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Research Article

Knowledge, Attitudes and Practices of Family Medicine Physicians Regarding Vitamin D Measurement and Treatment During Pregnancy in PHC, Riyadh, Saudi Arabia

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Abstract

Background: The mother and the unborn child both experience a multitude of problems as a result of vitamin D insufficiency. The evaluation of medical professionals' knowledge in measuring vitamin D levels and treating deficits is the main objective of this study. According to recent studies, low vitamin D levels have been associated with unfavorable outcomes for mothers, including pregnancy-induced hypertension, high blood pressure in diabetic pregnancies, gestational diabetes mellitus, recurrent miscarriages, preterm delivery, primary Caesarean section, and postpartum depression. **Aim and objective:** The major goal of this study is to find out how family medicine doctors at PHC, Riyadh, Saudi Arabia, feel about measuring and treating pregnant women for vitamin D deficiency. **Methodology:** In a cross-sectional research at PSMMC, Riyadh, family medicine practitioners are asked to complete a self-administered questionnaire to assess their knowledge of diagnosing and treating vitamin D deficiency during pregnancy. Utilizing the Statistical Package for Social Studies, data were examined IBM Corp., New York, NY, USA; SPSS 22). The categorical variables' expressed percentages. The chi square test was used to categorical variables. A p-value of 0.05 was used to determine statistical significance. **Conclusion:** Most PHC and PSMMC physicians recommend using vitamin D supplementation during pregnancy. The majority of respondents did routinely suggest vitamin D supplements to their patients in pregnancy. Doctors at PHC and PSMMC's average level of vitamin D awareness is associated to gender, kind of specialization, personal vitamin D supplement use, and suggesting others take supplements.

Keywords: Vitamin D; Pregnancy; Pregnant women; Vitamin D deficiency

Introduction

The steroid element vitamin D comes from a class of prohormones that are fat-soluble. Pregnancy and vitamin D are both crucial. For both their personal health and the proper development of their unborn child, expectant moms must ensure that they consume the required levels of vitamin D during pregnancy. D2 and D3 are the most important substances for human growth [1].

Vitamin D has a variety of important biological effects that support the growth of strong bones, teeth, and muscles in addition to improving the intestinal absorption of calcium, magnesium, and phosphate. Vitamin D supplementation is thought to modify metabolic profile and may have an impact on fertility and results. Consequently, this investigation was carried out to learn the extent to which the doctor tests for vitamin D insufficiency and treats it throughout pregnancy. Unfortunately, the majority of doctors are ignorant when it comes pertaining to vitamin D treatment for expectant mothers, the dosage during pregnancy, and the

significance of measuring vitamin D levels [2].

The physiologically greater 1,25-dehydroxy vitamin D levels seen in the second and third trimesters suggest that pregnant women have higher vitamin D requirements. Even though 1,25(OH)2D levels do not directly correlate with 25 hydroxy vitamin D concentrations, the physiological increase in the active metabolite, the improved intestinal calcium absorption, and the increased fetal calcium requirement (250 mg/day in the third trimester) all point to the significance of vitamin D biology in pregnancy [3].

Since roughly a century ago, rickets and osteomalacia have been linked to vitamin D deficiency, exhibiting the disease's well-known musculoskeletal symptoms. Currently being uncovered are several metabolic and nonskeletal connections with vitamin D insufficiency. Several researchers have shown links between low vitamin D levels and various features of the metabolic syndrome. Others discuss vitamin D's potential for immunomodulation, anabolism, anti-infection, and anti-tumor effects [3]. Numerous authors have reported on and extensively explored a variety of issues, including maternal secondary hyperparathyroidism, osteomalacia, neonatal hypocalcemia, tetany, delayed cranial vertex ossification, enlarged cranial fontanelles, and abnormal fetal bones ossification.

Low vitamin D levels have been linked to adverse maternal outcomes, such as pregnancy-induced high blood pressure, hypertension in diabetic pregnancies, gestational diabetes mellitus, reoccurring miscarriages, premature delivery, primary Cesarean delivery, and postnatal depression, according to recent studies [4].

There is mounting evidence that the vitamin D status of mothers has an impact on the long-term health of their offspring. There is conflicting evidence about how maternal vitamin D affects a child's skeleton's integrity. In one research that measured bone mass at age 9, high maternal vitamin D levels were positively correlated with bone mass, but no meaningful link could be identified in another analysis of the same longitudinal cohort.

Although a population-based cohort of infants at genetic risk for type 1 diabetes has not shown vitamin D intake from food or supplements to increase this risk, nested case control studies have shown a high risk of type 1 diabetes in the offspring of women with low levels of vitamin D during pregnancy. Asthma and weakened lung function in kids have been linked by other writers to maternal vitamin D insufficiency [5].

The best approach to actually guarantee ample vitamin D, though, is with a simple pill. You will have an option between two types of vitamin D while taking supplements. Cholecalciferol, an animal-derived type of vitamin D, is frequently made from sheep's lanolin or fish liver oil. The vegetarian version of vitamin D is ergocalciferol. Ergocalciferol is preferable if you're vegan, whereas cholecalciferol is more readily absorbed and used by the body. Quality is crucial. The natural form of cholecalciferol, Vitamin D3 from Nordic Naturals (1000 IU per soft gel), is advised [5].

Vitamin D deficiency causes a number of issues for both the mother and the unborn child. This study's primary goal is to assess and ascertain how well-versed medical professionals are in measuring vitamin D levels and treating deficiencies. A self-administered questionnaire will be used in a cross-sectional study at PSMMC, Riyadh, to gauge family medicine doctors' understanding of how to measure and treat vitamin D insufficiency during pregnancy. Our goal is to determine the attitude and practices of family medicine physicians related to the Vitamin D and evaluate their knowledge about measuring the levels of Vitamin D during pregnancy and also treat if levels were found to be insufficient.

Aim and Objective

The main aim of this study is to determine the knowledge, attitudes and practices of family medicine physicians regarding vitamin d measurement and treatment during pregnancy in PHC, Riyadh, Saudi Arabia.

Specific Objectives

- To evaluate the expertise of family care doctors on the detection and treatment of vitamin D insufficiency during pregnancy.
- To explain family medicine doctors' procedures for assessing and treating vitamin D insufficiency in pregnant women in PHC.

Materials and Methods

Study Approach: Cross Sectional.

Target population: Physicians in PHC, PSMMC

Sampling Method: Comprehensive sample of 332 physicians of PHC and PSMMC.

Inclusion Criteria: PHC and PSMMC physicians.

Working definition: The degree to which a doctor orders a vitamin D level and treats a deficit when pregnant

Software for Data Management: SPSS

Study duration: one year (March 2021 to March 2022).

Data Collection Form: We will utilize a questionnaire that was created by the researcher and has been approved as follows:

- Two experts checked the research's validity, and it was amended as recommended.
- A two-pilot study with five physicians was conducted.

Statistical Plan: Descriptive statistics, Observational study

Types of Bias and Their Control: Type error occurs when the alternative hypothesis (the availability of doctors' knowledge on the timing of diagnosing and treating vitamin D deficiency during pregnancy) is accepted even when it is incorrect. Accepting the null hypothesis while knowing it to be incorrect is type, and doing so would be a mistake.

Sample size calculation: Qualitative of one proportional, One group

$$n = \left[\frac{Z_{\alpha/2}}{E}\right]^2 * P(1-P)$$

Where: n= sample size (332 physicians) Zα/2=1.96 (The critical value that divides the central 95% of the Z distribution from the 5% in the tail) proportion of physicians=the prevalence of the outcome variable= 50% E = the margin of error (=width of confidence interval) = 95%.

Statistical Analysis

Utilizing the Statistical Package for Social Studies, data were examined (SPSS 22; IBM Corp., New York, NY, USA). The percentages used to express categorical variables. Categorical variables were subjected to the chi square test. Statistical significance was defined as a p-value 0.05.

Results

The cross sectional study of 332 physicians from PHC and PSMMC showed the demographic characteristics as follows:

Most of the physicians were in the age range of 25-35 years (52.10%) followed by 36-45 years' age group (21.26%). Majority of the physicians are male (61.08%) followed by 38.92% female. About 61.98% were Saudi nationals and 38.02% were Non-Saudi. The level of education is 31.44% are residents; 23.95% are registrar; 22.75% are senior registrar and 12.87% are general practitioners and 8.98% are consultants. 33.83% have more than 5 years of practicing experience (Table 1).

		Number	%
Age	25-35	174.00	52.10
	36-45	71.00	21.26
	46-55	60.00	17.96
	56-65	28.00	8.38
	66-75	1.00	0.30
Gender	Male	204.00	61.08
	Female	130.00	38.92
Nationality	Saudi	207.00	61.98
	Non-Saudi	127.00	38.02
Level of Education	Consultant	30.00	8.98
	Senior registrar	76.00	22.75
	Registrar	80.00	23.95
	Resident	105.00	31.44
	General Practitioner	43.00	12.87
Practicing years	<5 years	113.00	33.83
	5-10 years	78.00	23.35
	11-15 years	93.00	27.84
	16-20 years	43.00	12.87
	>20 years	7.00	2.10

Table 1: Demographic characteristics of the participants (n=334).

The figure 1 showed 44.9% fortified dairy products as the source of vitamin D; 52.1% green leafy vegetables as the source of vitamin D; 58.4 fatty fish as the source of vitamin D; 54.5 fortified cereals as the source of vitamin D; 66.5 vitamin D supplements as the source of vitamin D; 44.3 sun exposure as the source of vitamin D; 17.4 fish oils as the source of vitamin D; 9.3 animal liver as the source of vitamin D.

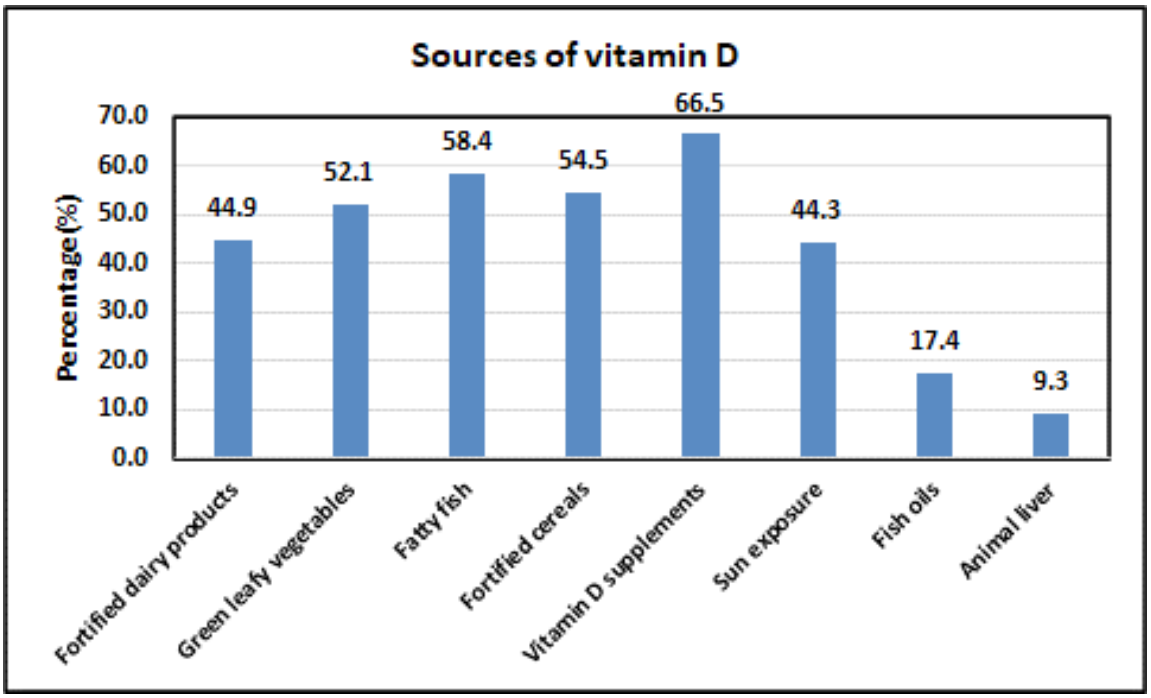

Figure1: Sources of vitamin D.

50.3% got online source of information about vitamin D; 51.5% got journals as the source; 54.8% got textbooks as the source of information; 58.1% had medical training as the source to learn about vitamin D deficiency. While remaining 16.5% and 10.5% of the information was obtained by literatures and colleagues respectively (Figure 2).

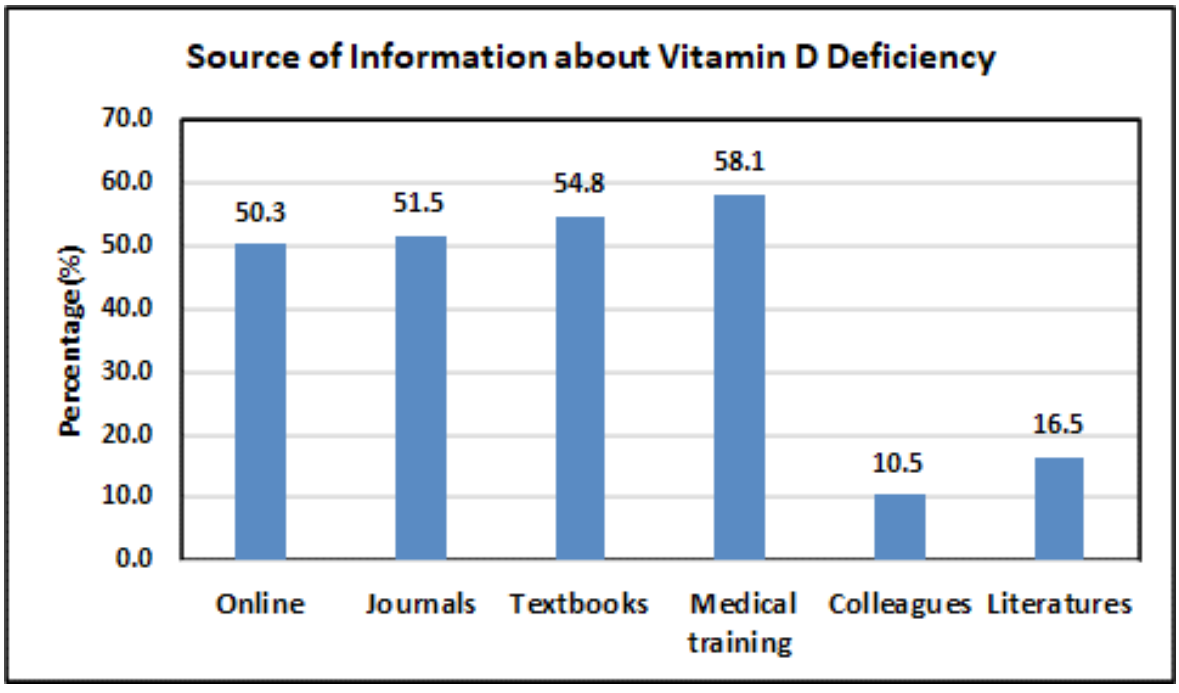

Figure 2: Source of Information about Vitamin D Deficiency.

The causes to request vitamin D level in pregnancy are: obesity (44.9%); malabsorption syndrome (68.9%); gastric bypass surgery (72.2%); family history of osteoporosis (47%). The outcomes of Vitamin D deficiency if not treated were selected as follows: small for gestational age (30.8%); osteoporosis (55.7%); Bone fracture (61.7%); week immunity (50%); colon cancer (41%); cardiovascular disease (36.5%); impaired glucose metabolism (22.5%); preclampsia (17.4%) preterm labor (7.2%) (Tables 2 and 3).

	Number	%
What are the vitamin D Sources?		
Fortified dairy products	150	44.9
Green leafy vegetables	174	52.1
Fatty fish	195	58.4
Fortified cereals	182	54.5
Vitamin D supplements	222	66.5
Sun exposure	148	44.3
Fish oils	58	17.4
Animal liver	31	9.3
What is the source of Information about Vitamin D Deficiency?		
Online	168	50.3
Journals	172	51.5
Textbooks	183	54.8
Medical training	194	58.1
Colleagues	35	10.5
Literatures	55	16.5
What are the causes to request vitamin D level in pregnancy		
Obesity	150	44.9
malabsorption syndrome	230	68.9
gastric bypass surgery	241	72.2
family history of osteoporosis	157	47.0
What are the outcomes of vitamin D deficiency if not treated		
Small for gestational age	103	30.8
Osteoporosis	186	55.7
Bone fracture	206	61.7
week immunity	167	50.0
Colon Cancer	137	41.0
Cardiovascular disease	122	36.5
Impaired Glucose metabolism	75	22.5
Preeclampsia	58	17.4
Preterm labor	24	7.2

Table 2: Answers of knowledge questions of family medicine physician toward measure and treat vitamin D deficiency during pregnancy.

		Number	%
Does Vitamin D supplementation during pregnancy safe?	Agree	250	74.9
	Disagree	84	25.1
Does Vitamin D supplementation during pregnancy usually not necessary	Agree	89	26.6
	Disagree	245	73.4
Would you screen pregnant Women for vitamin D deficiency?	Never	103	30.8
	Rarely	109	32.6
	Often	80	24.0
	Always	42	12.6
What is the recommended dose for pregnant with vitamin D deficiency?	50000 IU\ week for 8 weeks	145	43.4
	10000 IU\ day for 8 weeks	58	17.4
	4000 IU\ day for 6 weeks	56	16.8
	1000 IU\ day for 6 weeks	44	13.2
	400 IU\ Day for 6 weeks	31	9.3

Table 3: Answers of practice questions of family medicine physician toward measure and treat vitamin D deficiency during pregnancy.

74.9% of medical professionals support the safety of vitamin D supplementation during pregnancy. 73.4% of the participants disagree that vitamin D supplements are often not required during pregnancy. 32.6% of the physicians would rarely screen pregnant women for vitamin D deficiency. 43.4% thinks that 50000 IU\week for 8 weeks is the recommended dose for pregnant with vitamin D deficiency (Figure 3) (Tables 4-13).

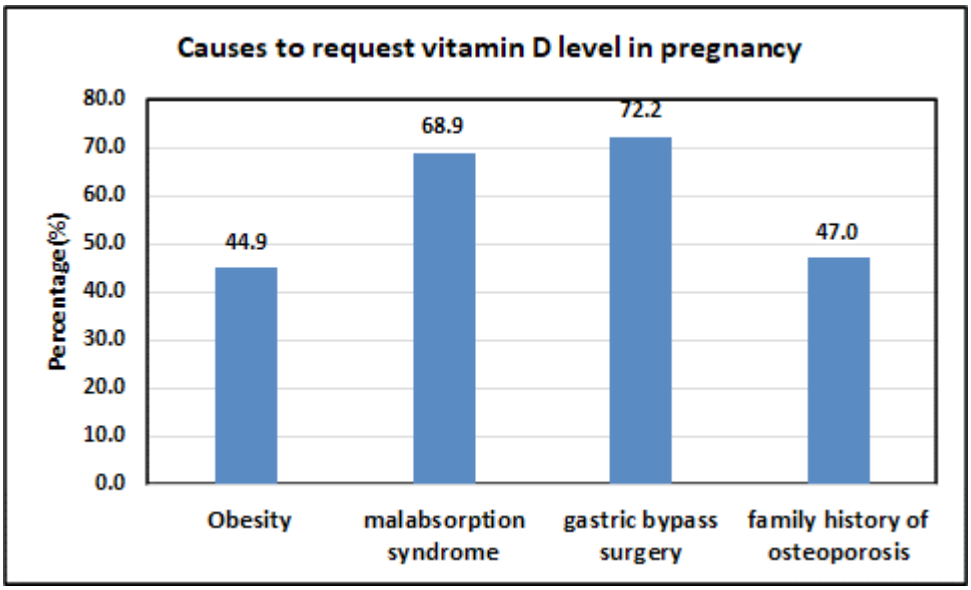

Figure 3: Causes to request vitamin D level in pregnancy.

	Male		Female		p value
	Number	%	Number	%	
What are the vitamin D Sources?					
Fortified dairy products	97	47.5	53	40.8	0.225
Green leafy vegetables	108	52.9	66	50.8	0.698
Fatty fish	118	57.8	77	59.2	0.802
Fortified cereals	114	55.9	68	52.3	0.522
Vitamin D supplements	134	65.7	88	67.7	0.705
Sun exposure	93	45.6	55	42.3	0.556
Fish oils	37	18.1	21	16.2	0.641
Animal liver	21	10.3	10	7.7	0.424
What is the source of Information about Vitamin D Deficiency?					
Online	111	54.4	57	43.8	0.060
Journals	109	53.4	63	48.5	0.376
Textbooks	111	54.4	72	55.4	0.862
Medical training	117	57.4	77	59.2	0.735
Colleagues	18	8.8	17	13.1	0.216
Literatures	30	14.7	25	19.2	0.277
What are the causes to request vitamin D level in pregnancy					
Obesity	95	46.6	55	42.3	0.445
Malabsorption syndrome	140	68.6	90	69.2	0.908
Gastric bypass surgery	142	69.6	99	76.2	0.193
Family history of osteoporosis	92	45.1	65	50.0	0.381
What are the outcomes of vitamin D deficiency if not treated					
Small for gestational age	63	30.9	40	30.8	0.983
Osteoporosis	116	56.9	70	53.8	0.588
Bone fracture	130	63.7	76	58.5	0.335
week immunity	105	51.5	62	47.7	0.501
Colon Cancer	86	42.2	51	39.2	0.596
Cardiovascular disease	71	34.8	51	39.2	0.413
Impaired Glucose metabolism	47	23.0	28	21.5	0.749
Preeclampsia	31	15.2	27	20.8	0.190
Preterm labour	13	6.4	11	8.5	0.471

Table 4: Assessing the knowledge of family medicine physician toward measure and treat vitamin D deficiency during pregnancy by gender.

	Saudi		Non-Saudi		p value
	Number	%	Number	%	
What are the vitamin D Sources?					
Fortified dairy products	102	49.3	48	37.8	0.041*
Green leafy vegetables	108	52.2	66	52.0	0.971
Fatty fish	119	57.5	76	59.8	0.672
Fortified cereals	106	51.2	76	59.8	0.124
Vitamin D supplements	145	70.0	77	60.6	0.077
Sun exposure	105	50.7	43	33.9	0.003*
Fish oils	43	20.8	15	11.8	0.036*
Animal liver	25	12.1	6	4.7	0.025*
What is the source of Information about Vitamin D Deficiency?					
Online	118	57.0	50	39.4	0.002*
Journals	102	49.3	70	55.1	0.300
Textbooks	109	52.7	74	58.3	0.317
Medical training	118	57.0	76	59.8	0.610
Colleagues	23	11.1	12	9.4	0.630
Literatures	34	16.4	21	16.5	0.979
What are the causes to request vitamin D level in pregnancy					
Obesity	92	44.4	58	45.7	0.827
malabsorption syndrome	140	67.6	90	70.9	0.536
gastric bypass surgery	144	69.6	97	76.4	0.178
family history of osteoporosis	99	47.8	58	45.7	0.701
What are the outcomes of vitamin D deficiency if not treated					
Small for gestational age	69	33.3	34	26.8	0.207
Osteoporosis	125	60.4	61	48.0	0.027*
Bone fracture	134	64.7	72	56.7	0.142
week immunity	108	52.2	59	46.5	0.310
Colon Cancer	79	38.2	58	45.7	0.176
Cardiovascular disease	60	29.0	62	48.8	<0.001*
Impaired Glucose metabolism	36	17.4	39	30.7	0.005*
Preeclampsia	29	14.0	29	22.8	0.039*
Preterm labour	20	9.7	4	3.1	0.018*

*Significant p value

Table 5: Assessing the knowledge of family medicine physician toward measure and treat vitamin D deficiency during pregnancy by Nationality.

	25-35		36-45		46-55		>55		p value
	Number	%	Number	%	Number	%	Number	%	
What are the vitamin D Sources?									
Fortified dairy products	89	51.1	31	43.7	18	30.0	12	41.4	0.040*
Green leafy vegetables	89	51.1	45	63.4	28	46.7	12	41.4	0.126
Fatty fish	92	52.9	50	70.4	31	51.7	22	75.9	0.011*
Fortified cereals	86	49.4	41	57.7	36	60.0	19	65.5	0.235
Vitamin D supplements	116	66.7	44	62.0	44	73.3	18	62.1	0.538
Sun exposure	88	50.6	19	26.8	28	46.7	13	44.8	0.008*
Fish oils	33	19.0	6	8.5	14	23.3	5	17.2	0.125
Animal liver	22	12.6	2	2.8	5	8.3	2	6.9	0.106
What is the source of Information about Vitamin D Deficiency?									
Online	111	63.8	34	47.9	14	23.3	9	31.0	<0.001*
Journals	85	48.9	35	49.3	35	58.3	17	58.6	0.505
Textbooks	96	55.2	35	49.3	31	51.7	21	72.4	0.191
Medical training	102	58.6	39	54.9	34	56.7	19	65.5	0.797
Colleagues	15	8.6	10	14.1	4	6.7	6	20.7	0.123
Literatures	27	15.5	9	12.7	13	21.7	6	20.7	0.492
What are the causes to request vitamin D level in pregnancy									
Obesity	73	42.0	36	50.7	27	45.0	14	48.3	0.634
malabsorption syndrome	114	65.5	48	67.6	43	71.7	25	86.2	0.154
gastric bypass surgery	123	70.7	50	70.4	42	70.0	26	89.7	0.183
family history of osteoporosis	79	45.4	31	43.7	33	55.0	14	48.3	0.561
What are the outcomes of vitamin D deficiency if not treated									
Small for gestational age	**57**	**32.8**	**24**	**33.8**	**16**	**26.7**	**6**	**20.7**	**0.478**
Osteoporosis	**114**	**65.5**	**32**	**45.1**	**25**	**41.7**	**15**	**51.7**	**0.002***
Bone fracture	**111**	**63.8**	**43**	**60.6**	**37**	**61.7**	**15**	**51.7**	**0.663**
week immunity	**89**	**51.1**	**31**	**43.7**	**33**	**55.0**	**14**	**48.3**	**0.600**
Colon Cancer	**65**	**37.4**	**35**	**49.3**	**25**	**41.7**	**12**	**41.4**	**0.394**
Cardiovascular disease	**51**	**29.3**	**30**	**42.3**	**26**	**43.3**	**15**	**51.7**	**0.029***
Impaired Glucose metabolism	**28**	**16.1**	**19**	**26.8**	**17**	**28.3**	**11**	**37.9**	**0.019***
Preeclampsia	**21**	**12.1**	**15**	**21.1**	**12**	**20.0**	**10**	**34.5**	**0.016***
Preterm labour	**13**	**7.5**	**5**	**7.0**	**6**	**10.0**	**0**	**0**	**0.395**

*Significant p value

Table 6: Assessing the knowledge of family medicine physician toward measure and treat vitamin D deficiency during pregnancy by age.

	Consultant		Senior registrar		Registrar		Resident		General Practitioner		p value
	Number	%	Number	%	Number	%	Number	%	Number	%	
What are the vitamin D Sources?											
Fortified dairy products	12	40.0	34	44.7	29	36.3	59	56.2	16	37.2	0.057
Green leafy vegetables	13	43.3	48	63.2	43	53.8	47	44.8	23	53.5	0.134
Fatty fish	18	60.0	43	56.6	56	70.0	56	53.3	22	51.2	0.158
Fortified cereals	23	76.7	43	56.6	47	58.8	47	44.8	22	51.2	0.028*
Vitamin D supplements	24	80.0	42	55.3	52	65.0	80	76.2	24	55.8	0.009*
Sun exposure	15	50.0	24	31.6	29	36.3	67	63.8	13	30.2	<0.001*
Fish oils	6	20.0	12	15.8	13	16.3	22	21.0	5	11.6	0.686
Animal liver	1	3.3	4	5.3	4	5.0	19	18.1	3	7.0	0.006*
What is the source of Information about Vitamin D Deficiency?											
Online	11	36.7	33	43.4	30	37.5	72	68.6	22	51.2	<0.001*
Journals	15	50.0	49	64.5	42	52.5	42	40.0	24	55.8	0.026*
Textbooks	15	50.0	41	53.9	48	60.0	56	53.3	23	53.5	0.862
Medical training	18	60.0	35	46.1	45	56.3	70	66.7	26	60.5	0.093
Colleagues	7	23.3	7	9.2	9	11.3	8	7.6	4	9.3	0.168
Literatures	7	23.3	13	17.1	14	17.5	18	17.1	3	7.0	0.411
What are the causes to request vitamin D level in pregnancy											
Obesity	15	50.0	37	48.7	33	41.3	37	35.2	28	65.1	0.016*
malabsorption syndrome	24	80.0	55	72.4	61	76.3	63	60.0	27	62.8	0.066
gastric bypass surgery	23	76.7	61	80.3	58	72.5	72	68.6	27	62.8	0.254
family history of osteoporosis	19	63.3	27	35.5	38	47.5	60	57.1	13	30.2	0.002*
What are the outcomes of vitamin D deficiency if not treated											
Small for gestational age	8	26.7	27	35.5	19	23.8	35	33.3	14	32.6	0.512

Osteoporosis	**14**	**46.7**	**37**	**48.7**	**43**	**53.8**	**70**	**66.7**	**22**	**51.2**	**0.088**
Bone fracture	**22**	**73.3**	**53**	**69.7**	**39**	**48.8**	**67**	**63.8**	**25**	**58.1**	**0.042***
week immunity	**17**	**56.7**	**35**	**46.1**	**45**	**56.3**	**49**	**46.7**	**21**	**48.8**	**0.601**
Colon Cancer	**16**	**53.3**	**31**	**40.8**	**31**	**38.8**	**39**	**37.1**	**20**	**46.5**	**0.518**
Cardiovascular disease	**12**	**40.0**	**27**	**35.5**	**41**	**51.3**	**25**	**23.8**	**17**	**39.5**	**0.004***
Impaired Glucose metabolism	**9**	**30.0**	**25**	**32.9**	**20**	**25.0**	**13**	**12.4**	**8**	**18.6**	**0.014***
Preeclampsia	**9**	**30.0**	**12**	**15.8**	**15**	**18.8**	**15**	**14.3**	**7**	**16.3**	**0.366**
Preterm labour	**3**	**10.0**	**6**	**7.9**	**5**	**6.3**	**9**	**8.6**	**1**	**2.3**	**0.673**
*Significant p value											

Table 7: Assessing the knowledge of family medicine physician toward measure and treat vitamin D deficiency during pregnancy by level of education.

	<5 years		**5-10 years**		**11-15 years**		**>15**		**p value**
	Number	**%**	**Number**	**%**	**Number**	**%**	**Number**	**%**	
What are the causes to request vitamin D level in pregnancy									
Obesity	43	38.1	41	52.6	42	45.2	24	48.0	0.242
malabsorption syndrome	74	65.5	56	71.8	59	63.4	41	82.0	0.102
gastric bypass surgery	76	67.3	54	69.2	70	75.3	41	82.0	0.209
family history of osteoporosis	61	54.0	22	28.2	46	49.5	28	56.0	0.002*
What are the outcomes of vitamin D deficiency if not treated									
Small for gestational age	38	33.6	28	35.9	26	28.0	11	22.0	0.315
Osteoporosis	76	67.3	47	60.3	44	47.3	19	38.0	0.001*
Bone fracture	72	63.7	53	67.9	50	53.8	31	62.0	0.265
week immunity	53	46.9	40	51.3	45	48.4	29	58.0	0.602
Colon Cancer	41	36.3	29	37.2	49	52.7	18	36.0	0.064
Cardiovascular disease	29	25.7	22	28.2	43	46.2	28	56.0	<0.001*
Impaired Glucose metabolism	12	10.6	16	20.5	30	32.3	17	34.0	<0.001*
Preeclampsia	12	10.6	10	12.8	20	21.5	16	32.0	0.004*

Preterm labour	8	7.1	3	3.8	8	8.6	5	10.0	0.536
*Significant p value									

Table 8: Assessing the knowledge of family medicine physician toward measure and treat vitamin D deficiency during pregnancy by practicing years.

		25-35		36-45		46-55		>55		p value
		Number	**%**	**Number**	**%**	**Number**	**%**	**Number**	**%**	
Does Vitamin D supplementation during pregnancy safe?	agree	136	78.2	57	80.3	37	61.7	20	69.0	0.042*
	Disagree	38	21.8	14	19.7	23	38.3	9	31.0	
Does Vitamin D supplementation during pregnancy usually not necessary	agree	45	25.9	17	23.9	17	28.3	10	34.5	0.725
	Disagree	129	74.1	54	76.1	43	71.7	19	65.5	
Would you screen pregnant Women for vitamin D deficiency?	Never	55	31.6	20	28.2	22	36.7	6	20.7	0.599
	Rarely	58	33.3	23	32.4	18	30.0	10	34.5	
	Often	38	21.8	16	22.5	17	28.3	9	31.0	
	Always	23	13.2	12	16.9	3	5.0	4	13.8	
What is the recommended dose for pregnant with vitamin D deficiency?	50000 IU\ week for 8 weeks	75	43.1	33	46.5	26	43.3	11	37.9	0.007*
	10000 IU\ day for 8 weeks	25	14.4	19	26.8	8	13.3	6	20.7	
	4000 IU\ day for 6 weeks	30	17.2	12	16.9	10	16.7	4	13.8	
	1000 IU\ day for 6 weeks	32	18.4	5	7.0	4	6.7	3	10.3	
	400 IU\ Day for 6 weeks	12	6.9	2	2.8	12	20.0	5	17.2	
*Significant p value										

Table 9: Assessing the practice of family medicine physician toward measure and treat vitamin D deficiency during pregnancy by age.

		Male		Female		p value
		Number	%	Number	%	
Does Vitamin D supplementation during pregnancy safe?	agree	159	77.9	91	70.0	0.103
	Disagree	45	22.1	39	30.0	
Does Vitamin D supplementation during pregnancy usually not necessary	agree	54	26.5	35	26.9	0.927
	Disagree	150	73.5	95	73.1	
Would you screen pregnant Women for vitamin D deficiency?	Never	63	30.9	40	30.8	0.999
	Rarely	66	32.4	43	33.1	
	Often	49	24.0	31	23.8	
	Always	26	12.7	16	12.3	
What is the recommended dose for pregnant with vitamin D deficiency?	50000 IU\ week for 8 weeks	92	45.1	53	40.8	0.443
	10000 IU\ day for 8 weeks	37	18.1	21	16.2	
	4000 IU\ day for 6 weeks	32	15.7	24	18.5	
	1000 IU\ day for 6 weeks	22	10.8	22	16.9	
	400 IU\ Day for 6 weeks	21	10.3	10	7.7	

Table 10: Assessing the practice of family medicine physician toward measure and treat vitamin D deficiency during pregnancy by gender.

		Saudi		Non-Saudi		p value
		Number	%	Number	%	
Does Vitamin D supplementation during pregnancy safe?	agree	160	77.3	90	70.9	0.189
	Disagree	47	22.7	37	29.1	
Does Vitamin D supplementation during pregnancy usually not necessary	agree	62	30.0	27	21.3	0.081
	Disagree	145	70.0	100	78.7	
Would you screen pregnant Women for vitamin D deficiency?	Never	65	31.4	38	29.9	0.111
	Rarely	71	34.3	38	29.9	
	Often	41	19.8	39	30.7	
	Always	30	14.5	12	9.4	
What is the recommended dose for pregnant with vitamin D deficiency?	50000 IU\ week for 8 weeks	85	41.1	60	47.2	0.243
	10000 IU\ day for 8 weeks	34	16.4	24	18.9	
	4000 IU\ day for 6 weeks	34	16.4	22	17.3	
	1000 IU\ day for 6 weeks	34	16.4	10	7.9	
	400 IU\ Day for 6 weeks	20	9.7	11	8.7	

Table 11: Assessing the practice of family medicine physician toward measure and treat vitamin D deficiency during pregnancy by nationality.

		Consultant		Senior registrar		Registrar		Resident		General Practitioner		p value
		Number	%	Number	%	Number	%	Number	%	Number	%	
Does Vitamin D supplementation during pregnancy safe?	agree	23	76.7	55	72.4	58	72.5	79	75.2	35	81.4	0.823
	Disagree	7	23.3	21	27.6	22	27.5	26	24.8	8	18.6	
Does Vitamin D supplementation during pregnancy usually not necessary	agree	10	33.3	13	17.1	23	28.8	32	30.5	11	25.6	0.265
	Disagree	20	66.7	63	82.9	57	71.3	73	69.5	32	74.4	
Would you screen pregnant Women for vitamin D deficiency?	Never	6	20.0	27	35.5	23	28.8	30	28.6	17	39.5	0.137
	Rarely	11	36.7	16	21.1	30	37.5	38	36.2	14	32.6	
	Often	11	36.7	20	26.3	21	26.3	20	19.0	8	18.6	
	Always	2	6.7	13	17.1	6	7.5	17	16.2	4	9.3	
What is the recommended dose for pregnant with vitamin D deficiency?	50000 IU\ week for 8 weeks	14	46.7	38	50.0	27	33.8	46	43.8	20	46.5	0.034*
	10000 IU\ day for 8 weeks	4	13.3	13	17.1	22	27.5	10	9.5	9	20.9	
	4000 IU\ day for 6 weeks	7	23.3	8	10.5	14	17.5	20	19.0	7	16.3	
	1000 IU\ day for 6 weeks	3	10.0	9	11.8	6	7.5	23	21.9	3	7.0	
	400 IU\ Day for 6 weeks	2	6.7	8	10.5	11	13.8	6	5.7	4	9.3	

*Significant p value

Table 12: Assessing the practice of family medicine physician toward measure and treat vitamin D deficiency during pregnancy by level of education.

		<5 years		5-10 years		11-15 years		>15		p value
		Number	%	Number	%	Number	%	Number	%	
Does Vitamin D supplementation during pregnancy safe?	agree	91	80.5	68	87.2	60	64.5	31	62.0	<0.001*
	Disagree	22	19.5	10	12.8	33	35.5	19	38.0	
Does Vitamin D supplementation during pregnancy usually not necessary	agree	30	26.5	15	19.2	22	23.7	22	44.0	0.016*
	Disagree	83	73.5	63	80.8	71	76.3	28	56.0	
Would you screen pregnant Women for vitamin D deficiency?	Never	36	31.9	24	30.8	28	30.1	15	30.0	0.002*
	Rarely	44	38.9	29	37.2	26	28.0	10	20.0	
	Often	16	14.2	12	15.4	33	35.5	19	38.0	
	Always	17	15.0	13	16.7	6	6.5	6	12.0	
What is the recommended dose for pregnant with vitamin D deficiency?	50000 IU\ week for 8 weeks	50	44.2	35	44.9	39	41.9	21	42.0	0.154
	10000 IU\ day for 8 weeks	13	11.5	16	20.5	21	22.6	8	16.0	
	4000 IU\ day for 6 weeks	21	18.6	9	11.5	15	16.1	11	22.0	
	1000 IU\ day for 6 weeks	23	20.4	9	11.5	7	7.5	5	10.0	
	400 IU\ Day for 6 weeks	6	5.3	9	11.5	11	11.8	5	10.0	

*Significant p value

Table 13: Assessing the practice of family medicine physician toward measure and treat vitamin D deficiency during pregnancy by Practicing years.

Discussion

The physiologically greater 1,25-dehydroxy vitamin D levels seen in the second and third trimesters suggest that pregnant women have higher vitamin D requirements. The physiological rise in the active metabolite, the increased fetal calcium need (250 mg/day in the third trimester), and the better intestinal calcium absorption all testify to the importance of vitamin D biology in pregnancy.

In healthy, non-pregnant individuals, the optimal vitamin D level is thought to be the quantity required to maintain blood parathormone levels and prevent secondary hyperparathyroidism. This notion states that normal levels during pregnancy should be the same as those in non-pregnant adults. However, the extra factors of prenatal health and subsequent child health make the situation more complicated. There is little information available on the impact of raising vitamin D levels on birth weight, neonatal health, long-term health, and mother outcomes.

Due to a lack of evidence, the World Health Organization (WHO) presently does not advise giving vitamin D supplements to pregnant women as part of standard prenatal care, which is in accordance with recommendations made by the American Congress of Obstetricians and Gynecologists.

In this study, the majority of the participants had strong understanding of how to prevent vitamin D insufficiency while pregnant. Apartment life and the unavailability of women-only public spaces were also highlighted as obstacles to getting adequate vitamin D from sunshine. Although participants had a strong understanding of how to prevent vitamin D insufficiency during pregnancy, their performance in activities like eating foods high in vitamin D and receiving vitamin D from sunshine, which is the major source of this vitamin, was only average. Perceived self-efficacy was the key factor in determining the behaviors pregnant women used to prevent vitamin D insufficiency. This information can be used to inform the creation of the required treatments to improve how well this group does in obtaining enough vitamin D.

April 2015 cross sectional study by Miranda Davies-Tuck and associates. In this study, the status of vitamin D throughout pregnancy was examined, along with the relationships between early-pregnancy vitamin D levels and variations in vitamin D throughout pregnancy. Among 1550 women, 55% had insufficient vitamin D (50 nmol/L), 37% had insufficient vitamin D (50-74 nmol/L), and 8% had sufficient vitamin D (>75 nmol/L). Although vitamin D insufficiency is frequent among expectant mothers, it is seldom harmful [6].

A cross-sectional research completed on August 25, 2016 by Sara A. Mohamed and colleagues This research was conducted to assess the doctor's screening and supplementing practices for pregnant women. 101 (45%) of the 225 randomly chosen practicing obstetricians and gynecologists responded to the survey. Most pregnant patients would benefit from vitamin D treatment, according to 66.3% of the practicing doctors, who reported that vitamin D deficiency affects their patient group. Only 25% of the patients will have their vitamin D status checked when pregnant, but half of the patients (52.5%) will prescribe vitamin D treatment throughout pregnancy. To guide practice, higher quality evidence is required. Current clinical studies may give the necessary direction, but until more conclusive outcomes are obtained clinical practice in US [7].

Sina Gallo, et al. conducted a systematic review in 2019 to analyze the connections between maternal 25(OH)D levels, vitamin D supplementation, and health outcomes. Research indicates that vitamin D supplementation during pregnancy raises mother and fetal levels of 25(OH)D and may be connected to Insulin resistance in the mother and fetal development.

2019 retrospective research by Buse Güler et al. In this study, 697 pregnant women between the ages of 18 and 40 were studied to determine the frequency of first-trimester vitamin and mineral supplement recommendations. According to the women's requests to the doctor for laboratory testing, ferritin was 18.4%, mean corpuscular hemoglobin (MCH) was 99.7%, folic acid was 10.2%, vitamin D was 6.3% (the least), vitamin B12 was 17.2%, and calcium was 20.4%. It was discovered that the levels of ferritin, vitamins B12 and D, calcium, folic acid, iron, and iodine were not routinely examined [8].

2015 cohort research by Yuan-Hua Chen, et al. This study sought to ascertain whether there is a correlation between maternal vitamin D deficiency during pregnancy and the chance of having SGA and LBW infants in a Chinese population. And last, the study shows that maternal vitamin D deficiency during pregnancy raises the frequency of SGA and LBW newborns in a Chinese population [9].

2018 review research by Michelle Rockwell and colleagues. This study was conducted to evaluate how doctors handle low vitamin D levels in this challenging setting. The standardization of rules and practices for vitamin D testing and medical treatment, according to authors of various studies that have been evaluated, would be beneficial for patient care. A better knowledge of how doctors handle ambiguity in clinical practice might prevent overuse [10].

2016 cohort research carried out by Fariba Aghajafari and colleagues. In this study, it was determined whether or not pregnant women were getting the appropriate amounts of vitamin D through their diets alone or via supplements. b) If women who are pregnant may reach the recommended levels of vitamin D when their reported dietary consumption of the vitamin complied with those guidelines. Last but not least, Canada and the current vitamin D guidelines for Canadian expectant women should be reassessed [11].

According to a cross-sectional research conducted in 2020 by Ashima Taneja et al., they split the 189 women who participated in the study into Group A and Group B. 105 Group A: Before giving birth, deficient women (30 ng/ml) between 26 and 28 weeks were given supplements and retested. Group B (84): Women who were deficient after 34 weeks but did not get prenatal supplements. Preeclampsia, gestational diabetes, and premature delivery have greater incidences when there is a vitamin D shortage. To enhance maternal outcomes, maternal screening in the targeted group and its augmentation are advised [12].

Research conducted cross-sectionally in 2018 by Arif Abu-Abed et al. On a scale of 1 to 10, dermatologists received a mean recommendation score of 4.7, endocrinologists a mean recommendation score of 4.2, and general physicians a mean recommendation score of 6.4. The purpose of this study was to assess and compare the opinions and suggestions of general practitioners, dermatologists, and endocrinologists about sun exposure and vitamin D. These medical practitioners, whether specialists or primary care physicians, have only sporadic consensus about sun exposure. Family doctors recommended a mean daily sun exposure of 67.4 minutes as opposed to 41.4 minutes and 47.1 minutes from dermatologists and endocrinologists, respectively [13].

In order to compare the vitamin D status of two distinct populations of pregnant women in Australia and New Zealand and investigate the relationship between vitamin D status and pregnancy outcome, Rebecca L. Wilson et al. undertook a prospective cohort study in 2018. 1156 (41%) of the 2800 were hired in Adelaide, while 1644 (59%) were hired in Auckland. In conclusion, it has been demonstrated that having high blood 25(OH)D levels at 15 1 weeks of gestation can prevent the onset of GDM [14].

The age group of 36-45 years had the second-highest percentage of doctors (21.26%), followed by that of 25-35 years (52.10%). The majority of doctors (61.08%) are men, with women making up 38.92% of the workforce. 38.02% of the population was non-Saudi, while 61.98% were Saudi citizens. The degree of education is 12.87% general practitioners, 23.95% registrars, 22.75% senior registrars, 31.44% residents, and 8.98% consultants. More than 5 years of professional experience are included in 33.83%.

Among the sources of vitamin D, fortified dairy products account for 44.9% of consumption, followed by 52.1% of green leafy vegetables, 58.4% of fatty fish, 54.5 percent of fortified cereals, 66.5 percent of vitamin D supplements, 44.3 percent of sun exposure, 17.4 percent of fish oils, and 9.3 percent of animal liver. 50.3% of respondents found material on vitamin D online; 51.5% found it in periodicals; 54.8% found it in textbooks; and 58.1% used their medical knowledge to learn about vitamin D insufficiency. While the remaining 16.5% and 10.5% of the data were gathered from colleagues and the literature, respectively.

Obesity (44.9%), malabsorption syndrome (68.9%), gastric

bypass surgery (72.2%), and family history of osteoporosis (47%) are the main reasons why vitamin D levels are requested during pregnancy. The following outcomes of vitamin D insufficiency were chosen if untreated: Preterm labor (7.2%), small for gestational age (30.8%), osteoporosis (55.7%), bone fracture (61.7%), weakened immunity (50%) colon cancer (41%), cardiovascular disease (36.5%), impaired glucose metabolism (22.5%), preclampsia (17.4%), and week immunity (50%) are all pregnancy-related conditions.

Conclusion

The majority of PHC and PSMMC doctors advise using vitamin D supplements. The majority of responders did frequently advise their patients to use vitamin D supplements. The average degree of vitamin D knowledge among doctors at PHC and PSMMC is correlated with gender, kind of specialization, personal vitamin D supplementing experience, and advising others to take supplements. Our research found that doctors' attitudes on vitamin D supplementation are influenced by their degree of expertise, which also influences how they suggest it to patients, loved ones, and healthy individuals.

According to the study, medical professionals at PHC and PSMMC would benefit from increased training in vitamin D in order to reduce the population of Saudi Arabia's steadily growing vitamin D deficit. Male doctors who are pursuing surgical specialties and do not supplement their own vitamin D should receive further instruction in particular. Along with improving their own health, patients would gain from this.

Ethical Consideration

1. Consent of physician before participation was obtained.
2. Confidently all personal date will be confection
3. Information will be used in this Serace
4. We will seek for Institutional Review Board of PSMMC approval Before Conducting the research.

Transparency Declaration: The primary investigator has no conflict of interest to declare.

References

1. Bischoff HA, Stahelin HB, Urscheler N (1999) Muscle strength in the elderly: its relation to vitamin D metabolites Arch Phys Med Rehabil 80: 54-58.
2. Roth DE, Abrams SA, Aloia J, Bergeron G, Bourassa MW, et al. (2018) Global prevalence and disease burden of vitamin D deficiency: a roadmap for action in low‐ and middle‐income countries. Ann N Y Acad Sci 430: 44‐79.
3. Vitamin D Supplementation during Pregnancy Part 2 NICHD/CTSA Randomized Clinical Trial (RCT): Outcomes.
4. Robinson CJ, Wagner CJ, Hollis BW, Baatz JE, Johnson DD (2011) Maternal vitamin D and fetal growth in early-onset severe preeclampsia. Am J Obstet Gynecol 204: 556.e1-4.
5. Davies-Tuck M, Yim C, Knight M, Hodges R, Doery JC, et al. (2015) Vitamin D testing in pregnancy: Does one size fit all? Aust N Z J Obstet Gynaecol 55: 149-155.
6. Mohamed SA, Al-Hendy A, Schulkin J, Power ML (2016) Opinions and Practice of US-Based Obstetrician-Gynecologists regarding Vitamin D Screening and Supplementation of Pregnant Women. J Pregnancy 2016: 1454707.
7. Gallo S, McDermid JM, Al-Nimr RI, Hakeem R, Moreschi JM, et al. (2020) Vitamin D Supplementation during Pregnancy: An Evidence Analysis Center Systematic Review and Meta-Analysis. J Acad Nutr Diet 120: 898-924.e4.
8. Güler B, Bilgiç D, Okumuş H, Yağcan H, Alan M (2019) An investigation of vitamin and mineral supplement recommendation among first-trimester pregnancies. J Perinat Med 47: 958-962.
9. Chen YH, Fu L, Hao JH, Yu Z, Zhu P, et al. (2015) Maternal vitamin D deficiency during pregnancy elevates the risks of small for gestational age and low birth weight infants in Chinese population. J Clin Endocrinol Metab 100: 1912-1919.
10. Rockwell M, Kraak V, Hulver M, Epling J (2018) Clinical Management of Low Vitamin D: A Scoping Review of Physicians' Practices. Nutrients 10: 493.
11. Aghajafari F, Field CJ, Kaplan BJ, Rabi DM, Maggiore JA, et al. (2016) The Current Recommended Vitamin D Intake Guideline for Diet and Supplements During Pregnancy Is Not Adequate to Achieve Vitamin D Sufficiency for Most Pregnant Women. PLoS One 11: e0157262.
12. Taneja A, Gupta S, Kaur G, Jain NP, Kaur J, et al. (2020) Vitamin D: Its Deficiency and Effect of Supplementation on Maternal Outcome. J Assoc Physicians India 68: 47-50.
13. Abu-Abed A, Azbarga S, Peleg R (2018) Knowledge and attitudes of family doctors, dermatologists, and endocrinologists on sun exposure and vitamin D. Postgrad Med 130: 477-480.
14. Wilson RL, Leviton AJ, Leemaqz SY, Anderson PH, Grieger JA, et al. (2018) Vitamin D levels in an Australian and New Zealand cohort and the association with pregnancy outcome. BMC Pregnancy Childbirth 18: 251.
15. Kalra S, Malik S, John M (2011) Gestational diabetes mellitus: A window of opportunity. Indian J Endocrinol Metab 15: 149-151.
16. Mithal A, Wahl DA, Bonjour JP, Burckhardt P, Dawson-Hughes B, et al. (2009) Global vitamin D status and determinants of hypovitaminosis D. Osteoporos Int 20: 1807-1820.
17. Hyppönen E, Cavadino A, Williams D, Fraser A, Vereczkey A, et al. (2013) Vitamin D and pre-eclampsia: Original data, systematic review and meta-analysis. Ann Nutr Metab 63: 331-340.
18. Bodnar LM, Klebanoff MA, Gernand AD, Platt RW, Parks WT, et al. (2014) Maternal vitamin D status and spontaneous preterm birth by placental histology in the US Collaborative Perinatal Project. Am J Epidemiol 179: 168-176.
19. Lawlor DA, Wills AK, Fraser A, Sayers A, Fraser WD, et al. (2013) Association of maternal vitamin D status during pregnancy with bone-mineral content in offspring: A prospective cohort study. Lancet 381: 2176-2183.
20. Zosky GR, Hart PH, Whitehouse AJ, Kusel MM, Ang W, et al. (2014) Vitamin D deficiency at 16-20 weeks gestation is associated with impaired lung function and asthma at 6 years of age. Ann Am Thorac Soc 11: 571-577.
21. Dawodu A, Saadi HF, Bekdache G, Javed Y, Altaye M, et al. (2013) Randomized controlled trial (RCT) of vitamin D supplementation in pregnancy in a population with endemic vitamin D deficiency. J Clin Endocrinol Metab 98: 2337-2346.
22. Holick MF, Binkley NC, Bischoff-Ferrari HA, Gordon CM, Hanley DA, et al. (2011) Evaluation, treatment, and prevention of vitamin D deficiency: An Endocrine Society clinical practice guideline. J Clin Endocrinol Metab 96: 1911-1930.

23. Marya RK, Rathee S, Manrow M (1987) Effect of calcium and vitamin D supplementation on toxaemia of pregnancy. Gynecol Obstet Invest 24: 38-42.

24. Sahu M, Das V, Aggarwal A, Rawat V, Saxena P, et al. (2009) Vitamin D replacement in pregnant women in rural north India: A pilot study. Eur J Clin Nutr 63: 1157-1159.