Research Article

Prevalence and Decisive Factors of Protein Energy Malnutrition Among Children between 1-5 Years of Age

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Abstract

Protein energy malnutrition (PEM) is a widespread nutritional disease in the developing countries. The present study was intended to assess the prevalance and decisive factors of protein energy malnutrition among children of age group between 1-5 years attending Pediatric department of a tertiary level hospital at Thiruvananthapuram. The objectives of the study were to identify the prevalence of protein energy malnutrition among children between the age group of 1-5 years and to find out the decisive factors leading to PEM. The research approach adopted for the study was quantitative approach and research design was descriptive cross sectional method.

The present study was conducted among 150 children belonging to the age group of 1-5 years of age attending Pediatric department, SAT Hospital, Thiruvananthapuram. The participants were selected by purposive sampling method. Structured interview and anthropometric measurements were used to collect data. The collected data were analyzed using descriptive and inferential statistics. It was found that 38% of the sample were affected with protein energy malnutrition among which 25.3% have Grade 1 PEM, 7.3% have Grade 2 PEM, 4.6% have Grade 3 PEM, and 0.6% have Grade 4 PEM. There is significant association between PEM and birth weight, timing of weaning, exclusive breast feeding upto 6 months, continuation of breast feeding upto 2 years, two or more episodes of respiratory infection in a year and dietary pattern.

Keywords: Protein Energy Malnutrition; Children; Decisive Factors

Introduction

Nutrition is a fundamental pillar of human life, health and development across the entire life span. From the earliest stages of fetal development, at birth, through infancy, adolescence, adulthood and old age, good nutrition is essential for survival, physical growth, mental development, performance, health and well-being. Clinically, malnutrition is characterized by inadequate intake of protein, energy, micronutrients and by frequent infections or disease.

Children of today are citizens of tomorrow. The young child under 5 years is most vulnerable to the vicious cycles of malnutrition, infection and disability all of which influence the present condition of a child and the future human resource development of the nation as a whole. Hence the assessment of the ground reality as reflected by the statistics on nutritional status of children becomes very significant in this context.

Malnutrition casts long shadows, affecting close to 800 million people – 20% of all people in the developing world [1]. In 2018,

globally there were 149 million children under 5 year of age were stunted, 49 million wasted and 40 million overweight [2]. Malnutrition remains one of the most common cause of morbidity and mortality among children throughout the world. It has been responsible, directly or indirectly, for 60% of the 10.9 million deaths annually among children under five [3]. Geographically, more than 70% of the protein energy malnourished (PEM) children live in Asia, 26% in Africa and 4% in Latin America and the Caribbean. Out of those 70% in Asia, maximum number of PEM is in Southeast Asia which includes India.

In India almost half of children under five years of age (48 percent) are stunted and 43 percent are underweight. Wasting is also quite a serious problem in India, affecting 20 percent of children under five years of age [4]. Even though severe under nutrition is more pronounced in states like Bihar, Madhya Pradesh, Orissa, Uttar Pradesh and Rajasthan, even in well endowed states like Kerala, Goa and Sikkim, the levels of mild under nutrition is unacceptably high [5]. In Kerala, 23% of children are under weight, 27% stunted and 16% wasted [6].

The group most vulnerable to malnutrition is children below five years, who constitute a special risk group in any population. Their nutritional requirement is disproportionately higher for body weight than older children and adults [7]. There is strong evidence that malnutrition is associated with impaired growth, delayed mental development, poor school performance and reduced intellectual capacity [7-10]. Thus even mild malnutrition in children can affect their long term intellectual ability, brain development and can predispose them to infections which push them further into severe malnutrition [9].

Kerala also known as the 'God's own country' is blessed with good health indicators and some of the health indices of the state are even comparable with western countries. With limited resources and high literacy status especially among women, it has been able to reduce the levels of severe malnutrition to below 1%. But the levels of mild malnutrition are still unacceptably high. It has been reported that the average moderately malnourished child in the 6-24 months category looks entirely normal, but is too small for age, has lowered resistance to infection and the only outward sign is the frequent desire to feed. This condition called invisible PEM which can only be found out through growth monitoring and surveillance. It is high time that attempts are made to resolve the problem of mild under nutrition in children so that they do not become victims of severe under nutrition and its consequences in the future. PEM affect particularly the preschool children less than 6 years as it is the most crucial period of time of development which can lead to permanent impairment in later life [10].

During the clinical and field experience, the investigators have noticed an increase in the rate of Protein Energy Malnutrition among children admitted in pediatric wards. Some of these children were found to have certain common risk factors. So the investigators thought about the need for assessing the prevalence and risk factors of Protein Energy Malnutrition.

Materials and Methods

Objectives of the study were to identify the prevalence and decisive factors of protein energy malnutrition among children of age group between 1-5 years attending Pediatric department of a tertiary level hospital at Thiruvananthapuram district of Kerala. Proportion of children affected with protein energy malnutrition was calculated using anthropometric measurements. Decisive factors or the factors influencing the occurrence of protein energy malnutrition, were evaluated using structured interview schedule. The exposure variables studied included birth weight of the child, gestational age at birth, congenital anomalies, feeding status, episodes of respiratory infection, diarrhea, and timing of weaning and dietary practices.

A quantitative research approach with descriptive cross sectional survey design was adopted for this study in order to accomplish the envisaged objective. A total number of 150 children were recruited for the study using purposive sampling technique. Data collection was started after getting permission from the institution. The investigator met samples at OP department of the hospital and explained about the study and its need. They were assured that all information will be kept confidential and would be used for the study purpose. After getting informed consent, data were collected using structured interview schedule and anthropometric measurements of the children were taken. Data were analyzed and protein energy malnutrition was assessed, variables were summarized to frequency and percentage and association of decisive factors with protein energy malnutrition was found using chi square test.
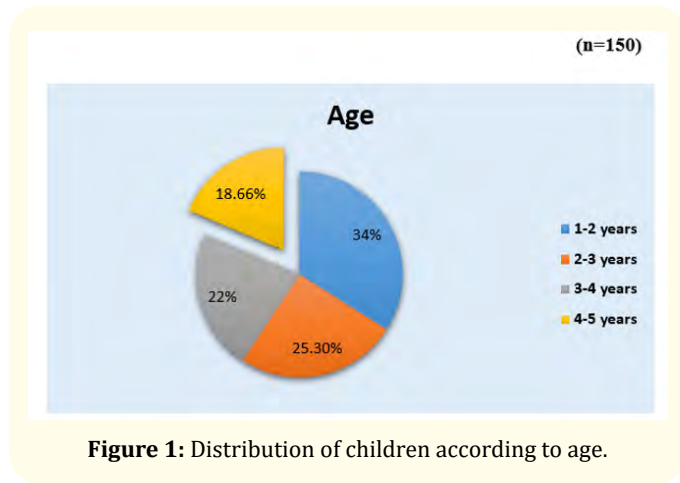
Results

Socio personal data

Figure 1: Distribution of children according to age.

The figure 1 represents distribution of children according to age. Most of the children (34%) belongs to 1-2 years, 25.30% belong to 2-3 years of age.
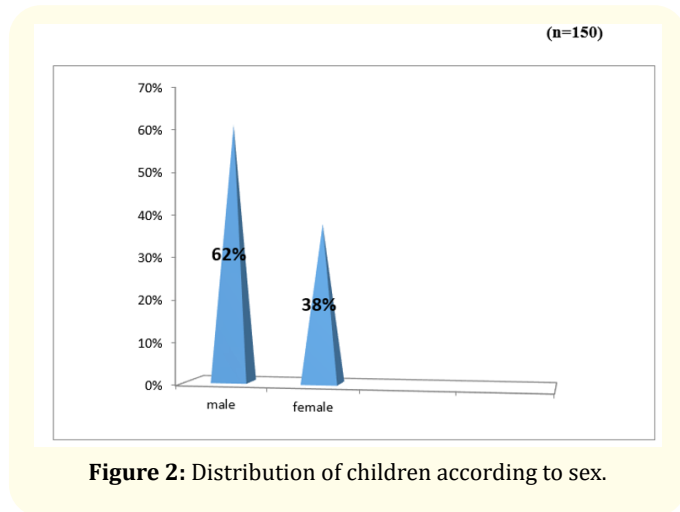

Figure 2: Distribution of children according to sex.

Figure 2 shows that majority of the children (62%) were males and 38% were females.

Figure 3 reveals that 61.3% of the children belong to BPL status and 38% in APL status.
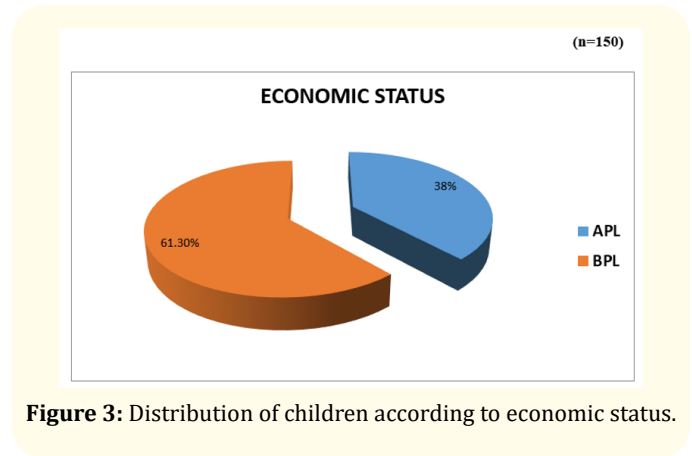

Figure 3: Distribution of children according to economic status.

Place of Residence	Frequency	Percentage
Village	116	77
Town	26	17
Colony	1	0.6
Coastal area	7	4.6
TOTAL	150	100

Table 1: Distribution of participants based on their place of residence.

Table 1 shows that majority 77% of the sample are from village, 17.3% from town, 0.6% from colony area and 4.6% from coastal area.

Prevalence of PEM

Protein energy malnutrition	Present					Absent	Total	
	Grade 1	Grade 2	Grade 3	Grade 4	Total			
Frequency	38	11	7	1	57	93	150	
Percentage	25.3	7.3	4.6	0.6	38	62	100	

Table 2: Prevalence of protein energy malnutrition.

Table 2 shows that out of 150 sample, 57 children have protein energy malnutrition, which constitute 38% of total sample among which 25.3% were Grade1 PEM, 7.3% were Grade 2 PEM, 4.6% were Grade3 PEM and 0.6% were Grade 4 PEM.

Association between protein energy malnutrition and selected factors

Study Variables		Protein energy Malnutrition		Chi-square
		Present	Absent	
Economic status	APL	21	37	0.13
	BPL	36	56	
Education of mother	Primary	4	5	0.59
	High school	8	17	
	Higher secondary	17	26	
	Degree and above	28	45	
Gestational age at delivery	<37 weeks	13	19	3.84
	>37 weeks	44	74	
Birth weight	<2.5 Kg	21	13	12.27*
	>2.5 Kg	36	80	
Time of initiation of breast feeding	Within 1 hour	35	56	4.49
	After 1 hour	18	36	
Exclusive breast feeding up to 6 months	Yes	34	75	7.76*
	No	23	18	
Time of weaning	Before 6 months	13	14	10.67*
	At 6 months	29	56	
	After 7 months	15	38	
Continuation of breast feeding	Less than 2 years	32	58	13.98*
	More than 2 years	25	35	
Two or more episodes of respiratory tract infection in an year	Yes	26	35	14.28*
	No	31	58	
Two or more episodes of diarrhea in an year	Yes	12	26	0.87
	No	45	67	
Dietary pattern	Appropriate	17	57	13.98*
	Inappropriate	40	36	

Table 3: Association between PEM and variables under study.

Table 3 shows that there is statistically significant association between occurrence of PEM and the study variables such as birth weight, exclusive breast feeding up to 6 months, time of weaning, continuation of breast feeding up to 2 years, more than 2 episodes of respiratory tract infections in a year and dietary pattern.

Discussion

The present study was focused to assess the prevalence and decisive factors of PEM among children of age group between 1-5 years of age attending a tertiary level hospital. Based on the findings the investigators arrived the following conclusions. Among 150 study participants, 38% have PEM, in which 25.3% were Grade1 PEM, 7.3% were Grade2 PEM, and 4.6% were Grade 3 PEM and 0.6% were Grade4 PEM. The findings were supported by a cross sectional study done in Ambala, Haryana, India by covering 300 under five children. In this study 39.34% were Grade 1 PEM, 15.6% were Grade 2 PEM and 0.6% were Grade 3 PEM [11].

The present study shows that there is significant association between birth weight and PEM. This study finding was supported by a cross sectional study to assess the prevalence of under nutrition in 0-5 years of children in Junagatt district of Gujarat. The result of which shows that low birth weight and lower socioeconomic status were significantly associated with PEM [12].

The present study reveals a significant association between exclusive breast feeding up to 6 months and PEM. This was supported by a cross sectional study conducted to assess the prevalence of PEM in under five children in the Urban Slum of Mumbai which reveals a significant association of PEM with exclusive breast feeding [13].

A significant association was found between prevalence of PEM and introduction of weaning. This was supported by a cross sectional study conducted to assess the prevalence and determinants of PEM among under five children of Kannauj district of Uttar Pradesh. The study concluded that initiation of breast feeding, practice of breast feeding and initiation of complementary feeding at 6 months were significantly associated with PEM [14].

The present study shows that a significant association is found between continuation of breast feeding up to 2 years with PEM. This finding was supported by a study conducted in Benue state of Nigeria to assess the prevalence of PEM among 0-5 years. This study shows that factors such as occupational status of mothers, length of breast feeding and parental income have significant association with PEM [15].

The present study shows a significant association between 2 or more episodes of respiratory infection in a year with PEM. This finding was supported by a cross sectional descriptive, epidemiological study conducted in tribal area, Parole, Thane district Maharashtra. This study reveals that history of respiratory infection and diarrhea in one month has significant association with PEM [16]. Another study supporting this evidence is available from an investigation conducted to assess the prevalence of PEM in under five children in an urban slums of Mumbai. This study concludes that the exclusive breast feeding, children with incomplete immunization and more than 3 episodes of acute respiratory infection has association with PEM [16].

Conclusion

The inquiry identified that 38% of the children have PEM. Among these 25.3% have grade 1 PEM, 7.3% have grade 2 PEM, 4.6% have grade 3 PEM, 0.6% have grade 4 PEM. There is an increased need for health education to the mothers about the importance of exclusive breast feeding up to 6 months, continuation of breast feeding up to 2 years, introduction of weaning at 6 months and dietary pattern of child to include food items from all food groups.

The findings highlight the need for more research in the areas of PEM, nutritional practices of children, weaning, breastfeeding and recurrent infections. On the basis of findings of the present study, the following recommendations are made for further study. Periodical growth monitoring for children in community and hospitals will be beneficial. Exclusive breast feeding should be given up to 6 months. Weaning should be initiated at 6 months. Breast feeding should be continued up to 2 years. Children should be kept free from infections. All types of food groups should be included in the diet of the children.

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