Perimenopausal Women's Perception Regarding Vitamin D Deficiency

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Abstract

Background: Vitamin D deficiency is more common in peri-menopausal women than previously thought and it may impair quality of life mainly due to lack of awareness about the importance of vitamin D and prevention of its deficiency. Vitamin D deficiency is now being increasingly associated with non-classical roles, like linking it with autoimmune diseases as well as chronic diseases. **The study was aimed to**: assess perimenopausal women's perception regarding vitamin D deficiency. **Research design**: A Descriptive study design was used. **Sample:** A Purposive sample included 311 perimenopausal women who were obtained from gynecology outpatient clinic at Ain Shams University Maternal hospital. **Tools**: first tools, Structured interviewing questionnaire to assess perimenopausal women's general characteristic and their knowledge regarding vitamin D deficiency. Second tool, Lirket scale to assess perimenopausal women's attitude regarding vitamin D deficiency. **Results:** (80.4%) among the studied samples had satisfactory total knowledge score regarding vitamin D deficiency, while (19.6%) of them had unsatisfactory level and (30.8%) of the studied samples were received their knowledge from internet, while (25.6%) of them received their knowledge from health caregivers, while (91%) of them had a positive total attitude score toward vitamin D deficiency in addition to there was a positive correlation between studied sample's total knowledge score and studied sample's total attitude regarding vitamin D deficiency p<0.001. **Conclusion**: The majority of the studied samples had satisfactory total knowledge score regarding vitamin D deficiency while less than one fifth of them had unsatisfactory level, as well as the majority of the studied samples had a positive total attitude score toward vitamin D deficiency. **Recommendations:** Establish perimenopausal educational program to increase women health awareness about screening for vitamin D deficiency. Further research needed to study the effect of self-care guideline on perimenopausal women's screening regarding vitamin D deficiency.

Keywords: Perimenopausal women's, vitamin D, Perception, Attitude.

Introduction:

Vitamin D popularly known as sunshine vitamin is both vital and indispensable for human beings. It plays a pivotal role in calcium and mineral metabolism. Vitamin D is also recognized to influence wide range of fundamental biological functions such as cell differentiation, and immunomodulation that could potentially explain epidemiological and observational data linking it to variety of clinical disorders such as diabetes, hypertension autoimmune disorders and malignancy **(Kumari & Kumari, 2019).**

Most women experience menopause between ages 40 and 58. The average age is 51. Perimenopause or "menopause transition" can begin eight to 10 years before menopause, when the ovaries gradually produce less estrogen. Perimenopause lasts up until menopause, the point when the ovaries stop releasing eggs. In the last one to two years of perimenopause, the drop in estrogen accelerates. At this stage, many women may experience menopause symptoms. Women are still having menstrual cycles during this time, and can get pregnant **(The North American Menopause, 2020).**

Vitamin D deficiency means that not have enough vitamin D in the body. Vitamin D is unique because skin actually produces it by using sunlight. Subclinical" vitamin D deficiency or vitamin D insufficiency is common and is defined as a lower than normal vitamin D level that has no visible signs or symptoms **(Giustina et al., 2019).** It is now being increasingly associated with non-classical roles, like linking it with autoimmune diseases as well as chronic diseases like type II diabetes mellitus, multiple sclerosis, hypertension, cardiovascular diseases as well as cancer **(Mazhar and Garg, 2016).**

Vitamin D has been implicated in various obstetric and gynecological conditions in various phases of the woman's life cycle. Vitamin D effect on maternal health that apparent with the association of vitamin D deficiency with preeclampsia and gestational diabetes mellitus. Insufficient vitamin D levels may impair placental implantation, and angiogenesis. Vitamin D deficiency has an influence on several gynecological conditions namely polycystic ovary syndrome (PCOS), endometriosis, subfertility, and assisted conception as well as ovaries and breast cancer. For established breast cancer, a meta-analysis in 2013 has linked low vitamin D levels to higher risk of recurrence and death **(Mazhar and Garg, 2016).**

Women with vitamin D deficiency may complain from some signs and symptoms of vitamin D deficiency such as: Getting Sick or Infected Often, Fatigue and Tiredness, Bone and Back Pain, Depression, Impaired Wound Healing, Bone Loss, Hair Loss and Muscle Pain **(Lefevre and Lefevre, 2018).**

Increasing the morbidity status of elderly women lead to a study on the vitamin D status in perimenopausal women is essential, for early identification and focus on promoting health, in preventing the disease in later life. Such morbidity reduction may have positive impact on women's quality of life and may reduce financial consequences. Hence, the present study mainly focuses on the role of vitamin D status affecting the quality of life in perimenopausal women **(Maheswari, Lathab & Sampson, 2020).**

Nurses play an important role in prevention and management of vitamin D deficiency through early detection and assessment about vitamin D deficiency in the community and motivation and to create awareness about vitamin D deficiency in the community by encouraging women to measure calcium, vitamin D levels and provide health education about life style modification such as exposure to sun light, maintaining normal body weight, eating calcium and vitamin D rich foods, intake of calcium and vitamin D supplements. Taking these preventive measures at the right time will reduce the occurrence of vitamin D deficiency; thereby it improves the quality of life of pre and post-menopausal women **(Helen, 2016).**

Justification of the Study:

Vitamin D deficiency is a well-recognized epidemic problem worldwide. Also common in older adult especially in women. Vitamin D deficiency was present in 37.80% of perimenopause and 51.21% of postmenopausal women, and vitamin D insufficiency reported in 2.43% of peri and 6.09% of postmenopausal women. Only 2.43% of peri menopausal women found sufficient for serum vitamin D level **(Huang et al., 2020).**

The National Council for women monitored that Vitamin D deficiency about 80% in women in Egypt and the Middle East and these women with age from 30 years to 60 years **(The National Council for women 2018).**

Apart from its effects on bone health, calcium (Ca) and phosphorus (P) metabolism, vitamin D plays a role in lowering the risk of some cancer types, autoimmune, cardiovascular and infectious diseases, so the study aimed to assess Perimenopausal Women's Perception Regarding Vitamin D deficiency.

Aim of the study

This study aimed to assess Perimenopausal Women's Perception Regarding Vitamin D Deficiency, through the following objectives:

1- Assessing perimenopausal women's knowledge regarding vitamin D deficiency.

2- Assessing perimenopausal women's attitude regarding vitamin D deficiency.

Research question:

1- What are the premenopausal women's knowledge regarding vitamin D deficiency?

2- What are the premenopausal women's attitude regarding vitamin D deficiency?

Subjects and Methods:

Subjects and methods for this study portrayed under four main designs as follow:
1. Technical design.
2. Administrative design.
3. Operational design.
4. Statistical design.

1) Technical design

The technical design for this study included a description of research design, setting of the study, subjects involved in the study and tools of data collection.

Research design:

A descriptive study was used in the current study.

Research Setting:

This study was conducted at gynecology outpatient clinic Ain Shams University Maternal hospital, because it had high flow rate and availability of the sample needed to fulfill enrolled into the study.

Subjects:
Type of sample:

A purposive sample with the following criteria:

Women age between 35 - 55 years regardless their education level, different marital status and number of gravida and para.

Exclusion criteria:

Women suffer from early menopause due to natural or surgical condition.

Sample Size: (311) premenopausal women. The sample size was calculated according to the following formula.

$$n = [z^2 * p * (1 - p) / e^2] / [1 + (z^2 * p * (1 - p) / (e^2 * N))]$$

Tools of data collection:

Two tools were used for data collection; these were:

Tool I: A Structured Interviewing questionnaire.

A structured interviewing questionnaire was designed by the researcher after reviewing the related current and previous literature which was adapted from **Parisa Amiri et al., (2017).**

It consists of 4 parts as the following:

Part I: It included the general characteristic of the study sample as age, residence, education level, marital status, occupational status (Question, 1 – 5).

Part II: It designed to assess obstetric and gynecology history as gravide, parity, number of abortion, types of delivery, any gynecology problem (Question, 6 – 15).

Part III: It concerned with Life style history regarding sun exposure, diet, daily activity (Question, 16 – 30).

Part IV: It designed to assess women's knowledge regarding vitamin D deficiency as definition, causes, risk factors, complication, treatment and preventive measures, it consists of 9 closed end questions.

❖ **Knowledge scoring system:**

The scoring system responses ranged from (1-2): (2) for correct answer and (1) for incorrect answer/ don't know.

While the total Knowledge scored was ranged between (9 - 18) was calculating as the following: Then the total knowledge score classified as the following

1) Satisfactory if the percent score was equal and more than 60% from total score = (>11 scores).

2) Unsatisfactory if it was less than 60% from total score = (< 11 scores).

Tool II: Likert Attitude Scale:
It was adapted from **ParisaAmiri, et al, (2017)** to assess perimenopausal women's attitude regarding vitamin D deficiency.

It consisted of 12 statements with 3 responses "disagrees, uncertain, agree".

❖ Scoring system:
Each statement took 3 responses in which score (1) denote disagree, score (2) denote uncertain and score (3) denote agree and the total attitude score range from 12 to 36 which divided into negative attitude<65% from total score and positive attitude > or = 65% from total score.

Validity & Reliability:
Tools were reviewed by a panel of three experts in obstetric and gynecological nursing field to test the face and content validity. Each of the experts was asked to examine tools for content coverage, clarity, wording, length, format, and overall appearance. Modifications were done according to the comments. Reliability of tools was measured through **Cronbach's Alpha test.**

Reliability analysis by measuring of internal consistency of the tool through Cronbach's Alpha 0.763 for tool I & 0.738 for tool II

2) Administrative design:

An official approval letter was obtained from Dean of faculty of nursing Ain Shams University including the Title and aim of the study was directed to the administrator of the previous mentioned study setting to conduct this study.

Ethical considerations:
o The ethical research considerations in this study were included:
o Informed consent was obtained from each participant after explaining the purpose of the study.
o Tools of data collection were not touching moral, religious, ethical and culture aspect of the sample studied.
o Each participant had right to with draw from the study at any time.
o Human right was considered.
o Data was confidential and using coding system from data.

3) Operational design:
Operational design included the preparatory phase, content validity of the developed tool, pilot study and field work.

A. The Preparatory phase:
It was include reviewing current, past, local and international related literature and theoretical knowledge of various aspects of the study using books, articles, internet, periodicals and magazines to develop tools for data collection. The developed tools were examined by experts to test their reliability to the study.

B. Pilot Study:
A pilot study was carried out on (10%) 31 of the perimenopausal women who included in the study sample as modification done in the tools of data collection.

C. Field Work:
The researcher visited the prementioned study setting 3 days / week at morning shift from 9 am to 2 pm. At beginning of the

interview the researcher start to introduce herself and explained briefly the aim of the study to the studied women to gain confidence and trust then took oral consent from them. The researcher interviewing with each perimenopausal women who fulfilled the sample criteria individually in waiting area at outpatient clinics. The average number of perimenopausal women interviewed per day was (6-10). The researcher start to assess general characteristics, obstetric and gynecology history, Life style history, women's knowledge by using tool I within time range (10_15min) then the researcher start to assess women's attitude regarding vitamin D deficiency by using tool II within time range(5_10min).

The total duration of each interview was (20 -25) minutes and filled by the researcher. The researcher repeated the previous steps until finished the duration of data collection.

4) Statistical design:

Data collected from the studied sample was revised, coded and entered using Personal Computer (PC). Computerized data entry and statistical analysis were fulfilled using the Statistical Package for Social Sciences (SPSS) version 22. Data were presented using descriptive statistics in the form of frequencies, percentages and Mean SD. The Chi Square statistic is commonly used for testing relationships between categorical variables. A correlation coefficient is a numerical measure of some type of correlation, meaning a statistical relationship between two variables.

➤ Significance of the results:
• Highly significant at p-value < 0.01.
• Statistically significant was considered at p-value < 0.05.
• Non-significant at p-value ≥ 0.05.

Results:

Table (1): showed distribution of the studied sample according to their general characteristics, it represented women age range from <40 - >50 years with mean age (43.17+5.82), 71.7% of them from urban areas, 34.1% of them Secondary educated and 65.9 % were not working and 76.5% of them married women.

Table (2): Showed distribution of the studied sample according to their obstetric and gynecological history, 48.5% of the studied sample delivered normal, and 44.1% of them had pregnancy from 1-3 times, and 59.8% of them had no abortion. It was revealed that 34.2% of them had pregnancy complication as preeclampsia, gestational diabetes, (42.1%, 21.1%) respectively. Otherwise 24.6% of them had delivery complication as PIH, bleeding during delivery, premature birth, (28.4%, 26.9%, 25.4%) respectively. Also 22.9% of them had postpartum complication as postpartum hemorrhage, postpartum depression, (32.2%, 30.6%) respectively.

Table (3): Illustrated distribution of the studied sample according to their lifestyle history. 79.4% of the studied sample exposed to sunlight daily, while 76.2% of them never using sunscreen / sun protection and 62.7% of them not had foods rich in vitamin D. 48.2% of studied sample reported that they did exercise regularly, 69.3% of them did low – moderate exercise and 44.6% of them did exercise from 60 to 120mins per week.

Table (4): Illustrated that, about 69.8%, 55.9%, 53.1% of the studied sample had correct knowledge about treatment of vitamin D deficiency, risk factors of vitamin D deficiency, and symptoms of vitamin D deficiency respectively. Whenever, 97.1% of them had incorrect knowledge about complications of vitamin D deficiency.

Figure (1): 80.4% of the studied samples had satisfactory level of total knowledge score regarding vitamin D deficiency while 19.6% of them had unsatisfactory level.

Figure (2): It was observed that more than one third of the studied samples were received their knowledge from internet, while less than one – fifth of them reported that they were received their knowledge from health caregivers.

Table (5): Illustrated that, high percent of agree response for importance of sun exposure for vitamin D synthesis is 76.2% and high percent of agree response for necessity of highly enriched vitamin D food is 54.3%, while high percent of agree response for serious consequences resulted from vitamin D deficiency is 81%.

Figure (3): 91% of the studied sample showed a positive total attitude score regarding vitamin D deficiency and 9.0% of them showed negative total attitude score regarding vitamin D deficiency.

Table (6): Shows that, there were a positive correlation between the studied samples level of total knowledge score regarding vitamin D deficiency and their level of total attitude score regarding vitamin D deficiency.

Table (1): Distribution of the studied sample according to their general characteristics **(n=311).**

Personal information	No	%
Age group		
Range age	(<40->50)	
Mean ±SD()	43.17+5.82	
Residence		
Urban	222	71.4
Rural	89	28.6
Education		
Uneducated	39	12.5
reads and writes	23	7.4
Primary education	41	13.2
Secondary education	106	34.1
University	102	32.8
Occupation		
Working	106	34.1
Not working	205	65.9
Marital		
Unmarried	13	4.2
Married	238	76.5
Divorced	19	6.1
Widowed	41	13.2

Table (2): Distribution of the studied women according to their obstetric and gynecological history **(n=311).**

Items	No	%
Gravida		
None	33	10.6
1-3	137	44.1
3-5	87	28.0
More than 5	54	17.4
Para		
None	39	12.5
1-3	172	55.3
3-5	78	25.1
More than	22	7.1
number of abortions		
None	186	59.8
1-3	116	37.3
3-5	6	1.9
More than 5	3	1.0
Mode of Delivery (n=272)		
Normal	132	48.5
C.S	95	34.9
Both	45	16.5
Any previous pregnancy complications (n=278)		
Yes	95	34.2
No	183	65.8
If yes, what are types of complications? **(n=95)**		
gestational diabetes	20	21.1
Pre-eclampsia	40	42.1
Other remember(anemia, bleeding)	35	36.8
Any previous delivery complications (n=272)		
Yes	67	24.6
No	205	75.4
If yes, what are types of complications? **(n=67)**		
high blood pressure	19	28.4
premature birth	17	25.4
Bleeding during childbirth	18	26.9
Uterine problems(injury, hysterectomy)	13	19.4
Any previous postpartum period complications (n=272)		
Yes	62	22.9
No	210	77.2
If yes, what are types of complications? **(n=62)**		
High blood pressure	11	17.7
Occurrence of uterine problems	12	19.4
Postpartum depression	19	30.6
Postpartum hemorrhage	20	32.2

Table (3): Distribution of studied women according to the lifestyle history **(n=311).**

Items	No	%
Exposure to sunlight		
Yes	247	79.4
No	64	20.6
If yes, duration of exposure to sunlight per day (n=247)		
10-15 minutes	37	14.9
15-30 minutes	49	19.8
More than 30 minutes -2 hours	115	46.5
More than 2 hours	46	18.6
Time of exposure to sunlight (n=247)		
Before 10 am and after 4 pm	153	61.9
from 10 in the morning until 4 in the afternoon	94	38
How to be exposed to the sun (n=247)		
Direct exposure to sunlight	70	28.3
through the shadows	40	16.2
Wear full clothes	137	55.4
Using sunscreen / sun protection		
Sometimes	42	13.5
Always	32	10.3
Never	237	76.2
Having foods rich in vitamin D		
Yes	116	37.3
No	195	62.7
What are the food sources?		
oily fish	135	43.4
fortified foods	38	12.2
Yolk	174	55.9
Red meat	149	47.9
Chicks	195	62.7
Taking vitamin D supplements		
Yes	77	24.8
No	234	75.2
Doing exercise regularly (n=311)		
Yes	150	48.2
No	161	51.8
Types of exercises(sports) (n=150)		
high intensity (e.g. running, speed walking, carrying heavy objects)	46	30.7
Low - moderate intensity (e.g. Swimming,light exercise, light walking)	104	69.3
Duration for exercise per a week? (n=150)		
60 - 120mins per week	67	44.6
120 – 180mins per week	55	36.6
More than 180mins per week	28	18.6

Table (4): Distribution of women knowledge regarding vitamin D deficiency **(n=311).**

| Items	No	%
Definition of Vitamin D		
Incorrect	201	64.6
Correct	110	35.4
Importance of vitamin D		
Incorrect	196	63.0
Correct	115	37.0
Definition of Vitamin D deficiency		
Incorrect	158	50.8
Correct	153	49.2
Causes of vitamin D deficiency		
Incorrect	149	47.9
Correct	162	52.1
Symptoms of vitamin D deficiency		
Incorrect	146	46.9
Correct	165	53.1
Risk factors of vitamin D deficiency		
Incorrect	137	44.1
Correct	174	55.9
Complications of vitamin D deficiency		
Incorrect	302	97.1
Correct	9	2.9
Treatment of vitamin D deficiency		
Incorrect	94	30.2
Correct	217	69.8
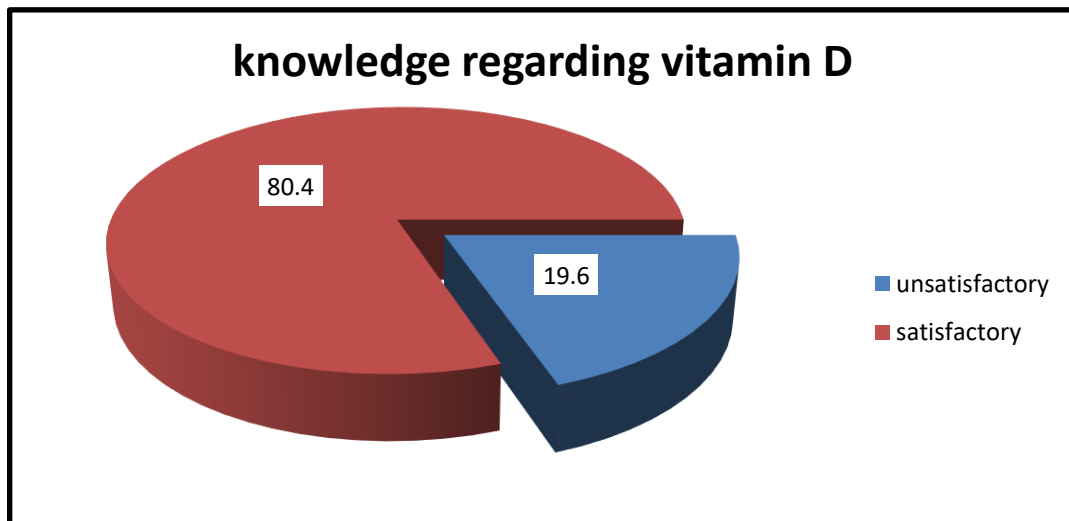
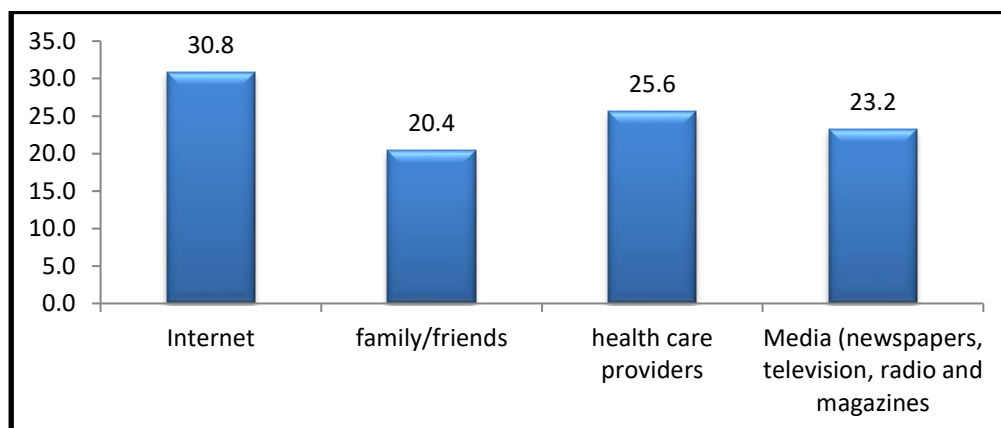**Figure (1):** Total women knowledge score regarding vitamin D deficiency.

Figure (2): Source of women information regarding vitamin D deficiency.

Table (5):- Distribution of the studied women according to their attitude regarding vitamin D deficiency **(n=311).**

Items	disagree		uncertain		Agree	
	No	%	No	%	No	%
Vitamin D deficiency causes osteoporosis, which is one of the most serious bone diseases as a result of its deficiency	16	5.1	43	13.8	252	81.0
I am exposed to the sun to reduce the incidence of osteoporosis	15	4.8	59	19.0	237	76.2
Vitamin D deficiency reduces my social activity, which causes depression	56	18.0	139	44.7	116	37.3
I need to be exposed to the sun on a daily basis to avoid vitamin D deficiency	24	7.7	73	23.5	214	68.8
It is forbidden to work indoors all the time, to be exposed to sunlight, which is necessary for the production of vitamin D	64	20.6	104	33.4	143	46.0
I still have time to improve my healthy bones	73	23.5	113	36.3	125	40.2
Not eating seafood may be one of the reasons for vitamin D deficiency	33	10.6	109	35.0	169	54.3
In case of vitamin D deficiency, I take supplements as they are more effective compared to eating food and exposure to sunlight	84	27.0	96	30.9	131	42.1
Taking nutritional supplements is necessary to treat vitamin D deficiency, not prevent it	41	13.2	105	33.8	165	53.1
I use sunscreen every time before going out, even for a short period of time, to avoid vitamin D deficiency and its complications	148	47.6	82	26.4	81	26.0
I only take supplements in the absence of exposure to sunlight to avoid vitamin D deficiency and its complications	61	19.6	98	31.5	152	48.9
The high cost of food sources of vitamin D is one of the obstacles that lead to the failure to provide these foodstuffs rich in vitamin D	31	10.0	63	20.3	217	69.8

attitude of premenopausal women regarding vitamin D deficiency

91.0

9.0

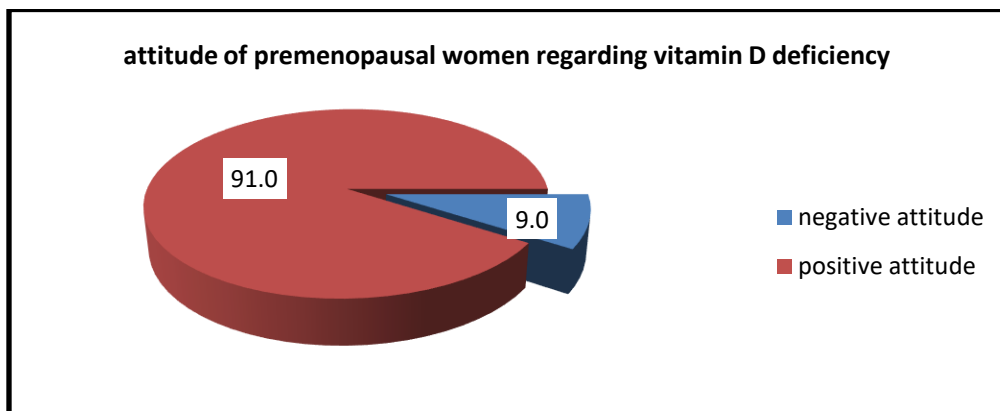■ negative attitude
■ positive attitude

Figure (3):- Total women attitude regarding vitamin D deficiency (n=311).

Table (6):- Correlation Co-efficient between total knowledge and attitude for Study women (n=311).

Correlations	Mean ±SD	R	P
Knowledge regarding vitamin D	11.55±2.03		
Attitude of premenopausal women regarding vitamin D deficiency	28.36±4.15	0.297	<0.001**

Discussion:

Vitamin D deficiency has been consistently linked to major chronic and non-communicable diseases such as diabetes and cardiovascular disease to name a few and as such, correction of vitamin D status has been encouraged as a preventive and adjuvant management in various disorders (**Al-Daghri et al., 2022).**

The aim of the present study was to assess perimenopausal women's perception regarding vitamin D deficiency. This aim was significantly achieved through the present study question which was: what is perimenopausal women's perception regarding vitamin D deficiency?

Regarding to general characteristics of the study sample, the current study revealed that more than half of the studied sample ranged from 40 to less than 50 years old with a mean age of (**43.17+5.82**).Less than three quarters of them from urban areas, slightly more than one third of them had secondary educated and less than two thirds were housewives and more than three quarters of them married women.

As regards to women's knowledge regarding vitamin D deficiency, the current study illustrated that, about slightly more than half of the studied sample had correct knowledge regarding risk factors, slight more than two third of the studied sample had correct knowledge regarding the treatment of vitamin D deficiency and more than two third of the studied sample had correct knowledge regarding symptoms of vitamin D deficiency. Whenever, majority of them had incorrect knowledge related to complications of vitamin D deficiency.

The current study agree with by **Khayyatzadeh et al., (2019**) who studied "What is the best solution to manage vitamin D deficiency?" and founded that most of the studied sample had knowledge regarding to treatment of vitamin D deficiency, risk factors of vitamin D deficiency, and symptoms of vitamin D deficiency.

On other hand, this finding disagreement with study by **Al-Saleh et al., (2015)** who conducted study aimed to compare the knowledge and status of vitamin D deficiency in Saudi Arabia and reported that more than two thirds of studied sample had adequate knowledge about complication of vitamin D deficiency. The differences between two studies might be due to different setting and their lifestyle history.

Regarding to total knowledge score about vitamin D deficiency, the current study findings revealed that the majority of the studied sample had satisfactory total knowledge score, while one fifth of them had unsatisfactory level. This finding in same line with study by **Alhothali et al., (2019)** who assess the knowledge regarding vitamin D deficiency among adult women attending the primary health clinic at Makkah, Saudi Arabia Saudi Arabian and illustrated that less than two thirds of the studied sample had adequate knowledge about vitamin deficiency D.

On other hand, this finding disagreement with **ghraibawiet al., (2018)** who studied knowledge and practices regarding vitamin D deficiency at imam hussein medical city in karbala and revealed that less than half of the studied sample had satisfactory total knowledge score regarding vitamin deficiency D

This finding was consistent with study conducted in Saudi Arabia by **Alwadei et al., (2018)** that aimed to assess the awareness of public regarding vitamin D deficiency and revealed that the majority of studied sample had correct knowledge regarding vitamin D deficiency.

In the same line a study conducted by **Baobaib et al., 2017**that aimed to assess the level of awareness and knowledge of vitamin D deficiency and investigating the factors associated with the level of awareness such as the knowledge in vitamin D sources, benefits and stated that more than half of studied samples had correct knowledge regarding vitamin D deficiency. Inconsistent with **Zareef**

& Jackson, 2021 who conduct study about Knowledge and attitudes about vitamin D and sunlight exposure in premenopausal women living in Jeddah, and their relationship with serum vitamin D level and reported that the studied samples expressed the feeling of having insufficient knowledge regarding vitamin D sources.

Concerning on the source of studied sample knowledge in the present study, it was observed that more than one third of the studied samples were received their knowledge from internet, while less than one – fifth of them reported that they were received their knowledge from health caregivers. This outcome matched with study by **O'Connor et al., (2018)** who conducted study about "Knowledge, attitudes and perceptions towards vitamin D in a UK adult population" and displayed that the most common source of vitamin D deficiency information was the internet.This result might be due to internet easy to access at any time.

On other hand, this finding disagreement with study by ghraibawi et al., (2018) who studied knowledge and practices regarding vitamin D deficiency among perimenopausal women attending imam hussein medical city in karbala and showed that the most common source of vitamin D deficiency information was the relatives and friends. The differentia between two studies might be due to different of studied sample characteristics, lifestyle and methodology

In contrast with Alnadwi **et al., (2021)** who conducted study about " assessment the knowledge regarding vitamin d deficiency among female adult attending the primary health clinic at Makkah, Saudi Arabia Saudi Arabian in 2019 " and report that doctors were the main source of knowledge of vitamin D deficiency, while internet is lowest percentage. This difference may be explained by the differentia between setting and general characteristics of the study sample between two studies.

In relation to attitude, the current study findings revealed that, the majority of the studied sample had agree response towards "Vitamin D deficiency causes osteoporosis, which is one of the most serious bone diseases as a result of its deficiency" and three quarter of them had agree response towards "I am exposed to the sun to reduce the incidence of osteoporosis" this matched with **Jamil et al., (2019)** who studied " Knowledge, attitude and practice related to vitamin D and its relationship with vitamin D status among Malay female office workers" and reported that most of the studied female had agree response towards vitamin D deficiency causes osteoporosis, which is one of the most serious bone diseases as a result of its deficiency. Moreover, this finding supported with study by **Juanid et al., (2019)** who studied "Knowledge, attitude and practice of medical students regarding vitamin D" and represented that I am exposed to the sun to reduce the incidence of osteoporosis.

Regarding to total attitude score, the current study findings revealed that the majority of the studied sample had a positive attitude regarding vitamin D deficiency and less than one third of them had negative attitude. this finding in same line with study by **Özel et al., (2020)** who conducted study about " Vitamin D Knowledge, Attitudes, and Behaviors in Young Danish Women with a Non-Western Ethnic Minority Background—A Questionnaire Survey" and reported that most of the studied sample had a positive attitude toward Vitamin D deficiency. This might be due to that the perimenopausal women under the study perceived themselves at risk, suggesting that they were more careful in sustaining health and preventing diseases resulted from vitamin D deficiency.

On other hand, this finding disagreement with **Blebil et al., (2019)** who explore the awareness, knowledge, attitude and practices regarding Vitamin D among the general public in Malaysia and reported that most of studied sample had negative attitude toward Vitamin D. This difference between two studies might be due to the location of Malaysia which is around

the equator, receiving sunlight all year round and this allow the people to expose to sunlight once they are in the outdoors.

This finding disagreement with **Taherpour et al., 2015** who conduct study about Menopause knowledge and attitude among Iranian women, who found that more than half of the studied samples had a positive attitude about vitamin D deficiency.

The current study illustrated that, there were a positive correlation between the studied sample's level of knowledge regarding vitamin D deficiency and their level of attitude regarding vitamin D deficiency, this result might be due to level of knowledge that determinate attitude toward sources and importance of vitamins to prevent complications of vitamin D deficiency and knowledge had a direct influence on their attitude. This result supported with study by **Jamil et al., (2019)** who conducted study about " Knowledge, attitude and practice related to vitamin D and its relationship with vitamin D status among Malay female office workers" and showed that there were a positive correlation between the studied samples' level of knowledge regarding vitamin D deficiency and their level of attitude regarding vitamin D deficiency. This is because knowledge always corrects misconception and misbelieves.

Also, this finding in same line with study carried out by **Benhusein & Abdelmola, 2018** who conduct study about awareness of vitamin D deficiency among Tripoli university students in Libya who stated that there was high positive correlation between knowledge and their attitude related vitamin D deficiency.

Conclusions:

The present study findings emphasized that the majority of the studied samples had satisfactory total knowledge score regarding vitamin D deficiency while less than one fifth of them had unsatisfactory level, as well as the majority of the studied samples had a positive total attitude score toward vitamin D deficiency, In addition to there was a positive correlation

between total knowledge score and level of total attitude score regarding vitamin D deficiency of the study sample.

Recommendations:

1- Establish perimenopausal educational program to increase women health awareness about screening for vitamin D deficiency.

2- Application of preventive strategy through evidence based practices information to prevent vitamin D deficiency through face book group or what's App.

3- Further study: Effect of self-care guideline on perimenopausal women's screening regarding vitamin D deficiency.

4- Barriers & factors associated with lifestyle preventive measures regarding vitamin D deficiency.

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