

Knowledge and Health Behavior about Vitamin D during Epidemic COVID-19 among Female University Students

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Abstract

Background: Vitamin D deficiency it considers a global health problem and a significantly linked with skeletal and non-skeletal problems. Prevention can be kept by sun exposure or supplementation and to lower extent by dietary intake.

Objective: to assessed knowledge and health behavior regarding the vitamin D during epidemic COVID-19 among female university students

Methodology: A descriptive study was conducted, total of 400 femal student aged between 20 and 30 years who study in university, institute, from 7th July 2020 to 30 September 2020, by using electronic form and freely agree to participate in the research project. The validity was estimated through a penal of experts related to the field of study. Data was analyst through the implementation of descriptive and inferential statistical analysis.

Results: The results of this study show that the knowledge of the study sample was low regarding student knowledge in some item while there is high score about the importance of vitamin D, so us the grand mean above the cut of point duo to the behavior

Recommendations: It was recommended increasing awareness about the importance of vitamin D and guidelines on how to obtain it were necessary by (food, sun exposure) especially in period of epidemic COVID-19

Key words: *The vitamin D, Knowledge, epidemic COVID-19 and student.*

Introduction

Vitamin D was defining as the sunshine vitamin. It considers as one of the older hormones that made in the early life forms for over 750 million years. Phytoplankton, zooplankton and most plants and animals that have been exposed to sunlight can producing vitamin D (1).

So low vitamin D status its prevalence has been reported to be high, with approximately 50% of the world population they be affected. We usually can assess vitamin by measuring the serum 25-hydroxyvitamin D (25(OH) D) concentration (2).

Vitamin D is made when the skin exposed to UVB radiation as a result of photolysis of 7-dehydrocholesterol and another source of vitamin D from food (3,4).

Previous studies found independent associations between low serum concentration of 25-hydroxyvitamin D and portability to acute respiratory tract infections, globally experiencing its third epidemic of coronavirus (CoV) infections (5).

A first CoV infection epidemic began in Wuhan, Hubei, China, in end 2019, and "renamed COVID-19 by the World Health Organization on February 11, 2020. (6)

Farther role vitamin D is also known to function in the immune system, which is a key reason why some think it's believable the nutrient might impact COVID-19 (7,4).

The recommendations for the prevention of the increase of COVID-19 from the WHO "In situations

where individuals' vitamin D status is already marginal or where foods rich in vitamin D (including vitamin D-fortified foods) are not consumed, and exposure to sunlight is limited, a vitamin D supplement in doses of the recommended nutrient intakes (200-600 IU, depending on age)⁽⁸⁾.

Aim of Study: Our study provides a comprehensive view regarding the recent knowledge health behavior about vitamin D during epidemic COVID-19 among female student

Methodology

A descriptive study was conducted, total of (400) female student aged between 20 and 30 years who study in Baghdad college of medical science, medical institute, higher institute for health from 7th July 2020 to 30 September 2020, by using electronic online form and freely agree to participate in the research project. Questionnaire links are sent via email, WhatsApp by giving electronic consent.

The validity was estimated through a panel of experts related to the field of study, so the reliability was evaluated through a pilot study conducted included (10) student (except from the original sample). Data was analyzed through the implementation of descriptive and inferential statistical analysis.

The questionnaires were consisted of four parts, socio-demographic characteristics and vit D knowledge, behavior.

The data was analyzed by using (Statistical Package of Social Sciences SPSS) software descriptive statistics (frequency, Percent, Mean of score (M.S.), and inferential statistics (Chi Square). The items of student documentation were rated on two levels: know, and don't know, and scored as 2 and 1, respectively. Mean of score Low (1-1.49), Moderate (1.5-1.75), and High (1.76 – 2] behavior documentation was rated (Yes, Sometimes, No) which are scored as (3, 2, 1) for each level respectively. The health behaviors cutoff point = 2. Low (1.5-1.99), Moderate (2 – 2.29), and High (2.30 - 3)

Results of the Study

Table (1): Distribution of female university students by Their Demographic Characteristics (N= 400)

Variable	Group	No.	%	Cum. %
Age /Years	18-23	294	73.5	73.5
	24-29	62	15.5	89.0
	30 and above	44	11.0	100.0
Level of education	Institute	341	85.3	85.2
	college	59	14.8	100.0
Resident	City center	252	63.0	63.0
	Out of city	148	37.0	100.0
Type of house	Horizontal	19	4.8	4.8
	Transfer	381	95.2	100.0
Do you check vit D	No	249	62.2	62.3
	Yes	151	37.8	100.0
If yes what is the result	Normal	83	55.0	55.0
	Abnormal	68	45.0	100.0
If abnormal you take supplement	No	15	22.0	22.0
	Yes	53	78.0	100.0

Table (1) reveals that (73.5%) ages were between (18-23) years old, and most of them were Institute. Furthermore, (63.0 %, 95.2%) of sample live in City center with Horizontal house, most of them they didn't check vit D.

Table (2): Distribution of female university students knowledge about vitamin D (N=400)

Variable	N =400					
	No		Yes			
	F	%	F	%	MS	Asses.
Have you ever heard/learnt about vitamin D	19	4.8	381	95.3	1.95	H
If Yes where have you heard or learn about vitamin D internet	115	28.7	285	71.3	1.71	M
Doctor	188	47.0	212	53.0	1.53	M
nurse	189	47.3	211	52.8	1.52	M
Friends/Relatives	172	43.0	228	57.0	1.57	M
School/university	165	41.3	235	58.8	1.58	M
Do you have any signs of vitamin D deficiency like?						
-Muscle pain	203	50.7	197	49.3	1.49	L
-Mood disturbance	121	30.2	279	69.8	1.69	M
-skin wrinkles	304	76.0	96	24.0	1.24	L
-constipation	282	70.5	118	29.5	1.3	L
-osteoporosis	269	67.3	131	32.7	1.32	L
-loos of hair	108	27.0	292	73.0	1.73	M
Tendency to infection	221	55.3	179	44.7	1.44	L
Do you know the source of vitamin D?						
-Food	70	17.5	330	82.5	1.82	H
-Sun	45	11.2	355	88.8	1.88	H
-Supplement	121	30.2	279	69.8	1.69	M

Table (2) indicated that most of them (95.3 %) was heard about vitamin D half of them they heard from the same source and so as the signs except loos of hair (73.0%)

Low (1-1.49), Moderate (1.5 – 1.75), and High (1.76 –2]

Table (3): Assessment of female students' knowledge related to the Vitamin D deficiency

No	Items	N =400			
		NO F	Yes F	M S	Asses
1.1	Knowledge about Vitamin D				
1.1. a	Normal range of vitamin D 30-50 ng/ml	198	202	1.50	M
1.1. b	Almost, deficiency of calcium associated with (vitamin D) deficiency	137	263	1.65	M
1.1. c	Vitamin D works to absorb calcium and phosphors from intestine	230	170	1.43	L
1.1. d	Proteins can facilitate the absorption of calcium from intestine	232	168	1.42	L
1.1. e	Adult need 600iu of (vitamin D)	257	143	1.36	L
1.1. f	Vitamin D requirement for individual aged over 50 years should be doubled from (5-10) mcg.	216	184	1.46	L
1.1. g	Vegetarian people are more likely to have vitamin D deficiency	202	198	1.49	L
1.1. h	There are two type of vitamin D2 and D3	227	173	1.43	L
1.2	Source of vitamin D				
1.2. a	Vitamin D is higher in animal meat than vegetables and fruits	92	308	1.77	H
1.2. b	A fat-free food may be a cause of vitamin D deficiency	270	130	1.3	L
1.2. c	Human skin can synthesize vitamin D by exposure to sun light	47	353	1.88	H
1.2. d	People living in cloudy regions are more likely to vitamin D deficiency	82	318	1.79	H
1.2. e	People with dark skin is more exposed to vitamin D deficiency	263	137	1.34	L
1.3. a	Important of Vitamin D in the maintenance of bone and teeth	51	349	1.87	H
1.3. b	Vitamin D helpfullin strengthen theimmunity	72	328	1.82	H
1.3. c	Vitamin D helps to promotion of muscles	70	331	1.83	H
1.3. d	Vitamin D is important in prevention kidney disease	221	179	1.44	L
1.3. e	Vitamin D is important in prevention cancer	243	157	1.4	L
1.3. f	Vitamin D toxicity may lead to hypercalcemia leading to calcinosis	225	175	1.43	L
1.3. g	Vitamin d in pandemic COVID 19 increase body immunity	89	311	1.77	H
1.3. h	Vitamin D deficiency lead to rickets in children	66	334	1.83	H

Cont... Table (3): Assessment of female students’ knowledgerelated to the Vitamin Ddeficiency

1.3.j	decrees the amount of vit D by pregnancy and lactation	127	273	1.68	M
1.3.k	decrees the amount of vit D by smoking	203	197	1.49	L
1.4	Signs of vitamin deficiency				
1.4.a	low mood	120	280	1.70	M
1.4.b	skin wrinkles	169	231	1.32	L
1.4.c	constipation	171	229	1.57	M
1.4.d	osteoporosis	69	331	1.82	H
1.4.e	Hair loos	52	348	1.87	H
1.4.f	fatigues	68	332	1.83	H
1.4.g	Increase tendency to infection	123	277	1.69	M

Low (1-1.49), Moderate (1.5 – 1.75), and High (1.76 –2]

Table (3) demonstrate that there is Low students ‘ knowledge, in(6) item with mean of scores (MS) low than (1.49) while there are high students ‘ knowledge(5) item about important of vitamin with mean of scores (MS) more than (1.76)and so us students ‘ knowledge related to signs.

Table (4): Assessment of female student’shealth behaviorrelated to the Vitamin D

N0	Items	N =400			
		N0	sometime	Yes	M S
1.1	Exposure to sun Your exposure to sun light 10 minute in the day	29	134	237	2.52
1.2	The ideal time to exposure in the morning 9-10am afternoon 3-4 pm	57	147	196	2.34
1.3	Face, head and hand exposed one factors that decrease the amount of VD in the body	51	109	240	2.47
1.4	Put of sun creams may be a causing vitamin D deficiency	220	84	96	1.69
1.5	Walking and doing Exercise outwhen sunshine for at least half an hour daily	155	103	142	1.96
Grand mean=2.2					
2.1	food Do you take food rich invitamin d such as egg,	33	58	309	2.69
2.2	Meat and fish	19	62	319	2.75

Cont... Table (4): Assessment of female student’s health behavior related to the Vitamin D

2.3	Milk one cup at least in a day	80	151	169	2.22
2.4	Vegetable and fruit	14	63	323	2.77
2.5	Nut and walnuts	32	174	194	2.40
Grand mean=2.5					
3.1	supplement Do you take vitamin d supplement	173	105	122	1.87
3.2	Do you take omega3 supplement	198	107	95	1.74
3.3	Do you take calcium supplement	251	81	68	1.54
3.4	Do you take vitamin d supplement during covered 19	171	86	143	1.93
3.5	Do you encourage family and friend to take supplement during covered 19	53	49	298	2.61
Grand mean=1.9					

Table (4) Reveals that the mean of score of all items related to students ‘ health behaviors about Exposure to sun, food were above of cutoff point and grand mean score was (2.2)(2.5) which indicates for good health behaviors while the grand mean score of items related supplement was (1.9) lower than cut off point

Table (5) Association between Level of Knowledge, behavior of Study Sample and Studied Variables

Studied variables	Knowledge level		χ^2	d. f	P-value	Sig.	Behavior level			χ^2	d. f	P-value	Sig.	
	unacceptable	Acceptable					low	moderate	high					
	No	No					No	No	No					
Age / Years	18-23	42	252	5.681	2	.058	NS	12	234	48	9.208	4	.056	NS
	24-29	13	49					3	40	19				
	30-above	2	42					0	34	10				
Level of education	institute	50	291	0.322	1	.570	NS	12	262	67	0.528	2	.768	NS
	college	7	52					3	46	10				
resident	city	36	216	.587	1	.979	NS	8	194	50	.725	2	.696	NS
	Out of city	21	127					7	114	27				
Hear about vitamin D	no	9	10	17.905	1	.000	S	2	16	1	4.604	2	.099	S
	yes	48	333					13	292	76				

Table (5) demonstration that there was no statistically significant relationship among studied variable, and level of Knowledge and behavior

Discussion

1 -Demographic characteristics of study sample.

Regarding age group, more than half of student their ages were between (18-23) Years old. This study focuses on 20- to 30-year-old of female student, because of the high incidence of vitamin D deficiency in young female student due to pregnancy and lactation and they are a critical period in development of lifestyles which are very significant in future health. "In general undergraduate students tend to engage in problematic eating behaviors, unhealthy dieting, eating of fast foods, low fruits and vegetables taking"⁽⁹⁾. This result is similarly with a study done in Malaysian that majority of the Participant (50.8 %) from medical school, age 21-25 years old (61.2%)⁽¹⁰⁾.

Most study sample living in houses that mean they can exposure to sun light better than who live in department so study in Saudi Arabia found the most of the students think that vitamin D deficiency is widespread just in high-risk groups limited to urban areas⁽¹¹⁾.

When ask the student about if they check vit D level more than half didn't check that mean they didn't aware about the important of and so us student in Saudi Arabia they not realize that vitamin D deficiency was attained epidemic rates across the world irrespective of age groups, and geographical area⁽¹¹⁾. and 78.0 who had low level they take supplement 95.3%) of the student heard or learn about vitamin D that result similar with study in Karbala found two-thirds of the study sample they heard about Vitamin D and were aware of its importance, symptoms of Vitamin D deficiency"^(12,7).

The source of information we found (71.3%) of study sample was internet and the same result from (doctor, nurse, relative and school) Our findings were nearly in line with the results by Ming Zhou (2016) found that most of the participants (59.5 %) they had achieved information about vitamin D from the mass media (Internet, television, radio, newspapers), while 43.3 % got their information from (doctors, teachers) and 25.0 % stated that their information was given by colleagues.⁽¹³⁾

About if there were any signs of deficiency appear on study sample most of them 73.0 they had loss of hair This may be not all of them had deficiency may be from another medical causes most of them know the source of vitamin (food 82.5%, sun 88.8%, supplement 69.8%) this result agree with study done in Saudi Arabia found most common source of Vitamin D in exposing to sun (57.2%), followed by Vitamin D-rich foods (51.2%) and supplements (18.8%)⁽¹²⁾.

2-Student' knowledge related to the Vitamin D deficiency

2.1. Knowledge about of Vitamin D and Its Deficiency.

There is low students ' knowledge, in (6) item with mean of scores (MS) low than (1.49) related to benefits of vitamin like Vitamin D works to absorb calcium and phosphors facilitate the absorption of calcium from intestine and adult need of the Vitamin D 600 IU this study agree with study in Malaysia found only 11% of participant have right identified as 600 IU daily while only 11.9% of participant identified the time needed for a fair-skinned individual.⁽¹⁴⁾

So, us study in Iraq found less than half (46.4%) of the subjects were knew that there is a relation between VD and calcium. Little percent (19%) of the subjects had a good level of knowledge⁽⁷⁾.

2.2. Knowledge about source of Vitamin D deficiency they are high mean of score in tow item (food, Human skin can synthesize vitamin D by exposure to sun light, person residing in cloudy areas are more likely to vitamin D deficiency)

So us results in a French they found 72% of participants reported sun exposure as the main source of vitamin D and 50–60% of them found right food sources like fatty fish⁽¹²⁾.

In Iraq 2018 study found half (48.2%) of the subjects had regular sun exposure. Most subjects (85.7%) had been included foods rich in VD to their meal.⁽¹³⁾ and study in Pakistan stated dark skin is more likely to vitamin D deficiency and only 36% participants identified that sunlight exposure influenced vitamin D production⁽¹⁵⁾.

2.3. Knowledge about Important of Vitamin D there are high students ' knowledge in (5) item about important of vitamin with mean of scores (MS) more than (1.76) Vitamin D helps to strengthen immunity, and helps to strengthen muscles, Vitamin D in pandemic COVID 19 increase body immunity

Gupta (2014) found that bone and skeletal illness as a complication of deficiency are (94.4%), majority of study sample were ignorant of the other systemic consequences (diabetes mellitus cardiovascular problem) (16).

WHO assess "should delineate the protective factors in anti-infective agents that might protect against infection and factors that improve the outcome once the infection has been produced"⁽⁵⁾.

Epidemiological studies found links between circulating levels of 25-hydroxyvitamin D (25[OH]D; the biomarker of vitamin D status) and severity of COVID-19 are now limited in number. Two ecological studies have reported inverse correlations between vitamin D status and COVID-19 incidence and mortality⁽¹⁷⁾.

2.4. Knowledge about signs of Vitamin D deficiency there are high students ' knowledge (3) item (osteoporosis, Hair loss, fatigue) so this result disagree with study carried out in United Kingdom, found more than two-thirds of participants with low level of knowledge about the common symptoms of vitamin D deficiency⁽¹⁸⁾. participants were aware of the symptoms of Vitamin D deficiency such as tiredness, low mood, muscle, and bone pain⁽¹²⁾.

3. Assessment of female university student's health behavior related to the Vitamin deficiency Study result that the mean of score of all items related to students ' health behaviors about Exposure to sun, food was above of cutoff point and grand mean score was (2.2) (2.5) which indicates good health behaviors while the grand mean score of items related supplement was (1.9) lower than cut off point and when ask the student if they encourage family and friend to take supplement during covid 19, we found (2.61).

study done in our country found more (51.9%) reported the duration of daily sun exposure of the

subjects was 10-20 min. Face and hands were the most parts that had been exposed to sun. and they found the main reasons for being not exposed to sunlight that were indoor lifestyle and hot weather⁽⁷⁾. and so our study in Qassim Region (2018) they found Approximately half (51.2%) of the participants reported eating Vitamin D-rich foods such as milk, oily fish, and eggs. The majority (83.5%) of the participants drank 1 or 2 cups of milk every day. Only 18.8% of the participants took Vitamin D supplements and 19.6% took multivitamins. when they were exposed to sunlight⁽¹²⁾.

In line of benefit of vitamin during covid 19 study in Italy say «we conclude that the causal link between vitamin D levels and COVID-19 cannot be assumed at present. Indeed, we would like to point out that, even in the presence of strong and significant associations, a causal role of hypovitaminosis D in facilitating COVID-19 spread»⁽¹⁹⁾.

5- Association between Level of Knowledge, behavior of study sample there was no significant relationship among studied variable, and level of Knowledge and behavior. So, the medical student has unsatisfactory knowledge, inappropriate behavior. Study done in Karbala found There is no statistical association between age, education, marital status or occupation and the mean practice score (P value > 0.05)⁽⁷⁾.

Conclusion

Our study found a low student knowledge in some item while high score about the importance of vitamin D, so our the behavior and there was no statistically significant relationship among studied variable, and level of knowledge and behavior that mean there is medical knowledge deficit among student

Conflict of Interest: Nil

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Recommendation:

1-increasing awareness in the importance of vitamin D and guidelines on how to obtain it are necessary like(food, sun exposure)

2- more research in specific areas including the prevalence of vitamin D deficiency

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