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CALORIES & PROTEIN CONSUMPTION AMONG PRE-SCHOOL CHILDREN IN RURAL AREA-A CROSS SECTIONAL STUDY

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ABSTRACT

Background: The health and nutritional status of the children is a true reflection of the overall health and economic development of a country. In view of this, the study was planned to assess the daily consumption of calories and proteins by the preschool children in rural area. **Materials and Methods:** This is a cross-sectional study conducted in a rural area. 174 children between 2 to 6 years of age were included in the study using purposive sampling technique. Data of subjects was recorded in the suitable proforma. Dietary history elicited by 24-hour recall method, was taken by interviewing mothers. The calories and protein intake by the subjects was calculated as per the guidelines. The data was entered in the Microsoft Excel and analysed with the help of suitable statistical methods. **Results:** The mean age of the subjects was 4.31 years. The mean calories and protein consumption was 668.96 kcal and 20.71 gm respectively. The mean calories consumption of boys was 683.46 kcal and of girls was 654.46 kcal. All the subjects were consuming less amount of calorie. 80(45.98%) subjects were consuming less amount of protein. 92(52.87%) subjects were consuming excess amount of protein. Only 02(02.17%) subjects in age group of >4-6 years were having accurate protein intake. **Conclusion:** Inappropriate feeding practices among preschool children were noticed. The deficiency of these macronutrients has detrimental effect on nutritional and health status of children. Nutritional interventions, health education, good access to health services and utilisation of health care will help in this situation.

KEYWORDS: Calories, Protein, Preschool Children, Rural Area.

INTRODUCTION

Nutrition plays vital role in growth and development of preschool children. Nutrient requirements and suggested dietary intakes of nutrients currently recommended by national and international organisations are primarily intended for healthy normal growth and development during rapid stages of development such as childhood. Wide variations exist in the feeding practices among pre-school children starting from the initiation of complementary feeding. Wide spectrum exists between the nutrient intake from region to regain and factors associated with it.[1] Hence the present study was conducted to assess the calories and protein intake among pre-school children in rural area. Adequate nutrition during infancy and early childhood is essential to ensure children's growth, health and development to their full potential. Inadequate dietary intake is one of the immediate causes of malnutrition, especially undernutrition, including wasting, stunting, underweight. Undernutrition makes children much more vulnerable to disease and death. Appropriate feeding practices during early childhood stimulate psychosocial development, lead to good nutritional status and physical growth, reduce susceptibility to common childhood infections and improve resistance to cope with them.[2]

Nutrition of the child is of paramount important, because of the foundation for lifetime health, strength and intellectual vitality is laid down during this period.[3] Consumption of cereals and pulses together resulted in adequate protein intake, but the low intake of leafy vegetables, milk, egg, meat, fish and fruits resulted in insufficient intake of calcium and beta carotene.[4] Protein Energy Malnutrition is a major public health problem in India. This affects the child at the most crucial period of time of development, which can lead to permanent impairment in later life. Protein Energy Malnutrition is measured in terms of underweight (low weight for age), stunting (low height for age) and wasting (low weight for height).[5] Despite considerable

improvements in the quality of life and health status, the levels of child malnutrition in India is very high. More than half the young children show moderate to a severe degree of malnutrition.[7] Malnutrition among children continued to be a serious problem in India. The uneven magnitude of this problem across Indian states reveals the need for ascertaining the magnitude of malnutrition. The factors like household income and mother's literacy are strongly associated with malnutrition.[8]

The period of life from 2 to 6 years of age is called early childhood. These are the preschool years. This is an important period in the life of an individual. The nutrition of preschool children is of considerable important not only because of concern over their nutrition in formative stage of life but is widely perceived to have a substantial and persistent impact on their physical and mental development, their health status and productivity during adult life. Poor nutrition increases the risk of morbidity and is responsible directly and indirectly for the mortality that occur in children less than 5 years of age.[10] In view of the various nutritional problems and inappropriate feeding practices, the study was planned to assess the daily consumption of calories and proteins by the preschool children in rural area.

MATERIALS AND METHODS

This is a descriptive cross-sectional study conducted in the catchment area of a rural health training centre of a medical college during June to December, 2022. 174 children between 2 to 6 years of age were included in the study as subjects using purposive sampling technique. The subjects were identified by house-to-house survey. The socio-demographic factors i.e., age, gender and dietary history of the subjects was recorded in the pre-designed and pre-tested proforma. Necessary permissions were obtained for the study. Consent of the parents of the subjects was obtained before the commencement of the study. Dietary history of the subjects was taken by interviewing mothers. 24-hour recall method was used here to assess the daily calories and protein intake in subjective manner. The calories and protein intake by the subjects was calculated as per the guidelines. The data of the 174 subjects was entered in the Microsoft Excel and analysed with the help of suitable statistical methods. The data is represented by tables. The statistical level of significance is fixed at $p<0.05$.

RESULTS

174 children aged 2-6 years of age were included in the study of which 93(53.45%) were boys and 81(46.55%) were girls. The mean age of the study group was 4.31 years. The mean age of boys and girls was 4.30 and 4.31 years respectively. 82(47.13%) subjects were in the age group of 2-4 years of which 46(49.46%) were boys and 36(44.44%) were girls. 92(52.87%) subjects were in the age group of >4-6 years of which 47(50.54%) were boys and 45(55.56%) were girls. (Table-1).

Table 1: Age and Gender wise distribution of the subjects (n=174).

Age groups in years	Boys(n=93)		Girls(n=81)		Total(n=174)	
	Frequency	%	Frequency	%	Frequency	%
2-4	46	49.46	36	44.44	82	47.13
>4-6	47	50.54	45	55.56	92	52.87

The mean calorie consumption of the study group was 668.96 kcal and the mean protein consumption was 20.71 gm. The mean calorie consumption of boys was 683.46 kcal and of girls was 654.46 kcal. The mean protein intake of the boys was 21.18 gm and of girls was 20.23 gm. The mean calorie deficit for boys was 591.69 kcal and for girls, it was 633.13 kcal ($p>0.05$). All the subjects both boys and girls were consuming less amount of calorie. 80(45.98%) subjects were consuming less amount of protein of which 43(24.71%) were boys and 37(21.26%) were girls. 92(52.87%) subjects were consuming excess amount of protein of which 49(28.16%) were boys and 43(24.71%) were girls. 02(01.15%) subjects protein intake was accurate. (Table-2)

Table 2: Gender wise distribution of calories and protein intake (n=174)

Variables	Total(n=174)		Boys(n=93)		Girls(n=81)	
	Frequency	%	Frequency	%	Frequency	%
Calorie Deficit	174	100.0	93	100.0	81	100.0
Protein Deficit	80	45.98	43	46.24	37	45.68
Protein Excess	92	52.87	49	52.69	43	53.09
Accurate Protein Intake	02	01.15	01	01.08	01	01.23

All the subjects in both the age groups were consuming less amount of calorie. Of the 82 subjects in the age group of 2-4 years, 43(52.44%) and of the 92 subjects in the age group of >4-6 years, 37(40.22%) were consuming diet deficient in proteins($p>0.05$). 39(47.56%) children in the age group of 2-4 years and 53(57.61%) in the age group of >4-6 years were having excess protein intake($p>0.05$). 02(02.17%) subjects in the age group of >4-6 years were having accurate protein intake. (Table-3).

Table 3: Age wise distribution of calories and protein intake (n=174).

Variables	Age groups in years		P value
	2-4(n=82)	>4-6(n=92)	
Calorie deficit	82(100.0%)	92(100.0%)	
Protein deficit	43(52.44%)	37(40.22%)	>0.05
Protein excess	39(47.56%)	53(57.61%)	>0.05
Accurate protein intake	00(00.00%)	02(02.17%)	

All the boys and girls were consuming less amount of calorie. Of the 93 boys, 43(46.24%) and of the 81 girls, 37(45.68%) were consuming less amount of protein. 49(52.69%) boys and 43(53.09%) girls were consuming excess amount of protein. 01(01.07%) boy and 01(01.23%) girl were consuming accurate amount of protein. (Table-4)

Table 4: Gender wise distribution of calories and protein intake (n=174).

Variables	Boys(n=93)	Girls(n=81)
Calorie deficit	93(100.0%)	81(100.0%)
Protein deficit	43(46.24%)	37(45.68%)
Protein excess	49(52.69%)	43(53.09%)
Accurate protein intake	01(01.07%)	01(01.23%)

DISCUSSION

In the present study in the rural area, it is observed that all the boys and girls in the age group of 2-6 years were consuming less amount of calorie. B K Sidhu et al[4] observed in their study among children attending Anganwadi in urban slum of Patiala that the caloric intake was lower among the 4–5-years olds than among the 3-4 years olds (831.7 vs. 858.9 Kcal). D T Bhutia[5] mentioned the prevalence of stunting among under five was 48.00%, wasting was 20.00% and underweight 43% in his article. Madhu Bala Singh et al[6] observed the prevalence of marasmus 1.7%, very high overall deficits in mean energy and protein intakes i.e., 76% and 54% respectively, in their study in a drought-affected desert area of western Rajasthan, among preschool children aged 0-5 years. Kulsum A et al[7] observed only 22.00% children were enjoying diet adequate in protein and calories in their study among children aged 4-14 years in a slum in Mysore city in south India. In the present study, it is observed that 80(45.98%) subjects were consuming less amount of protein of which 43(24.71%) were boys and 37(21.26%) were girls. 92(52.87%) subjects were consuming excess amount of protein of which 49(28.16%) were boys and 43(24.71%) were girls. Also, of the 82 subjects in the age group of 2-4 years, 43(52.44%) and of the 92 subjects in the age group of >4-6 years, 37(40.22%) were consuming diet deficient in proteins. 39(47.56%) children in the age group of 2-4 years and 53(57.61%) in the age group of >4-6 years were having excess protein intake.

Dilip Kumar L et al[8] observed in their study in a rural belt of southern Rajasthan, that the magnitude of calorie intake differed significantly across communities with higher variability among tribal children. Priyanka R. et al[9] observed in their study in a rural area of Thrissur district in Kerala that the calorie consumption (elicited by 24-hour recall method) was not adequate (<80% of RDA) in 241(66.90%) of children and protein intake was not adequate in 209(58.10%). Seema Kumari et al[10] conducted study in Samastipur district of Bihar and observed that the energy intake by preschool children was 1264.85 kcal as compared to RDA of 1350 kcal and protein intake was 39.64 grams as compared to RDA of 20 grams per day. During early childhood, adequate nutrition can ensure normal growth, proper organ development, a strong immune system as well as neurological and cognitive development. In the present study it was observed that the mean calorie consumption of the study group was 668.96 kcal and the mean protein consumption was 20.71 gm. The mean calorie consumption of boys was 683.46 kcal and of girls was 654.46 kcal. The mean protein intake of the boys was 21.18 gm and of girls was 20.23 gm. The mean calorie deficit for boys was 591.69 kcal and for girls, it was 633.13 kcal.

CONCLUSION

Inappropriate feeding practices among preschool children in rural area like less consumption of calories and proteins was noticed in this study. The deficiency of these macronutrients has detrimental effect on the nutritional and health status of children. The preschool children are most vulnerable to nutritional problems. Nutritional services, health education, good access health services and utilisation of health care can be very effective interventions which could result in substantial reduction in nutritional disorders prevalent in rural preschool children.

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