Knowledge, Attitude and Practice and Its Related Factors towards Vitamin D Deficiency among a Sample of Women Attending Primary Health Care Centers in Baghdad / Al-Rusafa/ 2024

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Abstract:

Background: Vitamin D deficiency is a widespread health concern with significant implications for women's health. Understanding knowledge, attitudes, and practices, regarding Vitamin D is crucial for effective interventions.

Objective: To evaluate the knowledge, attitudes, and practices related to Vitamin D among women attending primary health centers in Baghdad, Iraq.

Subjects and Methods: From March 1st to August 31th, 2024, a cross-sectional study was conducted in 10 primary healthcare centers across, two districts in Baghdad Al-Rusafa. The study included 500 women (mean age 36.15 years), and data were collected through structured questionnaires assessing demographics, knowledge sources, attitudes, and practices. Statistical analysis examined associations between knowledge, attitudes, and practices levels and sociodemographic factors.

Results: The majority had a fair knowledge of Vitamin D, with over a quarter demonstrating good knowledge, and the rest were poor. While most participants recognized sunlight and fatty fish as Vitamin D sources, gaps persisted regarding ideal sun exposure times and the role of skin pigmentation in synthesis. Positive attitudes were common, especially among those with higher education levels. Yet, practical application remained limited, with low adherence to consuming Vitamin D-rich foods, reading food labels, and regular sun exposure. Media and healthcare professionals were the main knowledge sources, though the reliability of media was uncertain. Sociodemographic factors like age, marital status, and occupation had no significant impact on knowledge or practices, but education level was associated with positive attitudes.

Conclusion: This study on Vitamin D deficiency among women found fair knowledge but persistent misconceptions about sunlight exposure, diet, and skin pigmentation. Higher-educated women showed more positive attitudes, yet adherence to recommended behaviors was inadequate. Other sociodemographic factors had minimal influence, highlighting the need for targeted public health interventions to improve awareness and practices.

KEYWORDS: primary health care, KAP study, vitamin D

Introduction:

Vitamin D is essential for maintaining bone health, supporting immune function, and reducing the risk of chronic diseases. However, vitamin D deficiency remains a widespread public health issue, particularly among women in Iraq. Studies indicate a high prevalence of deficiency, with 66.5% of women in Basrah, 53% in Erbil, and 50% among infertile women in Baghdad being affected. [1, 2] A staggering 96.6% of pregnant women in a Baghdad hospital were also found to be deficient, highlighting the vulnerability of certain groups. [3] Several factors contribute to this deficiency, including cultural practices limiting sun exposure, inadequate dietary intake, and obesity. Wearing full-body clothing and Al-Hijab significantly reduces the body's ability to produce vitamin D. [4] Additionally, many individuals lack awareness of optimal sun exposure practices and dietary sources such as fish, eggs, and fortified products. Obesity further exacerbates the problem, as research shows that higher BMI is linked to lower vitamin D bioavailability. [5]

Vitamin D deficiency has serious health implications, increasing the risk of osteoporosis, cardiovascular diseases, and type-2 diabetes. [6] Among pregnant women in Erbil, 71.3% were deficient, which was associated with complications like preeclampsia and preterm birth. [7] Moreover, low vitamin D levels are linked to immune dysfunction, higher susceptibility to infections, and chronic conditions such as hypertension and cardiovascular diseases. [8] Additionally, low serum vitamin D3 levels have been associated with the occurrence of uterine fibroids, emphasizing the role of vitamin D in reproductive health. [9]

Interestingly, studies on hemodialysis patients show a different trend, with more than two-thirds of patients having sufficient vitamin D3 levels, while vitamin D insufficiency was found in about one-quarter of patients and deficiency in only 1.2%. This suggests that some populations, such as those receiving medical supervision and supplementation, may have better vitamin D status compared to the general population. [10] Given the broad health impact of vitamin D deficiency, addressing this issue in Iraq requires public health campaigns, dietary education, fortification programs, and targeted supplementation for at-risk populations, including women of reproductive age, pregnant women, and individuals with obesity. Improving vitamin D status could lead to significant health benefits and reduce the prevalence of related diseases. [11]

Knowledge, Attitude, and Practice (KAP) studies on vitamin D deficiency highlight a widespread lack of awareness among women, particularly those attending primary healthcare centers. Research from Saudi Arabia, Cairo, and Kuwait indicates that while many women recognize the term "vitamin D," their understanding of its sources, health benefits, and broader roles in disease prevention remains limited. [12] Cultural and lifestyle factors, such as traditional clothing and indoor living, further hinder sun exposure, and misconceptions persist regarding dietary sources and supplementation. [13] Despite some awareness, attitudes toward vitamin D intake are inconsistent, with many women failing to take preventive actions. [14] In Iraq, there is a critical knowledge gap regarding how sociocultural influences shape women's behaviors and the impact of educational interventions on improving awareness and practices. This study hypothesizes that Iraqi women attending primary healthcare centers have insufficient knowledge, attitudes, and practices regarding vitamin D deficiency, contributing to its high prevalence.

Addressing these gaps is essential for developing effective public health strategies to enhance vitamin D awareness and management among Iraqi women. [15]

Objective: To assess the KAP related to Vitamin D among women attending primary health centers in Baghdad, Iraq.

Subjects and methods:

This cross-sectional study utilized a simple random sampling method to select two health sectors (Al-Adhamiya and Al-Sha'ab) from 10 sectors in Al-Rusafa's Health Directorate, followed by the random selection of five primary healthcare centers (PHCCs) from each sector. Conducted in Baghdad/Al-Rusafa from March 1st to August 31th, 2024, the study targeted women attending these PHCCs, with a sample size of 500 women. Data were collected using a structured questionnaire, developed from validated sources, translated into Arabic, and administered via direct interviews two days per week for six months. Women who attended the selected centers and agreed to participate were included, while those who were ill or refused were excluded. A verbal consent was taken from all the participants.

The 40-item questionnaire included sections on demographics (6 questions), knowledge (12 questions), attitudes (12 questions), and practices (10 questions) related to Vitamin D. Scoring was structured as follows: knowledge (0–24 points), attitude (12–36 points), and practice (10–30 points), with overall performance classified as poor (≤50%), fair (51%-74%), or good (≥75%).

Key variables included Vitamin D, defined as a fat-soluble vitamin essential for calcium absorption and bone health, [16] occupation, referring to a person's job or activity, residence, denoting their living location, and marital status, indicating their legal relationship status. [17] Knowledge was defined as understanding an issue, attitudes as beliefs influencing behavior, and practice as frequently performed actions. [18]

Data was submitted to SPSS version (26) and presented in the following way: Descriptive analysis was presented in numbers, tables, and graphs. Analytical statistics using the Chi-square test to show the association between knowledge, attitude, and practice. An independent sample t-test was used to define the significance of the difference among the variables. A p-value of less than or equal to 0.05 was considered statistically significant.

Results:

Table 1 showed Sociodemographic data of the sample of studied women, while Table 2 showed Responses regarding knowledge questions about vitamin D deficiency among a sample of women attending primary health care centers in Baghdad / Al-Rusafa/ 2024.

Table 3 demonstrated the Responses regarding attitude questions about vitamin D deficiency among a sample of women attending primary health care centers in Baghdad / Al-Rusafa/ 2024. Table 4 showed the Responses regarding practice questions about vitamin D deficiency. among a sample of women attending primary health care centers in Baghdad / Al-Rusafa/ 2024.

Table 1: Sociodemographic characteristics of a sample of women attending primary health care centers in Baghdad / Al-Rusafa/ 2024.

Sociodemographic data		No.	%
Age group/ years	20-29	164	32.8%
	30-39	150	30.0%
	40-49	122	24.4%
	50-59	49	9.8%
	60-69	15	3.0%
Marital status	Single	175	35.0%
	Married	265	53.0%
	Divorced	41	8.2%
	Widowed	19	3.8%
Residence	Central	385	77.0%
	Peripheral	115	23.0%
Education level	Illiterate	4	0.8%
	Read and write	17	3.4%
	Primary	24	4.8%
	Secondary	88	17.6%
	College	367	73.4%
Occupation	Employed	244	48.8%
	Unemployed	187	37.4%
	Student	69	13.8%
Source of information	TV and media	212	42.4%
	Physician\Nurse	204	40.8%
	Neighbors\Elder People	53	10.6%
	No Information	31	6.2%
Total		500	100%

Table 2: Responses regarding knowledge questions about vitamin D deficiency

Knowledge	No		Not sure		Yes	
	No.	%	No.	%	No.	%
Vitamin D can be produced from sunlight.	26	5.2%	70	14.0%	404	80.8%
Bone diseases such as osteoporosis are associated with vitamin D deficiency.	41	8.2%	58	11.6%	401	80.2%
In Iraq, the ideal time for the body to be exposed to sunlight is before 10 am.*	73	14.6%	87	17.4%	340	68.0%
The only body part that needs to be exposed to sunlight is the face.*	352	70.4%	86	17.2%	62	12.4%
People with darker skin need longer periods to produce vitamin D from sunlight as compared to people with fairer skin.	125	25.0%	221	44.2%	154	30.8%
People who work in the buildings have a low risk of vitamin D deficiency*	184	36.8%	102	20.4%	214	42.8%
The use of adequate sunscreens can prevent sunlight from penetrating the skin.	146	29.2%	94	18.8%	260	52.0%
Fish with high-fat content such as salmon, tuna, and sardines are among the food sources containing vitamin D.	49	9.8%	75	15.0%	376	75.2%
Egg yolk is one of the food sources that contains vitamin D.	43	8.6%	105	21.0%	352	70.4%
Vegetables are among the food sources containing vitamin D.*	125	25.0%	131	26.2%	244	48.8%
Dairy products are among the examples of vitamin D-enriched drinks	86	17.2%	137	27.4%	277	55.4%
Cod liver oil is one of the examples of supplements containing vitamin D.	61	12.2%	146	29.2%	293	58.6%

Table 3 demonstrated the Responses regarding attitude questions about vitamin D deficiency

Attitude	Disagree		Not sure		Agree	
	No.	%	No.	%	No.	%
Osteoporosis is a serious bone disease.	26	5.2%	48	9.6%	426	85.2%
I still have time to improve my bone health status.	28	5.6%	95	19.0%	377	75.4%
Exposure to sunlight can reduce the risk of osteoporosis.	22	4.4%	108	21.6%	370	74.0%
We need to expose our bodies to sunlight every day.	18	3.6%	73	14.6%	409	81.8%
Urbanization lowers the chance of exposure to sunlight.	43	8.6%	135	27.0%	322	64.4%
The lack of public recreational parks lowers the chance of exposure to sunlight.	44	8.8%	68	13.6%	388	77.6%
The lack of campaigns focusing on the benefits of sunlight prevents the production of vitamin D as needed.	19	3.8%	83	16.6%	398	79.6%
Working full-time in the building prevents the production of vitamin D as needed.	41	8.2%	105	21.0%	354	70.8%
We do not need to do outside household chores if we have done it inside of the house.*	173	34.6%	124	24.8%	203	40.6%
The use of sunscreen is necessary every time before going out, even only for a short time.*	376	75.2%	70	14.0%	54	10.8%
Vitamin D supplementation is only necessary if sunlight exposure is low.	121	24.2%	73	14.6%	306	61.2%
The high price of dietary sources of vitamin D is one of the barriers to providing this nutrient.	81	16.2%	94	18.8%	325	65.0%

Table 4 showed the Responses regarding practice questions about vitamin D deficiency. among a sample of women attending primary health care centers in Baghdad / Al-Rusafa/ 2024.

Practice	Always		Sometimes		Never	
	No.	%	No.	%	No.	%
I do activities outside of the house/building.	82	16.4%	307	61.4%	111	22.2%
During the day, I walk outside of the building (not roofed)	63	12.6%	295	59.0%	142	28.4%
I use a hat/umbrella whenever I am under the sun.*	191	38.2%	111	22.2%	198	39.6%
I use sunscreen on the face and hands if staying outdoors for a longer time (more than 1 h).*	77	15.4%	245	49.0%	178	35.6%
The hot weather in Iraq makes me more comfortable doing activities indoors.*	31	6.2%	138	27.6%	331	66.2%
During the day, I am exposed to sunlight indirectly through a window.*	81	16.2%	267	53.4%	152	30.4%
I eat oily fish (e.g., salmon, tuna, and sardines) at least twice weekly.	59	11.8%	263	52.6%	178	35.6%
I eat only egg white.*	255	51.0%	162	32.4%	83	16.6%
I read nutrition information (food labels) and choose foods/drinks enriched with vitamin D.	81	16.2%	289	57.8%	130	26.0%
I take vitamin D supplements.	118	23.6%	273	54.6%	109	21.8%

As shown in Figure 1, the knowledge of participants regarding vitamin D deficiency was poor among 71 (14.2%), fair among 291 (58.2%), and good among 138 (27.6%). The attitude of participants about vitamin D deficiency was fair among 68 (13.6%) and positive among 432 (86.4%), %), as shown in figure 2. Figure 3, showed the practice of participants regarding vitamin D deficiency was poor among 35 (7.0%), fair among 359 (71.8%), and Good among 106 (21.2%).

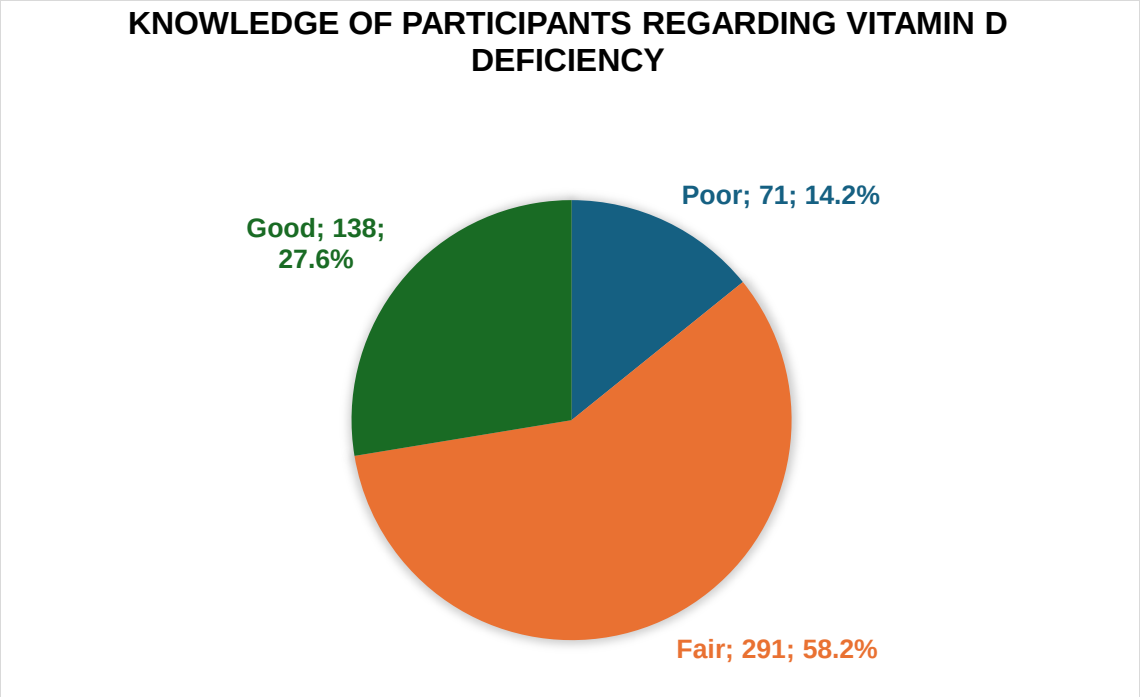


Figure (1): Knowledge regarding Vitamin D Deficiency among a sample of women attending primary health care centers in Baghdad / Al-Rusafa/ 2024.

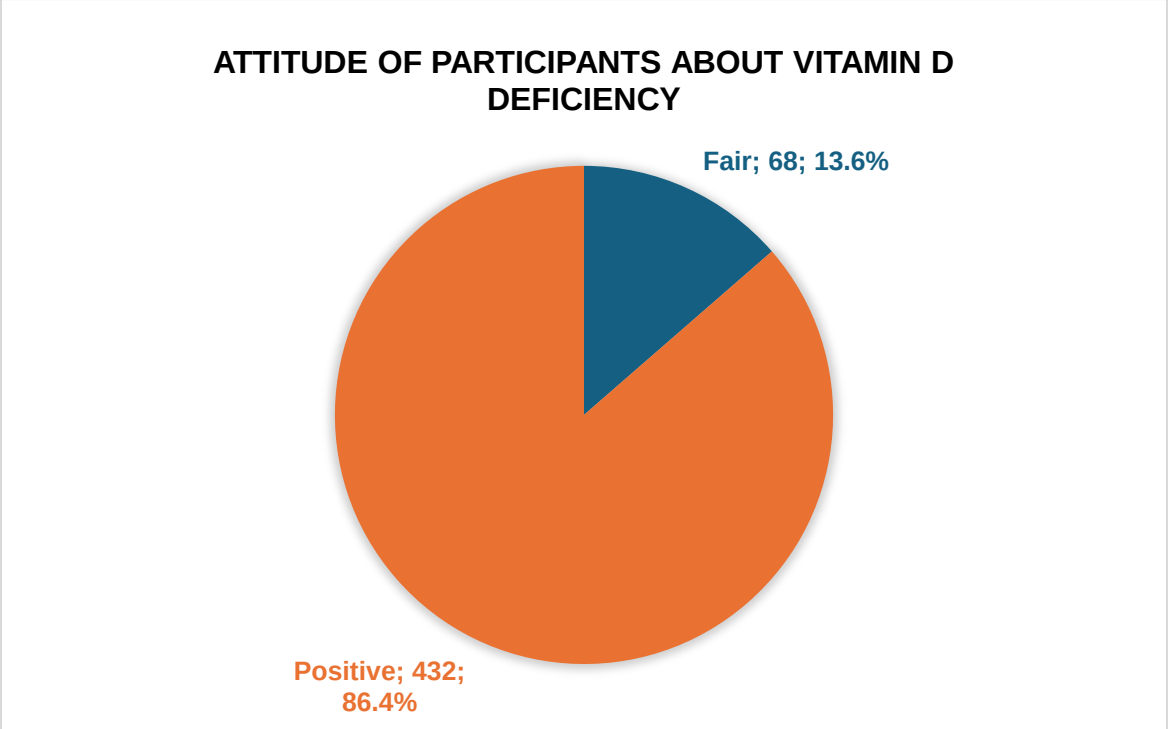
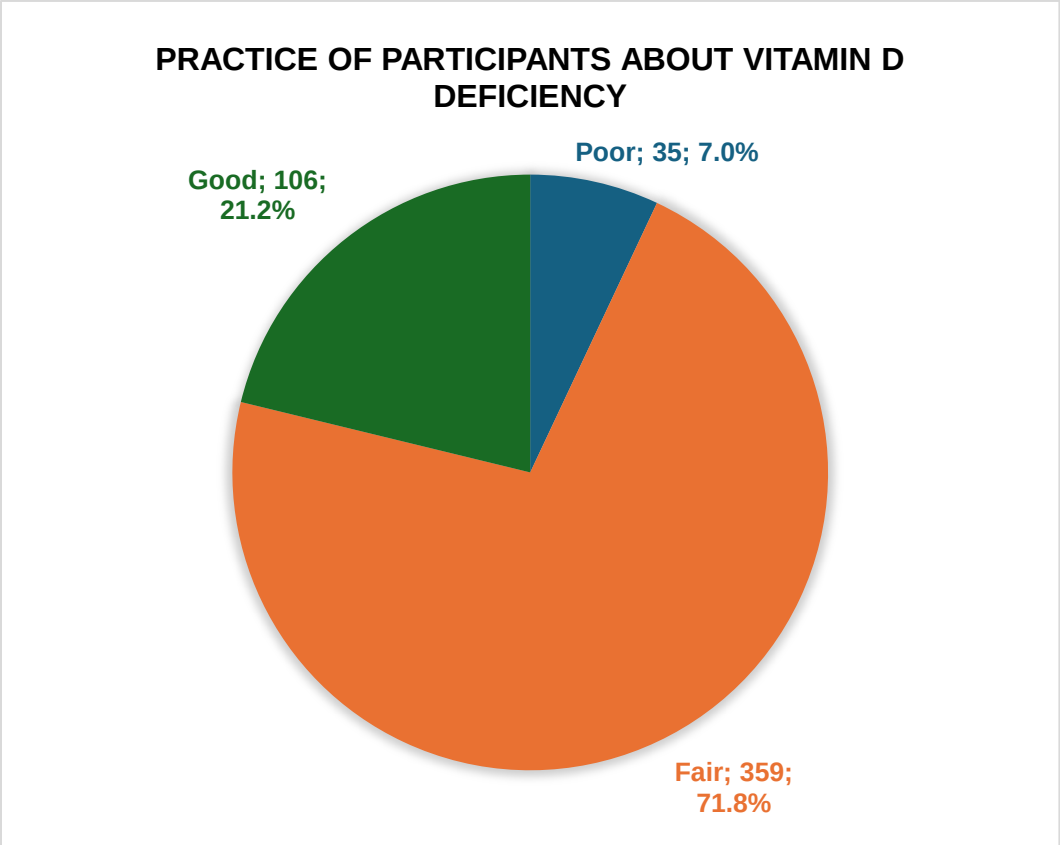


Figure (2): Attitude about Vitamin D Deficiency among a sample of women attending primary health care centers in Baghdad / Al-Rusafa/ 2024.



Figure(3): Practice about vitamin D deficiency among a sample of women attending primary health care centers in Baghdad / Al-Rusafa/ 2024.

Discussion:

Vitamin D deficiency is a global health issue, particularly affecting women. This study assessed knowledge, attitudes, and practices (KAP) related to Vitamin D deficiency among 500 women attending primary healthcare centers in Baghdad/Al-Rusafa. The mean age of participants was 36.15 ± 10.817 years, with most aged 20-49 years and over half being married, consistent with studies in Malaysia and Saudi Arabia. [19, 20] About three-quarters had a college education, and nearly half were employed, aligning with findings from Jeddah and Cairo. [12, 20] The most common sources of information were TV, media, and healthcare professionals, reflecting the growing influence of social media. [21]

Most participants knew that Vitamin D is produced from sunlight, prevents osteoporosis, and is found in fatty fish, consistent with studies in Oman and Saudi Arabia. [22,12] However, misconceptions persisted, including inaccurate knowledge about ideal sunlight exposure times, the role of vegetables as a source of Vitamin D, and the impact of skin color on Vitamin D synthesis. Many wrongly believe that hot weather reduces the need for sun exposure, and dark-skinned individuals produce Vitamin D more efficiently, despite scientific evidence that melanin reduces UV

absorption and Vitamin D production. [12, 14, 23]

Regarding attitudes, most participants agreed that osteoporosis is a serious disease and that daily sun exposure is necessary, similar to findings in Malaysia. [19] However, hot weather limited outdoor activities and consumption of Vitamin D-rich foods was low, mirroring results from other studies. About half of the participants had fair knowledge, one-quarter had good knowledge, and the rest had poor knowledge, consistent with a study in Karbala, Iraq. [24] In contrast, higher knowledge levels were reported in Jeddah and lower levels in Malaysia, likely due to differences in classification methods. [12, 25]

Most participants had a positive attitude toward Vitamin D deficiency, differing from studies in Egypt, where attitudes were less favorable. [20] About three-quarters had fair practice, with less than one-quarter demonstrating good practices, similar to findings in Karbala but lower than in Cairo, possibly due to differences in assessment criteria. [20, 24]

A significant association was found between knowledge level and information sources, with better knowledge linked to physician-provided information, as seen in studies in Saudi Arabia and the UK. [26,27,28] However, sociodemographic factors (age, marital status, education level, occupation, and residence) were not significantly associated with knowledge, aligning with research in Saudi Arabia and India. [29,30] Higher education (college) was linked to a more positive attitude, as observed in Cairo, [20] but not in Saudi Arabia, [27] possibly due to sample size differences. Lastly, no significant relationship was found between sociodemographics and practice, consistent with findings in Saudi Arabia and Iraq. [24, 26] These results highlight the need for targeted public health initiatives to improve Vitamin D awareness and behavior among women in Iraq.

Conclusions: This study on Vitamin D deficiency among women found fair knowledge but persistent misconceptions about sunlight exposure, diet, and skin pigmentation. Higher-educated women showed more positive attitudes, yet adherence to recommended behaviors was inadequate. Other sociodemographic factors had minimal influence, highlighting the need for targeted public health interventions to improve awareness and practices.

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