliyah PHCC, Al-Yarmouk PHCC.
- Al-Adel Health District: Al-Adel PHCC, Al-Jami'aa PHCC, Al-Khadra PHCC, Al-Amriya PHCC.

Data Collection Time: Data were collected over six months, from March 1 to August 31, 2024, for two days per week, four hours per day.

Study Population and Sampling: The study included 400 postmenopausal women attending the selected health centers during data collection. A convenient sampling method was used.

Inclusion Criteria.

- Consenting postmenopausal women attending the selected health centers within the study period.

Exclusion Criteria:

- Women previously diagnosed with osteoporosis.

Variable Definitions

- Postmenopausal women: Defined as those with at least one year since their last menstrual period.[8]

Data Collection Tools: A structured questionnaire, developed based on similar research[9,10] and reviewed by specialists, was used. It was translated into Arabic and administered via direct interviews. The questionnaire had four sections.

1. Sociodemographic Data (age, marital status, education, occupation, family history of osteoporosis, smoking history).
2. Knowledge Assessment (21 questions on osteoporosis causes, risk factors, prevention).
3. Attitude Assessment (5 questions on perceptions about osteoporosis).
4. Practice Assessment (5 questions on osteoporosis-related behaviors).

Scoring System

- Knowledge: (0-42), classified as poor (<21), fair (21-34), good (>34).
- Attitude: (0-10), classified as negative (<5), neutral (5-8), positive (>8).
- Practice: (0-10), classified as poor (<5), fair (5-8), good (>8).

Ethical Considerations

- Approval from the Al-Nahrain College of Medicine and Al-Karkh Health Directorate (Appendices C & D).
- Informed verbal consent was obtained from all participants.

Data Analysis: Data were coded and analyzed using SPSS version 24.0. Descriptive statistics (mean, standard deviation, frequency, percentages) were used. Associations between variables were tested using the chi-square test, with statistical significance set at $p \leq 0.05$.

RESULTS

A total of 400 participants were included, with a mean age of 59.52±6.801 years (range 47-78). The most common age group was 50-59 years (47.0%), followed by 60-69 years (42.5%). University education (40.3%) was the most common, and housewives (47.7%) were the predominant occupation. Most participants were non-smokers (93.5%), and 41.7% had a family history of osteoporosis. As in table 1.

Table 1: Sociodemographic data of participants.

Sociodemographic data		**No.**	**%**
Age group/ years	40-49	11	2.8
	50-59	188	47.0
	60-69	170	42.5
	≥70	31	7.7
Education	Illiterate (not read and write)	51	12.7
	Primary	59	14.7
	Secondary	129	32.3
	University or higher	161	40.3
Occupation	Housewife	191	47.7
	Governmental Employer	124	31.0
	Self-Employer	16	4.0
	Retired	69	17.3
Marital status	Single	85	21.2
	Married	259	64.8

	Divorced	18	4.5
	Widow	38	9.5
Smoking history	Never	374	93.5
	Ever smoked	19	4.7
	Current smoking	7	1.8
Family history of Osteoporosis		167	41.7
Total		400	100.0

Poor knowledge regarding osteoporosis was observed among 71 (17.8%) participants, fair knowledge was observed among 296 (74%) participants, and good knowledge among 33 (8.3%) participants, A negative attitude regarding osteoporosis was observed among 2 (0.5%) participants, a neutral attitude among 176 (44.0%), and a positive attitude among 222 (55.5%) participants, Poor practice regarding osteoporosis was observed among 100 (25%) participants, fair practice among 279 (69.8%), and good practice among 21 (5.3%) participants. As in table 2.

Table 2: Knowledge, Attitude, and Practice Towards Osteoporosis.

Category	Level	Number (n)	Percentage (%)
Knowledge	Good	33	8.3
	Fair	296	74.0
	Poor	71	17.8
Attitude	Positive	222	55.5
	Neutral	176	44.0
	Negative	2	0.5
Practice	Good	21	8.3
	Fair	279	69.8
	Poor	100	25.0

The distribution of sociodemographic data of participants regarding their knowledge about osteoporosis is shown in **Table 3.** and revealed no significant association, P>0.05.

Table 3: Distribution of sociodemographic data of participants regarding their knowledge about osteoporosis.

Variables		Knowledge						Total	P* value
		Poor N=71		Fair N=296		Good N=33			
		No.	%	No.	%	No.	%		
Age group/ years	40-49	0	0.0	10	90.9	1	9.1	11	0.46
	50-59	35	18.6	133	70.7	20	10.6	188	
	60-69	31	18.2	128	75.3	11	6.5	170	
	≥70	5	16.1	25	80.6	1	3.2	31	
Education	Illiterate (not read and write)	11	21.6	35	68.6	5	9.8	51	0.41
	Primary	10	16.9	47	79.7	2	3.4	59	
	Secondary	27	20.9	93	72.1	9	7.0	129	
	University or higher	23	14.3	121	75.2	17	10.6	161	
Occupation	Housewife	34	17.8	142	74.3	15	7.9	191	0.52
	Governmental Employer	21	16.9	89	71.8	14	11.3	124	
	Self-Employer	5	31.3	10	62.5	1	6.3	16	
	Retired	11	15.9	55	79.7	3	4.3	69	
Marital status	Single	16	18.8	61	71.8	8	9.4	85	0.67
	Married	43	16.6	193	74.5	23	8.9	259	
	Divorced	2	11.1	15	83.3	1	5.6	18	
	Widow	10	26.3	27	71.1	1	2.6	38	
Smoking history	Never	68	18.2	276	73.8	30	8.0	374	0.33
	Ever smoked	3	15.8	15	78.9	1	5.3	19	
	Current smoking	0	0.0	5	71.4	2	28.6	7	
Family history of Osteoporosis	Yes	26	15.6	130	77.8	11	6.6	167	0.33
	No	45	19.3	166	71.2	22	9.4	233	

*** Fisher's Exact Test**

The fair attitude was associated significantly with illiterate (read and write) participants, P=0.03, as shown in Table 4.

Table 4: Distribution of sociodemographic data of participants regarding their attitude about osteoporosis.

Variables		Attitude						Total	P* value
		Negative N=2		Neutral N=176		Positive N=222			
		No.	%	No.	%	No.	%		
Age group/ years	40-49	0	0.0	3	27.3	8	72.7	11	0.15
	50-59	0	0.0	77	41.0	111	59.0	188	
	60-69	1	0.6	80	47.1	89	52.4	170	
	≥70	1	3.2	16	51.6	14	45.2	31	
Education	Illiterate (not read and write)	0	0.0	33	64.7	18	35.3	51	0.03
	Primary	0	0.0	27	45.8	32	54.2	59	
	Secondary	1	0.8	54	41.9	74	57.4	129	
	University or higher	1	0.6	62	38.5	98	60.9	161	
Occupation	Housewife	0	0.0	97	50.8	94	49.2	191	0.07
	Governmental Employer	1	0.8	45	36.3	78	62.9	124	
	Self-Employer	0	0.0	7	43.8	9	56.3	16	
	Retired	1	1.4	27	39.1	41	59.4	69	
Marital status	Single	1	1.2	41	48.2	43	50.6	85	0.71
	Married	1	0.4	109	42.1	149	57.5	259	
	Divorced	0	0.0	9	50.0	9	50.0	18	
	Widow	0	0.0	17	44.7	21	55.3	38	
Smoking history	Never	1	0.3	163	43.6	210	56.1	374	0.15
	Ever smoked	1	5.3	9	47.4	9	47.4	19	
	Current smoking	0	0.0	4	57.1	3	42.9	7	
Family history of Osteoporosis	Yes	0	0.0	81	48.5	86	51.5	167	0.16
	No	2	0.9	95	40.8	136	58.4	233	

*** Fisher's Exact Test**

The fair attitude was associated significantly with illiterate (read and write) participants, P=0.03, as shown in Table 5.

Table 5: Distribution of sociodemographic data of participants regarding their attitude about osteoporosis.

Variables		Attitude						Total	P* value
		Negative N=2		Neutral N=176		Positive N=222			
		No.	%	No.	%	No.	%		
Age group/ years	40-49	0	0.0	3	27.3	8	72.7	11	0.15
	50-59	0	0.0	77	41.0	111	59.0	188	
	60-69	1	0.6	80	47.1	89	52.4	170	
	≥70	1	3.2	16	51.6	14	45.2	31	
Education	Illiterate (not read and write)	0	0.0	33	64.7	18	35.3	51	0.03
	Primary	0	0.0	27	45.8	32	54.2	59	
	Secondary	1	0.8	54	41.9	74	57.4	129	
	University or higher	1	0.6	62	38.5	98	60.9	161	
Occupation	Housewife	0	0.0	97	50.8	94	49.2	191	0.07
	Governmental Employer	1	0.8	45	36.3	78	62.9	124	
	Self-Employer	0	0.0	7	43.8	9	56.3	16	
	Retired	1	1.4	27	39.1	41	59.4	69	
Marital status	Single	1	1.2	41	48.2	43	50.6	85	0.71

	Married	1	0.4	109	42.1	149	57.5	259	
	Divorced	0	0.0	9	50.0	9	50.0	18	
	Widow	0	0.0	17	44.7	21	55.3	38	
Smoking history	Never	1	0.3	163	43.6	210	56.1	374	0.15
	Ever smoked	1	5.3	9	47.4	9	47.4	19	
	Current smoking	0	0.0	4	57.1	3	42.9	7	
Family history of Osteoporosis	Yes	0	0.0	81	48.5	86	51.5	167	0.16
	No	2	0.9	95	40.8	136	58.4	233	

*** Fisher's Exact Test**

DISCUSSION

Osteoporosis prevention among postmenopausal women is crucial, as raising awareness and improving knowledge directly contribute to adopting preventive measures.[11] This study included 400 postmenopausal women, with a mean age of 59.52 ± 6.801 years. The dominant age group was 50-59 years, consistent with studies by Saltık et al., Ankara 2023 (58.05 ± 9.1 years) [11] and Senthilraja et al., India 2019 (58 ± 6 years).[12] More than one-third of participants had university education, and around two-thirds were married, aligning with studies in Iraq[13] and Malaysia.[14] Less than half were housewives, consistent with Kale et al., India 2024.[15] The majority were non-smokers, similar to Mohammed and Dauod, Iraq 2021[16], but in contrast to Hage et al., Lebanon 2019[17], likely due to cultural differences. Less than half had a family history of osteoporosis, supporting findings from Saltık et al., Turkey 2023[11] and Mortada et al., Egypt 2020.[18]

The least recognized fact was that osteoporosis is often asymptomatic before fractures occur, similar to studies in Iraq[16] and Saudi Arabia.[19] Less than one-third of participants knew bone loss accelerates after menopause, consistent with Sitati et al., Kenya 2021.[5] Only 16.5% understood that physical activity helps prevent osteoporosis, reinforcing findings from previous studies.[20,21]

Less than a quarter identified family history as a risk factor, aligning with Sitati et al., Kenya 2021.[5] Similarly, less than a quarter knew osteoporosis has effective treatments, in agreement with Mohammed and Dauod, Iraq 2021[16] and Senthilraja et al., India 2019.[12] Only 16.5% recognized that lower weight increases osteoporosis risk, consistent with Alhouri et al., Syria 2022.[10] Less than a quarter associated smoking and alcohol with bone loss, agreeing with Senthilraja et al., India 2019[12] and Sitati et al., Kenya 2021.[5] Overall, about three-quarters had fair knowledge, similar to Mohammed and Dauod, Iraq 202[16] and Nohra et al., Lebanon 2022[22], but differing from Alfadhul and Abbas, Iraq 2023[13] and Abukhelaif et al., Saudi Arabia 2023,[23] possibly due to varied measurement tools.

Nearly three-quarters believed sun exposure benefits bone health, consistent with Al-Naggar et al., Malaysia 2016.[24] Over half had a positive attitude, which was higher than Alani et al., UAE 2024[25], Saltık et al., Turkey 2023[11], and Rundasa et al., Ethiopia 2022.[26] Differences may stem from varying education levels and participant ages.

Less than a quarter of participants had daily sun exposure or engaged in regular physical activity, aligning with Saltık et al., Turkey 2023[11] and Kale et al., India 2024.[15] More than two-thirds had fair practices, surpassing Alani et al., UAE 2024[25] and Mortada et al., Egypt 2020.[18] The discrepancy may be due to gender differences in other studies.

No significant association was found between knowledge and sociodemographic variables, aligning with Alani et al., UAE 2024[25] and Chan et al., Malaysia 2019.[27] A fair attitude was significantly associated with illiteracy, as reported by Majeed NM et al.[28] and Leng et al., Malaysia 2017.[28] No significant association was found between sociodemographic factors and osteoporosis practices, consistent with Almutairi et al., Saudi Arabia 2022[28] and Shakya et al., Nepal 2022.[30] Overall, these findings highlight the importance of targeted educational interventions to improve osteoporosis awareness and prevention.

CONCLUSION

This study found that over two-thirds of women had fair osteoporosis knowledge, over half had good attitudes, and over two-thirds had fair practice. Participants' sociodemographic variables did not significantly affect their knowledge. Fairness was strongly linked to illiteracy. Participant sociodemographic characteristics did not affect osteoporosis practice.

REFERENCES

1. Kumar V, Abbas AK, Robbins SL. Robbins Basic Pathology. 9th ed. Elsevier, 2013; 768-770. Cited 2024 Jun 22.
2. De Silva REE, Haniffa MR, Gunathillaka KDK, Atukorala I, Fernando EDPS, Perera WLSP. A descriptive study of knowledge, beliefs, and practices regarding osteoporosis among female medical school entrants in Sri Lanka. Asia Pac Fam Med., 2014; 13(15): 1-6. Available from: https://doi.org/10.1186/s12930-014-0015-y. Cited 2024 Feb 24.
3. Yasien EM, Kadhem QI. Family Physicians and Osteoporosis in Babylon Governorate. Iraqi Natl J Med [Internet]. 2022 Jul 1 [cited 2025 Feb 22]; 4(2): 195-203. Available

from: https://www.iqnjm.com/index.php/homepage/article/view/76.
4. Ezeonu PO, Agwu UM, Ajah LO, Dimejesi IBO, Ogbonnaya LU, Umeora OUJ, et al. The prevalence of osteoporosis among antenatal clinic attendees in a rural mission hospital in South-East Nigeria. Niger J Clin Pract., 2017; 20(12): 1522-1526. Cited 2024 May 25.
5. Sitati FC, Gichangi P, Obimbo MM. Prevalence of osteoporosis and its associated factors among post-menopausal women in Kiambu County, Kenya: a household survey. Arch Osteoporos, 2021; 15(1): 1-31. Available from: https://doi.org/10.1007/s11657-020-0685-z. Cited 2024 May 23.
6. Salari N, Ghasemi H, Mohammadi L, Behzadi MH, Rabieenia E, Shohaimi S, Mohammadi M. The global prevalence of osteoporosis in the world: a comprehensive systematic review and meta-analysis. J Orthop Surg Res., 2021; 16(609): 1-20. Available from: https://doi.org/10.1186/s13018-021-02772-0. Cited 2024 Jul 17.
7. Jamil N, Salman S. Knowledge about osteoporosis among primary health care physicians in Baghdad. Iraqi Postgrad Med J., 2020; 21(2): 138-147. Available from: https://doi.org/10.52573/ipmj.2020.174606. Cited 2024 Jul 18.
8. Bickerstaff H, Kenny LC. Gynaecology by Ten Teachers. 20th ed. Dokumen PUB; 2017; Cited 2024 Feb 11.
9. Huang IC, Wu HC, Lin CL, Wang HH. Development and validation of the osteoporosis knowledge, attitude, and behaviors questionnaire for female osteoporosis patients in Taiwan: A mediation model. Healthcare, 2023; 11: 1-14. Available from: https://doi.org/10.3390/healthcare11071023. Cited 2024 Feb 22.
10. Alhouri A, Zahrawi H, Alasaad S, Alhayek SM, Al Houri HN, Jomaa S, et al. Assessing the knowledge and attitude towards osteoporosis among Syrian women: A cross-sectional study. Int J Rheumatol, 2022; 2022(1): 6431151. Available from: https://doi.org/10.1155/2022/6431151. Cited 2024 Feb 10.
11. Saltık H, Öztürk F, Emiroğlu C, Hekimoğlu B, Aypak C. Knowledge, attitude, and behavior levels of postmenopausal women about osteoporosis. J Bone Metab., 2023 Nov; 30(4): 347-354. Available from: https://doi.org/10.11005/jbm.2023.30.4.347. Cited 2024 Oct 10.
12. Senthilraja M, Cherian KE, Jebasingh FK, Kapoor N, Paul TV, Asha HS. Osteoporosis knowledge and beliefs among postmenopausal women: A cross-sectional study from a teaching hospital in southern India. J Fam Med Prim Care, 2019 Apr 1; 8(4): 1374-1378. Available from: https://doi.org/10.4103/jfmpc.jfmpc_95_19. Cited 2024 Oct 15.
13. Alfadhul SA, Abbas ZH. Assessment of knowledge and beliefs toward osteoporosis among Iraqi perimenopausal women. Al-Rafidain J Med Sci., 2023; 5: 150-156. Available from: https://doi.org/10.54133/ajms.v5i.194. Cited 2024 Oct 9.
14. Cheng YT, Keshavarzi F, Farrukh MJ, Mahmoud SS. Assessment of knowledge, attitude, and practice of Malaysian women towards osteoporosis. Curr Trends Biotechnol Pharm., 2020; 14(5): 55-63. Available from: https://doi.org/10.5530/ctbp.2020.4s.6. Cited 2024 Oct 9.
15. Kale A, Khandelwal N, Sirohi B, Shaki O, Rai S. Knowledge, attitudes, practices, and awareness levels among Indian postmenopausal women about osteoporosis and its relationship with sociodemographic factors: A cross-sectional study from Northern India. Cureus, 2024 May 3; 16(5): 4-5. Available from: https://doi.org/10.7759/cureus.59606. Cited 2024 Oct 5.
16. Mohammed LA, Dauod AS. Knowledge, awareness, and preventive behaviors toward osteoporosis among a sample of premenopausal women in Erbil city, Iraq. Zanco J Med Sci., 2021; 25(1): 464-472. Available from: https://doi.org/10.15218/zjms.2021.008. Cited 2024 Oct 5.
17. Hage EL C, Hallit S, Akel M, Dagher E. Osteoporosis awareness and health beliefs among Lebanese women aged 40 years and above. Osteoporos Int., 2019 Apr 1; 30: 771-786. Available from: https://doi.org/10.1007/s00198-019-04901-2. Cited 2024 Oct 10.
18. Mortada EM, El Seifi OS, Abdo NM. Knowledge, health beliefs, and osteoporosis preventive behavior among women of reproductive age in Egypt. Malays J Med Health Sci., 2020; 16(1): 9-16. Available from: https://medic.upm.edu.my/upload/dokumen/2020011611515402_MJMHS_0057.pdf. Cited 2024 Oct 11.
19. Elmorsy E, Elsawi AN, Alruwaili NM, Alruwaili AH, Alanazi SN, Alenezi KR. Awareness about osteoporosis among the general population based on the osteoporosis knowledge assessment tool (OKAT): A cross-sectional study in the Northern Border Region of Saudi Arabia. Cureus, 2024 Mar; 16(3): 3-4. Available from: https://doi.org/10.7759/cureus.56839. Cited 2024 Oct 11.
20. Proia P, Amato A, Drid P, Korovljev D, Vasto S, Baldassano S. The impact of diet and physical activity on bone health in children and adolescents. Frontiers in Endocrinology, 2021 Sep 13; 12: 704647. Available: doi: 10.3389/fendo.2021.704647. cited [11-10-2024].
21. Bull FC, Al-Ansari SS, Biddle S, Borodulin K, Buman MP, Cardon G, et al. World Health Organization 2020 guidelines on physical activity and sedentary behaviour. British journal of sports medicine, 2020 Dec 1; 54(24): 1451-1462.

Available: doi: 10.1136/bjsports-2020-102955 cited [1-10-2024].
22. Nohra J, Sacre Y, Abdel-Nour A, Mannan H. Evaluation of knowledge, attitudes, and practices related to osteoporosis and correlates of perceived high risk among people living in two main districts of Lebanon. Journal of Osteoporosis, 2022; (1): 1188482.
23. Abukhelaif AE, Alzahrani SA, Al-Thobaiti LY, Almutairi NO, Alzahrani MA, Alzahrani AA, et al. Knowledge and behavior of postmenopausal women regarding osteoporosis and its screening in Al-Baha region, Saudi Arabia. Middle East Journal of Family Medicine, 2023; 7(10): 166-174. Available doi:10.5742/MEWFM.2023.95251577 cited [15-10-2024].
24. Al-Naggar RA, Ismail N, Zaliha I, Aini N, Nadira AM, Shamsidah NN, et al. Knowledge, Attitude and Practice of Osteoporosis among Malay Adults in Selangor, Malaysia.Research journal of pharmaceutical biological and chemical sciences, 2016; 7(3): 2116-2124. Available: https://www.rjpbcs.com/pdf/2016_7 (3)/[258].pdf cited [16-10-2024].
25. Alani Q, Yassir M, Mansoor R, Flayyih R, Yaqoob NA, Rafeeq H, et al. Knowledge, Attitude, and Practices Towards Osteoporosis Among Adults in the United Arab Emirates (UAE) in 2023. Cureus, 2024 Mar; 16(3): 1-21. Available doi: 10.7759/cureus.56084. Cited [14-10-2024].
26. Rundasa DT, Ayisa AA, Mekonen EG. Knowledge, health belief, and associated factors towards the prevention of osteoporosis among post-menopausal women in Metu Town, southwest Ethiopia: a community-based cross-sectional study. Int J Orthop Trauma Nurs., 2022 May 1; 45: 100905. Available from: https://doi.org/10.1016/j.ijotn.2021.100905. Cited 2024 Oct 16.
27. Chan CY, Subramaniam S, Chin KY, Ima-Nirwana S, Muhammad N, Fairus A, et al. Knowledge, beliefs, dietary, and lifestyle practices related to bone health among middle-aged and elderly Chinese in Klang Valley, Malaysia. Int J Environ Res Public Health, 2019 May 20; 16(10): 1787. Available from: https://doi.org/10.3390/ijerph16101787. Cited 2024 Oct 18.
28. Majeed NM, Habib HA. Knowledge regarding osteoporosis risk factors, prevention, and management in women of reproductive ages in Diyala, 2019. Iraqi J Community Med., 2024; 37(2): 81-5. doi:10.4103/IRJCM.IRJCM_17_24.
29. Leng LS, Ali A, Yusof HM. Knowledge, attitude, and practices towards osteoporosis prevention among adults in Kuala Lumpur, Malaysia. Malays J Nutr., 2017; 23: 279–290. Available from: https://www.researchgate.net/publication/319455768 Cited 2024 Oct 15.
30. Shakya R. Awareness and preventive practice regarding osteoporosis among women in a community, Lalitpur. J Patan Acad Health Sci., 2022 Jun 17; 9(1): 82-91. Available from: https://doi.org/10.3126/jpahs.v9i1.44304. Cited 2024 Oct 15.