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The Prevalence of People Knowing the Importance of Vitamin D to The Skin in Saudi Arabia

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ABSTRACT

Background: despite the availability of knowledge and multiple educating social medias, the prevalence of people who know the importance of vitamin D to the skin in Saudi Arabia is decreasing these days.

Objectives: This study was done to know the prevalence of people knowing the importance of vitamin D to the skin in Saudi Arabia.

Methods: a cross-sectional study on knowing the prevalence of people knowing the importance of vitamin D to the skin in Saudi Arabia was done from January to April 2018 on 864 participants within many different social media platforms.

Results: only (36%) of the participants know the importance of vitamin D to the skin, (36.7%) of the participants have checked their vitamin D level at a certain time of point, (25.1%) of the participants have been diagnosed with a vitamin D deficiency,(66%) of the participants know the sources of vitamin D, (63.1%) of the participants know the consequences of vitamin D deficiency, (42.9%) of the participants usually get exposed to the sunlight, only (18.3%) of the participants use vitamin D supplements, (47.3%) of the participants know the symptoms of vitamin D deficiency, (37.8%) of the participants have a current skin disease and more than half of the participants (55.9%) think that the society has a role in educating people about the importance of vitamin D.

Conclusion: at the end of this study, there is a decrease number of participants who know the importance of vitamin D to the skin in Saudi Arabia.

Keywords: vitamin D, skin, supplements.

INTRODUCTION

Vitamin D is very unique because it can be made in the skin from the exposure to the sunlight [(1)]. Vitamin D has two forms. Vitamin D2 which is made from the UV irradiation of the yeast sterol ergosterol and is found naturally in sun-exposed mushrooms. UVB light from the sun insert the skin, and humans synthesize vitamin D3, so it is the most natural form of vitamin D. Human beings do not make vitamin D2, and most oil-rich fish like mackerel and salmon contain vitamin D3. Vitamin D that is ingested in the human body is incorporated into chylomicrons, which are absorbed into the lymphatic system and enters the venous blood. Vitamin D that comes from the skin or diet is biologically not active and requires its first hydroxylation in the liver by the vitamin D-25-hydroxylase (25-OHase) to 25(OH)D [(2)]. However, 25(OH)D requires a further hydroxylation by the 25(OH)D-1-OHase (CYP27B1) in the kidneys to form the biologically active form of vitamin D 1,25(OH)2D [(2)].1,25(OH)2D stimulates intestinal calcium absorption [(3)]. Without the availability of vitamin D, only 10–15% of dietary calcium and about 60% of phosphorus are absorbed. Vitamin D availability enhances calcium and phosphorus absorption by 30–40% and 80%, respectively [(4)].

Vitamin D receptor (VDR) is present in most tissues and cells in the human body [(5,6)]. 1,25(OH)2D has multiple biological functions, such as inhibition of cellular proliferation, inhibiting angiogenesis, stimulating insulin production, inhibiting renin production, stimulating macrophage cathelicidin production and inducing terminal differentiation [(7)]. 1,25(OH)2D may be responsible for regulating up to 200 genes that may facilitate many of the pleiotropic health benefits that have been reported for vitamin D [(8,9)]. Vitamin D has a role in skin differentiation, 1,25(OH)2D has an important and interacting functions in regulating the skin differentiation process. 1,25(OH)2D increases the expression of loricrin, involucrin, transglutaminase and

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filaggrin and increases keratinocytes formation while inhibiting proliferation [10,11]. These actions are due to the ability of 1,25(OH)2D to increase intracellular calcium levels achieved by induction of the calcium receptor and the phospholipase C that are critical for the ability of calcium to stimulate keratinocyte differentiation [12,13]. Mice lacking the VDR show defective epidermal differentiation manifesting as reduced levels of involucrin and loricrin and loss of keratohyaline granules [14,15].

MATERIALS AND METHODS

A cross-sectional study involving 864 participants all over Saudi Arabia was done between January to April 2018. The sample size for this study was selected and distributed randomly. A self-administered questionnaire was developed after a careful review of literature on the subject and it includes 13 questions to people in Saudi Arabia. The questionnaire had two parts. Part one; demographical data that includes age, gender and marital status. Part two; the participants were asked whether they have checked their vitamin D level or not, whether they have vitamin D deficiency or not, do they know the sources of vitamin D, do they know the consequences of vitamin D deficiency, do they know the importance of vitamin D to the skin, do they usually expose themselves to the sunlight, do they use vitamin D supplements, do they know the symptoms of vitamin D deficiency, whether they think that the society has a role in educating people about the importance of vitamin D or not and whether they a current skin disease or not. Data were collected by through a survey that was distributed through a website-link through participants in Saudi Arabia in different social media sites and platforms**.** Statistics were descriptively used to describe the answers of the participants in the study using numbers and percentages.

The answers were compared for different questions within the different groups using Pearson chi-square test. Statistical significance was set at $p < 0.05$ and analysis was performed using IBM SPSS statistics, version 23 (IBM, Armonk, NY, USA).

The study was done after approval of ethical board of University of Hail.

RESULTS

A total of 864 participant women from all over Saudi Arabia were participated in the study and 44.9% of them are between the ages of 20 to 30 years old, 24.1% were between 30 to 40 years old, 21% were between 10 to 20 years old and only 9.3% were more than 40 years old (Table1). More than half of the participants 57.6% were single and 42.4% are married (Table 2). Regarding the participants who have checked their vitamin D level, only 36.7% of the participants have checked their vitamin D level and 25.1% have a vitamin D deficiency (Table 3). 66% of the participants knew some sources of vitamin D, 63.1% of the participants knew the consequences of vitamin D deficiency to the human body, only 36% of the participants have the experience of the importance of vitamin D to the skin, only 42.9% of the participants usually expose themselves to the sunlight and only 18.3% of the participants use vitamin D supplements and almost half of the participants (Table 4). 47.3% know the symptoms of vitamin D deficiency (Table 5). 37.8% of the participants have a current skin disease (Table 6). More than half of the participants 55.9% thought that the society has a role in educating people about the importance of vitamin D (Table 7).

Table (1): Age distribution of the participants:

Age	Frequency	Percent
1-10	7	0.7
10-20	181	21
20-30	388	44.9
30-40	208	24.1
>40	80	9.3
Total	864	100

Table (2): Marital status and gender of the participants:

Marital status	Frequency	Percent
Single	498	57.6
Married	366	42.4
Total	864	100
Gender		
Male	585	67.7
Female	279	32.3
Total	864	100

Table (3): Participants who checked their vitamin D and have vitamin D deficiency:

Checked vitamin D	Frequency	Percent
Yes	317	36.7
No	547	63.3
Total	864	100
Have vitamin D deficiency		
Yes	217	25.1
No	108	12.5
I don't know	539	62.4
Total	864	100

Table (4): Multiple questions about the participants and vitamin D:

Know the sources of vitamin D	Frequency	Percent
Yes	570	66
No	294	34
Total	864	100
Know the consequences of vitamin D deficiency		
Yes	545	63.1
No	319	36.9
Total	864	100
Know the importance of vitamin D to the skin		
Yes	311	36
No	553	64
Total	864	100
Usually get exposed to the sunlight		
Yes	371	42.9
No	493	57.1
Total	864	100
Use vitamin D supplements		
Yes	158	18.3
No	706	81.7
Total	864	100

Table (5): Participants who know the symptoms of vitamin D deficiency:

Know the symptoms of vitamin D deficiency	Frequency	Percent
Yes	409	47.3
No	455	52.7
Total	864	100

Table (6): Participants who have a current skin disease:

Have a current skin disease		
Yes	327	37.8
No	537	62.2
Total	864	100

Table (7): Participants who think that the society has a role in educating people about the importance of vitamin D:

Think that the society has a role in educating people about the importance of vitamin D	Frequency	Percent
Yes	483	55.9
No	381	44.1
Total	864	100

DISCUSSION

In the present study, we found that there was an increased number of people who do not know the importance of vitamin D to the skin. Vitamin D has a role in preventing multiple disorders like psoriasis, skin cancer, ichthyosis, autoimmune skin disorders such as vitiligo, blistering disorders, scleroderma and systemic lupus erythematosus, as well as atopic dermatitis, acne, hair loss, infections and photodermatoses [(16)]. Even though, it remains speculative whether vitamin D deficiency primarily contributes to disease pathogenesis or merely represents a consequential event to the inflammation processes that occurs. A recent systematic review including 290 prospective cohort studies and 172 randomized trials of major health outcomes and of physiological parameters related to disease risk or inflammatory status showed that there is one solid fact is emphasized; vitamin D deficiency appears to be a marker of illness to health regardless of being an actual cause or an association [(16)]. Vitamin D has a role in skin differentiation and proliferation since both calcium and 1,25(OH)2D perform important and interacting functions in regulating the skin differentiation process [(17)]. 1,25(OH)2D causes an increase in the expression of transglutaminase, involucrin, loricrin, and filaggrin and increases keratinocyte envelope formation while inhibiting proliferation process [(18)]. Vitamin D has arole in wound healing process since 1,25-Dihydroxyvitamin D3 regulates the expression of cathelicidin an antimicrobial protein that appears to mediate innate immunity in skin by promoting wound healing and tissue repair [(19)]. This shows that (36.7) % of the participants have not checked their vitamin D level and (25.1%) of the participants have a vitamin D deficiency. 37.8% of the participants have a current skin disease and almost half of them (44.1%) don not think that the society has a role in educating people about the importance of vitamin D deficiency which reflects the present status than a huge number of the participants have not checked their vitamin D level.

CONCLUSION

We can conclude that there is an increased number of people who do not know the importance of vitamin D to the skin in Saudi Arabia. People should pay more attention to their vitamin D level and how to deal with a deficiency once occurred since vitamin D affects the skin and the whole body in general. Society and doctors should inform and teach people about the importance of vitamin D to the skin and how to know the early symptoms of vitamin D deficiency.

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