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Impact assessment of developed nutri-garden on nutritional status of preschool childrens in Anganwadis at Gopalganj District, Bihar

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Abstract
Aim of the study to assess the nutritional status of preschool childrens (3-5years) in selected five anganwadis of Gopalganj district in Bihar with a view to develop nutri-garden in anganwadis. Observational, interventional and convenience sampling was adopted to select 30 preschool childrens who are attending anganwadis at Gopalganj district of Bihar. The scale to assess the nutritional status and nutritional assessment checklist were used. The Nutri-garden was developed and an inteventional programmes was organized in all five anganwadi centers of Gopalganj district. Result revealed a high prevalence of child malnutrition in preschool childrens in selected rural anganwadi centers. Development and intervention on Nutri-garden showed the significant improvement on nutritional status of preschool children in selected anganwadi centers centers at Gopalganj district, Bihar.

Keywords: Malnutrition, nutritional status, nutri-garden, intervention, preschool childrens, nutritional assessment

Introduction

Children under the age of 5 years constitute a priority group because of their large numbers and they comprise about 13% of the total population. They are also regarded as vulnerable or high-risk group because of their health problems arising out during their growth, development & survival. About 50% of the deaths in childrens under the age of 5 years are in developing countries including India. Malnutrition is one of the most widespread condition affecting the health status of under age of five years. Children under age of five years suffer mostly from a variety of diseases like diarrhoea, respiratory infections, measles, pertusis, polio, tuberculosis and diphtheria due to malnutrition. Approximate 11 million children will die before they reach the age of five. Malnutrition is the principle cause of child deaths. Malnutrition in young children is due to inadequate feeding; faulty feeding practices, repeated infections like diarrheal diseases, acute respiratory infections and worm infestations and the consequences of malnutrition are; high level of morbidity, mortality and disability apart from poor physical growth and-development.

According to World health organization (WHO) approximately 150 to 200 million pre-school children (< 5 years) are underweight and stunted in developing countries. In India, weight for age has been the most widely used indicator for assessment of nutritional status, detection of undernutrition and monitoring the improvement following interventions in children. Anthropometric measurement is a practical and immediately applicable technique for assessing children's development patterns during the first five years of life. Assessing of growth patterns and also provides useful insights into the nutrition and health situation of entire population.

Methodology

List of blocks and anganwadi centers was procured from the office of Block Development Office on the basis of availability of land for the development of Nutri-garden. On the basis of availability of land Kuchaikote, Manjha, Gopalganj sadar, Thawe and Baikunthpur Blocks were selected. Preliminary survey was made before development of Nutri-garden for selection of site in anganwadi centers. From various models of Nutri-garden, circular model was selected for development of Nutri-garden in Anganwadi centers. Then an intervention program was organized in all five anganwadi centers for savika, sahaika and childrens on Nutri-garden, its importance and benefits of Nutri-garden. An interview schedule was also prepared, duly pre-tested, and then finalized for collection of data regarding the existing nutritional status of preschool childrens, development of nutri-garden and an interventional program was organized in all five anganwadis *viz*., Development of Nutri-garden and training programs on Nutri-gardens, its importance and its benefits for savikas, sahaikas and for preschool childrens.

Result

In the table it was clearly shows that there is a difference between energy, protein and fat consumption before and after intervention on nutri-garden in anganwadi centers.

Table 1: Comparison between Anganwadi Children's Before and After and Recommended nutritional requirement for children for age group of 3-5 years (Body weight-12.9 kg)

S.No.	Nutrients	Recommended RDA	Anganwadi-1 (Kuchaikote)		Anganwadi-2 (Manjha)		Anganwadi-3 (Gopalganj sadar)		Anganwadi-4 (Thawe)		Anganwadi-5 (Baikunthpur)	
			Before	After	Before	After	Before	After	Before	After	Before	After
1.	Energy	1070 Kcal/d	960	1010	980	1030	940	1010	930	1020	960	1030
2.	Protein	12.5 g/d	7	10	8	10	8	10.2	8	11	7	10
3.	Fat	27 g/d	18	23	20	25	19	23	19	23	17	24

Before intervention maximum energy consumption was 980Kcal/d whereas after intervention energy consumption was found more than 1000 Kcal in all anganwadi centers. Maximum protein consumption before intervention was found 8g/d whereas after intervention it was found more than 10g/d in all anganwadi centers. Same as maximum fat consumption before intervention was 20g/d whereas after intervention fat consumption was found more than 23g/d for preschool childrens for age group of 3-5 years in all anganwadi centers.

Fig 1: Development of Nutri-garden in Anganwadi centers at Gopalganj district, Bihar

Regarding mineral consumption Table 2 shows that maximum calcium consumption before intervention was 450mg/d but it was found more than 520 mg/d after intervention in all anganwadi centers.

Table 2: Comparison between Anganwadi Children's Before and After and Recommended Dietary Allowances for minerals for age group of 3-5 years (Body weight-12.9 kg)

S.No.	Minerals	Recommended RDA	Anganwadi-1 (Kuchaikote)		Anganwadi-2 (Manjha)		Anganwadi-3 (Gopalganj Sadar)		Anganwadi-4 (Thawe)		Anganwadi-5 (Baikunthpur)	
			Before	After	Before	After	Before	After	Before	After	Before	After
1.	Calcium mg/d	600 mg/d	400	530	450	540	430	540	430	550	400	520
2.	Iron mg/d	13 mg/d	6	10.2	8	11	6	11	6	10.5	7	10.5
3.	Zinc mg/d	7 mg/d	4	6	3	6	4	5	3	5	4	5
4.	Magnesium mg/d	70 mg/d	40	65	50	65	45	62	40	62	40	65

Before intervention maximum iron consumption was 8mg/d and after intervention iron consumption was found more than 10.2mg/d among pre school anganwadi childrens. Maximum Zinc consumption was found 4mg/d whereas after intervention zinc consumption was more than 5mg/d in pre school anganwadi childrens. For magnesium maximum consumption before intervention was 50mg/d whereas it was found more than 62mg/d after intervention of preschool childrens for age of 3-5 years in anganwadi centers.

Fig 2: Intervention on Nutri-garden in Anganwadi centers at Gopalganj district, Bihar

Regarding consumption of Vitamins before intervention Table-3 shows that maximum consumption of Retinol was 210 µg/d but after intervention on nutri-garden it was found more than 300 µg/d for preschool anganwadi childrens.

Table 3: Comparison between Anganwadi Children's Before and After and Recommended Dietary Allowances of Vitamins for children of age group of 3-5 years (Body weight-12.9 kg)

S.No.	Vitamins	Recommended RDA	Anganwadi-1 (Kuchaikote)		Anganwadi-2 (Manjha)		Anganwadi-3 (Gopalganj Sadar)		Anganwadi-4 (Thawe)		Anganwadi-5 (Baikunthpur)	
	Vitamin A µg/d		Before	After	Before	After	Before	After	Before	After	Before	After
1.	Retinol	400µg/d	190	300	200	330	190	320	190	320	210	330
	β-carotene	3200µg/d	2000	2800	2000	2800	2010	2700	2000	2800	2010	2900
2.	Thiamin mg/d	0.5mg/d	0.2	0.4	0.2	0.3	0.2	0.4	0.2	0.4	0.2	0.4
3.	Riboflavin mg/d	0.6mg/d	0.2	0.4	0.2	0.5	0.3	0.4	0.2	0.4	0.3	0.5

4.	Niacin mg/d	8mg/d	3	6	3	7	4	6	3	6	4	7
5.	Vitamin B6 mg/d	0.9mg/d	0.4	0.6	0.4	0.75	0.4	0.6	0.4	0.6	0.4	0.7
6.	Ascorbic acid mg/d	40mg/d	20	30	19	35	20	33	20	33	18	30
7.	Dietary folate µg/d	100 µg/d	40	80	50	80	50	70	40	75	50	70
8.	Vitamin B12 µg/d	0.2 µg/d	0.05	0.1	0.04	0.1	0.04	0.1	0.04	0.15	0.05	0.1

Fig 3: After intervention on Nutri-Garden in Anganwadi centers at Gopalganj district, Bihar

Maximum consumption of β-carotene before intervention was 2010 µg/d whereas after intervention it was found more than 2700 µg/d. Maximum consumption of Thiamine before intervention was 0.2mg/d whereas after intervention it was found more than 0.3 mg/d. Same as maximum consumption of Riboflavin was 0.3mg/d but after intervention it was found more than 0.4mg/d. Maximium Niacin consumption before intervention was 4mg/d and it was found more than 6mg/d for preschool anganwadi childrens. Vitamin B6 maximum consumption was found 0.4 mg/d in preschool anganwadi preschool childrens but after intervention it was found 0.6 mg/d. Before intervention maximum consumption of Ascorbic acid was 20 mg/d whereas after intervention on nutri-garden it was found more than 30 mg/d. Dietary folate maximum consumption before intervention was 50 µg/d but after intervention it was more than 70 µg/d for preschool anganwadi childrens. And maximum consumption of Vitamin B12 was 0.05 µg/d whereas it was found more than 0.1 µg/d after intervention on nutri-garden for preschool anganwadi childrens of age group of 3-5 years.

Conclusion

Present study shows the alarming prevelance of malnutrition in anganwadi preschool childrens in Gopalganj district, Bihar. There are several factors associated with malnutrition among preschool childrens. These factors are child's age, birth order, family type, family size, number of siblings, educational status of parents, occupation of parents etc. Therefore, interventions on nutri-garden, it's benefits, it's importance, health and nutrition education are needed to improve the nutritional status of preschool anganwadi childrens. Continued efforts are required to develop and implement effective interventions.

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