

## Awareness Regarding Vitamin D Amongst The Medical And Non-medical Students Of Karachi

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### ABSTRACT

**Objective:** To assess the awareness regarding Vitamin D amongst medical and non-medical students.

**Study Design and Setting:** A cross-sectional study was conducted during the period December 2016-June 2017 on a sample size of 388 subjects.

**Methodology:** Undergraduate medical and dental students that are in their 3rd or 4th year, house officers, post graduate trainees and graduate medical students were included in the study. Undergraduate and graduate students from non-medical institutes were also included. The participants were assessed on the basis of a questionnaire which contained 15 closed ended questions.

**Results:** The age of participants in this research varied from 21 to 35 years with the mean age of 24. Male subjects were 25 % but the females were predominant in this study, calculating 75%. Medical subjects were 70.4% (n= 273) and Non-medical subjects were 29.6% (n= 115). Undergraduates were 79.4% (n=308) and Graduates were 20.6% (n=80). An overall of 75% of the medical subjects have satisfactory knowledge as compared to 25% of the non-medical subjects.

**Conclusion:** There is a lack of awareness regarding vitamin D among non-medical students. Awareness of vitamin among medical students was also not up to the mark.

**Keywords:** Awareness, medical and non-medical students and Vitamin D,

### INTRODUCTION:

Medical and allied health professionals are the first referrals to whom the patients present, when they have signs of vitamin D deficiency/insufficiency. Due to cosmopolitan life style, our local population is not exposed to sufficient amount of sunlight that is required for vitamin D activation. Latest literature shows that, Vitamin D which is also known as the sunshine vitamin, plays a vital role in fighting against cancer, heart diseases, bone fractures, type 2 diabetes, depression, influenza and autoimmune diseases.<sup>1</sup> This vitamin is not solely consumed through diet but it is produced endogenously by the action of sunlight on skin as well.<sup>2</sup> Vitamin D is classified into two types: Vitamin D2 and Vitamin D3. The Former is also known as Ergocalciferol while the latter is also known as Cholecalciferol. There are two sources of Vitamin D3. First, being the exogenous source that is obtained from diet and the second is the endogenous source, in which vitamin D3 is synthesized

through sunlight. Regardless the source from which the Vitamin D3 comes, it has to undergo two hydroxylation processes. The first hydroxylation process occurs in the liver, where it forms 25-hydroxy vitamin D3 [25(OH) D], and then second hydroxylation process occurs in the kidney to form 1, 25 hydroxy vitamin D3 (activated form). Vitamin D2 has lower binding capacity to proteins and has a rapid clearance, whereas Vitamin D3 has a half-life of around 2-3 weeks, this is the reason behind more potency of Vitamin D3 than Vitamin D2.<sup>3</sup>

It is seen that deficiency of vitamin D affects over one billion people across the globe as it is the most under diagnosed and untreated of all the deficiencies.<sup>4</sup> Defects in mineralization of the skeletal components of our body are caused by Vitamin D deficiency. These mineralization deficits provide little anatomical support for the periosteal covering. Due to these deficits, patients suffering from osteomalacia complain of generalized arthralgia and myalgia. Patients with mineralization defects of bones are often misdiagnosed with fibromyalgia, dysthymia, degenerative joint disease, arthritis, chronic fatigue syndrome and other diseases.<sup>5-6</sup>

The prevalence of vitamin D deficiency has been found all over the world except for a few areas in South and Southeast Asia.<sup>7</sup> Studies have shown that rickets is common in all age groups in Pakistan, Bangladesh and India.<sup>8</sup> Mothers with deficiency of Vitamin D and low intake of calcium in their diet were found to be the cause of rickets in Pakistan, Bangladesh and India.<sup>9</sup> A survey conducted in 2007 by International Osteoporosis Foundation showed that people are familiar with the role that calcium plays as a bone constructing agent but are not apprehensive about the role

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of Vitamin D in preservation of a healthy body.<sup>10</sup> In a study done in 2007, Mc Gillivray and his colleagues realised that out of a total of 232 East African migrant children and adolescents aged 0-17 years who were residing in Melbourne, the prevalence of vitamin D deficiency (serum 25-OHD level < 25 nmol/l) was 44% and that of vitamin D insufficiency (serum 25-OHD level <50 nmol/l) was 87%. Risk factors for vitamin D deficiency in these subjects included children less than 5 years of age, female, prolonged stay in Australia, reduced sunlight exposure and spring or winter season.<sup>11</sup> According to a report, maximal risk of Vitamin D insufficiency and decreased calcium absorption is seen in young adults aged between 20-39 years.<sup>12</sup> In a study conducted in Karachi, it was observed that high prevalence of vitamin D deficiency was found in females. The prime predictors for the vitamin D deficiency were found to be Age, location of residence and housing structure.<sup>13</sup>

In Pakistan, basic needs of people are not fulfilled and the healthcare systems are not up to the mark. Health education and health care systems do not meet the criteria of public's health demand.<sup>14</sup> It is due to this breach in health education system that we are facing outcomes in which there are high prevalence of vitamin D deficiency.

The objective of this study was to assess the awareness of Vitamin D amongst medical and non-medical students. It is very influential to assess the awareness levels among medical and non-medical groups as this will predict the future health issues.

**METHODOLOGY:**

A descriptive cross-sectional study was conducted during the period December 2016-June 2017. Ethical review board of Fatima Jinnah Dental College and Hospital provided Ethical approval, with code DEC-2016-ORS-01 to conduct this study.

Undergraduate medical and dental students that are in their 3rd or 4th year, house officers, post graduate trainees and graduate medical professionals were included in the study. Undergraduate and graduate students from non-medical institutes were also included. A self-explanatory pre-tested questionnaire was given in various medical, dental and non-medical schools which contained 15 close ended questions.<sup>15</sup>

The sampling technique chosen was non probability convenient Sampling technique. The sample size was calculated using sample size calculator on www.openepi.com at 95% confidence level and prevalence of 50%. The sample size used for this study was 388 which excluded Non-practicing dental professionals; Post graduate non-medical students and Practising medical doctors.

Prior consent was obtained from every respondent before including in the study. A data entry sheet was formulated and filled by the participants that had questions regarding their age, gender, education and level of education. Data

tabulation and analysis was completed using SPSS software version 22. A Chi -square test was used to determine awareness among them.

**RESULTS:**

Data was entered in IBM SPSS statistics version 22. Percentages, standard deviation, Odds ratio and Chi square tests were applied to all the Qualitative questions. The total subjects who participated in this research were 388.

**General Characteristics**

The age of participants in this research varied from 21 to 35 years with the mean age of 24. Male subjects were 25 % but the females were predominant in this study, calculating 75%. Medical subjects were 70.4% (n= 273) and Non-medical subjects were 29.6% (n= 115). Undergraduates were 79.4% (n=308) and Graduates were 20.6% (n=80). (Table 1), Table 2 shows the percentage of medical and non- medical students answered positively on various questions asked regarding vitamin D. (Table 2), Table 3 shows statistically the comparison between medical and non- medical professionals regarding their awareness of vitamin D. Although medical professionals were found to be more knowledgeable than non-medical professionals as expected, but their knowledge was also not upto the mark.

**DISCUSSION:**

Vitamin D deficiency is common all over the world but it is more prevalent in Pakistan<sup>16</sup>. The main function of vitamin D is to maintain the balance of calcium absorption and excretion in the body<sup>17</sup>. A study was conducted in Manchester, UK to check the awareness of vitamin D among people at risk of vitamin D. A total of 363 people were included in the study whose ages were above 18 years. In this study, one hundred and sixty people (72%) had heard about vitamin D and 61 of the respondents (28%) had never heard of vitamin D.<sup>18</sup> Another study was conducted in New Delhi, in which 599 students aged between 18 to 25 years were included. Amongst them, 99.7% females answered that they heard about vitamin D before and 99% of the male answered the same.<sup>19</sup>

In this study, 76.5% of the medical population answered correctly about the production of vitamin D. Moreover,

Table 1: Gender, Category and level of education wise distribution of the subjects

Group	Item	Percentage
Gender	Male	25.0
	Female	75.0
Category	Medical	70.4
	Non-medical	29.6
Level of Education	Under-graduate	79.4
	Graduate	20.6

Table 2: Percentage of medical and non-medical students answered positively on various questions asked

Questions	Medical (%)	Non-medical (%)	Total (%)
Have you ever heard of Vitamin D?	70.9%(271/382)	29.1%(111/382)	98.5%(382/388)
Is Vitamin D produced inside the body by itself?	76.5%(153/200)	23.5%(47/200)	51.5%(200/388)
Is Vitamin D good for bone health?	72.5% (272/375)	27.5%(103/375)	96.6%(375/388)
Do you think your Vitamin D status is sufficient?	70.1%(108/154)	29.9%(46/154)	39.7%(154/388)
Have you ever got your Vitamin D levels checked?	69.9%(100/143)	30.1%(43/143)	36.9%(143/388)
Is Vitamin D produced in the body with the help of sunlight?	70.9%(254/350)	27.4%(96/350)	90.2%(350/388)
Do you take sun protection while any outdoor activity?	70.6%(115/163)	29.4%(48/163)	42.0%(163/388)
What are the normal levels of vitamin D in serum	72.2%(39/54)	27.7%(15/54)	13.91%(54/388)
What should be the minimum daily intake of Vitamin D?	74.6%(44/59)	25.4%(15/59)	15.2%(59/388)
What is the average time needed to spend in sunlight to have enough vitamin D?	72.2%(172/238)	27.7%(66/238)	61.3%(238/388)

Table 3: Comparison between medical and non-medical students based on certain questions inquired regarding vitamin D

Question Asked	Yes	No	Don't know	Odds Ratio	95% CI.	P-Value
<b>1. Have you heard of Vitamin D?</b>				4.883	0.882 - 27.043	0.066
Medical	271	2	0			
Non-Medical	111	4	0			
<b>2. Is Vitamin D produced in the body by itself?</b>				1.502	0.936 - 2.411	0.058
Medical	153	104	16			
Non-Medical	47	48	20			
<b>3. Is Vitamin D good for bone health?</b>				7.922	0.815 - 77.029	0.068
Medical	272	1	0			
Non-Medical	103	3	9			
<b>4. Do you think your Vitamin D status is sufficient?</b>				0.875	0.532-1.439	0.345
Medical	106	104	47			
Non-Medical	39	36	20			
<b>5. Have you ever got your Vitamin D checked?</b>				0.849	0.535-1.349	0.282
Medical	92	159	6			
Non-Medical	40	46	9			
<b>6. Is Vitamin D Produced in the body with the help of sunlight?</b>				2.165	0.870-5.387	0.079
Medical	241	11	5			
Non-Medical	84	6	5			
<b>7. Do you take sun protection while any outdoor activity?</b>				0.939	0.579-1.518	0.445
Medical	109	108	40			
Non-Medical	41	39	15			

70.1% of the medical subjects and 29.9% of the non-medical subjects thought that their Vitamin D levels are sufficient.

Keeping the levels of all the minerals and vitamins adequate is crucial for a healthy body. Vitamin D being an essential vitamin needs to be within normal levels in our blood as prescribed (54-90ng/mL for sunny countries).<sup>20</sup> Vitamin D is needed for maintaining the levels of calcium and phosphate in our blood. It promotes absorption of Calcium and phosphorus in our blood. It also causes normal bone

mineralization and prevents tetany caused by hypocalcaemia.<sup>21</sup> Additionally, vitamin D has some non-calcemic effects including its effects on cell growth, body's natural defence system, neuromuscular functions, carcinogenesis and its cardiovascular functions.<sup>22</sup>

In this study, a cumulative of 36.9% students answered "Yes" on inquiring about assessment of their vitamin D levels. Among them 69.9% were medical students and 30.1% were non-medical. Periodic assessment of vitamin D levels

is paramount in prevention of disorders of bone, nutritional problems, organ malfunction and many other medical conditions as well. Sufficient levels of Vitamin D prevent many diseases like rickets in children, osteomalacia and osteoporosis in adults.<sup>21</sup>

A cumulative of 90.2% answered (Yes) when asked about the role of sunlight in the production of vitamin D which is in accordance to other studies.<sup>23-25</sup> Vitamin D formation is dependent on a sufficient amount of sun exposure but according to a number of studies, sun exposure is a big problem in most of the countries as UV radiation is a carcinogen and can cause skin cancer.<sup>22, 28</sup>

Results from a study suggest that less enthusiasm to sun's exposure was linked to a person's Vitamin D knowledge, female gender and if she had higher education. In this study, 62.3% of the people did not prefer going into the sun and many others took sun protection to avoid their sun exposure. These people were mostly young Chinese women who had enough Vitamin D knowledge and awareness.<sup>23</sup>

72.2% of the medical respondents and 27.2% of the non-medical respondents replied 30 minutes per day as the average time needed to spend in sunlight, which is the correct answer. As it has been suggested by some vitamin D researchers, people should get 5 to 30 minutes of sun exposure between 10 Am to 3 AM.<sup>29</sup>

In another study done on athletes in New Zealand, 76% of Athletes had great information on the role of sun as a source of vitamin D.<sup>24</sup> Awareness on the topic of sun exposure and how much sunlight a person needs to obtain for activation of Vitamin D should be given. Brand et al. found in his study that the participants who were Australian women were highly aware of this.<sup>25</sup>

In this study, 72.2% medical subjects and 27.7% non-medical subjects answered correctly regarding normal levels of vitamin D, stating that greater than or equal to 50nmol/L is the normal level for vitamin D in serum. As recorded from a report by National Institute of health published in the year 2018, people with serum levels of vitamin D less than 30nmol/L are suffering from vitamin D deficiency; serum levels of 30-50 nmol/L are considered less for good bone and overall health but levels of greater than 50 nmol/L are regarded as adequate for bone and overall health in healthy people. Levels greater than 125nmol/L are accompanied with potential adverse effects.<sup>26</sup> In a study conducted in Karachi, it was seen that many people who were apparently healthy also faced vitamin D deficiency and insufficiency. These individuals were seen to be at risk for developing musculoskeletal and other chronic diseases. It was concluded in this study that serum parathyroid hormone levels and serum 25 OHD levels are considered better markers for vitamin D deficiency and insufficiency.<sup>27</sup>

In this study, 74.6% of medical subjects and 25.4% non-medical subjects said that 600IU per day is the average daily

intake of vitamin D. According to the report, 600 IU per day is the adequate daily intake of vitamin D for a healthy individual aged 1 to 70 years.<sup>28</sup>

The sample size of medical and non-medical population was not same in this study. More researches and awareness on the topic of "Vitamin D" should be promoted.

### CONCLUSION:

The results of this study interpret that there is a lack of awareness regarding vitamin D among non-medical students. Although Medical students were found to be more knowledgeable than non-medical students as expected, their knowledge was also not up-to the mark.

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