

EFFECTIVENESS OF NEAP ON KNOWLEDGE REGARDING VITAMIN D DEFICIENCY AND ITS PREVENTION AMONG EARLY ADOLESCENTS IN SELECTED SCHOOLS OF DURG DISTRICT.

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Article Received on: 30/09/2026

Article Revised on: 21/10/2026

Article Published on: 01/11/2026

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<https://doi.org/10.5281/zenodo.23798825>



How to cite this Article: Ms. Neha, Mrs. Sapna Thakur, Kalpana Joshi (2026). Effectiveness of Neap on Knowledge Regarding Vitamin D Deficiency and Its Prevention Among Early Adolescents In Selected Schools of Durg District. International Journal of Modern Pharmaceutical Research, 10(11), 84–88.

ABSTRACT

Vitamin D deficiency is a major public health concern among adolescents in India. This quasi-experimental study evaluated the effectiveness of a Nutrition Education Activity Programme (NEAP) on knowledge regarding vitamin D deficiency and its prevention among 80 early adolescents (10–13 years) in a government school of Durg District. A one-group pre-test and post-test design was used, and knowledge was assessed using a structured questionnaire. The intervention was conducted over four days using interactive educational methods. Post-test results showed a significant improvement in knowledge scores compared to pre-test scores ($p < 0.05$). No significant association was found between post-test knowledge and selected demographic variables. The study concludes that school-based nutrition education programmes are effective in improving adolescents' knowledge and awareness regarding vitamin D deficiency and its prevention.

KEYWORDS: Vitamin D Deficiency, Nutrition Education Activity Programme, Early Adolescents, Knowledge, Prevention, Quasi-Experimental Study.

Vitamin D is a group of structurally related, fat-soluble compounds responsible for increasing intestinal absorption of calcium, and phosphate, along with numerous other biological functions. In humans, the most important compounds within this group are vitamin D3 (cholecalciferol) and vitamin D2 (ergocalciferol). Unlike the other twelve vitamins, vitamin D is only conditionally essential, as with adequate skin exposure to the ultraviolet B (UVB) radiation component of sunlight there is synthesis of cholecalciferol in the lower layers of the skin's epidermis. Vitamin D can also be obtained through diet, food fortification and dietary supplements.

Vitamin D deficiency is a condition in which the body has lower than recommended levels of vitamin D required for normal physiological functions. Vitamin D is produced in the skin through sunlight exposure and obtained from foods such as milk, eggs, fish, and fortified products. According to the World Health Organization (2023), deficiency occurs due to inadequate sunlight exposure and insufficient dietary intake. This deficiency impairs calcium absorption, leading to weak bones and an increased risk of fractures. Common symptoms include bone pain, delayed growth, fatigue, and frequent illness. Early detection, health education,

and lifestyle modification are effective strategies for prevention.

The Nutrition Education Activity Programme (NEAP) is a structured educational intervention aimed at improving nutrition and health knowledge. It uses interactive methods such as lectures, demonstrations, group discussions, visual aids, role play, and quizzes to promote effective learning. According to Krause and Mahan (2018), nutrition education is essential for preventing nutrient deficiencies and encouraging healthy dietary practices. In this study, NEAP was designed to enhance early adolescents' knowledge regarding vitamin D deficiency and its prevention, while promoting healthy behaviours such as adequate sunlight exposure and consumption of vitamin D-rich foods.

Early adolescence (11–14 years) is a critical period of rapid growth requiring adequate nutrition for bone and muscle development. According to UNICEF (2019), this stage is a "window of opportunity" for establishing healthy lifelong habits. However, reduced outdoor activity and poor dietary practices increase the risk of vitamin D deficiency. Therefore, educating early adolescents is appropriate, as awareness and preventive

behaviours developed at this age can support long-term health and prevent future complications.

Need of the study

Although India receives ample sunlight throughout the year, Vitamin D deficiency remains widespread. Numerous studies have reported that between **70% and 100%** of children and adolescents suffer from Vitamin D insufficiency across the country. As highlighted by the Indian Council of Medical Research (ICMR), over **80%** of Indian adolescents have lower-than-required levels of Vitamin D. Factors such as reduced dietary intake, lack of outdoor physical activity, limited sun exposure, and insufficient knowledge about Vitamin D's benefits have contributed to this persistent issue.

Review of Literature

HARIDARA BOHSAS (April 20224) Vitamin D deficiency is a preventable global health problem, often linked to low awareness levels. This online cross-sectional study was conducted in Syria between February 25 and March 29, 2023, to evaluate knowledge and awareness regarding Vitamin D deficiency among the general population. A total of 3,172 participants aged 18 years and above completed a validated 23-item questionnaire. Most respondents (57.9%) were between 18–28 years old, with a mean age of 30.8 ± 11.9 years. The majority recognized that Vitamin D supports bone health (91.4%) and maintains calcium and phosphate levels (84.6%). Over half correctly reported that sun exposure does not cause Vitamin D toxicity (54.1%) and that vegetarians are more prone to deficiency (54.9%). Multivariate analysis revealed that only age and occupation were significantly associated with adequate knowledge ($p < 0.05$).

Participants over 60 years had better awareness (OR = 7.95), while retired individuals were less aware than students. The study highlights the

OBJECTIVES

- To assess pre interventional knowledge of vitamin D deficiency and its prevention among early Adolescents in selected school Durg District.

Protocol of the study

Day	Intervention details	
1 st day	lecture cum Discussion	Students listened well and took interest. They asked questions and understood the topic.
2 nd day	Lecture cum Activity Session	Students actively participated in activities. They enjoyed learning and worked together nicely.
3 rd day	Lecture cum Demonstration methods	Students observed the demonstration carefully and understood how to do it step-by-step.
4 th day	Quiz competition and interactive session will be for students.	Students were excited and answered many questions. Participation and response were very good.

INCLUSION CRITERIA

(a) Willing to participate in study. (b) Present at the time of study. (c) Adolescents physically and mentally fit to attend education sessions.

- To find out effectiveness of Nutrition Education Activity programme in term of knowledge on vitamin D deficiency and its prevention among early Adolescents in selected school Durg District.
- To find out association between pre interventional knowledge on vitamin D deficiency and its prevention with selected demographic variables.

HYPOTHESIS

H₀: There is no significant difference in the knowledge scores regarding Vitamin D Deficiency and its prevention among the early Adolescents in Govt. school Durg District (C.G.).

H₁: There is significant deference between pre interventional knowledge score with post interventional knowledge at level of 0.05.

H₂: There is a significant association of knowledge regarding prevention vitamin D deficiency among early Adolescents with selected demographic variables.

METHODOLOGY

A quasi-experimental one-group pre-test and post-test design was used. A total of 80 early adolescents (10–13 years) from a government school in Durg were selected based on inclusion criteria. Data were collected using a self-structured knowledge questionnaire. The intervention NEAP was delivered through lectures, discussions, demonstrations, activity sessions, and a quiz over four days (45 minutes each), based on the General System Theory framework. Pre- and post-test scores were compared to assess effectiveness, and chi-square was applied to determine associations with demographic variables.

EXCLUSION CRITERIA

(a) Not willing to participate in study. (b) Absent at the time of study. (c) Adolescents with learning disabilities that may affect understanding of the programme.

RESULTS

The results revealed that the pre-test and post-test level of knowledge majority 55% of early adolescent had Poor knowledge, 35% of early adolescent had moderate knowledge and 1% had Good knowledge in pre-test but in the post-test majority 1% had Poor knowledge, 33.75% had moderate knowledge and 65% had Good knowledge. It shows that comparison of mean pre-test and post-test knowledge level on Vitamin D Deficiency and its prevention. The post-test mean score (15.42) was

high when compared to the pre-test score (6.52). the obtained „t“ value was greater than table value at 0.05 level of significant, which shows that there is significant difference between pre-test and post-test level of knowledge regarding Vitamin D Deficiency and its prevention among the early adolescent students. Hence, the formulated research hypothesis H1 was accepted.

Fig 1: Distribution of sample according to their pre-test and post-test level of knowledge (N=80).

Level of knowledge early adolescents				
	Poor	Moderate	Good	Total
Pre-test	44 (55%)	35 (43.75%)	1 (1.25%)	80 (100%)
Post-test	1 (1.25%)	27 (33.75%)	52 (65%)	80 (100%)

It shows that, the pre-test and post-test level of knowledge majority 55% of early Adolescents had inadequate knowledge, 43.75% of early Adolescents had moderate knowledge and 1.25% had adequate knowledge

in pre-test but in the post-test majority 1.25% had inadequate knowledge, 33.75% had moderate knowledge and 65% had adequate knowledge.

Fig 2: Comparison of pre-test and post-test knowledge level of early Adolescents regarding Nutrition Education Activity Programme regarding Vitamin D Deficiency and its prevention.

S.no.	Knowledge score	Mean	Mean difference	Standard deviation	t' value
1	Pre-test	6.52	8.9	4.13	2.36
2	Post-test	15.42		2.53	

It shows that comparison of mean pre-test and post-test knowledge level on Vitamin D Deficiency and its prevention.

difference between pre-test and post-test level of knowledge regarding Vitamin D Deficiency and its prevention among the early Adolescents students. Hence, the formulated research hypothesis H1 was accepted.

The post-test mean score (15.42) was high when compared to the pre-test score (6.52). the obtained „t“ value was greater than table value at 0.05 level of significant, which shows that there is significant

Fig 3: Association of Pre -test knowledge levels of with their selected demographic variables. N=80. P<0.05 level of level of significance; NS: Non – Significance

S.no	Demographic variables	Level of knowledge			χ^2	DF	Table value	Level of significance
	Age (in year)	Poor	Moderate	Good				
	a) 10 years	0	9	28				
1.	b) 11 years	0	7	4				
	c) 12 years	0	6	4	70.14	6	12.59	S
	d) 13 years	0	12	10				
2.	Gender	0	15	33	0.34	2	5.99	NS
	a) Male	0	12	20				
	b) Female							
3.	Types of family	0	5	49	1.01	4	9.49	NS
	a) Nuclear	0	1	24				
	b) Joint	0	0	1				
	c) Extended							
4.	Father Education	0	7	10	10.21	10	18.31	NS
	a) Illiterate	0	4	12				
	b) Primary	0	1	12				
	c) Middle	0	0	12				
	d) High school	0	2	12				
	e) Graduation) Post	0	1	7				

	graduation							
5.	Mother Education Illiterate	0	7	21				
	Primary	0	4	12				
	g) Middle	0	1	11	3.58	10	18.31	NS
	h) High school Graduation	0	0	6				
	i) Post graduation	0	2	8				
		0	1	7				
6.	Father's occupation	0	4	19				
	a) Private	0	4	16				
	b) Government	0	1	6	1.12	8	15.51	NS
	c) Daily wages	0	2	16				
	d) Farmer	0	1	11				
	e) House maker	0						
7.	Mother's occupation	0	6	22				
	a) Private	0	4	11				
	b) Government	0	3	14	1.76	6	12.59	NS
	c) Labour	0	2	18				
	d) House wife	0						
8.	Dietary Pattern							
	a) Veg	0	9	28				
	b) Non-veg	0	7	33	0.58	4	9.49	NS
	c) Egg-veg	0	0	3				
9.	No. of siblings	0	9	6				
	a) 0	0	7	14				
	b) 1	0	6	15	14.78	6	12.59	S
	c) 2	0	5	18				
	d) 3	0						
10.	Family monthly income	0	0	28				
	a) 5000 to 10000/-	0	0	22				
	b) 10000 to 20000/-	0	2	19	5.18	6	12.59	NS
	c) 20000 to 30000/-	0	1	8				
	d) More than 30000/-	0						

DISCUSSION

Vitamin D deficiency has emerged as a serious public health concern that spans across both developed and developing nations. Despite numerous advancements in healthcare, this condition remains among the most prevalent yet under diagnosed nutritional deficiencies worldwide. Various epidemiological studies suggest that Vitamin D deficiency affects individuals across all age groups, with an estimated global prevalence ranging from 30% to 80%, especially among children and adults. This widespread deficiency is primarily due to inadequate sun exposure, poor dietary intake, and lifestyle factors, making it a global health issue of significant concern.

The global burden of Vitamin D deficiency and insufficiency is staggering, with estimates suggesting that over one billion individuals worldwide are affected. The health consequences of Vitamin D deficiency are vast and extend far beyond skeletal disorders. While rickets in children and osteomalacia in adults are the most well-known manifestations, numerous studies have associated low Vitamin D levels with a broad spectrum of acute and chronic illnesses. Vitamin D is an essential fat-soluble vitamin that is synthesized in the skin through sunlight exposure and obtained from various dietary sources. These include oily fish, egg yolks, veal, beef,

liver, sun-dried mushrooms, offal, milk, dairy products, and nutritional supplements. Since its discovery, the role of Vitamin D has gotten extreme attention, from being a simple vitamin to a steroid prohormone.

The most established purpose of Vitamin D is to help calcium absorption from the gastrointestinal tract, hence ensuring adequate serum calcium and phosphate levels in the blood. It is important in a variety of vital processes, including mineralization and skeleton growth, control of the parathyroid gland's function, and the immune system as a whole. It helps to prevent autoimmune disorders, chronic diseases, and malignancies; additionally, it supports the cardiovascular system's health.

NURSING IMPLICATION

Nursing education should prepare an effective future nurse, active participation of student nurses in conducting educational programmes to provide information regarding Vitamin D Deficiency and its prevention, the nursing curriculum focuses more on the preventive aspect, the nurses must therefore be prepared to identify the areas of knowledge deficit through the assessment of learning needs of early adolescent.

RECOMMENDATION

Experimental designs with control groups may be used. NEAP can be implemented in **community settings, schools, and health institutions** as a cost-effective educational intervention.

Different teaching modalities (video, digital apps, interactive modules) may be tested.

CONCLUSION

The study findings provide clear statistical evidence that the Nutrition Education Activity Programme was highly effective in improving the knowledge of early adolescents regarding Vitamin D deficiency and its prevention. Educational interventions in schools can play an important role in improving adolescents' health awareness and long-term well-being.

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