CODEN [USA]: IAJPBB ISSN: 2349-7750

INDO AMERICAN JOURNAL OF
PHARMACEUTICAL SCIENCES
http://doi.org/10.5281/zenodo.3748394

Available online at: http://www.iajps.com Research Article

A CROSS-SECTIONAL RESEARCH TO EVALUATE BASELINE PARAMETERS AND INCREASE AWARENESS REGARDING THE DEFICIENCY OF VITAMIN 'D'

Ume Habiba, Maham Rukhsar, Hajira Sajid, Sumaira Liaqat
House Officer, Aimth Sialkot

Article Received: February 2020 **Accepted:** March 2020 **Published:** April 2020

Abstract:

Objective: *The objective of this research was to attain baseline evaluation and increase the Vitamin 'D' awareness among medical students.*

Materials and Method: *This cross-sectional research was carried out from August 2019 to March 2020 at Services Hospital, Lahore on medical undergraduates. Current awareness and knowledge of the medical students were gathered through a structured questionnaire about Vitamin 'D' deficiency. The questionnaire included questions regarding Vitamin 'D', awareness, health, affecting factors and management of Vitamin 'D' deficiency. Outcomes analysis was made on SPSS software (P-Value <0.05).*

Results: *Most of the medical undergraduates were not fully aware of Vitamin 'D' deficiency; whereas, students were suitably aware of the skeletal and bone-related disorders. Majority of them were not aware of the related consequences of CVD, diabetes mellitus (DM) and cancers. Outcomes show that 1/3rd of the respondents were well aware of the importance of intake of Vitamin 'D' through sun exposure. However, students were not aware of dose, biochemical forms, Vitamin 'D' supplementation duration and nutritional deficiency. This research highlights that students lack in the knowledge and awareness about Vitamin 'D' importance, its global prevalence and management strategies. Positive global health outcomes are only possible through the promotion of Vitamin 'D' knowledge and awareness.*

Conclusion: *This research indicates that importance of increasing knowledge and awareness among medical students about Vitamin 'D' importance, its global prevalence and management strategies. This information will surely provide medical professionals with baseline data for better identification, diagnosis, treatment and prevention of Vitamin 'D' deficiency. Better health-related behaviour formation is only possible through timely educational and awareness programmes. More emphasis is required on Vitamin 'D' awareness campaigns for the improvement of overall healthcare.*

Keywords: *Vitamin 'D', Diabetes Mellitus, Deficiency, Baseline and Nutrition.*

Corresponding author:
Dr. Ume Habiba,
House Officer, Aimth Sialkot

QR code

Please cite this article in press Ume Habiba et al, ***A Cross-Sectional Research To Evaluate Baseline Parameters And Increase Awareness Regarding the Deficiency of vitamin 'D',*** *Indo Am. J. P. Sci, 2020; 07(04).*

INTRODUCTION:

Majority of global population is not aware of the epidemic of Vitamin 'D' deficiency which is almost affecting everybody including toddlers to elderly people [1, 2]. It has affected both populations either urban or rural [2]. Higher risks are found among young adults; moreover, in childhood, this deficiency causes retardation in growth and skeletal disorders [3]. Adults also ensue fractures and muscle weaknesses [4]. Vitamin 'D' also promotes cardiovascular health along with the prevention of cancers, autoimmune disorders and diabetes mellitus [5]. Factors contributing to the non-awareness of Vitamin 'D' deficiency are mostly dependent on its reduced knowledge and awareness among populations all across the world. High-risk population need to undergo educational campaigns and awareness programmes to know its related treatments and consequences [6]. Positive health behaviour outcomes are easily possible through educating children at an early age about its importance which will help them to sustain those behaviours towards the end of their life. Two-fold opportunity is possible through educating undergraduates as they are an integral part of the healthcare and capable to bring long-lasting effects in their future assignments. Future healthcare programmes totally depend on the attribution of these young professionals for the promotion of healthy behaviours and formation of social health norms [7]. Through knowledge, motivation and attitude's information is crucial for effective and targeted health behaviour formation. Our research may form the basics of future programmes on the baseline assessment of Vitamin 'D' deficiency. The outcomes of this research are helpful for the determination of novel strategies to promote Vitamin 'D' awareness among undergraduate medical students. Thus, the objective of our research was to attain baseline evaluation and increase Vitamin 'D' awareness among medical students.

MATERIALS AND METHODS:

This cross-sectional research was carried out from August 2019 to March 2020 at Services Hospital, Lahore on medical undergraduates. Current awareness and knowledge of the medical students were gathered through a structured questionnaire about Vitamin 'D' deficiency. The questionnaire included questions regarding Vitamin 'D', awareness, health, affecting factors and management of Vitamin 'D' deficiency. We interviewed 300 medical undergraduates through a structured questionnaire after receiving their informed consent and ethical review committee's permission to conduct the research. All the doubts in the minds of the undergraduates were cleared. The question was framed to gather data about the demographics of the students along with an assessment of the knowledge and awareness in the perspective of research objectives. Questions were MCQs and they were answered in the given fifteen minutes time period. This research also included questions regarding sun exposure in terms of direct exposure and passing through the glass for different times of the day. The outcomes have been tabulated in the given tabular data. A pretest was also carried out on a total of ten students before applying the same on all the students. It showed the understanding of the students about the questionnaire and its contents. We considered good reliability and consistency by taking the Cronbach alpha estimated value (0.7). Students were randomly shortlisted and a staff not associated with the research conducted the questionnaire. Students were also taught about the deficiency of Vitamin 'D' after the completion of the questionnaire along with its management and knowledge. Outcomes analysis was made on SPSS software (P-Value <0.05).

RESULTS:

Most of the medical undergraduates were not fully aware of Vitamin 'D' deficiency; whereas, students were suitably aware of the skeletal and bone-related disorders. Majority of them were not aware of the related consequences of CVD, diabetes mellitus (DM) and cancers. Outcomes show that 1/3rd of the respondents were well aware of the importance of intake of Vitamin 'D' through sun exposure. However, students were not aware of dose, biochemical forms, Vitamin 'D' supplementation duration and nutritional deficiency. This research highlights that students lack in the knowledge and awareness about Vitamin 'D' importance, its global prevalence and management strategies. Positive global health outcomes are only possible through the promotion of Vitamin 'D' knowledge and awareness. Detailed outcomes analysis for Vit 'D' deficiency, Vit 'D' deficiency in High-Risk Groups, Vit 'D' Deficiency related Problems, Vit 'D' Sources, Vit 'D' Sunlight Exposure, Vit 'D' Minimum Sunlight Exposure Required, Vit 'D' RDA, Vit 'D' Supplement Intake, Vit 'D' Supplement Nutritional Deficiency and Calcium Supplements for Vit 'D' Deficiency is given in the tabular and graphical presentation below:

Table – I: Detail of Variables

Variables		No	%
Vit 'D' Deficiency	High-Risk Groups	60	23.8
	Urban Population	119	47.2
	Epidemic Proportions	45	17.8
	Rare	21	8.3
Vit 'D' Deficiency High-Risk Groups	Infants, Lactating and Pregnant Women	192	76.1
	Elderly	15	5.9
	Diabetes Patients	6	2.3
	Fair Skinned Patients	23	9.1
	None of the above	16	6.3
Vit 'D' Deficiency related Problems	Skeletal and Bone Disorders	238	94.4
	Diabetes Mellitus	2	0.7
	CVD	1	0.3
	Cancer	1	1.1
	Autoimmune Disorders	4	1.5
	None of the above	2	0.7
Vit 'D' Sources	Green Leafy Vegetables	43	17
	Sunlight passing through Glass	83	48
	Milk	57	22.6
	Egg (Yolk)	21	8.3
	None of the above	10	3.9
Vit 'D' Sunlight Exposure	Arms and Legs Exposure to Sun (10 am to 2 pm)	107	42.4
	Sunlight passing through Glass (10 am to 2 pm)	46	18.2
	Arms and Legs Exposure to Sun (2 to 4 pm)	9	3.5
	Arms and Legs Exposure to Sun (7 to 10 am)	79	31.3
	None of the above	11	4.3
Vit 'D' Minimum Sunlight Exposure Required	One hr/day	87	34.5
	30 min/twice a week	81	32.1
	Two hrs/day	51	20.2
	4 hrs/twice a week	24	8.7
	None of the above	11	4.3
Vit 'D' RDA	600 IU	62	24.6
	800 IU	84	33.3
	1000 IU	55	21.8
	2000 IU	13	5.1
Vit 'D' Supplement Intake	No	58	23
	Yes with (Serum 25-hydvit 'D')	61	24.2
	Yes without (Serum 25-hydvit 'D')	132	52.3
Vit 'D' Supplement Nutritional Deficiency	Alfacalcidol	19	7.5
	Cholecalciferol	101	40
	Calcitriol	105	41.6
	Either of the above	22	8.7
	None of the above	5	1.9
	Yes	164	65

Calcium Supplements for Vit 'D' Deficiency	No	88	34.9

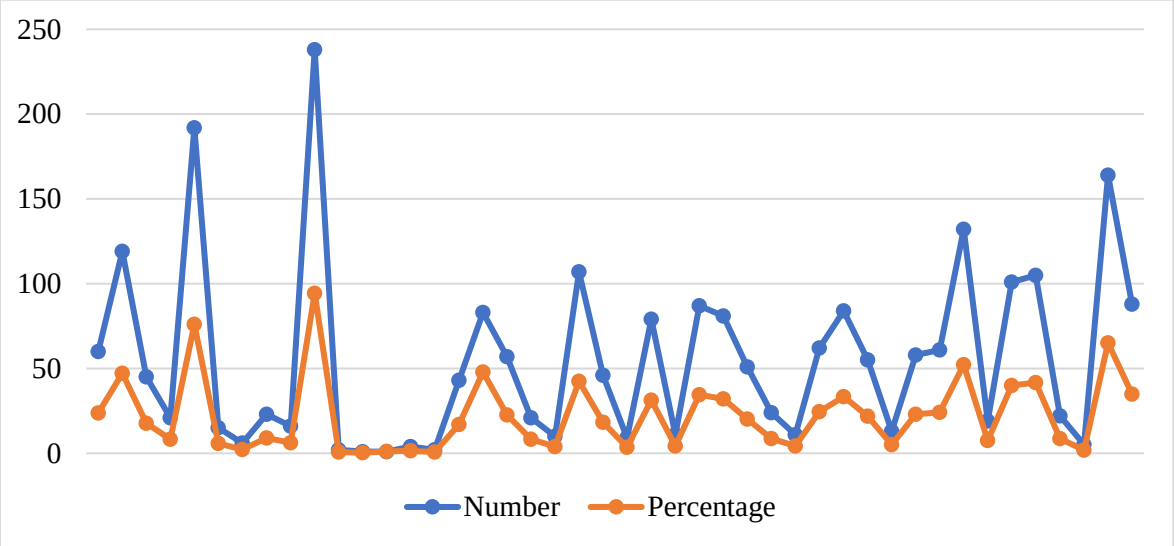

Table – II: Classification Details

Classification		Value (ng/mL)
IOM	Severe Deficiency	<5
	Deficiency	<15
	Sufficiency	>20
	Toxicity Risk	>50
US Society of Endocrine	Deficiency	>20
	Insufficiency	21 to 29
	Sufficiency	>30
	Toxicity	>150

DISCUSSION:

People are not aware of the Vitamin 'D' deficiency all over the globe irrespective of geographical locations, populations and age groups [2]. The key factors for the maintenance of levels of Vitamin 'D' are bone homeostasis, phosphate metabolism and calcium. Most of the students (94%) were aware of the skeletal and bone disorders as reported in the previous studies [8]. Studies have also shown the evidence of infections, mental disorders, autoimmune disorders, T2DM and CVD among those regions which show a deficiency of Vitamin 'D' [9]. However, in this case, students were not aware of the relation of vitamin 'D' deficiency with all the mentioned diseases and disorders. Vitamin 'D' is also available in diets like cod liver oil, egg yolk, salmon, sun-dried mushrooms etc. apart from sun exposure. Students must know about the fortified sources and dietary intakes rich in vitamin 'D'. Students also lacked in the knowledge about the availability of vitamin 'D' in replicant diets and supplements as mentioned in other studies as well [10]. We may overlook vitamin 'D' in Asian countries as they have ample exposure to sunlight throughout the year in comparison to other countries and regions [11]. Outdoor activities provide ample chances to get an intake of vitamin 'D' directly from the Sun. Air pollutants, urbanization and other contributing factors have reduced sun exposure which attributes in the deficiency of Vitamin 'D'. Moreover, it is an established fact that sunlight passing through the glass and entering the home is not suitable for building Vitamin 'D' [12]. Unfortunately, most of the students were not aware of his fact along with the effect of time of the day on the proportion of levels of vitamin 'D' intake. The dependency of time and hours spent in the sunlight for vitamin 'D' levels building. Students must know its effect on the skin, vitamin 'D' synthesis, time of the day, exposure duration, sunscreen use, clothing style and skin pigmentation [13]. IOM study shows that 1/3rd of the students were aware of vitamin 'D' dietary intake and RDA recommendation for health optimization among both males and females especially for their bone health [14]. Nonviability of sunlight and suitable diet may cause adequacy and absence of vitamin 'D'. Endocrine Society of the USA also classified vitamin 'D' (25-

hydroxycholecalciferol) levels of serum among adults for an indication of scarcity of vitamin 'D' (Table – II). There is a need to emphasize more on the awareness of vitamin 'D' levels apart from RDA concerning regions, age, sex, pregnancy status and diseases [15]. Long-term consequences such as toxicity and vitamin 'D' deficiency can be avoided through ample sunlight exposure and adequate vitamin 'D' supplements [16]. Vitamin 'D' deficiency either cholecalciferol or ergocalciferol may be treated with a weekly dose of 50,000 IU for eight weeks along with bi-monthly supplements [17]. Students would identify the solution of issues to take corrective measures at the community level for what they were unaware of. The silent outbreak of vitamin 'D' deficiency needs to be arrested essentially before it is too late and it leads to other related disease conditions. High-risk groups need more focused treatment and management of deficiency of vitamin 'D' [18]. More research work will even help in the collection of evidence-based baseline assessment.

CONCLUSION:

This research indicates that importance of increasing knowledge and awareness among medical students about Vitamin 'D' importance, its global prevalence and management strategies. This information will surely provide medical professionals with baseline data for better identification, diagnosis, treatment and prevention of Vitamin 'D' deficiency. Better health-related behaviour formation is only possible through timely educational and awareness programmes. More emphasis is required on Vitamin 'D' awareness campaigns for the improvement of overall healthcare.

REFERENCES:

1. S. Boland, "A baseline assessment of university students' vitamin D knowledge," Electronic Thesis and Dissertation Repository, Paper 1504, 2013.
2. A. Haase, A. Steptoe, J. F. Sallis, and J. Wardle, "Leisure-time physical activity in university students from 23 countries: associations with health beliefs, risk awareness, and national economic development," Preventive Medicine, vol. 39, no. 1, pp. 182–190, 2004.
3. L. W. Green and M. W. Kreuter, Health Program Planning: An Educational and Ecological Approach, McGraw-Hill, New York, NY, USA, 4th edition, 2005.
4. J. F. McKenzie, B. L. Neiger, and R. Thackeray, Planning, Implementing and Evaluating Health Promotion Programs, Pearson Benjamin Cummings, San Francisco, Calif, USA, 5th edition, 2009.
5. L. H. Vu, J. C. Van der Pols, D. C. Whiteman, M. G. Kimlin, and R.E. Neale, "Knowledge and attitudes about vitamin D and impact on sun protection practices among urban office workers in Brisbane, Australia," Cancer Epidemiology, Biomarkers and Prevention, vol. 19, no. 7, pp. 1784–1789, 2010.
6. M. F. Holick, "High prevalence of vitamin D inadequacy and implications for health," Mayo Clinic Proceedings, vol. 81, no. 3, pp. 353–373, 2006.
7. A. Mithal, D. A. Wahl, J.-P. Bonjour et al., "Global vitamin D status and determinants of hypovitaminosis D," Osteoporosis International, vol. 20, no. 11, pp. 1807–1820, 2009.
8. J. M. Pettifor, "Vitamin D &/or calcium deficiency rickets in infants & children: a global perspective," Indian Journal of Medical Research, vol. 127, no. 3, pp. 245–249, 2008.
9. T. Hagenau, R. Vest, T. N. Gissel et al., "Global vitamin D levels concerning age, gender, skin pigmentation and latitude: an ecologic meta-regression analysis," Osteoporosis International, vol. 20, no. 1, pp. 133–140, 2009.
10. M. I. K. von Bothmer and B. Fridlund, "Gender differences in health habits and motivation for a healthy lifestyle among Swedish university students," Nursing and Health Sciences, vol. 7, no. 2, pp. 107–118, 2005.
11. E. T. Edmonds, Osteoporosis knowledge, beliefs, and behaviours of college students: utilization of the health belief model, Abstracts International Section A: Humanities and Social Science, vol. 70, pp. 2908, 2009.
12. D. Von Ah, S. Ebert, A. Ngamvitroj, N. Park, and D.-H. Kang, "Predictors of health behaviours in college students," Journal of Advanced Nursing, vol. 48, no. 5, pp. 463–474, 2004.
13. W. C. Kung and K.-K. Lee, "Knowledge of vitamin D and perceptions and attitudes toward sunlight among Chinese middle-aged and elderly women: a population survey in Hong Kong," BMC Public Health, vol. 6, article 226, 2006.
14. M. F. Holick and T. C. Chen, "Vitamin D deficiency: a worldwide problem with health consequences," The American Journal of Clinical Nutrition, vol. 87, pp. 1080S–1086S, 2008.
15. M. F. Holick, "Medical progress: vitamin D deficiency," New England Journal of Medicine, vol. 357, no. 3, pp. 266–281, 2007.
16. J. M. Pettifor, "Vitamin D Deficiency and nutritional rickets in children in vitamin D," in Vitamin D, D. Feldman, J.W. Pike, and F. H. Glorieux, Eds., pp. 1065–1084, Elsevier Academic Press, Boston, Mass, USA, 2nd edition, 2005.
17. R. K. Marwaha, N. Tandon, D. R. H. K. Reddy et al., "Vitamin D and bone mineral density status of healthy schoolchildren in northern

India," American Journal of Clinical Nutrition, vol. 82, no. 2, pp. 477–482, 2005.
18. R. P. Heaney, "Bone health, "The American Journal of Clinical Nutrition, vol. 85, pp. 300S–333S, 2007.