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Full Length Research Paper

Vitamin D Deficiency: Knowledge and Practice among Adult Saudi Females

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This study is to assess the knowledge and practice of Saudi female about vitamin D deficiency. This study used descriptive designs. Convenience sample of 310 Saudi Females aged 20 and above were included in the study. The sample size was estimated using sample size calculator. Three tools were developed to collect data namely: Sociodemographic questionnaire, Knowledge assessment tool, Practice Assessment tool. The validity and reliability of the tools were ensured. The participants were aware about the aim of the study. Verbal agreement (consents) was taken before data collection. Data was coded for entry and analysis using SPSS statistical software package version 18. The mean age of the sample was 25.18± 6.7 years old. About one third (29%) of the sample had correct information about importance of Vitamin D, While only 19% use vitamin D supplement. Forty six percent of the subjects do not expose themselves to sun daily, while out of those who expose to sun daily 16.6% expose to sun less than 10 minutes. There was a significant positive correlation between knowledge of females and their practices toward prevention of vitamin D deficiency (p = 0.000). Younger females had better knowledge and practice scores as there were negative relationship between age and both knowledge, and practice total scores (p = 0.000, P = 0.014). Knowledge of females to prevent Vitamin D deficiency was insufficient. Age was an indicator for females' knowledge and practice. More emphasis should be carried out to improve female's knowledge and practice.

Keywords: vitamin D deficiency, knowledge and practice, Saudi females.

INTRODUCTION AND LITERATURE REVIEW

There are two forms of vitamin D, cholecalciferol (vitamin D3) and ergocalciferol (vitamin D2). The chemical difference between vitamin D2 and D3 is in the side chain; in contrast to vitamin D3, vitamin D2 has a double bond between carbons 22 and 23 and a methyl group on carbon 24, cholecalciferol (vitamin D3), is produced from the conversion of 7-dehydrocholesterol in the epidermis and dermis in humans, and ergocalciferol (vitamin D2) (Michael , 2008).

Vitamin D is an essential vitamin to the body, to such an extent that medical professionals call it the "super nutrient". It is capable of helping reduce the risk of different health problems, including some cancers and autoimmune diseases, multiple sclerosis, rheumatoid arthritis, Type diabetes and many others (Cauley, 2008).

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Vitamin D deficiency is also known as hypovitaminosis D. It is currently estimated that one billion people suffer from vitamin D deficiency worldwide. A major cause is lack of sun exposure, and this is evident even in countries at mid and low latitudes. Although, a high prevalence has been found in Saudi Arabia, little is known to date about the reasons for this and consequently about reduction methodologies (P. Lips.. 2007).

Complications of vitamin D deficiency include Rickets, Osteoporosis, Depression and Fatigue, Hyperparathyroidism, Obesity, Osteomalacia, Chronic Backache, Hypertension, cancers, chronic pain, diabetes, multiple sclerosis or heart disease (Al-Mogbel, 2012 and Saleh, 1983).

Sunlight Exposure is the major source of vitamin D. The efficiency of the conversion of 7-dehydrocholesterol to vitamin D3 is dependent on time of day, season of the year, skin color and age. Even though there is little vitamin D found in food naturally , food considered another source of vitamin D, such as seafood, shrimp, mushroom, egg yolk and fortified milk (Mark, 2009 and Shamma, 2013).

The etiology of vitamin D deficiency in Saudi Arabian women could be related to inadequacy of diet and sunlight exposure, as well as skin pigmentation playing a role. Inadequate exposure to sunlight is attributed by a conservative style of dress as abaya, hijab that covers most of the body surfaces when they are outdoor, which limits the skin surfaces that exposure to sun with the deficiency being partly overcome in some subjects who expose themselves to sunlight (Al Bathi, 2011)

The prevalence of vitamin D deficiency among female in Saudi Arabia ranged between 30%– 80%. Vitamin D deficiency is a preventable disease; therefore it was highly informative to assess knowledge and practice of adult Saudi females regarding vitamin D

The aim of this study was to assess the knowledge and practice of Saudi female about vitamin D deficiency.

METHODOLOGY

This study used a descriptive cross sectional design to assess the knowledge and practice of Saudi female about vitamin D deficiency.

Non probability Convenience sample of Saudi Females aged 18 and above were included in the study. The inclusion criteria are: (1) Saudi nationality (2) female; (3) age 18 and above. Those who met inclusion criteria and accept to participate were included in the study. The subjects were recruited from public places such as malls, mosques, colleges, and restaurant in Riyadh city. Using the sample size calculator with a confidence level of 95 and confidence interval of 5.5, the sample size was computed to be 295 subjects, and it was increased to 310 to insure representativeness of the sample.

The participants were aware about the aim of the study, and they were informed that the participation is voluntary. Verbal agreements (consents) were taken before data collection. The subjects were informed that the data will be anonymous and confidential and they have the freedom to withdraw from the study any time.

Three tools were developed to collect data for this study: The first tool was Sociodemographic questionnaire, which included age, education, occupation and marital status. The second tool was Knowledge Assessment Questionnaire, which included 20 questions such as source of knowledge of the subjects about Vitamin D, Importance of vitamin D, Source of Vitamin D, and Complications of vitamin D deficiency. The third tool was Practice Assessment Questionnaire which included 20 questions, such as duration of daily sun exposure, use of sunscreen, and health practices by the subjects to improve vitamin D level such as diet, and vitamin D supplementation. Each subject took 18 – 20 minutes to answer the questionnaire through face to face interview to insure higher response rate which help eliminate bias, and to clarify misunderstood questions

Each question was scored 3 for correct answer, 1 for incomplete answer and 0 to wrong answer. The knowledge and practice questionnaires were scored and the total score for knowledge and total score for practice were computed for each subject.

The content validity of the instrument was assessed by a group of experts who examined the tools and approved it. Test retest method was used to determine the reliability of the tool, by applying this tool twice on 5 subjects who were excluded from the study. The reliability was 0.84. Subjects needed 15 -20 minutes to complete the questionnaire. A pilot study was conducted to test the feasibility and applicability of the tools.

Data was coded for entry and analysis using SPSS statistical software package version 18. Data was presented using descriptive statistics in the form of frequencies and percentages. Interval and ratio variables were presented in the form of means and standard deviations. Pearson r used to test correlation. The significance level was chosen as ($p<0.05$).

RESULTS

A sample of 310 Saudi women was interviewed to assess their knowledge and practice regarding vitamin D sufficiency.

The mean age of the sample was 25.14 + 6.78 years. The majority of the subjects had age ranged between 20 – 29 years old. About three quarters (75.7%) of the sample were singles. More than half of the sample (62.6%) was employee, and small percentage of the subjects (1.3) were retired.

About one quarter of the sample (25.6%) of the

Table 1. Frequency Distribution of the Sociodemographic Characteristics of the Sample

	Frequency n = 310	Percent
Age		
20 -29	252	81.3
30 – 39	38	12.2
30 – 49	14	4.5
50 and up	6	1.9
Mean	25.14	
SD	6.78	
Marital Status		
Single	234	75.5
Married	63	21.0
Divorced	12	3.9
Widow	5	1.6
Occupation		
Private sector employee	54	17.4
Public sector employee	140	45.2
Housewife	54	17.4
Student	58	18.7
Retired	4	1.3

Table 2. Frequency Distribution of the Subjects' Knowledge about Vitamin D

	Frequency n = 310	Percent
Importance of vitamin D		
Correct	80	25.6
Incomplete	180	58.1
Do not know	6	1.9
Wrong	44	14.2
Source of Vitamin D		
Correct	92	29.7
Incomplete	170	54.8
Do not know	2	0.7
Wrong	46	14.8
Complications of vitamin D deficiency		
Correct	4	1.3
Incomplete	52	16.8
Do not know	130	41.9
Wrong	124	40
Normal level of vitamin D		
Correct	2	0.65
Incomplete	0	0
Do not know	152	49.0
Wrong	157	50.6

subjects had correct knowledge about importance of vitamin D while 16.1% either did not know the importance of vitamin D, or they gave the wrong answer. Regarding the source of Vitamin D 29.7% of the subjects answer it correctly. The majority of the subjects (81.9%) did not know the complication of Vitamin D deficiency, as they did not know or gave the wrong answer. Only 0.65% of the sample knew the normal level of Vitamin D in the adult body (table 2).

Table 3. Frequency Distribution of the Source of knowledge of the subjects about Vitamin D

	Frequency	Percent
Source of knowledge		
Newspaper	74	23.9
TV program	108	34.8
Internet	100	32.3
Lecture	76	24.5
Book	54	17.4
Friend	58	18.7
Your doctor	116	37.4

Table 4. Frequency Distribution of Practice of the Subjects toward Sun Exposure and Protection

	Frequency n = 310	Percent
I expose to sun daily		
Yes	144	46.5
No	166	53.5
Duration of exposure		
10 or less	78	51.2
10 – 29	42	29.3
30 – 60	24	16.6
I often use a parasol to shade from the sun		
Yes	68	21.9
No	242	78.1
Do you use sun screen		
Yes	136	43.9
No	174	56.1
Do you look for the SPF of the sun screen?		
Yes	40	12.9
No	96	31.0
How often do you use sun screen?		
Rarely	66	21.3
Sometimes	40	12.9
Usually	30	9.7

Table three showed the source of knowledge of the subjects about vitamin D. More than one third of the subjects got their information about Vitamin D from doctors, and TV program (37.4%, and 34.8% respectively). About one fifth of the sample got their information about Vitamin D from Internet and Lecture (32.3%, and 24.5% respectively). The percentages in this table do not add up to one hundred, as the alternatives are not exclusive, and most of the subjects in the sample indicated that they got their information about Vitamin D from more than one source.

Table four showed that only 46.5% of the sample indicated that they have daily sun exposure. Out of those 46.5 % who expose to sun daily 51.2% expose to sun less than ten minutes per day and only 29.3% of them expose to sun 10 – 30 minutes per day. Only 21.9% of the subjects use a parasol to shade from the sun. Less than half (43.9%) of the sample use sun screen, and out of those only 12.9% look for the sun protection factor(SPF) of the sun screen . Only 9.7% used sun screen usually with sun exposure.

Table 5 showed the health practices by the subjects to improve vitamin D level. More than half of the sample did not take any measures to improve their vitamin D level. Only 10.3% of the sample reported that they drink at least 2 cups of milk per day. Only 12.9% of the subjects reported that they take vitamin D supplementation. The percentages in this table do not add up to one hundred, as the alternatives are not exclusive, and some of the subjects in the sample indicated that they do more than

Table 5. Health Practices by the Subjects to Improve Vitamin D level

	Frequency	Percent
What are health practices that you apply to manage your vitamin D level		
None		
Exposure to sun light	178	57.4
Drink 2 cups of milk	32	10.3
Take vitamin D supplement	40	12.9
Increase seafood in diet	84	27.1

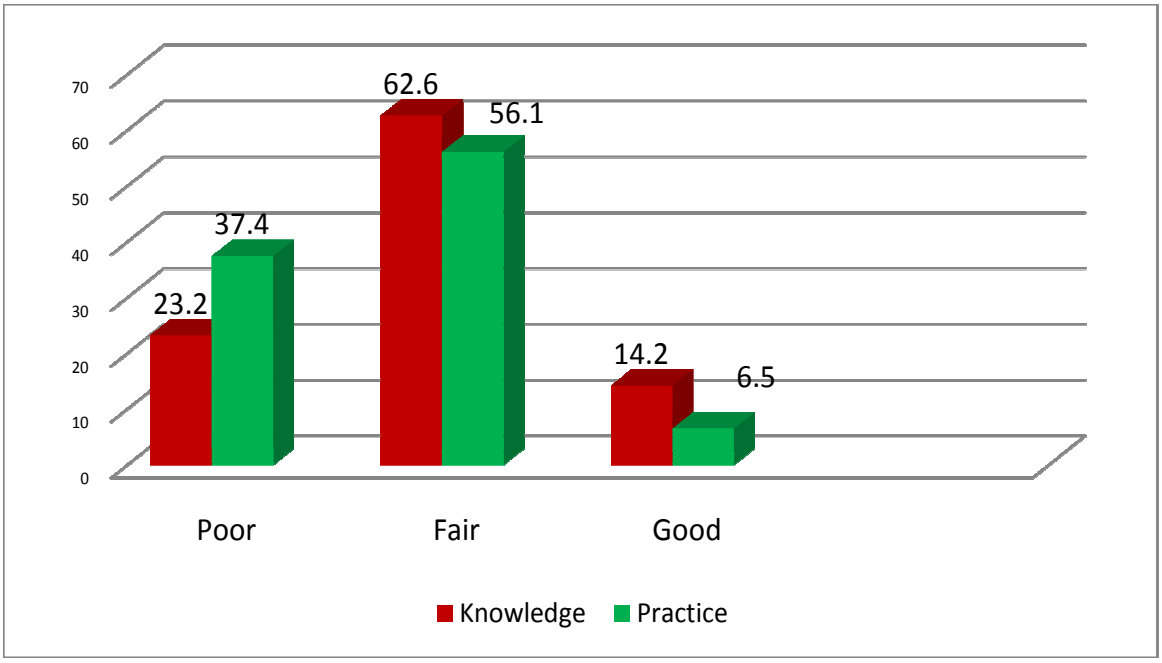

Figure 1. Frequency Distribution of Total knowledge and total Practice Scores.

Table 6. Correlation between Age, Total Knowledge Score, and Total Practice Score

	Total Knowledge Score	Total Practice Score
Age		
r	-.33	-.20
P	O.000	0.014

one measure to prevent or manage vitamin D deficiency.

Figure 1 showed Percent distribution of total knowledge and total practice scores. The subjects had better knowledge score than their practice score. 14.2 percent of the subjects had good knowledge score compared to only 6.5% of the subjects had good practice score

Table 6 showed correlation between age, total knowledge score and total practice score. There were negative correlation between both total knowledge score and total practice score with age. The younger the age, the higher the total knowledge score and total practice score (p = 0.000, 0.014 and respectively).

Figure 2 showed correlation between total knowledge score and total practice score. There was a positive association between the total knowledge score and the total practice score. The increase in total knowledge was associated with an increase in the total practice score (p = 0.000).

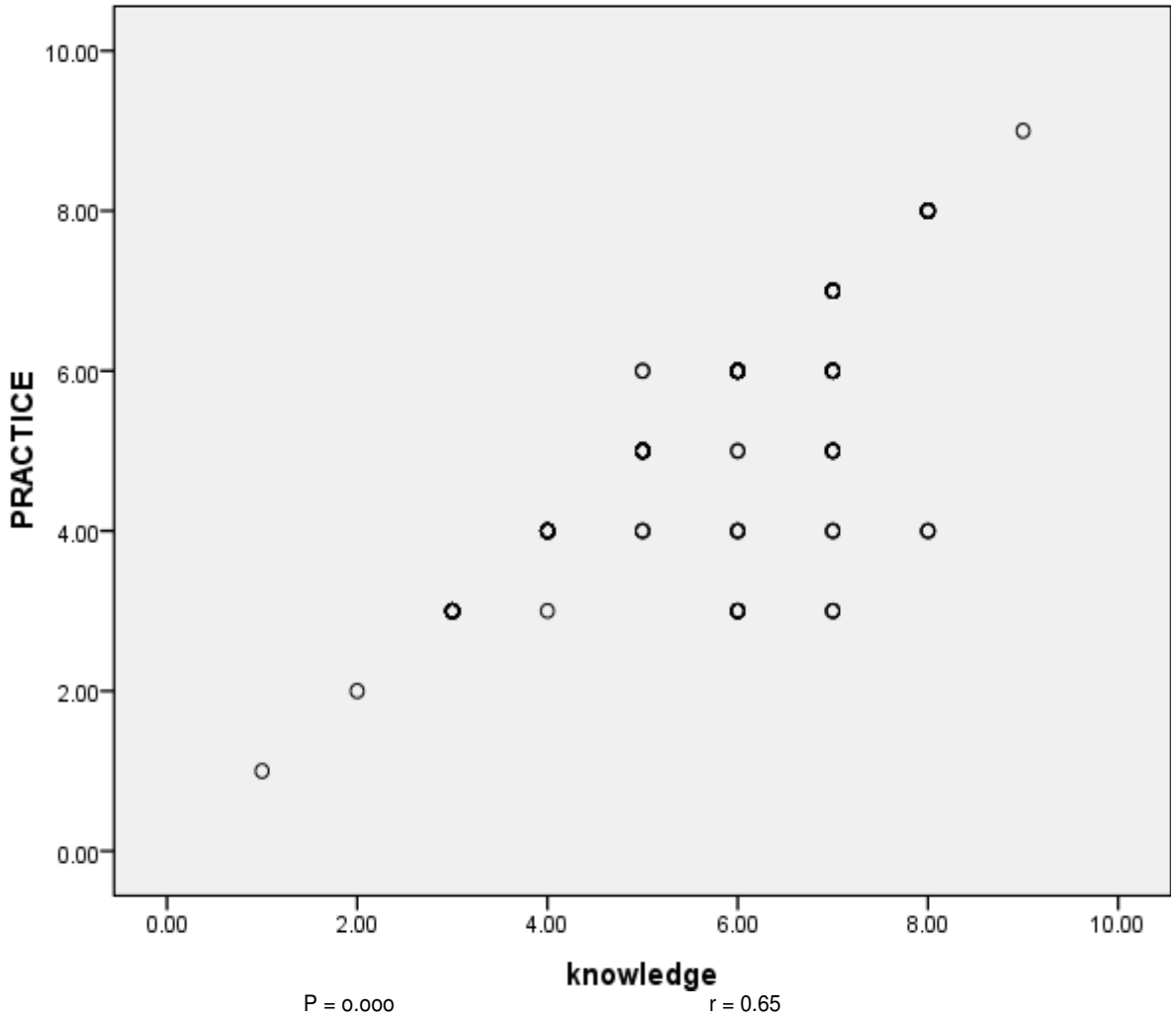

Figure 2. Correlation between Total Knowledge Score, and Total Practice Score

DISCUSSION

This study aimed to assess the knowledge and practice of Saudi women about Vitamin D. Three hundred and ten Saudi female were interviewed to assess their knowledge and practice.

Only 14.2% of the subjects had good knowledge about vitamin D. The rest (85.8%) of the subjects either had bad or fair knowledge. Similar findings by Vu LH (2010) He found that Lack of knowledge about vitamin D was apparent. Eighteen percent of people were unaware of the bone benefits of vitamin D but 40% listed currently unconfirmed benefits. Over half of the participants indicated that more than 10 minutes in the sun were needed to attain enough vitamin D in summer, and 28% indicated more than 20 minutes in winter. In the current study more than half of the participant (53.5%) indicated that they did not expose to sun daily. About one quarter of the sample 25.2% exposed to sun less than 10 minutes per day.

Different findings by Al-Mutairi, (2012) who studied Photoprotection and vitamin D status: A study on awareness, knowledge and attitude towards sun protection in general population from Kuwait, and its relation with vitamin D levels. It was found that the majority (80%) of the subjects had good knowledge. of the beneficial and harmful effects of sun exposure, and had been using sunscreens regularly, and adopting other sun protective measures in their daily life. The levels of vitamin D were found to be deficient in both sunscreen users and those who had never used sunscreens. In the current study only 21.9% of the subjects use a parasol to shade from the sun. Less than half (43.9%) of the sample use sun screen, and out of those only 12.9% look for the sun protection factor(SPF) of the sun screen . Only 9.7% used sun screen usually with sun exposure.

In a study by Christie, (2011) conducted in Saudi Arabia, it was found that participants were limited in their knowledge about vitamin D and vitamin D deficiency. They reported limited sun exposure due to intense heat, cultural reasons for covering the body, and an infrastructure that makes sun exposure difficult.

The main source of knowledge about vitamin D was Doctors 37.4%, followed by TV program (34.8%). Thirty two percent got their knowledge fron the internet. This results was online with the study by Al Bathi (2011). He studied Knowledge, attitude and practice of patients attending primary care centers toward vitamin D in Kuwait. He found that the main sources of knowledge about vitamin D, 40.5 % of patients got knowledge from doctors, 12.5% from the media, 29.0% from relatives and friends, 8.5% from background information and 9.5% from journals and magazine.

The current study showed that although subjects had higher knowledge score than their practice score, there was a significant positive association between the knowledge and practice score. Saudi women with good knowledge score had better practice score. This might indicate that improving knowledge is one of the effective methods to improve practice.

Younger females had better knowledge as there was negative relationship between age, knowledge and practice total score. The educational program for managing vitamin D deficiency should start as early as adolescent age or even in the childhood.

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