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### Nutritional deficiency disorders among primary school going children: A case study of rural Darbhanga village

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#### Abstract

**Introduction:** Malnutrition among children is the biggest problem for India. The period of school age is nutritional important because it is the prime time for bodybuilding. This study considers nutritional disorders in school going children suffering from floods every year so, that measures can be taken to improve their health status.

**Objective:** To assess the nutritional status of a school going children (6-12 year) in a village of Katuaka Bariaul in Darbhanga district of Bihar.

**Methods:** 600 children were randomly selected from 300 families from different economic status. A Sample of six groups of 100 school going children each group. Information was collected with the help of a pre-designed and pretested questionnaire, anthropometric and clinical sign and symptoms.

**Result:** The overall prevalence of vitamin A deficiency was noted in 2.2% of night blindness, 18.0% of conjunctival xerosis, and 9.0% of corneal xerosis. Vitamin B- complex deficiency was noted in 11% of angular stomatitis, 7% of glossitis and Iron deficiency were noted in 49% of anaemia in children

**Conclusion:** High prevalence of nutritional deficiency among school-going children need skilled based nutrition education, health education and hygiene education.

**Keywords:** Nutritional deficiency, Vitamin A, Vitamin B- complex, Iron

#### Introduction

Health is the most precious possession, fundamental human right, the key to success in life which has to be earned by individual efforts. Health may be defined as the state of being hale and sound is body-mind or soul especially free from physical disease or pain. Food and health are related like both sides of a coin. In India, 40 per cent of the population belong to the age group of 0 to 15 years and out of this 70 to 80 per cent of children suffer from various forms of growth retardation due to protein-calorie malnutrition. The main reason for this is the insufficiency of food ignorance poverty and faulty food habits.

Malnutrition continues to be a major public health problem in many developing countries. Apart from contributing to high child mortality severe malnutrition can lead to permanent regulars in those who survive. These include stunted poor learning ability and reduced work efficiency. This malnutrition has serious repercussions on human development and national productivity. Recently attention has been focused on the possibility that protein-calorie malnutrition young children may affect intellectual development. It increases the chances of children becoming poor reader and poor writers. These, in turn, lead to defects in the neuron in neuron-integrative functioning school failures and subsequent subnormal adoptive abilities.

PEM is a consequence not only of inadequate food intake but also of poor living conditions unhygienic environment and lack of health care. It is primarily a disease of socioeconomic inequalities and misdistribution of food and wealth. Malnutrition is thus a multi-problem requiring a variety of intervention measures for its control.

Nutritional blindness due to xerophthalmia is an important public health problem among young children in India and several other developing countries the term exophthalmia compasses all ocular manifestations of Vitamin A deficiency. It includes the structural changes affecting conjunctiva cornea and occasionally retina and also the biophysical disorders of retinal rod and cone functions.

Vitamin A deficiency is preponderant in children. While it is rare during infancy school-age children are at a greater risk.

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A great majority of the cases of corneal xerophthalmia occur between 1 and 3 years, coinciding with the peak prevalence of severe protein-energy malnutrition (PEM) xerophthalmia is more frequent in boys than in girl, though the incidence of Keratomalacia is similar in both the sexes.

Children from rural and tribal families belonging to the low-income group are more vulnerable to Vitamin A deficiency cases are commonly seen in interior and remote villages rather than in villages which are accessible and have transport facilities. The mothers of vitamin A-deficient children are generally illiterate and unaware of the importance of diet in disease. Because of food fads and false beliefs foods like colostrum, green leafy vegetable and papaya which are rich in Vitamin A are avoided. The families cannot afford animal foods which are rich in performed Vitamin A because of their poverty.

Vitamins whether water or fat-soluble are micronutrients that are not synthesised within the body and are required for several physiological and biochemical functions. Most B complex vitamins are the prosthetic group for enzymes of biological importance. While the fat-soluble vitamins can be stored in the body the B complex vitamins which are water-soluble are easily excreted and do not have adequate stores in the body. Deficiencies of single B vitamins are relatively rare, while multiple deficiencies often occur.

Riboflavin is very common in children. Riboflavin deficiency is characterized by orolingual, dermal, haematological and corneal manifestations.

Angular stomatitis glossitis, cheilosis are characteristic features and in of mouth and tongue. The lesions at the angles of mouth are termed as angular stomatitis. The language, in general, is acutely inflamed and the papillar progress from hypertrophic to atrophic stages depending upon the duration and degree of deficiency (glossitis). The dry chapped appearance of the lips with superficial ulcers termed as cheilosis is one of the classical features of severe riboflavin deficiency.

Anaemia is a major global problem affecting between 20 to 70 per cent of the population in various countries in India it is an important public health problem affecting people from all walks of life. The disease is of particular significance is school going children and pregnant women because of the high prevalence (50-70) per cent and the adverse functional consequences. In school children, anaemia impairs scholastic performance. Anaemia is also, directly and indirectly, responsible for 10-20% of maternal deaths, high incidence of premature births and intrauterine malnutrition.

### Objective

To assess the nutritional status of a school going children (6-12 year) in a village of Ketuka Bariaul in Darbhanga district of Bihar.

### Methodology

The present investigation aimed to evaluate the interrelation among malnutrition and deficiency diseases. The procedure involved in the conduct of the above investigation included

the following step.

- Location of study- The studies proposed to be conducted in Darbhanga rural area three different economic group of rural area of Darbhanga district were selected for assessment of deficiency symptoms by stratified random sampling.
- Selecting of Respondents- A sample of six groups of 100 school going children each from three different economic groups.
- Measurement of variables- At first structured was formed. Survey of 600 selected school-going children was done. Evaluation of nutritional deficiency diseases (especially malnutrition, conjunctival xerosis, corneal xerosis, night blindness, angular stomatitis, rickets and anaemia etc.)
- Laboratory Investigation-Anthropometric measurement for all and assessment of blood level for 600 sub-samples was done further for better judgment of the nutritional status of pre-school children.

(1) Weight and Height Measurement- Weigh of all 600 school going children was measured by weighting machine in kilograms. For the measurement of height making on a smooth wall by pencil in cm. The samples were asked to stand against it with arms hanging down health together and the accept upper part of the back and buttock against the vertical upright wall. The external crevice and bonny orbit lying in a plane parallel with the floor. A six inches long cardboard placed on the head against the marking of the wall for reading the height.

(2) Assessment of blood Hemoglobin level: The estimation blood sample for HB% was done by sahibs Hemoglobin meter with a pipette.600 school going children 100 from every six groups of different economic status from the rural area were selected for assessment of blood HB level in which clinical sign of anemia was observed. Following procedure was used for estimation of blood samples for HB level in percentage.

The decimal hydrochloric acid was filled in the ducting tube up to 10 to 20 makes. An adequate puncture was made on the left-hand middle finger of The decimal children taking antiseptic care with the help of sucked up 20 marks i.e. 20 cm of blood. Blood was then gently blown into the diluting tube after us wiping the surplus blood attached to the pint of the pipette. The tube was then allowed to stand for 5 minutes. Distilled water now added drop by drop by a dropper until the tint of the drifting and the standards glass tube appeared identical. Then the results were noted.

### Findings

School going children from 300 families were selected for this study. These families were selected because these families are from a back socio-economic and weak section of the village. Every year these people face from the flood on heavy rain. Due to flood, these people migrate from one place to another for a short period of time. The socio-demographic profile of these children was presented in the table- 1.

**Table 1:** Socio-Demographic of children (n=300)

Variables		
Income of family per month	<5000	100(33.3)
	5000-10000	50(16.7%)
	10000-20000	70(23.3%)
	More than 20000	80(26.7%)
Education qualification of	Up to middle	76(25.3%)

Father	Up to matriculation	50(16.6%)
	Up to Intermediate	44(14.6%)
	Up to Bachelor degree	38(12.7%)
	Up to Master degree	20(6.4%)
	Illiterate	72(24.0%)
Type of family	Nuclear	84(28%)
	Joint	216(72%)
Food Habit	Vegetarian	84(28%)
	Non-vegetarian	216(72%)
Religion	Hindu	260(86.6%)
	Muslim	40(13.4%)
Occupation of father	Govt. Job	111(37.0%)
	Private job	40(13.3%)
	Daily wages	98(32.7%)
	Nil	51(17.0%)
Body Mass Index(n=600)	Under weight (<18.5)	267(44.5%)
	Normal (18.5-25.5)	330(55.0%)
	Over weight(>25.5)	03(0.5%)

Total of 300 families participated in the study. The finding revealed that 33% the people have family income 5000, 16% of the people have family income from 5000 to 10000, 23% of the people have income from 10000 to 20000 and 26% people have family income above 20000. Education qualification of the father was 25.3% up to middle 16.6% up to matriculation, 14.6% up to Intermediate, 12.7% up to Bachelor degree, 6.4% up to master degree and 24% illiterate. There were two types of religious people 86% Hindu and 14% Muslims. In the family father's occupation was 37% Govt. job, 13% private job, 32% daily wages and 17% were unemployed.

**Table 2:** Personal environmental hygiene (n=300)

Particular Awareness	No	Percentage (%)
Are you clean your home daily?		
Yes	186	62%
No	114	38%
Does your house get sunlight?		
Yes	165	55%
No	135	45%
Do you clean your utensils daily?		
Yes	177	59%
No	123	41%
Do you conduct regular health tests of your children?		
Yes	165	55%
No	135	45%
Is there a control at these health centers at the government level?		
Yes	153	51%
No	147	49%

Questions were asked from selected families related to personal hygiene. 45% of the people do not get sunlight while 55% of the houses get sunlight only. 41% of the people are

not cleaning the utensils properly, while 59% of the people utensils were being cleaned properly. 55% of the families' regular health tests of their children, while 45% were not health tested of their children.

**Table 3:** Knowledge about nutrients

Particular Awareness	No	Percentage
Do you use salad in your children's food?		
Yes	135	45%
No	165	55%
Do you use green vegetable with your food?		
Yes	177	59%
No	123	41%
Do you use spinach food of your children?		
Yes	138	46%
No	162	54%
Do you use banana with your food of your children?		
Yes	123	41%
No	177	59%
Do you use an apple with your food?		
Yes	75	25%
No	225	75%
Are you vegetarian?		
Yes	125	58%
No	175	42%
Do you use paneer and milk in food?		
Yes	75	25%
No	225	75%

Table -3 indicate that survey of 300 families, salads 165 (55%) green vegetable 123(41%), spinach 162(54%) banana 177(59%) apple 225(75%) paneer and milk 225(75%) families were not included in the diet.

**Table 4:** Deficiency disorders in children (N=600)

Vitamin A Deficiency	No. of children	Total (%)
Night blindness	13	2.2
Conjunctival xerosis	108	18.0
Corneal xerosis	54	9.0
<b>Vitamin -B complex</b>		
Angular stomatitis	64	11
Glossitis	42	7
<b>Iron deficiency</b>		
Anemia	294	49

Table-4 indicate that the prevalence of Night blindness was 13(2.2) conjunctival xerosis and corneal xerosis was observed in (18%) and (9.0%) Angular stomatitis (11%) Glossitis (7%) and Anemia (49%) among 600 school-going children. In the present study prevalence of Anemia was higher among school-going children.

### Conclusion

Malnutrition is highly prevalent among school-going children in Ketuka Barioul village of Darbhanga district. Anemia deficiency of micronutrients, reduction in personal hygiene has been found in children of these villages. Emphasis should be given towards nutrition education, personal hygiene education, health education. Parents of these children should be educated about the importance of a balanced diet. Awareness programs should be conducted by the government so that people can aware of nutrition and personal hygiene.

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