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Impact of health-mix food on health status of pre-school children in Auraiya district (U.P.)

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Abstract

India is likely to be the most populous country by 2030 with 1.6 billion people. While increased investments and technological breakthroughs can improve availability, they may not necessarily translate into increased accessibility and absorption of food. Nearly 43.5% of children under the age of 5 year being under weight (the highest rate in the world) and 50% of pregnant women being Anemic in India. The nutrition security of children and women are serious issues that need to be addressed urgently (World Bank 2009). Pre-school children undoubtedly are the most crucial segment of our population. Under nutrition is a critical determinant of mortality and morbidity in young children worldwide and it is associated with 45 percent of all deaths in children under five years of age. The major forms of malnutrition are kwashiorkor (edematous) and marasmus (wasting) with or without associated stunting. In a view to know the nutritional deficiency among the rural children, the present study was conducted with an objective to assess the clinical status of pre-school children and to know the impact of Health-mix Food Prepared from Locally Available Grains on Health Status of Pre-school Children in Auraiya district of Uttar Pradesh an OFT was planned. Twenty children selected randomly from each of the 5 villages of Bhagyanagar block of Auraiya district of Uttar Pradesh. Thus to know the health status total 100 pre-school children were selected randomly. Out of 100 only 25 pre-school children selected purposely and provided 100 gram health- mix per day per children till 180 days. The study shows that 58 children fall between 1-3 years of age while 42 children came under the 4-6 year of age. It was found that on the basis of their general appearance, 54 per cent were normal and 45 per cent were thin and obese 1% in a different village. It was found that average increased in height 3.3cm to 4.3 cm in six month and 1.1 kg to 1.3 kg in weight through use of 100 gram poshak laddu as a supplementary diet per children per day till 180 days. So, we can say that poshak laddu is very effective to combat malnutrition.

Keywords: Health-mix food, pre-school children, protein energy malnutrition (PEM), vitamins deficiency, anemia, immunization

Introduction

Malnutrition is one of the major public health problems in most of the developing countries, including India. More than 45% of deaths in 0-5 years of children are associated with malnutrition. In the country, the highest percentage of the child population was found in Bihar (40.8%) and Uttar Pradesh (40.1%). Nearly two out of three pre-school children in India are malnourished (Shrilakshmi, 2000) [6].

India has the highest population in the world and pre-school children (1-6 years) undoubtedly are the most crucial segment of our population. Malnutrition is one of the major health problems in children. Clinical examination is an important indicator which reveals nutritional deficiency sign for the assessment of the nutritional status of communities. Assessment of the nutritional status of the community is one of the first steps in the formation of any public health strategy to combat malnutrition. Gupta and Bhandari (1972) [3] found, in order of occurrence, Vitamin A deficiency as first, second and B complex deficiency as a third. Among the Vitamin A deficiency sign, xerosis was more prevalent than Bitot's spot and phrynoderma while in case of Vitamin B complex deficiency sign, Angular stomatitis was more common. Kumar *et al.* (1983) [4] studied clinical signs of nutritional deficiency diseases among children and reported Anaemia is the most common followed by PEM, Vitamin A and B deficiency. They also reported that the prevalence of malnutrition showed a significant increase with an increase in the age of children and was highest in children between 3-4 years. Approximately 48.7 percent of children were identified as children at risk.

Specific nutrient deficiencies may cause symptoms such as vitamin B12 (Cyanocobalamin) deficiency can lead to tingling, numbness, and burning in the hands and feet (due to nerve damage); a lack of vitamin A may cause night blindness and increased sensitivity to light; and a lack of vitamin D can cause bone pain, osteomalacia or malformation.

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The severity of symptoms depends on the intensity and duration of the deficiency of nutrition in the body. Some changes, such as to bone and nerves, may be irreversible.

The economy of the district is mainly based on agriculture. Wheat, jowar, chick pea, mustard, bajra, lentil, green gram, black gram, pigeon pea are the main crops. But due to lack of proper post harvest management and lack of value addition of grains and their nutritive value were not intake in daily routine diet Thus the value added products like health mix, Til Laddu. Which is rich source of protein, vitamins, minerals and Omega-3 fatty acids may reduce the malnutrition in the rural area. Nutrition security is also an outcome of food security, access to sufficient, nutritious food and basic health & sanitation facilities, along with good education.

Materials and Methods

In the present study preschool children were selected randomly from 5 villages (Parwaha, Siganpur, Kutubpur, Khanpur and Ban kepurwa) of Bhagyanagar block of Auraiya district of Uttar Pradesh in 2016-17. The 20 children were selected from each village under two age groups viz., 1-3 years and 4-6 years. Thus the study involved a total of 100 preschool children. Out of 100 children only 25 malnourished children were selected for the study. mal programme 25 Malnourished Pre-school children were selected from Village – Parwaha, Siganpur and Kutubpur, Bhagyanagar, Auraiya and provide 100gm soya based Poshak Laddu / Child / Day under OFT programme in 2016-2017 and 2017-2018. Height and weight of every children were measured in the metric system, using standardized technique. A Anthropometric Scale was used to assess height of the subjects. The subject was made to stand without footwear with the feet parallel and with heels, buttocks, shoulders, touching the measuring scale, hands hanging by the sides and head was held comfortably upright. A portable balance with an accuracy of 100g was used to record the weight of the subjects. Children were instructed to stand on the balance with light clothing and without footwear and with feet apart and looking straight. Weight was recorded to them nearest value. The Pre and Post clinical deficiencies were examined by the general appearance of the children. Structured and pre-coded interview schedule was designed on the basis of objectives. Mother/ caretaker of the children were purposely selected for interview to know the information regarding the present study Immunization status was recorded on the basis of the card provided by the hospital / ASHA worker.

Results and Discussion

The results of the study were discussed as follows.

Age distribution of children:

Table 1 reveals that 58 children fall between 1-3 years of age while 42 children came under the 4-6 year of age were clinically assessed in the present study.

Table 1: Age wise distribution of the children

S. No.	Age (Years)	No. of Preschool children (n=100)
1	1-3	58
2	4-6	42

Physical Examination

Physical examination results are as presented in Table 2. It was found that on the basis of their general appearance, 54 per cent were normal and 45 per cent were thin and obese 1% in a different village of Bhagyanagar Block of Auraiya district.

Table 2: Incidence of clinical deficiencies and excesses

S. No.	Clinical Signs	Preschool children		
		1-3 years (n=58)	4-6 years (n=42)	Total (n=100)
A General appearance				
i	Normal	31	23	54
ii	thin	27	18	45
iii	Obese	00	01	01
B PEM				
I	Absent	35	22	57
ii	Present	23	20	43
iii	Hair changes	15	13	28
iv	Marasmus	04	03	07
V	Odema	01	02	03
vi	Moonface	03	02	05
C Anemia				
i	Absent	34	22	56
ii	Present	24	20	44
iii	Pale conjunctiva	15	13	28
iv	Koilonychia	09	07	16
D Vitamin A deficiency				
i	Absent	57	37	91
ii	Present	00	05	05
iii	Night blindness	00	00	00
iv	Bitot's Spot	01	02	03
v	Conjunctival xerosis	01	03	04
E Vitamin B deficiency				
I	Absent	47	20	67
ii	Present	11	22	33
iii	Angular stomatitis	02	07	09
iv	Magenta tongue	01	03	04
v	Dermatitis	08	12	20
F Vitamin D deficiency				
i	Absent	51	33	84
ii	Present	07	09	16
iii	Knock knee and Bow leg	01	02	03
iv	Pigeon chest	03	04	07
v	Breeding of ribs	03	03	06
G Vitamin C deficiency				
i	Absent	42	18	60
ii	Present	16	24	40
iii	Bleeding of gums	14	16	30
iv	Spongy gums	02	08	10
H Fluorosis				
i	Absent	43	15	58
ii	Present	15	27	42
iii	Mottled enamels	15	27	42

Hair changes related to PEM were more commonly observed among younger children (23%) in comparison with their older children (13%). The most common deficiencies among children were Anemia (44%), Protein-energy malnutrition (43%) and vitamin C deficiency (40%). In addition deficiency of vitamin B (33%) and Vitamin D (16%) also were observed but to a lesser extent in Table 1.

Sign of Fluorosis namely mottling of enamel in teeth was observed most of the elder children (4-6 years) ie. 27 per cent as compare to the children belongs the age group of 1-3 years ie, 15 per cent. Anemia was observed as pale conjunctiva (28%) and Koilonychia (16%). Those with xerosis (1%) and Bitot's spot (2%). Conjunctivalxerosis being common among younger children and Bitot's spot more in older children. The study was supported by Indu *et al.*, 2012 also found that prevalence of nutritional deficiency of Nutritional Anemia 27%, followed by Protein Energy Malnutrition (PEM) 8%. fluorosis 2%, conjunctivalxerosis 1%, Bitot's Spot 1% and

Vitamin D 3% among children in Bihar. The findings also showed the poor health status of preschool children. There is a need for health counselling to the mother/ caretaker to improve the health status of rural preschool children. Immunization Status of pre School Children: Vaccines have reduced and, in some cases, eliminated many diseases that killed or severely disabled people just a few generations ago.

For example, smallpox vaccination eradicated that disease worldwide. In the present study, children were considered to have received immunization if they had received even a single dose of an antigen. As per this criterion, immunization coverage of the children was abysmally low. In the present study, Immunization status was recorded on the basis of the card provided by the hospital / ASHA worker.

Table 3: Immunization Status of pre School Children:

S. No.	Age	Details of Immunization	Prevents	No. of children
1.		Not Immunized		31
2.		Immunized		69
A	(At birth)	BCG	TB & bladder cancer	69
		Poliovirus	Polio	69
		HepB	Hepatitis B	34
B	4-6 Week	DTP	Diphtheria, Tetanus & Pertussis	08
		HepB	Hepatitis B	01
		Poliovirus	Polio	08
C	10 Week	Poliovirus	Polio	18
		HepB	Hepatitis B	03
		DTP	Diphtheria, Tetanus & Pertussis	03
D	14 Week	DTP	Diphtheria, Tetanus & Pertussis	00
		HepB	Hepatitis B	00
		Poliovirus	Polio	18
E	06 Month	HepB	Hepatitis B	02
F	9-12	Measles	Measles	47
		Polio	Polio	47
G	15-18 month	MMR	Measles, Mumps, Rubella	41
H	18 month	DTP	Diphtheria, Tetanus & Pertussis	28
		Polio	Hepatitis B	28
i	2 year	Typhoid	Fever, Diarrhoea	02
j	4 year	MMR	Measles, Mumps, Rubella	00
k	5 year	DTP	Hepatitis B	00
		Polio	Polio	12

It is evident from Table 3, that 69 per cent of the children were immunized whereas 31 per cent children were not immunized in rural area. Most of the children immunized at the time of birth (69%) by BCG and Polio. Forty-seven per

cent children were immunized by measles and 41 per cent MMR (15-18 month) whereas very few children (2%) immunized by Typhiod at the age of two years.

Table 4: Assessment of effectiveness of nutritional practices for correcting malnutrition through Nutritious Laddu

Treatment	No. of Children/Age	Details of technologies	Assessment of Poshak Laddu							
			Weight in Kg.				Height in cm.			
T1	25	Daily routine diet	ICMR1990	Before	After	Avg. improvement	ICMR1990	Before	After	Avg. Improvement
T2	25	100gm. Laddu/health mix (prepared from Locally available grains) / Day/Child for 180 Days	16.7	11.9	13.1	1.2	102.9	89.2	93.1	3.9
1	4.6-5.0 year		12.3	9.0	10.1	1.1	85.6	82.1	85.4	3.3
2	3.0-3.5 year		14.6	11.0	12.2	1.2	94.9	85.2	89.0	3.8
3	4.1-4.5 year		14.1	10.2	11.5	1.3	93.9	84.3	88.6	4.3
4	3.6-4.0 year		16.0	11.8	13.1	1.3	101.6	97.1	100.7	3.6
5	5.0-5.5 year									

Note: According to ICMR (1990) the average increase 9-10 cm /yr. in Height and 2-2.5 kg. /yr.in weight of Pre-school children



Fig 1: Poshak Laddu Provide to mal Nurished Children



Fig 2: Weight Measurement of children:



Fig 3: Physical examination of selected children

Table reveals that consumption of health mix laddu prepared from locally available grains till 100 gm/ child/ day till 180 day sthe average increased in height 3.3cm t0 4.3 cm in six month and 1.1 kg to 1.3 kg in weight. So, we can say that poshak laddu is very effective to combat malnutrition. Mother of children told children feel active also reduce exertion during activities after intervention of technology. Inclusion of these products in diet helps in improving the nutritional status as well as these can contributes to the food security of farm women and their family members

Conclusions

India has the highest population in the world and pre-school children (1-6 years) undoubtedly are the most crucial segment of our population. It was found that on the basis of their general appearance, 54 per cent were normal and 45 per cent were thin and obese 1% in a different village of Bhagyanagar Block of Auraiya district. The findings are showed poor health status of preschool children. There is a need for health counselling to the mother/ caretaker to improve the health status of rural preschool children.

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