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Assessment Of Knowledge Regarding Vitamin D Deficiency Among The Adolescent Students Of Selected School In Guwahati, Assam

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Abstract: Vitamin D deficiency is a widespread and serious global health concern, affecting a remarkable 30-80% of children and adults worldwide, regardless of a country's developmental status. The well-documented role of vitamin D in bone mineralization and skeletal health is complemented by a growing body of evidence linking vitamin D deficiency to a range of chronic diseases, including type 1 diabetes mellitus, systemic lupus erythematosus, multiple sclerosis, cardiovascular disease, and various malignancies.[3.] Objectives 1. Assess knowledge about vitamin D deficiency among adolescent students. 2. Determine association between knowledge and demographic variables. Methodology Descriptive study with 100 students using a structured questionnaire. Results Majority of students (70%) had moderate knowledge about vitamin D deficiency.Conclusion Improving knowledge about vitamin D deficiency among adolescent students is necessary to address its prevalence and consequences.

I. INTRODUCTION

"Vitamin D is a simple solution to a complex problem – It's a nutrient that can have a profound impact on our overall health and wellbeing."

Vitamin D (calciferol) is a group of fat-soluble secosteroid hormones important in calcium and bone metabolism. Lack of vitamin D manifests as rickets in children and degenerative bone diseases in older people . Vitamin D is one of the major vitamin and very essential for maintenance of normal growth and development of strong bones .[1] Vitamin D is produced endogenously when ultraviolet rays from sunlight strike the skin and trigger vitamin D synthesis. Vitamin D obtained from sun exposure, food, and supplements is biologically inert and must undergo two hydroxylations in the body for activation. [2]

Vitamin D deficiency has reached epidemic proportions globally, with South Asians being disproportionately affected. As sunlight exposure is the primary source of vitamin D, populations with limited access to sunlight are particularly vulnerable. Fortunately, dietary sources can help bridge the gap. Key vitamin D-rich foods include oily fish, egg yolks and fortified products, while supplements offer an additional solution. Addressing this deficiency is crucial to mitigating its associated health risks. [3]

Vitamin D deficiency is a complex issue influenced by various factors, including seasonal variations, sun exposure duration and timing, latitude, clothing choices, and individual skin pigmentation. In India,

modernization has exacerbated this issue, leading to decreased outdoor activities and sedentary lifestyles, particularly among urban populations. Furthermore, shifts in dietary habits among younger generations result in inadequate vitamin D intake. Rapid industrialization and increased pollution also obstruct ultraviolet-B (UVB) rays, hindering optimal vitamin D synthesis in the skin. Consequently, vitamin D deficiency poses significant health risks, including osteoporosis, fractures, cardiovascular disease, diabetes, and certain cancers. Addressing this deficiency requires a multifaceted approach, incorporating increased awareness, dietary modifications, regular sun exposure, and pollution reduction strategies.[5]

The Indian Academy of Pediatrics Guidelines and the Global Consensus on Prevention as well as Management of Nutritional Rickets recommend that 25(OH)D concentrations of over 50nmols/L (20ngm/ml) are sufficient, between 30 and 50 nmols/L (12–20 ngm/ml) are insufcient and below 30 nmols/L (12 ngm/ml) are in the deficiency range in children and adolescents. A systematic review published in 2014 suggests that vitamin D deficiency and insufficiency are a major public health problem globally irrespective of age, even in populations residing in countries where it is assumed that UV radiation is adequate and in industrialized countries where fortification has been implemented for years. It is estimated that about 1 billion people across all ethnicities and age groups have low vitamin D concentrations worldwide6. In India, approximately 490 million people are vitamin D deficient of which 31% are children and adolescents. India is a large country and in most published reports, participants are confined to one district or specific populations. Further, studies have been performed on relatively small sample sizes with differences in methods of vitamin D concentration estimation such as radioimmunoassay, ELISA, chemiluminescence etc. Te prevalence of vitamin D deficiency has been also been described using different cut-ofs, thus making interpretation of results default.[6]

MATERIALS AND METHODS

This was a descriptive non experimental study which was conducted in the Kaziranga English Academy, Guwahati , Assam , among the adolescent students of age group 14-18 years old. The study was conducted on 27th June , 2024. The size of the sample was 100 adolescent students. Non- probability convenience sampling technique was used to select the subjects for the study. For assessing the knowledge quantative research approach was adopted by the investigator. The knowledge of the students were assessed by using a structured self –administered questionnaire. descriptive design was adopted for the study.

Results :

The study result reveled that out of 100 students, majority of the students i.e. 33 (33%) falls under the age group 16-17 years, 61(61%) students are male, 29 students (29%) are from class 11 , 37 students (37%) spends 1-2 hours in outdoor, 80 students (80%) are non-vegetarian , 68 students (68%) previous knowledge regarding vitamin D deficiency and out of that majority 32 students (47.06%) have knowledge from internet sources .

The study also showed that out of 100 students, majority of the students 70 (70%) have moderate knowledge, 19(19%) have inadequate knowledge and 11(11%) have adequate knowledge on vitamin D deficiency .

The study findings states that there is significant association between level of knowledge on vitamin D deficiency and demographic variable (presence of previous knowledge) at $p = <0.05$ level and with the mean score of knowledge 8.82 ± 3.09 . The calculated Karl Pearson's correlation "r" value was 0.87 . It also

reveals that there is no significant association with other demographic variables such as Age, Gender, Educational qualification, food preference , time spend outdoor, presence of previous knowledge on vitamin D deficiency

SECTION I – Description of demographic characteristics

This section deals with description characteristics of the adolescents aged between 14-18 years in terms of frequency and percentage.

TABLE 1: Description of demographic characteristics

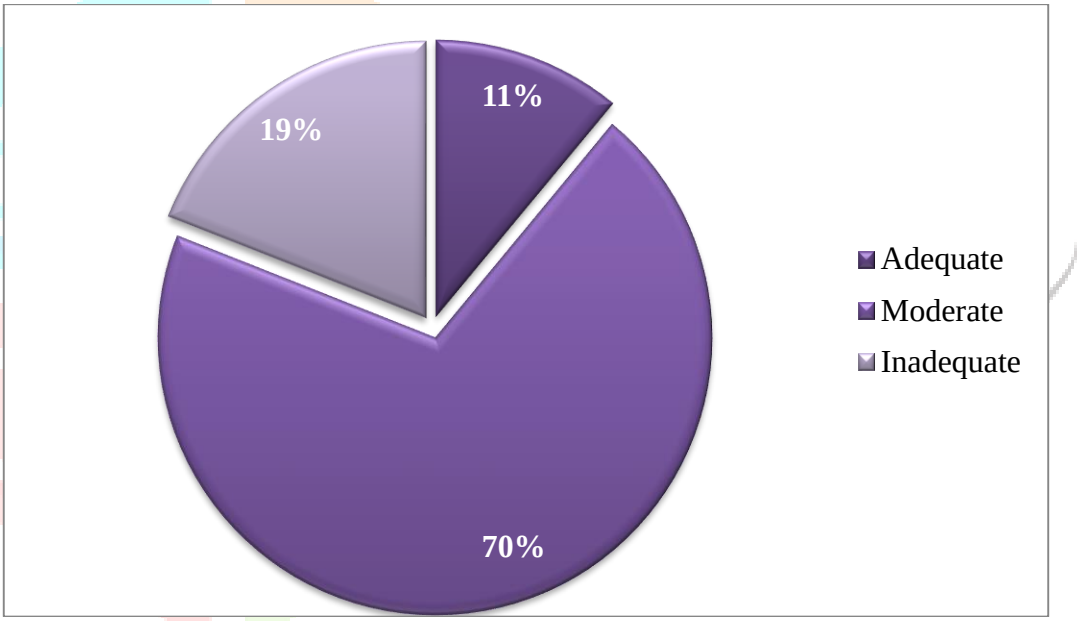
		FREQUENCY	PERCENTAGE
AGE	*14-15 years*	***17***	***17%***
	15-16 years	***30***	***30%***
	16-17 years	***33***	***33%***
	17-18 years	***20***	***20%***
GENDER	*Male*	***61***	***61%***
	Female	***39***	***39%***
EDUCATIONAL QUALIFICATION	*Class 9*	***27***	***27%***
	Class 10	***21***	***21%***
	Class 11	***29***	***29%***
	Class 12	***23***	***23%***
TIME SPEND OUTDOOR	*< 1hr*	***28***	***28%***
	1-2 hr	***37***	***37%***
	2-3 hr	***18***	***18%***
	> 3 hr	***17***	***17%***
FOOD PREFERENCE	*Vegetarian*	***20***	***20%***
	Non-vegetarian	***80***	***80%***
PREVIOUS KNOWLEDGE	*Yes*	***68***	***68%***
	No	***32***	***32%***
SOURCE OF INFORMATION	*Printed*	***15***	***22.06%***
	Internet	***32***	***47.06%***
	Other	***21***	***30.88%***

Section II –Assessment of knowledge regarding vitamin D deficiency

Table 2: Frequency and percentage distribution according to grading of knowledge score

KNOWLEDGE SCORE	FREQUENCY	PERCENTAGE	KNOWLEDGE RANGE	MEAN	SD
Adequate knowledge	***11***	***11%***	***>12***	***8.82***	***3.09***
***Moderate** knowledge*	***70***	***70%***	***6 – 12***		
Inadequate knowledge	***19***	***19%***	***< 6***		

Table 2 shows that , out of 100 students , majority i.e. 70 students (70%) have moderate knowledge ; 19 students (19%) have inadequate knowledge and 11 students (11%) have adequate knowledge regarding vitamin D deficiency .



SECTION III- Assessment of association between level of knowledge regarding vitamin D deficiency with demographic variables among adolescents students (14-18 years)

Table 3: Association between level of knowledge with demographic variables

Demograohic Variables	Adequate	Moderate	Inadequate	Chi-Square	df	p value	Remarks
AGE							
14-15 Years	***0***	***11***	***6***	***7.37***	***6***	***0.288***	NS
15 -16 Years	***3***	***21***	***6***				
16-17 Years	***6***	***22***	***5***				
17-18 Years	***2***	***16***	***2***				
CLASS							
CLASS 9	***1***	***17***	***9***	***7.62***	***6***	***0.268***	NS
CLASS 10	***3***	***14***	***4***				
CLASS 11	***5***	***21***	***3***				
CLASS 12	***2***	***18***	***3***				
TIME SPEND OUTDOOR							
<1 hour	***4***	***21***	***3***	***9.39***	***6***	***0.153***	NS
1-2 hour	***5***	***24***	***8***				
2-3 hour	***1***	***10***	***7***				
>3 hour	***1***	***15***	***1***				
FOOD PREFERENCE							
Non-vegetarian	***9***	***58***	***13***	***1.97***	***2***	***0.373***	NS
Vegetarian	***2***	***12***	***6***				
PREVIOUS KNOWLEDGE							
Present	***7***	***53***	***8***	***7.87***	***2***	***0.020***	S
Not present	***4***	***17***	***11***				
KNOWLEDGE SOURCE							
Printed media	***0***	***12***	***3***	***3.99***	***3***	***0.407***	NS
Internet	***3***	***25***	***4***				
Other	***4***	***15***	***2***				

DISCUSSION

The findings of the study have been discussed with reference to the objectives of the study.

1. To assess the knowledge regarding vitamin D deficiency among selected adolescent students.

- The present study findings states that out of 100 students , majority i.e., 70 students (70%) have moderate knowledge, 19 students (19%) have inadequate knowledge and 11 students (11%) have adequate knowledge regarding vitamin D deficiency .

- The findings are supported by similar study conduted by **Arora H. et.al** (January,2016). Total of 599 students between 18 and 25 years of age participated in the survey. Females were more predominant in the study (64.7%). The majority of the students were 18-20 (69.7%) years of age, followed by 20-25 (27%) years. Table 1 shows socio-demographic characteristics of the participants. 84.4% students belonged to the Hindu religion while only 6.3% students were from Muslims families. The average monthly income was more than ₹50,000 (59.2%). The majority of the students (92.3%) were from undergraduate followed by 7.6% of post-graduation. 41% of the students were residing in Delhi NCR (New Okhla Industrial Development Authority), and approximately half (49.9%) of the students opted non-vegetarian food as their most common choice over vegetarian food (36.7%).Knowledge about Vitamin D Almost all (99.5%) students reported that they had heard about Vitamin D .

2. To determine the association between the knowledge of vitamin D deficiency with selected demographic variables .

- The present study findings states that there is significant association between level of knowledge on vitamin D deficiency and demographic variable (presence of previous knowledge). It also reveals that there is no significant association with other demographic variables such as Age, Gender, Educational qualification, food preference , time spend outdoor, presence of previous knowledge on vitamin D deficiency .
- The findings are supported by similar study conduted by Amina Tariq et.al in 2020. Knowledge was examined using questions about food sources, health benefits and factors affecting vitamin D production within the human body. Out of the 900 eligible students invited to participate, 505 (56%) completed the questionnaire and were included in the analysis. Only 9% participants were able to identify the correct food sources of vitamin D, 33% were aware of the bone health benefits (bone health and calcium absorption) of vitamin D and 36% identified sunlight exposure as a factor influencing vitamin D production. Knowledge about food sources and health benefits of vitamin D was not associated with gender and individuals concern about their levels. Those tested and taking supplements were more likely to identify bone related health benefits and factors affecting vitamin D production.

CONCLUSION

The study will highlight the need of giving education to the adolescent regarding vitamin D deficiency. Nurses may give awareness programme to the people regarding vitamin D deficiency.

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