Original Article

Knowledge, Attitude, And Practice (KAP) Study on Vitamin D Among Phase II MBBS Students at Tertiary Care Teaching Hospital in Vadodara, Gujarat

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ABSTRACT

Introduction: Vitamin D is essential for calcium homeostasis, cellular growth and differentiation, immune regulation, etc. Vitamin D deficiency is one of the most underdiagnosed and undertreated nutritional deficiencies globally, affecting all age groups and genders. Despite of abundant sunlight in India, Vitamin D deficiency remains highly prevalent due to inadequate sun exposure, lifestyle factors and insufficient awareness. Medical students should be well aware of Vitamin D and its deficiency; hence this study was conducted.

Objective: To assess the knowledge, attitude and practices regarding Vitamin D among Phase II MBBS students.

Materials and Methods: A cross-sectional study was conducted among 150 Phase II MBBS students using a structured and pre-tested questionnaire in form of Google Form. The questionnaire covered sociodemographic details, knowledge, attitude and practices regarding Vitamin D.

Results: In our study, among the 150 participants, 43% of participants were female and 57% were male. Students were of the age group 19 - 21 years. 94.8% of participants were aware that sunlight is the primary source of this vitamin D and 91.7% knew about correct daily dietary allowance of vitamin D. 92.7% students were ready to take vitamin D supplements if required. 91.7% of students practice of exposing themselves to sunlight in morning. Despite of students with good knowledge scores about Vitamin D, they had comparably low attitude and practice scores, showing that they are unable to apply their knowledge because of time constraints.

Conclusion: The majority of students had good knowledge, average attitude and practice scores about vitamin D.

Keywords: Vitamin D, Students, KAP study, Vitamin D Deficiency, Sunlight Exposure, Supplementation.

INTRODUCTION

Vitamin D is essential for maintaining healthy bones and teeth, supporting immunity, neuromuscular function, cardiovascular health, lung function, insulin regulation, and gene expression related to cancer development [1]. Vitamin D is available mainly as Vitamin D_2 (ergocalciferol) from plant sources, vitamin D3 (cholecalciferol) from animal sources and ultraviolet-B (UVB) exposure [2]. Both forms require liver and kidney hydroxylation to become biologically active [3]. Deficiency of Vitamin D increases risk of rickets, osteomalacia, osteoporosis, infections, autoimmune disorders, metabolic diseases and certain cancers [4].

Vitamin D Deficiency is defined by serum 25-hydroxyvitamin D levels below 20 ng/mL [3]. Vitamin D deficiency is considered the most underdiagnosed and undertreated nutritional deficiency worldwide [4]. It presents as a pandemic, affecting individuals irrespective of age, gender, ethnicity, or geography.

Studies report high prevalence across different populations due to indoor lifestyle, cultural clothing practices, female gender, socioeconomic status, seasonal variations, and limited sunlight exposure [5]. Misconceptions about sunlight exposure have also been reported from Australia, China, and Malaysia [6,7,8].

In India, in spite of abundant sunlight, Vitamin D Deficiency prevalence remains high due to inadequate sun exposure, sunscreen use, cultural clothing such as veil/burkha, obesity, smoking, low intake of fortified foods and medical conditions such as malabsorption and inflammatory bowel disease [4,9].

Medical students are the future clinical practitioners responsible for educating patients; therefore, their knowledge, attitudes, and practices regarding Vitamin D is pivotal. Numerous studies have highlighted inadequate awareness and poor health behaviour among young adults, suggesting the need for structured educational interventions.

This study aims to evaluate the knowledge, attitude and practices regarding Vitamin D among Phase II MBBS students at Parul Institute of Medical Sciences and Research.

MATERIALS AND METHODS

Study Design:

It is a cross-sectional study.

Study Site:

The study was conducted at the Parul Institute of Medical Sciences and Research, Vadodara, Gujarat, India.

Study Population:

The study population consisted of Phase II MBBS students.

Sample Size:

A purposive sampling technique was used to include 150 students.

Inclusion Criteria:

All Phase II MBBS students who were willing to participate in the study were included.

Data Collection:

The study aimed to assess the knowledge, attitude and practice regarding vitamin D among Phase II MBBS students. The questionnaire consisted of 24 questions in total, including general demographic questions, knowledge, attitude and practice-related questions.

Before beginning the questionnaire, all participants were briefed about the study's objectives and were allowed to proceed only after taking their consent, ensuring voluntary participation. The link was shared in class. To maintain data integrity and prevent multiple responses from the same individual, only one response per participant was allowed.

RESULT

In this study, 69 participants (46%) of participants were female and 81 participants (54%) were male, with ages ranging from 19 to 21 years.

92.7% of participants correctly identified the active form of Vitamin D as 1,25$(OH)_2$ cholecalciferol, and 3.1% identifying it as Cholecalciferol.

In our study, a significant portion of respondents (94.8%) indicated that they meet their vitamin D requirements through sunlight exposure, followed closely by vitamin D supplements (89.6%). Vitamin D was obtained from fish oil (59.4%) and eggs (56.3%), followed by milk (49%), while substantially fewer participants reported obtaining vitamin D from vegetables (22.9%) and fruits (19.8%). These findings suggest that participants had a good level of knowledge regarding the important sources of vitamin D.

Majority of respondents (94.8%) correctly identified "absorption of calcium and phosphorus" as the major role of Vitamin D in the human body. This demonstrates a strong level of awareness among participants regarding Vitamin D is essential involvement in mineral metabolism and bone health.

Table 1: Demonstrating attitude perspective of study participants

	Attitude questionnaire	Number (%) of participants
1	If given option, will you take a vitamin D test?	
	Yes	142 (94.8%)
	No	08 (5.2%)
2	If you are found to be deficient in vitamin D, will you take a vitamin D supplements?	
	Yes	139 (92.7%)
	No	11 (7.3%)
3	Indoor activities could increase incidence of vitamin D deficiency?	
	Agree	98 (65.6%)
	Disagree	34 (22.9%)
	Neutral	17 (11.5%)
4	Application of sunscreen can decrease the absorption of vitamin D	
	Agree	58 (38.6%)
	Disagree	61 (40.6%)
	Neutral	31 (20.8%)
5	Vitamin D should be administered with fatty diet can increase its absorption.	
	Agree	94 (62.5%)
	Disagree	27 (17.7%)
	Neutral	30 (19.8%)

The findings reveal that exposure to morning sunlight is common among the study population with 138 respondents (91.7%). Only 12 participants (8.3%) indicated lack of morning sunlight exposure, suggesting that morning sunlight exposure is a widely practiced routine among participants.

Regarding protective measures against sun exposure, the use of umbrellas was less common. Only 61 participants (40.6%) frequently used an umbrella to protect themselves from the sun's rays, whereas 89 participants (59.4%) did not use an umbrella for sun protection. Regular use of sunscreen was practiced by 42 participants (28.1%), while 108 participants (71.9%), did not use sunscreen on a regular basis.

With respect to engagement in outdoor activities, 22 participants (14.6%) reported outdoor activities on everyday basis, while 47 participants (31.3%) usually engaged in outdoor activities. The largest proportion of respondents, 67 participants (44.8%), reported sometimes engaging in outdoor activities. 11 participants (7.3%) reported rarely and 3 participants (2.1%) never performed outdoor activities.

DISCUSSION

Majority of participants (97.9%) were aware that vitamin D is classified as a fat-soluble vitamin. For most individuals, the primary source of vitamin D is exposure of the skin to Ultraviolet B (UVB) rays from sunlight. Additionally, vitamin D can be obtained through dietary sources, like eggs, fatty fish, and vegetables, or via supplementation [10].

Approximately a 13.6% of study participants rarely read nutrition information when purchasing food items, which indicates that they are unaware of how crucial this is. In contrast to our study there is 47.9% of participant sometimes read nutrition facts while purchasing food products. Comparable findings were obtained from Malaysia, where more than half of Malay female office workers never or rarely read nutrition labels upon purchasing [11].

In our study, 10.4% of participants always and 25% usually read nutrition facts while purchasing food products, whereas 47.9% sometimes, 13.6% rarely, and 3.1% never did so. These findings show a moderate level of attention to nutritional information among participants. In comparison with Abir Elghazaly et al., it reported that 16.6% always and 11.9% usually read nutrition facts, while 27.6% sometimes, 30.6% rarely, and 13.4% never read nutritional labels while purchasing food products. Although consistent label-reading behaviour remains limited, but it should be promoted more for the benefit of society [3].

In the present study, 71.9% of participants did not apply sunscreen, while only 28.1% reported daily sunscreen use, indicating poor adherence to sun-protective practices. In contrast, a study conducted by M. Varaprasanna Rao et al. reported a substantially higher prevalence of sunscreen use, with 80.6 % of participants using sunscreen and only 19.4% not using it. Among MBBS Phase II students, academic workload, indoor study schedules, and limited emphasis on personal sun-protective practices may contribute to lower sunscreen use [1].

In the present study, the majority of participants 91.7% reported exposure to sunlight in the morning, while only 8.3% reported no such exposure. This proportion is much higher than that reported by Saeed Alfadly et al., who found that 72.9% of participants were exposed to sunlight, whereas 27.1% did not expose themselves to sunlight. The higher rate of morning sunlight exposure observed in the present study may be attributed to differences in lifestyle patterns, daily routines, or greater awareness of the health benefits of sunlight exposure among the study population[10].

In the present study, males constituted 57% of the participants, while females accounted for 43%. These findings are comparable to results of Dr. Shipra Sharma et al., who also noted a slightly higher male representation (54.29%) compared to females (45.71%). Furthermore, the majority of participants in the present study were hostel residents, a factor that may influence dietary habits and lifestyle practices due to limited access to dining facilities and the shared social environment [12].

In our study, 94.8% of participants were willing to undergo vitamin D testing when given the option, compared with 89.6% of participants who expressed readiness in the study conducted by Alfadly et al. The close similarity between these findings indicates a consistent trend of favourable attitudes toward vitamin D screening across different populations [10].

In the present study, 14.5% of participants always, 31.3% usually, and 44.8% sometimes performed activities outside the house or building, while 7.3% rarely and 2.1% never engaged in outdoor activities. Overall, 90.7% of participants reported some level of outdoor activity, whereas 9.4% reported minimal or no outdoor activity. These findings vary with those reported by M. Varaprasanna Rao et al., who found that 73.1% of participants engaged in outdoor physical activities for sun exposure, while 26.9% did not. The higher level of outdoor activity observed in the present study may reflect differences in lifestyle patterns; this may be due to different geographical and climatic conditions of study populations [1].

In the present study, 65.6% of participants agreed that indoor activities could increase the incidence of vitamin D deficiency, while 22.9% disagreed and 11.5% remained neutral. These findings are comparable to those reported by Abir Elghazaly et al., in which 62.9% of participants agreed that indoor activities could maximise vitamin D deficiency, 11.6% disagreed, and 25.5% were neutral. The similarity in agreement levels across both studies indicates a generally consistent awareness of the adverse impact of prolonged indoor activities on vitamin D status [3].

CONCLUSION

This study highlights that the majority of participants demonstrated good knowledge regarding vitamin D, including its active form, sources, and physiological role. Most respondents correctly identified the role of vitamin D in calcium and phosphorus absorption, reflecting strong awareness of its importance for bone health. Sunlight exposure was recognized as the primary source of vitamin D, with a high proportion of participants reporting regular morning sunlight exposure. Dietary sources such as fish oil, eggs, and milk were also commonly acknowledged, although awareness of plant-based sources was comparatively low. The findings indicate that vitamin D supplementation was widely practiced among participants. Despite adequate knowledge, the use of sun-protective measures such as sunscreen and umbrellas was limited. Participation in outdoor activities varied, with most participants reporting occasional rather than regular activity. These behaviours suggest a gap between knowledge and consistent health practices. Overall, the study demonstrates satisfactory awareness of vitamin D among Phase II MBBS students. However, targeted educational program is needed to promote balanced sun exposure and healthy lifestyle practices to optimize vitamin D status.

DECLARATION BY AUTHORS

Ethical Approval: Approved

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