Volume 3, Issue 10, 2025

Frontier in Medical & Health Research

ISSN: (e) 3007-1607 (p) 3007-1593

AWARENESS ABOUT VITAMIN-D AND ITS ASSOCIATION WITH SOCIODEMOGRAPHIC CHARACTERISTICS IN GENERAL POPULATION OF PESHAWAR: A CROSS-SECTIONAL STUDY

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DOI: https://doi.org/10.5281/zenodo.18767598

Keywords
vitamin D, Deficiency, awareness, Knowledge

Article History
Received: 30 October 2025
Accepted: 18 December 2025
Published: 31 December 2025

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Abstract

Background: *Vitamin D is one of the key nutrients in the human body that is found both naturally in the form of food sources and exposure to sunlight the knowledge, regarding VD varies within different, regions, cultures, and population settings. The research has provided evidence that variations in the determinants and awareness of VD are influenced by gender, education, occupation, personal attitudes, and behaviour.*

Objectives: *This study focuses on the level of awareness regarding Vitamin D among the general population of Peshawar.*

Methods: *The cross-sectional analytical design of this study, collected data from 350 participants in one private and one public tertiary care hospital in Peshawar city. Data was collected through a survey-based questionnaire. Three groups were made based on the knowledge of participants. Groups of poor awareness, fair awareness, and good awareness.*

Results: *The association of vitamin D awareness was assessed with socioeconomic status. This study concluded that almost 55% of the population had poor, 27% had fair 18% had good knowledge and awareness. Age groups P=0.02 and academic level P=0.001 were found significant for their association with vitamin D awareness among study participants. Gender, marital status and occupation were found non-significant.*

Recommendation: *this study was able to find out awareness about VD in the general population. However, more thorough research work is required for insight into the factors and determinants of poor awareness of CVD.*

Conclusion: *55% of study participants were unaware of Vitamin D, 27% had fair and 18% had good awareness. Moreover, lower age was found negatively associated and academic level was positively associated with vitamin D awareness among study participants.*

INTRODUCTION

Vitamin D also called Calciferol is a naturally found vitamin found in many foods and is termed as one of the most essential nutrients. It is added to many foods as a dietary supplement.

Frontier in Medical & Health Research

ISSN: (e) 3007-1607 (p) 3007-1593

[1] The term Vitamin D is referred to the wide group of steroid molecules. Vitamin D is either available from food sources or is produced by ultraviolet radiation when the skin is exposed to sunlight. There are two processes of vitamin D hydroxylation. [2] The initial takes place in the liver, where the vitamin D is converted into calcidiol also called and expressed as 25-Hydroxyvitamin D. Then to make it physiologically active, the later phase of the process takes place in the kidney. Here the product is termed calcidiol and the chemical form is expressed as 1.23-Hydroxyvitamin D.[3]

The Vitamin D intake among populations and cultures vary and so from region to region. It is dependent on many factors, and human behaviour, attitude and intake in daily routine can affect its level in the body. Research has indicated that almost 90% of the body's VD needs are met by exposure to sunlight. [4–6] The recommended daily intake for adults aged eighteen to sixty years is up to 600 IU (international units). For persons aged more than seventy years, the RDI may exceed 600 and reach up to 800 in International Units. [7] IU is the international unit for the measurement of taking vitamins into the body, although this unit measures the number of vitamins consumed by the body. However, the upper level of VDI is consumed daily if the user's age is more than 10 years. This amount may reach up to four thousand international units VD. The research supports its safety and may not cause any significant health risks or hazards. [8,9]

Awareness of Vitamin D, its benefits and sources of vitamin D intake differ in the general population. Vitamin D awareness may be affected by sociodemographic factors like age, gender, education, Monthly income (MI), marital status and occupation. Socioeconomic status factors are responsible for the Vitamin D deficiency. [10,11]. Knowledge, attitude and practices (KAP) studies about vitamin D awareness conducted in universities of Pakistan has concluded that students of life sciences and health sciences are aware of the micronutrients and essential multivitamins but students of other disciplines like engineering and social sciences lacked the basic knowledge of such life essential micronutrients [12,13]. Thus evidence about vitamin D awareness from Pakistan concluded that only 9% of the study participants were able to correctly identify what were the potential sources of Vitamin D intake. Only one-third of the participants were able to define the beneficial effects of VD for bone and skeletal health, and the same proportion of the population stated it as a major source of Vitamin D intake. [12]

Furthermore, the ethnic characteristics, SES, educational level of the participants, their age, the physical condition of the participants and smoking characteristics were all found associated with the Vitamin D level [14]. While maternal health awareness and education about vitamin D has been reported to be associated with improved vitamin D level in their children [15]. The effects of SES and sociodemographic factors on the KAP of VD and its further effect on Vitamin D levels cannot be denied. The objectives of the research were to assess the level of awareness of Vitamin D deficiency among the people of Peshawar. And to determine the association of demographic variables with the level of awareness regarding vitamin D deficiency among the population of Peshawar.

Methodology:

Design: This was a cross-sectional analytical study design. The purpose of the study was to take a snapshot of the description of Vitamin D awareness and its associated factors and demographic variables in Peshawar city.

Study Settings: The study was conducted in a tertiary care hospital in Peshawar city.

Study time frame: Data was collected from January 2023 to June 2023.

Population: Patients who were visiting the OPD of the study settings were included in the study through probable convenient sampling technique. The inclusion criteria were defined as all the individuals irrespective of gender to be included in the study if the participants were above the age of 18, were able to provide verbal and Ethical Approval:

The participants agreed to provide written consent for inclusion in the study. Institutional

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ISSN: (e) 3007-1607 (p) 3007-1593

ethical approvals were obtained from both hospitals before data collection.

Sample size: The sample size was calculated through Rao soft software 0.5% margin of error and, a 95% confidence interval. The calculated sample size was 350.

Questionnaire and data collection tools

The questionnaire was used to collect data about the participants' demographics of gender, age, nationality, occupation, place of residence, and educational level. The questionnaire was offered to the participants after the verbal consent was taken.

Statistical analysis: SPSS version 26 was used for descriptive statistics and application of Pearson correlation to study variables.

Results:

A total of 350 participants were enrolled in the study. 74% were male and 26% female participants. The pre-validated questionnaire included seven questions that asked participants about their vitamin awareness in terms of hearing about it, its health importance, deficiency, vitamin D-rich foods and sources of its dietary intake. Results of the study were reported in terms of Poor, fair and good knowledge. Descriptive statistics of the study reported that 55% of participants had poor knowledge about Vitamin D, 27% had fair knowledge and only 18% had good knowledge. Pearson correlation of the study reported age groups were associated with Vitamin D awareness as P=0.02, P<0.05. Differences were found among groups with age group of 18-30 years had significant differences than others. Academic level P=0.001 was also found positively correlated with awareness about Vitamin D in the general population. Thus participants with higher academic levels were more aware of Vitamin D.

Table 1: Sociodemographic characteristics and vitamin D awareness descriptive table of the participants

Sociodemographic Characteristics of Study Participants			
Gender			0.06
	Frequency	Percentage	
Male	260	74%	
Female	90	26%	
		Total=350	
Age groups			**0.02**
	Frequency	Percentage	
18-30 years	185	53%	
31-40 years	87	25%	
41-50 years	47	13%	
51-60 years	21	6%	
60 years and above	10	3%	
		Total:350	
Academic level			**0.001**
Illiterate	95	27%	
Matriculation	73	21%	
Intermediate	80	23%	
Graduation	91	26%	
Post-Graduation	11	3%	
		Total:350	

Volume 3, Issue 10, 2025

Frontier in Medical & Health Research

ISSN: (e) 3007-1607 (p) 3007-1593

Marital status				**0.167**
Married	208	59%		
Unmarried	118	34%		
Divorced	14	4%		
widowed	10	3%		
			Total: 350	
Occupation				0.063
Unemployed	73	21%		
Part-time employment	146	42%		
Full employment	107	30%		
Retired	24	7%		
			Total:350	

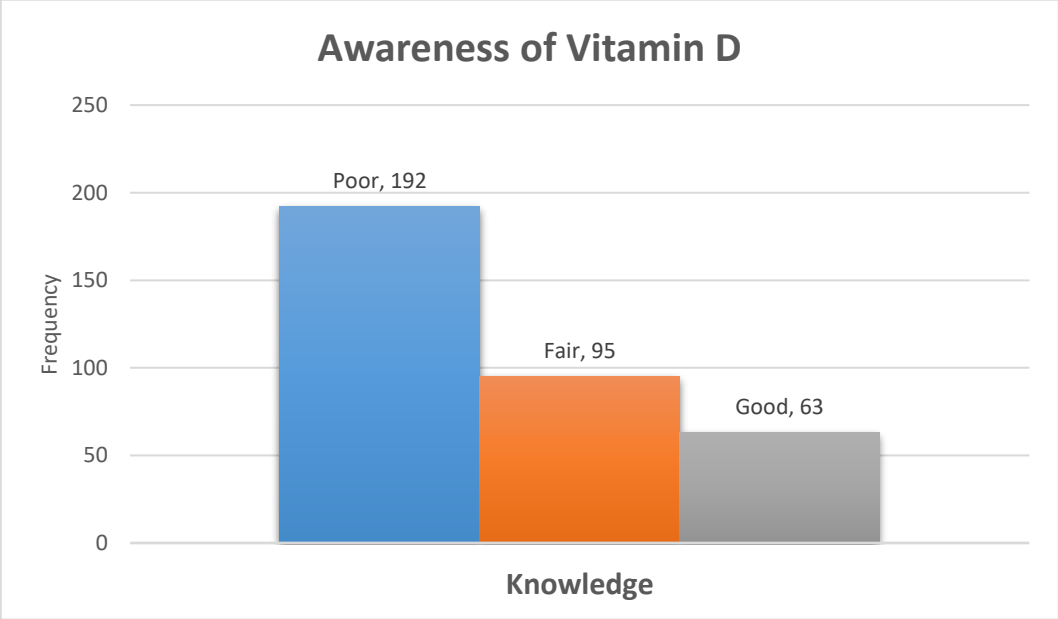


Figure 1: Awareness of Vitamin D in the studied participants

Discussion:

This study identified that age groups and education levels are associated with Vitamin D awareness among the general population. Based on the results of this study 55% of the population comprising a count of 192 participants, had poor knowledge of Vitamin D awareness, 27% had fair awareness and 18% had good awareness. These results are statistically significant when compared with the education level of the participants. In the studied sample only 3% of participants had an education level of post-graduation. Graduates were 26%, 23% had completed or equal to that qualification termed as intermediate in this study. The percentage of matriculates was 21%. The highest studied group of this sample was the illiterate which accounted for 27%. Our results showed that the illiterate group had significant differences from the mean of other groups when compared based on knowledge of vitamin D awareness. The same level of significance was noted among the participants of the matric group and the others. Knowledge was found higher in the high-education groups.

Frontier in Medical & Health Research

ISSN: (e) 3007-1607 (p) 3007-1593

53% of our population was under the age of 30 years. 74.3% of the participants were male participants. 48% of the participants had education at the equal matriculation level or below. Thus 52% of the population had an education level higher than matriculation and the results showed higher knowledge about vitamin D awareness in these groups. Parallel to these findings, earlier studies reported Vitamin D awareness in university students in Pakistan. [16] The results concluded that only 9% of the participants were able to name or list the food products that are thought to be Vitamin D sources. One-third of the participants were able to identify the benefits of Vitamin D intake and Vitamin D supplementation for bone health. Only 36% identified sunlight as a potential source for Vitamin D intake. From the findings of the current study, it was reported that in the groups of higher education, the knowledge of Vitamin D intake and its benefits was recorded higher when compared with the lower education groups.

Another study was conducted in Pakistani medical students regarding Vitamin D deficiency and awareness of its beneficial effects on health. The results concluded that the final-year students were the most, aware of the Vitamin D intake its sources and its benefits. The students who were less exposed to sunlight were found to have lower Vitamin D levels. [16]

Male athletes were found to have higher Vitamin D levels as compared to their counterparts in the female group. Only six out of ten male participants and three out of ten female participants were able to meet the recommended daily intake and had lower vitamin D levels than the recommended. The study concluded that lower vitamin D levels can be associated with lesser awareness of Vitamin D intake. [17] Contrary to the study settings of Qureshi [16] and Leitch [17], Maryam [18]conducted a study regarding awareness of Vitamin D at a community level in Gilgit Baltistan. 53% Vitamin D deficient according to the survey questionnaire criteria. 65% of the general population were found to know Vitamin D Deficiency. Leitch [17] did not show the related demographics of the population, additionally, the population size included minors of at least ten years old. At the community level where the general knowledge and information flow is much lower as compared to the cities and urban settings, it is somehow difficult that the minors in such settings will have such higher knowledge of these rare discussed issues and events. As Qureshi [16] stated only 9% of participants in their study had proper knowledge and awareness about VDD.

The findings of this study have provided a background for other researchers to investigate more about vitamin D awareness in the general population and its association with dietary intake of vitamin D and Vitamin D levels.

Recommendations:

Clinicians should focus on the age groups and academic levels of patients when counselling for nutrients and vitamin deficiencies. These sociodemographics can vary patients' understanding and knowledge about essential elements for human body functioning and healthy life. Health promoters, educationists and public health professionals should educate communities about vitamin D, its deficiency and its benefits for human health.

Conclusion:

The current study showed that 55% of the participants had poor knowledge about Vitamin D and its awareness. The percentages for fair knowledge and good knowledge were noted as 27% and 18% respectively. Thus the knowledge and awareness about VD in the general population are poor. The education level was found associated with awareness and knowledge of VD. And thus participants with higher education levels had good knowledge of VD. The age groups were also found to have effects on the level of VD awareness and knowledge. This study has provided a foundation for future research studies.

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Appendices:
Questionnaire

Awareness or Knowledge-Based Questions				
no.	**Question/Item**	Yes	No	Do not know
1.	Do you hear about vitamin D deficiency?			
2.	Do You think it's important for your health?			
3.	You were told that you have vitamin D deficiency.			
4.	Do you have any idea of Vitamin D D-rich food?			
5.	People, who work indoors are at high risk of Vitamin D deficiency			
6.	Both women and men are at risk of vitamin D deficiency.			
7.	Inappropriate dietary intakes are related to vitamin D deficiency?			