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Knowledge and practice of vitamin D deficiency among people lives in Riyadh, Saudi Arabia-A cross-sectional study.

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Abstract

This study evaluated the knowledge, attitude and practice towards vitamin D deficiency among Saudi population. A cross-sectional study utilizing an online survey was conducted. Descriptive statistics was applied. About 98.4% heard about vitamin D, most of them knew that the sun is important source of vitamin D, unfortunately only 46.4% of participants who is like going out to sun. A few of participants (13.7%) thought that they have sufficient sun exposure. Majority of participants 93.1% knew that vitamin D is important for bone health, and 48.4% of participants knew the presence of relation between vitamin D deficiency and other diseases such as diabetes, cardiovascular, and depression. In addition, the most of participants (91.0%) reported that vitamin D source was the sun. This study found inadequate knowledge, and poor practice about vitamin D deficiency. More efforts should be carried out for the public to improve their knowledge and attitude about vitamin D.

Keywords: Vitamin D, Knowledge, Practice, Deficiency.

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Introduction

Vitamin D deficiency is the most common nutritional deficiency and is highly alarming in Saudi Arabia and worldwide epidemic [1-3]. It has been recognized as an international public health problem due to its significant role for the most common medical Conditions for the skeletal system [4,5]. The main function of Vitamin D's is to reserve calcium and phosphorus homoeostasis by increasing the efficacy of intestinal calcium and phosphorus absorption in order to maintain signal transduction, metabolic activities, and neuromuscular function, and to promote skeletal mineralization. Several studies have shown that sunlight is the most important source of vitamin D deficiency [6,7]. Historically vitamin D deficiency causes rickets, osteomalacia, osteoporosis (weak bones), and osteogenesis imperfecta, in which the bones are especially brittle and easily broken [8].

Studies form varies countries confirm that association between Vitamin D deficiency to other major diseases such as numerous types of cancer [1,5,9] coronary heart disease [8] diabetes [10,11], hypertension, Alzheimer's [1,6] and multiple sclerosis [12].

Production of vitamin D in human body is greatly depends on exposure to sunlight but some of the sunniest parts of the world have the highest rates of vitamin D deficiency. However numerous factors have contributed to dangerously low vitamin D levels in Saudi Arabia. The peoples of Saudi Arabia mostly followed indoor lifestyle due to extreme of temperature, besides that it is supposed to be lack of vitamin D, due to cultural traditions whereby Muslim communities avoid body exposure to sun [13,14]. Ghada states that Risk factors for hypovitaminosis D included female gender, multi-parity, season, conservative clothing style, low socioeconomic status, and urban living [2].

Although Siddiqui [13] postulates that sun exposure in Saudi Arabia is limited because women wear an abaya hiding them completely from head to toe [11,14]. In addition a lack of awareness of the importance of vitamin D is noted by Siddiqui.

However little is known about public knowledge and practice towards vitamin D among Saudi people, specific to Riyadh city. To the best of our knowledge and after a broad literature review, only two studies were found on this topic, among adult males and female student were conducted in Riyadh city of Saudi Arabia. A qualitative exploration study was done among female students and found poor practice regarding vitamin D [15]. Another cross -sectional study did in Riyadh city among adult female (n=310) to assess their knowledge and practice of vitamin D. it reported that their knowledge was insufficient [16]. On the contrary, this study aimed to find out Knowledge, and practice of vitamin D deficiency among people lives in Riyadh, Saudi Arabia.

Material and Methods

A cross-sectional study using developed questionnaire was carried out at Riyadh city, Saudi Arabia between February and

April, 2016. An online Survey tool was used to administer the questionnaire among people who lives in Riyadh, Saudi Arabia, to determine their knowledge and practice about vitamin D deficiency. An invitation message using social media (Twitter®, Facebook® and WhatsApp®), and emails to participate in this study was sent to family members, friends and community with a link to the survey. The questionnaire consisted of a 15 item questionnaire was developed from different available literature related to knowledge, and practice towards Vitamin D deficiency. Also, demographic data were collected in questionnaire. The questionnaire was translated to Arabic language utilizing a forward backward method. It was validated in pilot study among eleven of Saudi people and the Cronbach's alpha value was 0.067.

Data analysis

The completed data was entered into Statistical Package for the Social Sciences (SPSS) version 22 software (SPSS Inc., Chicago, IL, SA) for statistical analysis. Descriptive statistics include percentages, and frequency distribution was applied

Results

Table 1 gives the general characteristics of participants with age ranging from 18 to 60. More than half (54.8%) of participants aged 18 to 25. The majority of participants were females (54.2%), 45.8% were males, and about 94. Percentage of participants was Saudi. About half of participants have university degree.

Table 1. *Distribution of general characteristics of participants.*

Item	N (%)
Gender	
Male	227 (45.8)
female	269 (54.2)
Age in years	
18-25	272 (54.8)
25-59	218 (44.0)
60 or more	6 (1.2)
Nationality	
Saudi	94.2
Other nationality	5.8
Status	
Single	290 (58.5)
Married	204 (41.1)
Divorced	2 (0.4)
Smoking	
Yes	49 (9.9)
No	447 (90.1)
Language	
Arabic	296 (59.7)
Both Arabic & English	200 (40.3)
Education level	
Primary school/Intermediate school	14 (2.08)
High school	192 (38.7)
University	250 (50.4)
Master/ philosophy degree	35 (7.0)
Others	4 (0.8)

Vitamin D and sources information knowledge

Almost all participants (98.4) have heard of vitamin D. The most frequent sources of Vitamin D information were health care provider (44%), followed by friends (29.8%), and then media (26.2%) as shown in Table 2.

Table 2. *Vitamin D and sources information.*

Items	Number (N)	Percent (%)
Heard of Vitamin D		
Yes	488	98.4
No	8	1.6
Source of information		
Health care professional	218	44
Media	130	26.2
Relatives and friends	148	29.8

Vitamin D and sun exposure practice

Only 46.4% of participants reported that they like to go into the sun, and 11.3% of then use used a parasol to shade from the sun. Only 21% of participants used sunscreen products containing SPF>15, and 2.1% out of those use sunscreen daily. A few participants (13.7%) believed that they have enough sun exposure.

Approximately 43% of participants are complaining from vitamin D deficiency symptoms, versus 24% with no vitamin D deficiency. About 33.3% of the participants revealed that they did not know if they complain from vitamin D deficiency symptoms. In addition, 52.2% of participants were suffering from muscle pain. Only 9.7% of participants had taken medications for muscle pain. Results are presented in Table 3.

Table 3. *Frequency of participants' practice towards vitamin D and sun exposure.*

Items	Number (N)	Percent (%)
Do you like going in the sun		
Yes	230	46.4

No/ do not know	265	53.4
Do you often use a parasol to shade from the sun?		
Yes	56	11.3
No/don't know	440	88.7
Do you use sunscreen products containing SPF>15		
Yes	104	21
No	392	79
How often sunscreen is used?		
Everyday	60	2.1
<2 days/week	30	6
>2 days/week	16	3.2
Do you think you have enough exposure to sunlight?		
Yes		
No	68	13.7
Do not know	428	86.3
Are you complaining from vitamin D deficiency symptoms?		
Yes	212	42.7
No	119	24
Do not know	165	33.3
Do you suffer from muscle pain and fatigue?		
Yes	259	52.2
No	202	40.7
Do not know	35	7.1
Do you take treatment for muscle pain and fatigue (who suffer)		
Yes	48	9.7
NO	448	90.3

Knowledge of health benefits of vitamin D

Majority of participants (93.1%) knew that vitamin D is essential for bone health. Only 66.3% of the participants revealed that muscle pain related to vitamin D deficiency. However, 48.8% of our subjects believed that vitamin D deficiency is related to other diseases like: cardiovascular, diabetes, depression, hypercholesterolemia, cancer and multiple sclerosis, versus 14.9% believed there is no relationship and 36.7% of the participants did not know the relationship. It was interesting that majority of participants (89.3%) would like to do vitamin D test as shown in Table 4.

Table 4. *Participants' knowledge for vitamin D health benefits.*

Items	Frequency (N)	Percent (%)
Do you know that vitamin D is good for bone health?		
Yes	462	93.1
No/ don't know	34	6.9
Does muscle pain could be related to vitamin D deficiency?		
Yes	328	66.3
No	48	9.7
Don't know	119	24
Do you think that vitamin D deficiency is related to other diseases like: cardiovascular, diabetes, depression, hypercholesterolemia, cancer and multiple sclerosis?		
Yes	240	48.4
No	74	14.9
Don't know	182	36.7
Willing to undergo a test for vitamin D?		
Yes	443	89.3
No/don't	52	10.5
If you are deficient of vitamin D, do you want to take vitamin D supplementation?		
Yes	476	96.4
No/don't know	18	3.6

Knowledge of vitamin D sources

This study revealed that only 3.2% of participants do not know the sources of vitamin D. the most reported t vitamin D source was the sun (91%), followed by Vitamin D supplements (73%), milk products (47.6%), fatty fish (45.8%), and then eggs (30.8%) (Table 5).

Table 5. Frequency of responses for knowledge of vitamin D sources.

Resources	Frequency (N)	Percentage (%)
Don't know	16	3.2
Sun*	454	91.5
Water	69	13.9
Vitamin D supplement*	364	73.4
Vegetables	156	31.5
Fatty fish*	227	45.8
Eggs*	153	30.8
Fruit	198	39.9

Discussion

This study assessed the practice of participants about vitamin D and their sun exposure. This study found that less than half of the participants had expose to sun daily. This is consistent with the results of a cross-sectional study did in Riyadh city among female [16]. Our findings are lower than that of a study was done in Kuwait to assess general population' awareness, knowledge and attitude regarding sun protection, and its relation with vitamin D deficiency. It showed that many of participants (80%), exposed to sun daily [17]. We found only 21% of participants used sunscreen products containing SPF>15, and 2.1% out of those use sunscreen daily. Similar findings was found in previous studies did in Riyadh city among female [16]. Another study by Christie [15] carried out in Saudi Arabia, among female students; found that subjects had inadequate in their knowledge towards vitamin D. In addition, it found subjects had limited sun exposure due to intense heat [15].

Vitamin D deficiency is related to a number of disorders included cancer, chronic diseases and physical impairments related particularly to the bones. This study found almost all of participants (91.3%) knew that vitamin D is a vital for bone health, but less than half of participants believed that vitamin D deficiency is related to other diseases such as cardiovascular, diabetes, depression, hypercholesterolemia, cancer and multiple sclerosis. Our finding was better than previous studies, a study was done in Kuwait [18] found only 29.5% of subjects knew that. Although low levels of vitamin D is associated with cardiovascular disorders. Many studies have reported cardiovascular diseases among patients with vitamin D deficiency [19-21]. However, Our finding is better than previous studies, a study was done among Saudi female and found about 25.6% of them had correct answer towards importance of vitamin D [16]. Another study was done in Australia mentioned that 76% of subjects know that Vitamin is a good for bone [22].

The most importance sources of vitamin D are nutritional (10-20%) and the cutaneous synthesis under the action of sun light (80-90%) [23]. About 90% of respondents reported that they achieve their VD requirement by sunlight exposure, followed by Vitamin D supplements (73%), milk products (47.6%), fatty fish (45.8%), and then eggs (30.8%). These findings indicated that participants had a good knowledge and awareness about the importance of sun rays as a source of vitamin D, but they did not practice enough exposure to sun. In comparison to previous studies [18] 85.5% of subjects identified the sun as main vitamin D source, followed by milk products (60%). Although the almost of participants in the present study identified the sun and vitamin D supplements as sources of vitamin D, while a minor of participants identified accurate food sources as sources of vitamin D.

This study found the main sources of vitamin D information were health care provider (44%), followed by friends (29.8%), and then media (26.2%). Health care provider is a good contributing factor to increase patient's sufficient knowledge of vitamin D. These findings is contracts with previous studies, where 16 found the most sources of vitamin D were physicians (37.4%), followed by TV program (34.8%) and then media (32.0%). A similar study was done in United Arab Emirates reported that more than half of participants trusted that the media is the main sources of their knowledge about vitamin d deficiency [24].

Conclusion

Results showed some understanding towards the insight of vitamin D among Saudi people. But they had inadequate benefit knowledge of vitamin D particular, its effect on cardiovascular system as well as they have poor practice of sun exposure. The results emphasized the importance of establishing continuing education programs to the public helps structure more awareness and knowledge about vitamin D importance.

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