

Prevalence of Nutritional Deficiency Disorders among Rural School-Age Children in Jawan Block of Aligarh District

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Abstract

Background

Children in the age group of 5-15 years are often considered as school age. It is recorded that in India, one fifth population consists of children between 5-14 years, which includes the primary and secondary school-age (1). Adequate micronutrient status is critical for good health and development during childhood. Access to high quality data on nutrition and health indicators in this age group would aid in prioritizing and setting up deliberate, evidence based nutrition intervention programs, targeting the nutritional problems that are of real concern (7). **Objectives:** 1. to examine the prevalence of clinical signs of nutritional deficiency disorders among school-age children. 2. to find out the difference in prevalence of deficiency disorders among boys and girls.

Methodology

The present cross-sectional study was undertaken in the selected villages of Jawan Block, Aligarh District. Jawan Block is the field practice area of Department of Community Medicine, Jawaharlal Nehru Medical College, A.M.U., Aligarh. A sample of 350 school age children was selected for the purpose of data collection. Clinical Examination Manual was used to examine the signs/symptoms of nutritional deficiency disorders among the target group. It was developed with the help of ICNNDs Manual for Nutrition Surveys (8).

Results and Discussion

Findings of the present study revealed that night blindness was more prevalent (6.3%) than Bitot Spot and the prevalence of pale conjunctiva (29.4%) was higher than the koilonychia (17.4%). Glossitis and Cheilosis was present in 8.0% and 6.0% school children respectively. Bleeding gums were observed among 15.1% children. No case of goiter was found in the areas of study.

Signs of nutritional deficiency disorders were more prevalent among boys than girls but the prevalence of night blindness and koilonychia was higher among the girls than boys.

Conclusion

Special programmes need to be formulated at the local level by visiting doctors and health service providers for the reduction in nutritional deficiency disorders among the target group and nutritional status of school-age children should be the matter of concern for policy makers.

Keywords: School-age children, clinical signs, nutritional deficiency disorders.

Introduction

Good nutrition is of prime importance in the attainment of normal growth and development and in the maintenance of health throughout the life. Children in the age group of 5-15 years are often considered as school age. It is recorded that in India, one fifth population consists of children between 5-14 years, which includes the primary and secondary school-age (1). School-age period is nutritionally significant because this is the prime time to build up body stores of nutrients in preparation for the rapid growth of adolescence (2). Adequate micronutrient status is critical for good health and development during childhood. Severe anemia, which can result from iron, folate or vitamin B12 deficiency, negatively impact work capacity, intellectual performance, and child cognitive development (3). Vitamin A plays a critical role in eye health and immune function (4) and also plays a role in the etiology of anemia. Sufficient iodine is critical to the growing child to optimize mental development and prevent goiter and its complications (5). Vitamin C is essential for the formation of collagen and intercellular matrix in teeth, bones and capillaries. Gum bleeds are common in vitamin C deficiency. glossitis, cheilosis and nasolabial dysbacea are associated with riboflavin deficiency (6).

The present study was undertaken on the assumption that school-age group is an important phase as far as the overall development is concerned. There is need for nutrition interventions in school-aged children and more high-quality research to assess nutritional status in this age group because an up-to-date overview of their nutritional status across the world is not available. Access to high quality data on nutrition and health indicators in this age group would aid in prioritizing and setting up deliberate, evidence based nutrition intervention programs, targeting the nutritional problems that are of real concern (7).

Objectives

1. To examine the prevalence of clinical signs of nutritional deficiency disorders school-age children.
2. To find out the difference in among prevalence of deficiency disorders among boys and girls.

Methodology

Profile of the Study Area: The present cross-sectional study was undertaken in the Rural Field Practice Areas (Jawan Block) of Department of Community Medicine, Jawaharlal Nehru Medical College, Aligarh Muslim University, Aligarh under Rural Health Training Centre (RHTC).

Ethical Consideration: The following approvals were obtained for conducting the study-

1. Permission from the chairman, Department of Community Medicine, Jawaharlal Nehru Medical College, A.M.U., Aligarh.
2. Permission from the in-charge, Rural Health Training Centre, Jawan Block, Aligarh District.

Period of the Study: The present study was carried out for a period of 6 months from April 2010 to September 2010.

Sample Size Estimation: A sample of 350 school age children was derived with the help of following formula-

$$n = 4pq/L^2$$

Sampling Frame: Spin the bottle method was used by the researcher to select the households to collect the sample of 350 school-age children. If any household having more than one child of the age group 6-12 years, then only the eldest one was selected.

Selection of Subjects in the Study-

(a) Inclusion Criteria:

- Children who had completed 6 years of age on the date of interview and were not more than 12 years of age.
- Male as well as female (both) were included in the study.

(b) Exclusion Criteria:

- Children less than 6 years of age and more than 12 years of age.

- ❑ Children having physical deformities of the limbs and spine
- ❑ Children who were suffering from disease and having mental defects were excluded from the study.

Tool for Data Collection:

In the present study, clinical examination manual was used to assess the nutritional deficiency disorders among school-age children. The researcher developed the schedule to detect the signs of deficiency disorders with the help of ICNNDs (8) Manual for Nutrition Surveys, to identify the prevalence of clinical signs of nutritional deficiency disorders. Clinical examination was done under the supervision of medical personnel. The gender wise association of nutritional deficiency disorders was established. WHO criteria was used by the researcher for the assessment of night blindness. It was based on the most recent guidelines from 1996 in a publication titled “Indicators for Assessing Vitamin A Deficiency and their Application in Monitoring and Evaluating Intervention Programs (9)”. Assessment of goiter was done on the basis of guidelines provided by WHO/UNICEF/ICCIDD (10).

Results and Discussion

The present cross-sectional study was done in the rural field practice areas of Department of Community Medicine, Jawaharlal Nehru Medical College, Aligarh Muslim University, Aligarh. The sample of 350 school age children was selected for the study and their clinical examination was done to examine the prevalence of clinical signs of nutritional deficiency disorders among them. The difference in the prevalence of nutritional deficiencies among boys and girls was also examined.

Table 1: Clinical Signs/Symptoms of Nutritional Deficiencies

Signs/Symptom	Present		Absent		Total		Nutrient
	n	(%)	n	(%)	N	(%)	
Thin and Lustre less Hair	98	28.0	252	72.0	350	100.0	Protein
Bitot Spot	20	5.7	330	94.3	350	100.0	Vitamin A
Night Blindness	22	6.3	328	93.7	350	100.0	Vitamin A
Pale Conjunctiva	103	29.4	247	70.6	350	100.0	Iron
Koilonychia	61	17.4	289	82.6	350	100.0	Iron
Glossitis	28	8.0	322	92.0	350	100.0	B.Complex
Cheilosis/Angular Stomatitis	21	6.0	329	94.0	350	100.0	Riboflavin
Bleeding Gums	53	15.1	297	84.9	350	100.0	Vitamin C
Goiter	0	0	350	10.0	350	100.0	Iodine

Table 2. Prevalence of Clinical Signs among Boys and Girls

Signs/Symptom	Prevalence among Boys and Girls											
	Boys						Girls					
	Present		Absent		Total		Present		Absent		Total	
	n	(%)	n	(%)	N	(%)	n	(%)	n	(%)	N	(%)
Thin and Lustre less Hair	53	28.8	131	71.2	184	100.0	45	27.1	121	72.9	166	100.0
Bitot Spot	12	6.5	172	93.5	184	100.0	8	4.8	158	95.2	166	100.0
Night Blindness	10	5.6	174	94.4	184	100.0	12	7.4	154	92.6	166	100.0
Pale Conjunctiva	55	29.9	129	70.1	184	100.0	48	28.9	118	71.1	166	100.0
Koilonychia	30	16.3	154	83.7	184	100.0	31	18.7	135	81.3	166	100.0
Glossitis	18	9.8	166	90.2	184	100.0	10	6.0	156	94.0	166	100.0
Cheilosis/Angular Stomatitis	15	8.2	169	91.8	184	100.0	6	3.6	160	96.4	166	100.0
Bleeding Gums	32	17.4	152	82.6	184	100.0	21	12.7	145	87.3	166	100.0

Prevalence of Nutritional Deficiency Disorders:

Table 1 represents the prevalence of clinical signs/symptoms of nutritional deficiency disorders among 350 school-age children in the rural block of Aligarh district.

Table 1 indicates that the prevalence of thin and luster less hair was 28% among 350 school-going children. Bitot spots and night blindness were observed in 5.7% and 6.3% of children respectively. The prevalence of pale conjunctiva and koilonychia was 29.4% and 17.4% respectively. Glossitis and cheilosis were present in 8.0% and 6.0% respectively in school going children. Bleeding gums were observed in 15.1% children. It is astonishing to mention that no case of goiter was found during the course of study.

Prevalence of Clinical Signs of Nutritional Deficiencies among Boys and Girls-

Table 2 shows the difference in the prevalence of nutritional deficiencies among boys and girls.

The findings of present study revealed that among 350 school-age children, there were 52.6% male and 47.4% female children. The above table indicated that the prevalence of thin and luster less hair (28.8%), Bitot Spot (6.5%), Pale Conjunctiva (29.9%), Glossitis (9.8%), Cheilosis (8.2%) and Bleeding Gums (17.4%) was higher among boys than girls. On the other hand, night blindness (7.4%) and Koilonychia (18.7%) were more prevalent among girls than boys.

In the present study, there was 28% prevalence of thin and lusterless hair, 5.7% Bitot spots, 6.3% night blindness, 29.4% pale conjunctiva, 17.4% koilonychia, 8.0% Glossitis, 6.0% cheilosis and 15.1% bleeding gums among 350 school going children. It was surprising to mention that no case of goiter was found during the course of study. It was further revealed in the study that prevalence of thin and lusterless hair (28.8%), Bitot spot (6.5%), pale conjunctiva (29.9%), Glossitis (9.8%), Cheilosis (8.2%) and Bleeding Gums (17.4%) was higher among boys than girls. On the other hand, night blindness (7.4%) and koilonychias (18.7%) were more prevalent among girls than boys. The similar trend for vitamin A deficiency was observed by Khan and Mahmood (11) as there was 6.37% prevalence of Vitamin A deficiency among school children of Bareilly. In their study, prevalence of VAD was slightly higher among boys as compared to girls, but in the present study, prevalence of Bitot spot was higher among boys and night blindness was more prevalent among girls than boys. Chandra and Salil (12), reported the 35% prevalence of night blindness among school children and contrary to the findings of present study, Chandra and Salil (12) further revealed the greater prevalence of night

blindness among boys than girls. In their study, 14% of total school children showed the presence of Bitot spot, which was higher than the findings of present study. Similar trend was observed by Chandra and Salil (12) in case of prevalence of Bitot spot among boys and girls as higher percentage of boys than girls showed the presence of Bitot spots. Chauhan *et al.*, (13) revealed the significantly higher prevalence of VAD among girls and boys. Very high prevalence (48.80%) of Bitot spot was found by Nigudgi *et al.*, (14) among school children of Gulbarga city, India. Prabhankar and Gangadhar (15) revealed the 94.1% prevalence of lack of luster among the studied children, which was greater than the findings of present study.

Chandra and Salil (12), observed the slightly lower prevalence (26%) of lack of lustre in the hair than the present study (28%). Similar to the findings of present study, greater percentage of boys than girls showed lack of lustre in their hair. Prevalence of koilonychia was observed in 11 percent of school children by Chandra *et al.*, (12), which was lower than the findings of present study (17.4%). Contrary to the findings of present study, Chandra *et al.*, (12) revealed the higher prevalence of koilonychia among boys than girls. Mehrotra *et al.*, (16) observed that 4.5% rural children had bleeding gums which was lower than the present findings (15.1%). Pale conjunctiva and Glositis was observed in 34% and 8% respectively among school children by Chandra and Salil (12).

Conclusion

The clinical examination of 350 school age children revealed that the deficiencies of various nutrients i.e protein, vitamin A, B-complex, vitamin C, iron and riboflavin were prevalent among the studied group. Jawan block of Aligarh district was fortunate because no case of goitre was seen during the course of study. On comparing the signs of deficiencies among boys and girls, it was found that thin and lustreless hair, bitot spot, pale conjunctiva, glossitis, cheilosis and bleeding gums was more prevalent among the boys than girls and night blindness and koilonychia were found more among girls than boys.

Recommendations

- ❑ Special programmes need to be formulated at the local level by visiting doctors and health service providers for the reduction in nutritional deficiency disorders among the target group.
- ❑ Effective IEC (information, education and communication) strategies are necessary because use of these materials and methods such as flash cards, posters, charts, flip album and indigenous method such

as puppet shows, “nukkad natak” (street plays), folk songs, have significant association with health service use.

- ❑ Nutritional status of school-age children should be the matter of concern for policy makers.

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