

Awareness Regarding Vitamin D Deficiency among Adult Females Attending the Outpatient Department at a Private Hospital in Lalitpur, Nepal: A Cross-sectional Analytical Study

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Vitamin D Deficiency (VDD) is a major contributor to osteoporosis, a serious public health problem worldwide, particularly affecting females. VDD is a preventable condition and is significantly linked to the awareness of Vitamin D. However, previous studies found a lack of awareness about VDD in Nepal. The study aimed to assess the awareness regarding VDD among adult females attending outpatient departments (OPDs) at a private hospital in Lalitpur. A cross-sectional analytical research design was conducted among 94 females over 20 years attending the outpatient department in B & B Hospital, Lalitpur, Nepal. Participants were selected using a convenience sampling technique. A structured questionnaire was used to collect the data using face-to-face interviews. Ethical approval was obtained from the Institutional Review Committee of B&B Hospital in Lalitpur. Mean, standard deviation, frequency, and percentage were used to present descriptive data. Chi-square tests were performed to assess the associated factors. The majority of the respondents (68.1%) were aware of VDD and found it significantly associated with educational level and residence. The hospital should cater to tailor VDD awareness initiatives and make them accessible and understandable to clients with different backgrounds.

Keywords: awareness, females, outpatient departments, vitamin D deficiency.

Vitamin D is a fat-soluble prohormone that plays a key role in calcium regulation and maintenance of bone health.¹ Vitamin D is also called the “sunshine vitamin” as its main source is sunlight.² Deficiency of Vitamin D is a preventable public health concern that affects billions of people worldwide.³ The serum 25(OH)D is less than 50 nmol/L or 20 ng/ml is considered Vitamin D deficiency (VDD) and leads to abnormal skeletal outcomes.⁴ The female gender has been found as the most important predictor of Vitamin D Deficiency (VDD).⁵ Insufficiency or deficiency of Vitamin D in adults results in decreased bone mass and increases the risk of fragility fractures.⁶

The prevalence of VDD has been reported as 24% in the United States of America, 37% in Canada, and 40% in Europe.⁴ The prevalence is higher in South Asian adults, with a 68% pooled prevalence. The highest prevalence was reported in Pakistan (73.0%), followed by Bangladesh (67.0%). Nepal reported a 57.0% VDD prevalence.³ The major cause of vitamin D deficiency is insufficient sun exposure, which leads to rickets in children and osteoporosis and fractures in adults.⁷ Individuals with VDD have a greater risk of cancers, autoimmune diseases, infectious diseases, and hypertension.⁸ VDD is a preventable health condition, and its risk can be reduced by

exposure to sunlight and consumption of foods that naturally contain Vitamin D.⁹ Daily sunlight exposure of 5 to 30 minutes without using sunscreen is needed to make vitamin D in our bodies.¹⁰

The knowledge regarding VDD is significantly associated with VDD prevalence.¹¹ Many people have limited knowledge and awareness regarding Vitamin D Deficiency, duration of sun exposure, and food fortification regarding vitamin D.¹² In Nepal, Kayastha et al. found a low awareness about VDD among parents of 1 to 15-year-old children.⁵ The objective of this study was to assess the awareness regarding Vitamin D Deficiency among female clients over 20 years attending the outpatient departments at a private hospital in Lalitpur, Nepal.

Materials & Methods

A cross-sectional analytical study was conducted among 94 participants at B&B Hospital, Gwarko, Lalitpur. The sample size was calculated using a prevalence of 44%¹³, an error of 10% in Cochrane’s formula. It is a well-known tertiary center providing emergency, medical, and surgical care in Nepal. We included female clients above 20 years of age attending the OPDs of orthopedic surgery, gynecology and obstetrics, general surgery, and general medicine. Those who did not provide consent and those with communication

issues were excluded from the study. Participants were selected conveniently and interviewed face-to-face using a semi-structured questionnaire from April to May 2024. Before data collection, ethical approval was obtained from the IRC of B&B Hospital (Ref: B&BIRC-24-32). Informed consent was taken from all the respondents before the interviews.

The study tool was developed by reviewing previous studies.^{5,11} The tool was divided into two parts. PART I included questions related to demographic information and the food preferences of the respondents. PART II assessed awareness regarding Vitamin D Deficiency, using 12 multiple-choice questions and eight multiple-response questions. The tool was revised after pretesting it among 10 OPD clients attending Alka Hospital, Lalitpur.

Following data collection, the data were checked for completeness and accuracy and coded. The total obtained score was categorized into two groups, i.e. unaware with $\leq 50\%$ score and unaware with $> 50\%$.¹³ Data analyses were performed in SPSS version 20 software. Descriptive statistics were presented as mean, SD, frequency and percentage. Pearson and Chi Square test was performed to find the associated factors for VDD.

Results

Table 1 illustrates that out of 94

respondents, about 45.4% were aged 40 and below, and most of the respondents had a higher education (60.6%). Most of the respondents (79.8%) were Hindu. The highest proportion of the respondents (43.6%) were homemakers, and more than half lived in urban areas (58.5%). Most of the respondents (77.7%) were nonvegetarian. More than half (56.4%) of the respondents sometimes spend some time outdoors in sunlight, and about 4.3% or respondents reported never being exposed to sunlight.

As shown in **Figure 1**, social media was a common source of information regarding Vitamin D Deficiency (45.7%), followed by peer groups (40.4%), and health professionals (39.4%).

Awareness regarding VDD

Results revealed that the majority, 64 (68.1%) of respondents were aware of VDD, and 30 (31.9%) were unaware.

Table 2 illustrates the mean score of awareness regarding Vitamin D Deficiency. The overall mean score was 31.11 ± 9.7 . This indicated that the overall mean percentage is 51.85%. The obtained mean score and percentage was highest (5.8, 65.3%) in the treatment of Vitamin D Deficiency and lowest (6.1, 43.2%) in the etiology of Vitamin D Deficiency.

Table 1: Sociodemographic information and food preferences (n=94)

Variables	n	%
Age group (In years)		
≤40	64	45.4
>40	30	21.3
Mean±SD36.43±10.70; Min-Max (20-65)		
Religion		
Hindu	75	79.78
Non-Hindu	19	20.2
Educational level		
Illiterate	6	6.4
Can read and write only	3	3.2
Primary level	7	7.4
Secondary level	21	22.3
Higher level (>10 th grade)	57	60.6
Occupation		
House makers	41	43.6
Student	17	18.1
Business	14	15.0
Service	11	11.6
Agriculture	6	6.4
Others	5	5.3
Residence		
Urban	55	58.5
Rural	39	41.5
Food Preferences		
Non-Vegetarian	73	77.7
Vegetarian	21	22.3
Exposure to sunlight		
Frequently	37	39.4
Sometimes	53	56.4
Never	4	4.3

Table 2: Respondents' mean score of awareness regarding VDD (n=94)

Area of Awareness	Possible score	Obtained range	Mean \pm SD	Mean%
Introduction (2)	2	0-2	1.1 \pm 0.7	54.0
Etiology(2x6*+2)	14	2-11	6.1 \pm 1.8	43.2
Signs and symptoms(1x6*)	6	1-6	3.9 \pm 1.0	65.3
Treatment (1x6*+3)	9	2-9	5.8 \pm 1.7	64.9
Prevention(1x6*+4)	10	3-9	5.4 \pm 1.5	54.0
Complications(1x6*+1)	7	1-6	3.5 \pm 1.1	49.3
Sources (2x6*)	12	1-10	5.4 \pm 1.8	44.8
Total score	60	10-53	31.1 \pm 9.7	51.9

Total MRQ*8(48 items) Total MCQ- (12)

Table 3: Association between VDD awareness and background variables (n=94)

Variables	Aware n (%)	Unaware n (%)	X ²	p-value
Age (In years)				
≤ 40	47(73.4)	17(26.6)	2.6	0.1
> 40	17(56.7)	13(43.3)		
Religion				
Hinduism	53(70.7)	22(29.3)	1.1	0.3
Non-Hindu	11(58.0)	8(42.0)		
Educational level			-	
Illiterate	1(16.7)	5(83.3)		<0.05
Literate	63(71.6)	25(28.4)		
Occupation				
Homemakers	29(70.7)	12(29.3)	0.2	0.6
Others	35(66.0)	18(34.0)		
Residence				
Rural	22(56.4)	17(43.6)	4.2	<0.05
Urban	42(76.4)	13(23.4)		
Food preferences				
Vegetarian	13(62.0)	8(38.0)	0.5	0.5
Non-vegetarian	51(70.0)	22(30.0)		

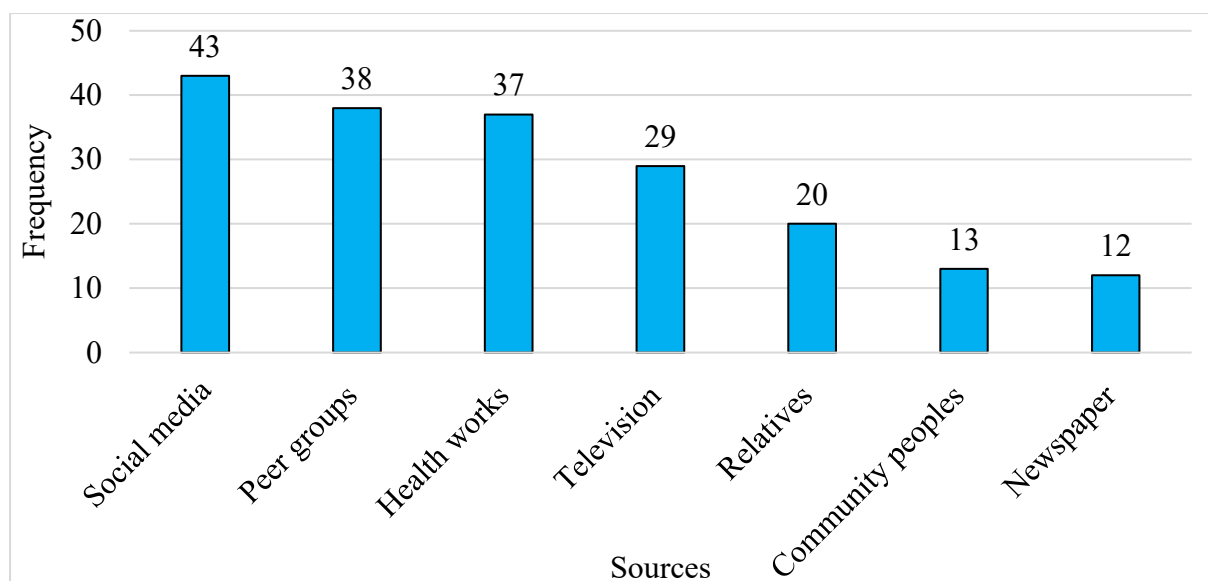


Figure 1: Sources of information for vitamin D deficiency (n=94)

Table 4 showed a significant association with the educational level (<0.05) and the residence (<0.05) of the respondents but was not significantly associated with the age (0.1), religion (0.3), occupation (0.6), or food preferences (0.5) of the respondents.

Discussion

The present study assessed the levels of awareness regarding Vitamin D Deficiency and the associated factors. We found that most respondents (68.1%) were aware of VDD, while almost one-third (31.9%) were unaware. In line with our study results, a study in the United Kingdom revealed that the majority (72%) had good knowledge about VDD.¹⁴

Similarly, a study at Ahfad University in Sudan also revealed that most of the respondents (88.8%) had essential knowledge about VDD.¹⁵ Unlike our

findings, the awareness level was lower (44.0% and 45.2%) in the previous studies by Kalyani and Sharma et al., and AL-GHRAIBAWI et al., respectively.^{13,16} The difference in the results might be attributed to the different study sites and sample sizes. In the present study, the overall mean score obtained was 31.1 ± 9.7 . The overall knowledge mean score was slightly higher in a previous study (49.4 ± 10.7) conducted by AlBlooshi et al. in the United Arab Emirates (UAE).¹⁷ The difference in mean value might be due to a difference in the question pattern used. Regarding sources of Vitamin D, the mean score obtained was 5.4 ± 1.8 in our study. The mean score for sources of Vitamin D was slightly lower (2.8 ± 1.6) mean score in a study conducted by Alamoudi et al., in Saudi Arabia.¹⁸ Variation in the total possible score might explain this minor difference.

Regarding the source of information, social

media was reported by the highest proportion of respondents (45.7%) in the present study. Similarly, mass media were also found to be the most reported source of information regarding VDD in a study conducted in Saudi Arabia.¹⁹ However, the main source of information reported in previous studies differs, as health professionals (73%) and family and friends reported mostly.^{17,20} The difference could be due to differences in healthcare access and the influence of social networks.

We found no association between age and knowledge regarding VDD. However, knowledge scores varied according to age in the previous studies.^{14,17} Results could be different due to differences in sample characteristics and study settings. We found a significant association between VDD awareness level and the educational level of respondents. AlBlooshi et al. also reported a significant association between the level of education and Vitamin D knowledge.¹⁷ The present study revealed that the awareness score varied according to the residency of respondents. Residency was also found to be significantly associated with VDD awareness in the previous studies by AL-GHRAIBAWI et al., and Kambal et al.,^{16,21}

Conclusion

The findings of the study showed that the majority of respondents (68.1%) are aware

of VDD. This reflects the gap in awareness among our study population. The study shows a statistically significant association between the awareness level and respondents' educational level and residency. The awareness programs should be implemented, focusing on all VDD information and targeting females from different educational backgrounds and residency.

Conflict of interest: None

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