

ORIGINAL ARTICLE

Assessment of awareness, attitude and practices of vitamin D health impact among Saudi residents of Hotat Bani Tammim, South Riyadh

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ABSTRACT

Vitamin deficiency is considered to be a major public health problem in Saudi Arabia, especially during summer. The major source of vitamin D is sun exposure. People have been exposed to a lot of information regarding vitamin D, with evidence suggesting that vitamin D may be involved in numerous health conditions, subsequently creating concerns about vitamin D insufficiency. In this study, we aimed to assess the awareness, attitude and practice of vitamin D among Saudi residence of HotatBaniTammim in the Kingdom of Saudi Arabia. Total of 96 participants were selected with equal numbers of male and female ratio (46 each). The mean serum vitamin D was observed as 11.48±6.30 ng/ml for females and 18.49±8.30 ng/ml for males. The prevalence of vitamin D deficiency was significantly greater in the female group with 42.6%, as compared to only 7.55% among males in these groups. Moreover, 4.16% of females were having their BMI less than 18.5, 12.5% with BMI more than 30, and 41.66% of females were having their BMI ranging from 18.5 to 29.9. In males, 20.82% were having BMI ranging from 18.5 to 24.9, 37.5% were having more than 30 BMI whereas 41.66% of males were having their BMI ranging from 25 to 29.9. In the conclusion, we found those participants with sufficient knowledge about vitamin D intake and its role in maintaining normal health were more cautious about vitamin D besides the other reasons for low vitamin D levels such as especially in females less exposure to sun and covering their whole body which is part of cultural values in Saudi Arabia. This awareness could lead to actions that potentially improve vitamin D levels through food, supplements, and safe sun exposure.

Keywords: Vitamin D Deficiency, HotatBaniTammim, knowledge and practice, Saudi females.

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INTRODUCTION

Despite of the advancement in the awareness of human health, vitamin D deficiency is still an unrecognized epidemic and a common health problem worldwide, including Saudi Arabia. A research conducted on healthy Saudi adults revealed that low levels of vitamin D is common among the Saudi Arabian population[1]. Among adults, vitamin D sufficiency is defined as serum levels of 25(OH)D >30ng/ml and levels of 20-29 ng/ml are considered as vitamin D insufficiency while levels <20ng/ml are considered a vitamin D deficiency whereas <7 ng/mL considered a severe vitamin D deficiency [2]. Low serum levels of vitamin D might be detrimental to health, as multiple reports suggest health concerns for those with insufficient serum vitamin D levels compared to those with normal levels[3]. Sunlight is

considered the best and optimum natural source of vitamin D, as its concentration in dietary food is limited. Upon exposure to the sun ultraviolet-B, the skin starts the synthesis of vitamin D by converting 7-dehydrocholesterol to vitamin D. Hence, there is a dire need of good understanding to every human being that sun light exposure plays a vital role in the synthesis of vitamin D in the skin.

However, still awareness and knowledge regarding the health benefits of normal levels of vitamin D, and its potential implications for healthy life, is unclear to Saudi population in large [4]. It was therefore hypothesized that unawareness and lack of sufficient information of health impact of vitamin D may modulate vitamin D sufficiency in the Saudi residents belonging to HotatBaniTammim. An understanding of the Saudi population awareness, knowledge, and attitudes toward normal levels and intake of vitamin D could help guide interventions aimed at achieving sufficient vitamin D status among them[5]. To obtain the said hypothesis, the study participants were exposed to questionnaire. Therefore, the aim of the present research work is to evaluate the awareness, knowledge, and attitudes regarding vitamin D health benefits and its vital sources among Saudi resident belonging to HotatBaniTammim.

MATERIAL AND METHODS

This study was conducted in 2013 - 2014 in two seasons. The summer at May, June and July and winter at November, December and January. This study was carried out at HotatBaniTammim province, South of Riyadh, Saudi Arabia. A total of 96 apparently healthy Saudi volunteers were recruited from randomly selected general hospital within HotatBaniTammim, South Riyadh and consisted of 48 males and 48 females both gender have age from 10 to 60 years. Written informed consent from the participants was obtained prior to inclusion. Subjects with chronic conditions such as osteoporosis, type 2 diabetes mellitus, renal, liver, and gastrointestinal diseases, as well as those on any form of drug treatment with possible effects on bone metabolism (e.g. corticosteroids, anticonvulsants, and/ or thyroid hormones) were excluded from the study.

Participants were interviewed individually regarding awareness, knowledge, and attitudes to vitamin D using multiple-choice and short-answer questions, as reported in previous studies[6,7].

Awareness of vitamin D was evaluated by asking participants if they had "ever heard of vitamin D". To assess their knowledge of vitamin D, participants were asked to "name a few benefits of vitamin D", and to list "any personal characteristics that may affect an individual's serum vitamin D levels". They were also asked, "what are the various sources of vitamin D?", and "weather he/she have concerned about his/her vitamin D status. A section of the questionnaire was designed to assess attitudes to sun exposure. This section included questions such as, "do you have exposure to the sun daily for more than an hour for any reason?", and "at which time of the day do you go out in the sun?". No information was disclosed to participants, including whether their responses were correct [8].

Statistical analysis

Data was analyzed using SPSS version 16.0 (SPSS, Chicago, IL, USA). Frequencies were presented as percentages (%) and continuous variables as mean \pm standard deviation. Chi-Square test was applied to compare frequencies and independent Student-test for normally distributed continuous variables. Statistical analyses were utilized to determine the participant's knowledge of vitamin D, attitudes toward vitamin D, and sources of vitamin D. Significance was set at p-value < 0.05.

RESULTS.

Demographic status of participants

The mean age of the participants ranged from 10-60 years. Out of 96 participants, 48 were female and 48 were male (Table 1). The age of 36.5% of the studied population ranged from 30-50 years, 60.4% were married and 28.1% have bachelors certificate.

Table 1: Demographics data (Gender, age and educational levels) of all participants (n = 96).

Parameter	Participants Number (n)	Percentage
Gender		
Male	48	50 %
Female	48	50%
Age		
From 10-20 years	15	15.6%
From 20-30 years	29	30.2%
From 30-50 years	35	36.5%
From 50 years to above	17	17.7%

Social Status		
Single	38	39.6%
Married	58	60.4%
Educational levels		
No educated	13	13.5%
Certificate of primary school	6	6.3%
Certificate of middle school	15	15.6%
Certificate of secondary school	35	36.5%
Certificate of Bachelors	27	28.1%

Table 2 show that, 53.1% of participants were jobless, while 34.4% have part time work. In addition to, 5.2% of participants were have 2 and 4 persons as a family members and 57.3% have more than 7 persons in their family.

Table 2: Social data (Family members and occupations) of all participants ($n = 96$).

Treatment	Participants Number (n)	Percentage
Number of family members		
2	5	5.2%
3	15	15.6%
4	5	5.2%
5	6	6.3%
6	10	10.4%
Above 7	55	57.3%
Occupation		
Not working	51	53.1%
Working as part time	33	34.4%
Working in more than one job	12	12.5%

Table 3 indicate the mean \pm SD of serum 25(OH)D as 11.48 ± 6.30 ng/ml for females and 18.49 ± 8.30 ng/ml for males. The levels of vitamin D in serum for females were characterized as the vitamin D deficiency group, while the levels in males were in the relative insufficiency group. The prevalence of vitamin D deficiency was significantly greater in the female group with 42.6%, as compared to only 7.55% among males in these groups ($p < 0.05$). Moreover, 4.16% of females were having their BMI less than 18.5, 12.5% with BMI more than 30, and 41.66% of females were having their BMI ranging from 18.5 to 29.9. In males, 20.82% were having BMI ranging from 18.5 to 24.9, 37.5% were having more than 30 BMI whereas 41.66% of males were having their BMI ranging from 25 to 29.9 (Table 3).

Table 3: Serum concentration of vitamin D and the body mass of all participants ($n = 96$).

Treatment	Number of participants		Concentration (ng/ml)	
	F	M	F	M
Vitamin D in serum (ng/ml)	48	48	11.48 ± 6.30	18.49 ± 8.30
Body Mass Index (BMI) Kg/m ²				
Less than 18.5	2	0	4.16%	0%
From 18.5-24.9	20	10	41.66%	20.83%
From 25-29.9	20	20	41.66%	41.66%
More than 30	6	18	12.5%	37.5%

Health status of participants

The results in Table 4 show that 70.83% of the participants were healthy, while 29.2% were not healthy. The results in the same table indicate the general health information sources for 41.7% participants were from television, 38.5% from internet and social media, 11.5% know from their friends, 8.3% from the clinical health care.

Table 4: Distribution of participants according to their health information

Question	Answer	n	Percentage
How to you find your health?			
	Non healthy	28	29.2%
	Healthy	68	70.83%
Are you have any health problems?			
	Yes	51	53.1%
	No	45	46.9%
What are your sources of medical information?			
	Television	40	41.7%
	Physician	8	8.3%
	Friends	11	11.5%
	Internet	37	38.5%

Moreover, 1% of the participants take daily dose of vitamin D, 87.5% consume rich vitamin D foods and 12.5% don't take any food containing high contents of vitamin D (Table 5). 45.8% of the participants got aware about the importance of vitamin D from television, 22.9% from internet, 18.8% from their private physicians, 12.5% from newspapers. 83.3% of the participants always wear clothes covering their whole body from sunlight, 5.2% of them were rarely wearing like these clothes. While 11.5% sometimes wear such clothes. Moreover, 46.9% don't receive adequate amount of vitamin D, 26% have no information about importance of vitamin D, 10.4% have chronic disease and 9.4% reported that their food is deficient in vitamin D, whereas 7.3% don't have exposure to sunshine. Moreover, 19.8% of the participants have good health due to the healthy behavior, 14.6% stated that the main factor responsible for their health is the clinic care centers. Moreover, 10.4% of the studied participants considered their chronic diseases as major cause of not taking vitamin D.

Table 5: Distribution of participants according to their vitamin D information

Question	Answer	n	Percentage
Are you taking daily dose of vitamin D?			
	Yes	1	1%
	No	95	99%
Are you take high content food with vitamin D as salmon, mackerel fish, tuna, mushroom, butter and milk?			
	Yes	84	87.5%
	No	12	12.5%
What are your sources of information about vitamin D?			
	Television	44	45.8%
	Physician	18	18.8%
	Newspapers	12	12.5%
	Internet	22	22.9%
Are you wear anything that protect you from sunlight?			
	Always	80	83.3%
	Sometimes	11	11.5%
	Rarely	5	5.2%
The reason of not getting enough amount of vitamin D is:			
Avoid the exposure to sunlight		7	7.3%
Low content of vitamin D in food		9	9.4%
Don't taking any vitamin D supplementation		45	46.9%
Less information about vitamin D		25	26%
Chronic diseases and other health problem prevent me from taking vitamin D.		10	10.4%

The characteristics of participants regarding the vitamin D knowledge are shown in Table 6. Ninety nine percent of participants responded that vitamin D is synthesized as a result of sun exposure. 97.9% of

participants mentioned the importance of vitamin D in the bone composition and strength, 60.4% believe the importance of vitamin D in the prevention of diabetes and cardiac disease. 39.6% of participant's report wearing clothes that cover the whole body don't prevent the sunshine to synthesize vitamin D, 77.1% stated that the Saudi population is suffering from deficiency of vitamin D.

Table 6: Distribution of participants according to their levels of vitamin D knowledge

Parameters		n	Percentage (%)
Vitamin D is synthesized when we are exposure to sunlight?	Know	20	20.8
	Not know	76	79.1
Vitamin D is important in strength of our bone	Know	30	31.2
	Not know	66	68.75
Vitamin D protect us from diabetes and cardiac disease	Know	15	15.6
	Not know	81	84.3
Wearing of sunscreen prevent synthesizing of vitamin D	Know	38	39.6
	Not know	58	60.4
Vitamin D deficiency is common in KSA	Know	22	22.9
	Not know	74	77.1
Infant who did not get breast milk are common to have vitamin D deficiency	Know	26	27.1
	Not know	70	72.9
Vitamin D deficiency among adults give them bone fractures at old age	Know	11	11.5
	Not know	85	88.5
Vitamin D preventing from colon, prostate and breast cancer	Know	42	43.8
	Not know	54	56.3
Using of vitamin D help in the reduction of mortality percentage	Know	27	28.1
	Not know	69	71.9
Exposure of hands and face to sunlight for 20 minutes in a day help body for synthesizing sufficient vitamin D	Know	42	43.8
	Not know	54	56.3
The recommended daily dose of vitamin D is 600 I.U for adults	Know	19	19.8
	Not know	77	80.2

DISCUSSION

Vitamin D deficiency is a major metabolic syndrome that mainly worsens the bone health in the form of bone growth, retardation and the development of classic signs and symptoms of rickets, osteopenia and osteoporosis [9].

Kingdom of Saudi Arabia in spite being a sunny subtropical country, with maximum span of summer in all seasons, is now widely known to have comparable vitamin D deficiency as other part of globe[10,11]. This source of information, sociodemographic and economic factors of the residents strongly influenced their vitamin D levels in the body. Interestingly, a high inconsistency was observed between what people think about their vitamin D status and their actual status.

The present study found significant number of both males and females with vitamin D deficiency/insufficiency, however percentage of female who are deficient in vitamin D is more than males. Traditionally females here in KSA are not much exposed to outdoors and though in local Saudi population both males and female usually covers whole body and limbs, but in general, Saudi Arabian females use to cover their arms and face also[12, 13], which can contribute to more pronounced vitamin D deficiency in them [14]. Skin exposure to sunlight is of prime importance as vitamin D is synthesized from a precursor 7-dehydrocholesterol naturally present in the skin[15]. This is one of the reasons that elderly people usually have low vitamin D level as skin concentration of 7- dehydrocholesterol gradually declined with growing age. A 70-year-old male will have 25% less of this vitamin D precursor than a young adult [16].

In our study we observed that, 79% of participants did not know the sun exposure importance in synthesis of vitamin D (primary source of vitamin D)[17], in contrary to cited previous studies in which high proportions of people associated sunshine with vitamin D[8, 19, 20]. Dietary sources of vitamin D mainly include fatty fish (salmon, mackerel), eggs, dairy products and some mushrooms, although the contribution of these sources to vitamin D status is low compared to sun exposure[17, 21].

Participants also attributed a role to vitamin D in other health conditions such as diabetes, cancers, and cardiovascular diseases, as previously observed[22, 23]. A better understanding of the role of vitamin D in these health outcomes represents interesting research perspectives and is needed to achieve a clear consensus.

Television was the first source of information in our observed population, especially for women and older participants. This source was associated with better knowledge regarding vitamin D, (45.8%) while the

second source of information was internet and multimedia (22.9%) while 18.8% of participants consider physician as their health educator. Whereas, other studies have shown that physicians are a major source of vitamin D-related information [24, 19, 20]. This highlights the important role played by physicians (trusted source of information) in the education of their patients[25, 26].

In our study, 22.9% of the participants got awareness about vitamin D by television, as is previously reported [26, 23,19].

Clothes area main blocker to sun exposure and therefore 25(OH)D synthesis and status; in this study, we found that females wearing hijab and Abbayahave low levels of 25(OH)D. Sun exposure to covered face and hands as in dressed females is not considered enough for vitamin D synthesis[27-29].

CONCLUSIONS

In this study, we found those with more knowledge were more cautious about vitamin D. Probably those who understand the importance of vitamin D and health risks due to their deficiency motivate themselves with prospective precautionary solutions. Thus, public education regarding the importance of vitamin D and the risk of deficiency may increase concern on serum vitamin D titer at both the population and individual level. This awareness could lead to actions that potentially improve vitamin D levels through food, supplements, and safe sun exposure.

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