

## Evaluation of Students' Knowledge and Pattern towards Vitamin D

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### Abstract:

**Background:** Several previous studies revealed an indicator of a high vitamin D deficiency rate in society groups, so this investigation aimed to verify the university students' knowledge about the significance of vitamin D in their lives.

**Method:** A questionnaire was used, including a set of questions about the information and significance of vitamin D among the 547 students of Hilla University College of different ages.

**Results:** This study evaluated university students' knowledge of vitamin D (V-D), as it illustrated that half of the students know about vitamin D deficiency, and their percentage was 49.8%, while 74.9% of students detect that the leading V-D source is sun, and this agrees with previous studies. Interestingly, (72.6%) of the people knew the sun as the primary V-D source. The findings clearly illustrated that there is shortage knowledge among students about V-D. It was found that most of the participants knew that a Deficiency of V-D is related to diseases Bones and osteoporosis. However, they did not know that V-D is also linked to other health problems.

**Conclusion:** More knowledge and practice regarding V-D need to be provided, which can be reduced by promoting awareness of V-D in society groups, especially university students.

**Keywords:** Vitamin D (V-D), Knowledge, Practice, Deficiency.

### Introduction

All the body's vitamin needs are obtained from various food sources except V-D, which is obtained through sunlight. The body manufactures V-D in the skin from a primary compound with the help of natural sunlight. (1)

Deficiency of V-D is a global epidemic, yet the problem of V-D is largely unknown by most humans (2,3), whereas many of them suffer from Deficiency of V-D (4,5). This Vitamin is essential for bone health (Heaney, 2007). There are several studies indicating that V-D is beneficial in promoting musculoskeletal health (6,7 ) as well as playing a role in immune function (7; 8; 9) and prevention of heart disease, vascular disease (10), and several cancer kinds (11) and several other diseases (12; 13). Although several researchers have recently increased their interest in V-D and the rates of various health benefits associated with it, V-D deficiency remains a problem (14). The percentage of Deficiency of V-D is very high in an investigation

conducted by (15 ) in the United Arab Emirates; it included (60,979) participants from 136 countries, the findings of which indicated a deficiency in the level of V-D, which reached 50 ng/ml.

Several studies have assessed the link between V-D and various health findings, but there needs to be more research focusing on young adults (16, 17). It has been observed that a significant number of young adults prefer carbonated beverages over milk, which can lead to a decrease in the consumption of essential nutrients like calcium and V-D. This, in turn, may potentially increase the risk of fractures (18). Students could shape their lifestyles during university and establish healthy patterns and behaviors (19). Several university students are keenly interested in studying nutrition, which can significantly improve their dietary habits. This is especially true for students at an ideal age to make long-term positive changes in their lives. Therefore, it is crucial to prioritize this age group as the focus for prevention and intervention programs that aim to safeguard their long-term well-being and shield them from future health complications.

### Methodology

The investigation included a group of departments of Hilla University College. Information was taken from students through a questionnaire. In April 2021, 547 students participated in the questionnaire, which included demographic information and information about the V-D significance among students.

### Statistical analysis

The data were analyzed statistically utilizing the Independent specimens T-Test and SPSS software version 20. A statistically significant result was defined as a P magnitude less than 0.05.

### Results

**Table (1) The students' distribution by their demographic features n= 574**

<b>Table (1)</b>			
		<b>F</b>	<b>%</b>
<b>sex</b>	<b>Male</b>	<b>379</b>	<b>66.0%</b>
	<b>Female</b>	<b>195</b>	<b>34.0%</b>
	<b>Total</b>	<b>574</b>	<b>100.0</b>
<b>Marital status</b>	<b>Married</b>	<b>96</b>	<b>16.7%</b>
	<b>Single</b>	<b>470</b>	<b>81.9%</b>
	<b>Divorced</b>	<b>5</b>	<b>.9%</b>
	<b>Widowed</b>	<b>3</b>	<b>.5%</b>
	<b>Total</b>	<b>574</b>	<b>100.0</b>
<b>living</b>	<b>Rural</b>	<b>157</b>	<b>27.4%</b>
	<b>Urban</b>	<b>417</b>	<b>72.6%</b>
	<b>Total</b>	<b>574</b>	<b>100.0</b>
<b>age</b>	<b>17-19 year</b>	<b>47</b>	<b>8.2%</b>
	<b>20-22 year</b>	<b>246</b>	<b>42.9%</b>
	<b>23-25 year</b>	<b>211</b>	<b>36.8%</b>
	<b>26 more than</b>	<b>70</b>	<b>12.2%</b>
	<b>Total</b>	<b>574</b>	<b>100.0</b>

The investigation findings illustrated that 66% of the samples were males. In comparison, the % of females who participated in the investigation was 34%. Most of the students were single, with a rate of 81.9%, while the married ones made up 16.7%, and the divorced and widowed people made up a tiny percentage of 9% and 5%, respectively. The investigation found that 72% of students live in the city, while those % live in the countryside were 27%. The ages of students ranged in different proportions according to age groups, and the highest percentage was 42% for the age group 20-22 years, then 36.8% for the age group 23-25 years.

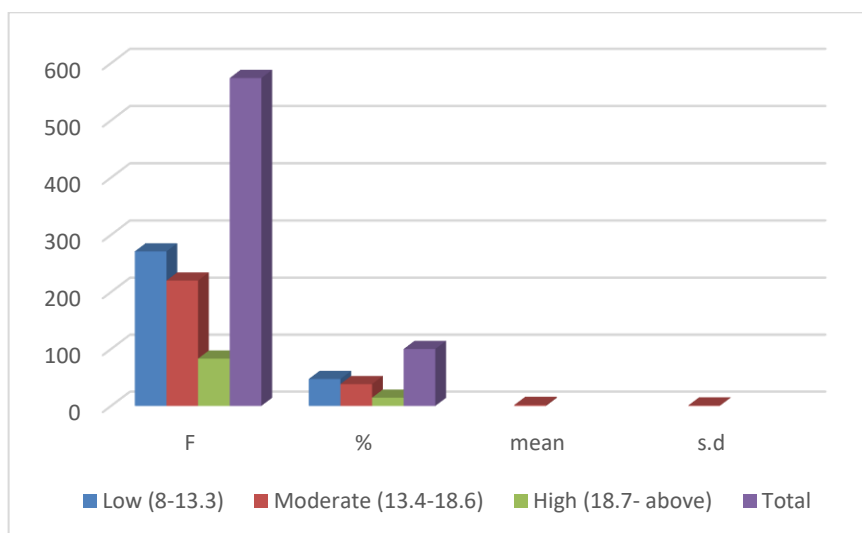
**Table (2): Assessment of Students' Knowledge toward V-D n= 574**

	scale	F	%	M.S	S.D.	Assessment
<b>Do you know about the deficiency of Vitamins?</b>	yes	286	49.8	1.78	1.00 0	moderate
	No	209	36.4			
	I do not know	79	13.8			
	<b>Total</b>	<b>574</b>	<b>100.0</b>			
<b>The primary vitamin source is the sun</b>	yes	430	74.9	1.63	1.17 2	moderate
	No	35	6.1			
	I do not know	109	19.0			
	<b>Total</b>	<b>574</b>	<b>100.0</b>			
<b>deficiency of vitamin Symptoms, osteoporosis</b>	yes	417	72.6	1.73	1.24 9	moderate
	No	27	4.7			
	I do not know	130	22.6			
	<b>Total</b>	<b>574</b>	<b>100.0</b>			
<b>The deficiency of Vitamins can be compensated by eating milk and its derivatives</b>	yes	281	49.0	2.15	1.32 1	moderate
	No	110	19.2			
	I do not know	183	31.9			
	<b>Total</b>	<b>574</b>	<b>100.0</b>			
<b>V-D causes depression</b>	yes	236	41.1	2.51	1.41 3	High
	No	74	12.9			
	I do not know	264	46.0			
	<b>Total</b>	<b>574</b>	<b>100.0</b>			
<b>There is a correlation between V-D and skin color</b>	yes	264	46.0	2.33	1.39 0	moderate
	No	84	14.6			
	I do not know	226	39.4			
	<b>Total</b>	<b>574</b>	<b>100.0</b>			
<b>V-D varies over time</b>	yes	191	33.3	2.64	1.36 9	High
	No	103	17.9			
	I do not know	280	48.8			
	<b>Total</b>	<b>574</b>	<b>100.0</b>			
<b>There is a correlation between heart disease and cancer and V-D</b>	yes	123	21.4	2.98	1.28 3	High
	No	109	19.0			
	I do not know	342	59.6			
	<b>Total</b>	<b>574</b>	<b>100.0</b>			

F= Frequency, %= Percentage, M.S. = score mean" Cut off point (0.66), low (score mean= 1-1.66), moderate (score mean=1.67-2.33), high (score mean = 2.34 and more)", S.d. = Stander deviation.

Assess=Assessment

**Figure (1): Overall Assessment of Students' Knowledge of V-D**



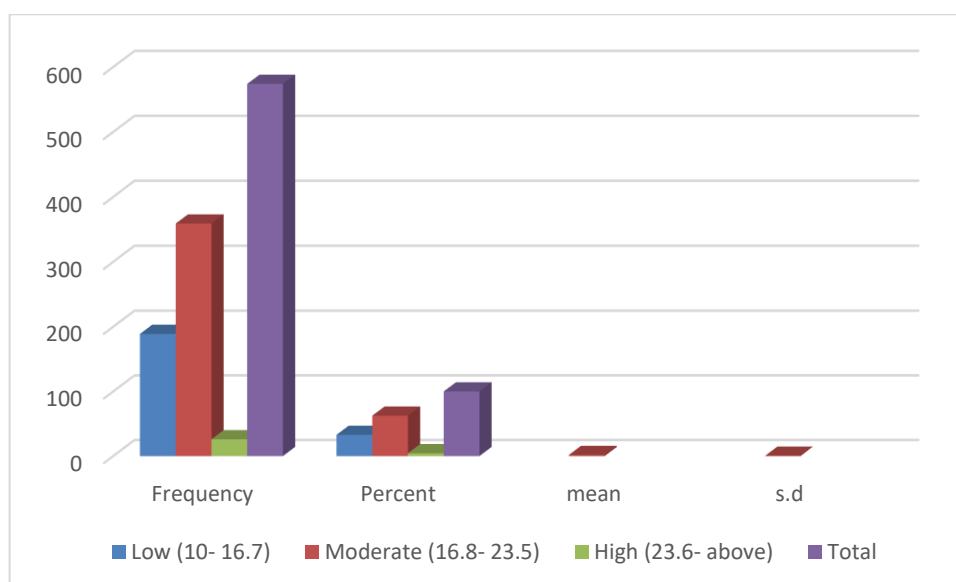
**Table (3): Distribution of Students' Patterns toward V-D**

	scale	F	%	M.S	S.d.	Assess
Are you exposed to little sunlight?	yes	268	46.7	1.82	.848	moderate
	No	143	24.9			
	Sometimes	163	28.4			
	Total	574	100.0			
Do you drink milk?	yes	152	26.5	2.17	.577	moderate
	No	367	63.9			
	Sometimes	55	9.6			
	Total	574	100.0			
Do you eat eggs?	yes	387	67.4	1.79	.531	moderate
	No	154	26.8			
	Sometimes	33	5.7			
	Total	574	100.0			
Do you eat fish?	yes	412	71.8	1.49	.816	low
	No	43	7.5			
	Sometimes	119	20.7			
	Total	574	100.0			
Do you eat vegetables and fruit?	yes	213	37.1	1.99	.856	moderate
	No	154	26.8			
	Sometimes	207	36.1			
	Total	574	100.0			
Do you take nutritional supplements?	yes	89	15.5	1.94	.502	moderate
	No	428	74.6			
	Sometimes	57	9.9			
	Total	574	100.0			
Have you had a test to find out the level of Vitamin in your body?	yes	85	14.8			moderate
	No	479	83.4			
	Sometimes	10	1.7			
	Total	574	100.0			

F= Frequency, %= Percentage, M.S. = score Mean " Cut off point (0.66), low (score mean = 1-1.66), moderate (score mean = 1.67-2.33), high (score mean = 2.34 and more)", S.d. = Stander deviation.

Assess=Assessment.

**Figure (2): Overall Assessment of Students' Patterns toward V-D**



## Discussion

This study assessed university students' knowledge and understanding of V-D as listed in Table 2. The study focused on students who knew V-D Deficiency, with a percentage of 49.8%. Additionally, 74.9% of students knew that the sun is the primary V-D source, which aligns with the inquiry's findings (22, 23). Notably, a majority (72.6%) of the participants recognized the sun as a primary V-D source, as indicated in the study conducted by Arora et al. (2016). This inquiry explored the knowledge, habits, and attitudes about V-D among Indian students [24]. This survey showed the public needs greater V-D education. This confirms past evidence that many people are unaware of V-D and associated deficits (25,26). Most participants in this survey recognized that V-D insufficiency causes bone diseases including osteoporosis. They were unaware of V-D deficiency's effects on cardiovascular disease, diabetes, and pregnancy. The results obtained match previous studies (27, 28, 29).

V-D deficiency may cause cancer, chronic diseases, and skeletal system deficiencies. This study revealed that a significant majority of students (72.6%) knew the (V-D) significance for maintaining bone health. However, a minority of students (59.6%) held the belief that a deficiency in V-D is linked to various diseases, including cardiovascular cancer and depression (46%). This finding aligns with a previous investigation (30).

The investigation revealed that 46.0% of the students knew of the association between (V-D) and skin discoloration. 48.8% are aware that the Vitamin undergoes age-related changes. According to research, the lack of awareness in adults and children in most Middle Eastern nations may be attributed to an indoor lifestyle, which significantly contributes to V-D deficiency (31). Most participants (51.9%) were consistently exposed to sunlight for 10-20 minutes per day, which can vary depending on factors such as time of day, skin type, season, and altitude. However, evidence supports the recommended timeframe for producing V-D without causing skin burns, which is 10 to 30 minutes between 11 a.m. and 3 a.m. M. Without sunscreen, the recommended frequency is three to five times per week throughout the relevant season (32).

The data presented in Table 3 illustrates the distribution of V-D practices among students. It reveals that 46.7% of the students reported limited exposure to sunlight, despite most of them recognizing the V-D significance for their health. This avoidance may be attributed to lifestyle changes resulting from modernization and the desire to conform to the prevailing cultural norms.

The study's results also showed that 26.5% of the participants consumed milk, 67.4% consumed eggs, 71.8% consumed fish, and 37% consumed fruits and vegetables. It is a significant primary V-D source, as supported by (22), which states that the majority (85.7%) of the participants in the study consume vitamin-rich foods like milk, fish, and eggs in their meals. This finding aligns

with the investigation conducted by Alemu and Varnam in 2012.35 (and this is located). Consistent with a separate study, it was shown that around 90% of participants met their V-D needs using solar exposure, which is followed by V-D supplements (73%), dairy products (47.6%), and fats. Salmon (45.8%), followed by eggs (30.8%). These results suggest that the participants had a strong understanding and recognition of the significance of sunshine as a V-D source. However, they needed to engage in sufficient sun exposure compared to prior research. The investigation revealed that 67.9% of the students reported taking nutritional supplements.

Conversely, a significant majority of students (83.4%) did not undergo a vitamin level assessment, which aligns with the findings of Karbala's investigation. Additionally, the investigation revealed a low percentage of individuals (22%) who consume nutritional supplements. According to the National Institute of Health, it is recommended that persons and women who wear long garments and head coverings for religious considerations, as well as those who engage in vocations that restrict sun exposure, consider supplementing with V-D in order to achieve their daily V-D needs (37).

Furthermore, many kids had yet to undergo a V-D 83 examination. This problem may indicate a need for more understanding among the individuals being investigated about the V-D significance level testing. Public hospitals need to provide the V-D test, and the exorbitant cost at private hospitals and labs may exacerbate this issue.

The present study demonstrated that a minority of participants exhibited a satisfactory degree of awareness and adherence to procedures about V-D AD, which aligns with the findings reported in the inquiry conducted by Habib et al. (38).

## **Conclusion**

As prospective leaders, college students embody the forthcoming cohort of parents and professionals that will influence future health education initiatives, formulate policies, and mold societal norms and convictions of health-promoting behaviors. Consequently, university students constitute an indispensable component of forthcoming health progressions. They, therefore, must be prioritized for effecting enduring transformations in terms of health and the significance of enhancing V-D levels within the human body.

## **References:**

1. Mahan, L. Kathleen., Escott-Stump, S. (2004). *Krause's food Journal, nutrition, & diet therapy* (11th ed.). Philadelphia: Saunders.
2. Holick, M. F. (2005). The vitamin D epidemic and its health consequences. *Journal of Nutrition*, 35, 2739S-2748S.
3. Holick, M. F. & Chen, T. C. (2008). Vitamin D deficiency: A worldwide problem with health consequences. *American Journal of Clinical Nutrition*, 87(4), 1080S– 6S.
4. Langlois, K., Greene-Finestone, L., Little, J., Hidiroglou, N., & Whiting, S. (2010). Vitamin D status of Canadians as measured in the 2007 to 2009 Canadian Health Measures Survey (Report No. 82-00-XPE). Retrieved from Statistics Canada website: <http://www.statcan.gc.ca/pub/82-003-x/82-003-x2010001-eng.htm>
5. Vatanparast, H., Calvo, M. S., Green, T. J., & Whiting, S. J.(2010). Despite mandatory fortification of staple foods, vitamin D intakes of Canadian children and adults are inadequate. *Journal of Steroid Biochemistry and Molecular Biology*, 121(1-2), 301– 303. doi: 10.1016/j.jsbmb.2010.03.079
6. Heaney, R. P. (2007). Bone health. *American Journal of Clinical Nutrition*, 85(Suppl. 5), 300S- 303S.
7. Holick, M. F. (2007). Vitamin D deficiency. *New England Journal of Medicine*, 357, 266-281. doi: 10.1056/NEJMra070553



8. van Etten, E. & Mathieu, C. (2005). Immunoregulation by 1,25-dihydroxyvitamin D<sub>3</sub>: Basic concepts. *Journal of Steroid Biochemistry & Molecular Biology*, 97(1-2), 93- 101.
9. White, J. H. (2008). Vitamin D signaling, infectious diseases, and regulation of innate immunity, *Infection and Immunity*, 76(9), 3837-3843. doi: 10.1128/IAI.00353- 08
10. Giovannucci, E., Liu, Y., Hollis, B. W., & Rimm, E. B. (2008). 25-hydroxyvitamin D and risk of myocardial infarction in men: A prospective study. *Archives of Internal Medicine*, 168(11), 1174-1180. doi: 10.1001/archinte.168.11.1174.
11. Gorham, E. D., Garland, C. F., Garland, F. C., Grant, W. B., Mohr, S. B., Lipkin, M., . . . Holick, M. F. (2007). Optimal vitamin D status for colorectal cancer prevention: A quantitative meta-analysis. *American Journal of Preventative Medicine*, 32(3), 210-216.
12. Annweiler, C., Schott, A. M., Rolland, Y., Blain, H., Herrmann, F. R., & Beauchet, O. (2010). Dietary intake of vitamin D and cognition in older women: A large population-based study. *Neurology*, 75(20), 1810-1816. doi:10.1212/WNL.0b013e3181fd6352
13. Hoang, M. T., Defina, L. F., Willis, B. L., Leonard, D. S., Weiner, M. F., & Brown, E. S. (2011). Association between low serum 25-hydroxyvitamin d and depression in a large sample of healthy adults: the Cooper Center longitudinal study. *Mayo Clinical Proceedings*, 86(11), 1050-1055. doi: 10.4065/mcp.2011.0208
14. Holick, M. F. & Chen, T. C. (2008). Vitamin D deficiency: A worldwide problem with health consequences. *American Journal of Clinical Nutrition*, 87(4), 1080S– 6S.
15. Haq, A., Svobodová, J., Imran, S., Stanford, C., & Razzaque, M. S. (2016). Vitamin D deficiency: A single centre analysis of patients from 136 countries. *The Journal of steroid biochemistry and molecular biology*, 164, 209-213.
16. Meehan M, Penckofer S. The role of vitamin D in the aging Adult. *J Aging Gerontol* 2014;2:60–71.
17. Zhang R, Naughton DP. Vitamin D in health and disease: current perspectives. *Nutr J* 2010;9:65
18. Tucker KL, Morita K, Qiao N, et al. Colas, but not other carbonated beverages, are associated with low bone mineral density in older women: The Framingham Osteoporosis Study. *Am J Clin Nutr* 2006;84:936–42.
19. Dinger MK, Waigandt A. Dietary intake and physical activity behaviors of male and female college students. *Am J Health Promot* 1997;11:360–2
20. Katz A, Davis P, Scott-Findlay S. Ask and ye shall plan-A health needs assessment of a university population. *Can J Public Health* 2002;93:63–6
21. Tucker P, Irwin JD. University students' satisfaction with, interest in improving, and receptivity to attending programs aimed at health and well-being. *Health Promot Pract* 2011;12:388–95
22. Sara.J., saad. I, Riyadh.D,(2018)KNOWLEDGE AND PRACTICES REGARDING VITAMIN D DEFICIENCY AMONG WOMEN ATTENDING IMAM HUSSEIN MEDICAL CITY IN Karbala,Int J Curr Pharm Res, Vol 11, Issue 6, 39-43.
23. Oudshoorn C, A Hartholt K, Van Leeuwen J, Colin E, Velde N, Van der Cammen T. Better knowledge on vitamin D and calcium in older people is associated with a higher serum vitamin D level and a higher daily dietary calcium intake. *Health Educ J* 2012;71:474-82.
24. Arora H, Dixit V, Srivastava N. Evaluation of knowledge, practices of vitamin D and attitude toward sunlight among Indian students. *Evaluation* 2016;9:308-13.

25. Vu LH, van der Pols JC, Whiteman DC, Kimlin MG, Neale RE. Knowledge and attitudes about vitamin D and impact on sun protection practices among urban office workers in Brisbane, Australia. *Cancer Epidemiology and Prevention Biomarkers*. 2010;19(7):1784-9.
26. Deschasaux M, Souberbielle J-C, Partula V, Lécuyer L, Gonzalez R, Srouf B, et al. What Do People Know and Believe about Vitamin D? *Nutrients*. 2016;8(11):718.
27. Soliman A. Vitamin D deficiency: A major global epidemic that requires effective strategy and guidelines for management. *Indian J Endocrinol Metab*. 2016;0(0):0.
28. Al-Sadat N, Majid HA, Sim PY, Su TT, Dahlui M, Bakar MFA, et al. Vitamin D deficiency in Malaysian adolescents aged 13 years: findings from the Malaysian Health and Adolescents Longitudinal Research Team study (MyHeARTs). *BMJ open*. 2016;6(8):e010689.
29. Moy F-M, Bulgiba A. High prevalence of vitamin D insufficiency and its association with obesity and metabolic syndrome among Malay adults in Kuala Lumpur, Malaysia. *BMC Public Health*. 2011;11(1):735.
30. Salmeen D., Syed Wajid\* , Meshal A., Ahmed S., Faisal D., Saeed, Sultan A, Mohammed N., Knowledge and practice of vitamin D deficiency among people lives in Riyadh, Saudi Arabia-A cross-sectional study, *Biomedical Research* 2017; 28 (7): 3114-3118
31. Holick MF. The vitamin D epidemic and its health consequences. *J Nutri* 2005;135:2739s-48s.
32. Al-Kindi MK. Vitamin D status in healthy Omani women of childbearing age: study of female staff at the royal hospital, muscat, oman. *Sultan Qaboos University Med J* 2011;11:56.
33. Christides T. Older Adults' Beliefs, knowledge and preferences for achieving healthy vitamin D status: a narrative review. *Geriatrics* 2018;3:26.
34. Alshamsan FM, Bin-Abbas BS. Knowledge, awareness, attitudes and sources of vitamin D deficiency and sufficiency in Saudi children. *Saudi Med J*. 2016;37(5):579.
35. Alemu E, Varnam R. Awareness of vitamin D deficiency among at-risk patients. *BMC Res Notes* 2012;5:17.
36. Al Bathi BA, Al Zayed KE, Al Qenai M, Makboul G. Knowledge, attitude and practice of patients attending primary care centers toward vitamin D in Kuwait. *Alexandria Med J* 2012; 48: 277-282
37. National Institution of Health. Vitamin D fact sheet for health professionals; 2018. Available from: [https:// www.mayoclinicproceedings.org/article/S0025-619660190-0/fulltext](https://www.mayoclinicproceedings.org/article/S0025-619660190-0/fulltext) [Last accessed on 05 Jul 2019].
38. Habib FM, Al-Motairi WA, Al-Mutairi WM. Vitamin D deficiency: knowledge and practice among adult Saudi females. *GloAdv Res J Med Sci* 2014;3:95-101.