Malnutrition Status Among Under - 5 Children in a Hill Community of Nepal

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ABSTRACT

Background

Malnutrition, especially under nutrition puts children at increased risk of morbidity and mortality and remains a serious barrier in child growth, development and survival. This is a major public health problem among under- 5 children in Nepal particularly in rural areas.

Objective

To assess the burden and contributing factors for malnutrition in hill community of Ilam district in eastern Nepal.

Method

A cross sectional study was conducted in rural hill communities of Ilam district, Nepal with a sample of 240 under- 5 children. Anthropometric measurements were used as per WHO guidelines to asses three nutritional status: Underweight, Stunting, and Wasting using descriptive statistics and chi square test was applied using SPSS 12.0 to assess social and predisposing factors.

Result

Seventeen percent of under- 5 children were moderately and 10.4 % were severely underweight. Similarly, 22.9%, and 17.5% were found to be moderately and severely stunted respectively. Less than 10% were found to be moderately and severely wasted. Older age group of children, education level of mother, not exclusive breast feeding practice had significant ($p < 0.05$) effect on stunting. More than 50% children were affected with stunting, underweight and wasting at the same time.

Conclusion

Significant proportion of under - 5 children were malnourished in the communities of the hilly areas. The study unveiled the importance of literacy and exclusive breast feeding for the prevention of malnutrition in under- 5 children.

KEY WORDS

Contributing factors, malnutrition, Nepal, under- 5 children.

INTRODUCTION

Malnutrition literally means imperfect nutrition or bad nutrition that technically includes both over and under-nutrition. Under-nutrition is the issue of concern among under-5 children in terms of morbidity and mortality as it is causing as high (175/1000) deaths in low income countries compared to high income countries (6/1000 deaths).[1,2] Under nutrition places children at an increased risk of impaired physical and mental growth, poor socio-emotional development due to deficiencies of micro and macro nutrients like protein, iodine, iron and vitamin A. Hence, the nutrition status of under -5 children is important.[2,3] WHO currently reported 29.1% of underweight under -5 children in Nepal, boys and girls being affected equally.[4]

Nepal being landlocked country and is divided in to three distinct ecological regions namely mountain, hill and terai.[3] Although the Nepal Demographic Health Survey (NDHS) 2011 reported declining trend of malnutrition since 2001 but the situation is still prevailing in rural hill and mountain community.[5,6] The socio economic inequalities and quality of life at rural and urban areas is one of the factor for prevailing nutritional problem in developing countries.[7]

So, this study was conducted in rural hill community of eastern Nepal to assess the burden of malnutrition and possible factors affecting nutrition status of under-5 children. Anthropometric measurement like age, gender, length, height, weight were used as per guidelines of WHO, CDC, and WFP to assess nutritional status (Table 1) based on standard deviation score (Z score).[8]

Table 1. Classification of malnutrition for weight for height, height for age, and weight for age

Classification	Z score
Adequate	Z score between -2 to +2
Moderately malnourished	Z score between -2 to -3
Severely malnourished	Z score < -3

METHODS

A cross sectional study was conducted in randomly selected Nepaltar, Barbote and Maikhola rural hill communities of Ilam district (selected purposively as Ilam is one of the teaching districts of BPKIHS) from May to June 2011. As per NDHS 2006 prevalence of underweight for under- 5 children was 33.2%, based on that estimated sample size calculated for study was 206 at 95% confidence limit. The study was carried out as part of academic purpose for MBBS students and focuses to select under-5 children from the above mentioned community as much as possible. The sample of 240 under-5 children were selected from the above three sites during data collection period. The data was collected by face to face interview with mother of the child with the help of structured questionnaire developed by reviewing different related studies. The questionnaire was pre tested before taking interview and essential changes were made in the questionnaire according to findings.

The data indicators used for anthropometry were age, height, weight and mid upper arm circumference. Age, height and weight were only used for assessment as per developed chart scale for boys and girls using WHO standard deviation score (Z score). Three summary indices of nutritional status: Weight for age (underweight), Weight for height (wasting), and Height for age (stunting) were used as per recommended by WHO which was also used for nutritional assessment in NDHS .[5,8]

To measure height and weight, measuring tape and weighing machine were used. For child < 24 months, recumbent length was taken with assistance by keeping knee extended, foot plantar flexed and forehead touching wall. Similarly for child ≥ 24 months to 59 months, standing height with footwear removed and support with wall was taken. The zero error of the weighing machine was corrected and weight of child was taken with minimum clothing. Child not able to stand, weight of child with mother was taken then mother weight was only taken and later was subtracted to previous weight to get the weight of the child. The guidelines were as per the rule of manual report by CDC (Centre of Disease Control and prevention). 8 Descriptive statistics were analysed using SPSS 12.0 and chi-square test was applied. Ethical clearance was taken from BPKIHS institutional ethical review board and informed consent was taken from parents for the anthropometric measurement.

RESULTS

The socio demographic distribution demonstrated that around 43% of under-5 children were in age group of 36 to 59 months. Majority (67%) of family were living below poverty line with main occupation of farmer as shown in Table 2. Almost all children (97%) were immunized as per the age but only 61% of children were exclusive breast fed during first 6 months and 15% had frequent or recurrent illness like diarrhoea, acute respiratory infection in last one year period.

Of the total sample size (240), around 28%, 41% and 18% were underweight, stunted and wasted respectively (Figure 1). The malnutrition status of under-5 children shows that nearly 55% were underweight, stunted and wasted at the same time. More than 50% were stunted and underweight, almost 51% were stunted and wasted (Figure 2). The three indices of malnutrition was found high in the older age group of more than 24 months and was significantly (p=0.01) associated with stunting (Table 3). Age group of above 24 months were severely stunted as compared to younger children of less than 24 months. The trend of malnutrition was found to be increasing with increase in age (Figure 3). Malnourished children (48%) were found more among illiterate mothers as compared to literates. Educational status of mother and absence of exclusive

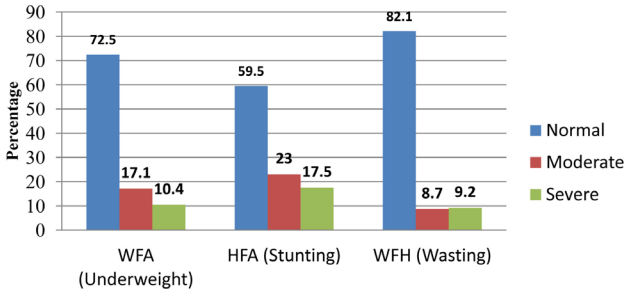

Figure 1. **Anthropometric evaluation of under-5 children (n=240)**

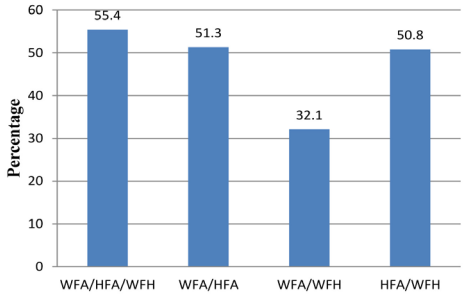

Figure 2. **Malnutrition status among under-5 children (n=240)**

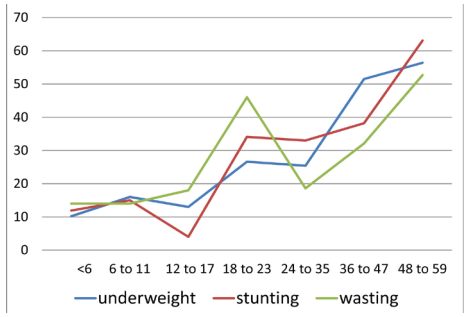

Figure 3. **Trend of malnutrition (%) with increase in children's age (in months) (n=240)**

Table 2. **Socio-demographic profile of under-5 children's family**

Characteristics	Frequency	Percentage (%)
Age group(mnths)		
<6	21	8.75
6 to 11	19	7.92
12 to 17	13	5.42
18 to 23	49	20.42
24 to 35	34	14.17
36 to 47	30	12.50
48 to 59	74	30.82
Sex		
Male	123	51.25
Female	117	48.75
Education of Mother		
Illiterate	57	23.75
Primary	53	22.08
Secondary	95	39.58
SLC & above	35	14.59
Occupation		
Farmer	78	32.50
Foreign worker	41	17.08
Labour	25	10.42
Business	47	19.58
Service	25	10.42
Driver	24	10.00
Economic Status		
< 1.25USD/day	162	67.50
≥ 1.25 USD/day	78	32.50

breast feeding was also significantly ($p<0.05$) associated with stunting. Male and female children had almost equal distribution for three indices (Table 3). Chronic illness has also role in giving high percentage of malnutrition but it did not show significant association for three indices but around 40 % shows stunting followed by underweight and wasting. Birth weight of the child did not show any significant association with malnourishment but child of low birth weight compared to normal birth weight were found more stunted (45% Vs 39%) ,underweight (36% Vs 25%), and wasted (26% Vs 15%) .

DISCUSSION

Developing countries are fighting with malnutrition among under-5 children.[1] The NDHS report 2011 shows the declining trend of malnourished children in the country over the last decade however burden is still present.[5] Our study conducted in rural hill region found 28%, 41 % and 18% of underweight, stunting and wasting among under-5 children respectively. The NDHS report 2011 in hill region also reported high percentage of stunting (58%) followed by underweight (33%) and wasting (13%). Stunting is the outcome of chronic effect. The high prevalence of stunting described in other studies also,[9-12] demonstrate the failure of adequate nutrition for the long period of time, or may be affected by recurrent or chronic illness like diarrheal disease, acute respiratory infection, heart disease, worm infestation and deficiency of micro or macro nutrients. The presence of chronic illness within one year period in our study also shows high number of malnourished children although the findings were not significant. The nutritional status of children was much affected in older age group. More proportion of children in age group of above 24 months was found to be affected and significantly associated with stunting. This could be evidenced as small proportion of children were stunted, underweight, and wasted in age group of less than 17 months but it considerably increases after that similar to the NDHS report 2011 showing more stunted and underweight children of older age group. Study from Nepal tarai area also reported small proportion of six months and lower age were underweight but it increases for 7 to 12 months and higher age group. The initiation of supplementary feeding practices along with mother's milk (till 24 months of child) after six months to enhance the nutritional status of children as mother's milk only is not

Table 3. **Nutritional status of under-5 children**

Variable	Weight for Age (%)			Height for Age (%)			Weight for height (%)		
	Normal	Moderate	Severe	Normal	Moderate	Severe	Normal	Moderate	Severe
Age group (months)									
<6	81.0	19.0	0	76.2	17.2	6.6	85.7	9.5	4.8
6 to 11	73.7	10.5	15.8	63.2	15.8	21.1	84.2	10.5	5.3
12 to 17	69.1	15.4	15.5	84.6	7.6	7.8	69.2	15.2	15.6
18 to 23	81.6	12.2	6.1	65.3	22.4	12.2	79.6	10.2	10.2
24 to 35	73.5	20.6	5.9	52.9	26.5	20.6	88.0	5.9	6.1
36 to 47	56.4	25.6	17.9	46.2	25.6	28.2	82.1	5.1	12.8
48 to 59	72.3	15.4	12.3	55.4	32.3	12.3	81.2	9.6	9.2
		P value= 0.41			P value = 0.07			P value= 0.9	
Age group (months)									
0 to 23	78.4	13.7	7.8	69.6	14.7	15.7	80.4	10.8	8.8
24 to 59	68.1	19.6	12.3	52.2	29.0	18.8	83.3	7.2	9.4
		P Value= 0.20			P Value= 0.01			P Value= 0.63	
Gender									
Boy	68.2	17.8	13.8	59.3	25.2	15.4	80.4	9.7	9.6
Girl	76.8	16.2	6.8	59.8	20.5	19.6	83.7	7.6	8.5
					P value = NS				
Education status (mother)									
Illiterate	71.9	14	14	45.6	26.3	28.1	80.7	5.3	14
Literate	72.7	18	9.3	63.9	21.9	14.2	82.5	9.8	7.7
		P value= 0.52			P value= 0.02			p value = 0.2	
Frequent illness									
Present	64.8	24.3	10.8	62.1	16.2	21.6	78.3	13.5	8.1
Absent	73.9	15.7	10.3	59.1	24.1	16.7	82.7	7.8	9.3
					P value = NS				
Breast feeding (exclusive)									
Present	76.9	15.6	7.5	66.0	19.7	14.3	83.7	6.8	9.5
Absent	65.6	19.4	5.1	49.5	28.0	22.6	79.6	11.8	8.6
		P value=0.12			P value=0.03			P value= 0.40	
Birth weight									
< 2.5 Kg	62.7	23.6	13.7	54.9	19.6	25.5	72.5	5.7	11.8
≥2.5 Kg	75.1	15.3	9.5	60.8	23.8	15.6	84.7	6.9	8.5
					P value = NS				

NS= Not Significant

sufficient beyond that age has been recommended. This suggest that improper supplementary feeding practices after six months is frequent as children of more than 24 months are more stunted (48%) and underweight (33%) in this study. In addition to that for the importance of breast feeding the study demonstrated significant association of absence of exclusive breast feeding related to stunting consistent with the finding from other region.[9,10] The importance of breast feeding and supplementary feeding depends upon the mother's education as she is the first person to be in contact with their children frequently in their early life. The NDHS 2011 report demonstrated that mother with no education had more proportion of stunted child followed by wasting and underweight. Our study also demonstrated a significant association with mother education with stunting. This defines the effect of longer period of inadequate nutrition among under – 5 children due to illiteracy in hill community and lack of information and knowledge regarding benefit of proper nutrition among mother. The finding was in agreement with finding from

other studies as mother's role in child feeding practices and education level associated with high rates of stunting and underweight.[10,11] The family economic condition also plays a role in living standard, health and nutrition but our study did not find the such relation of good economic status had no effect on nutritional status probably malnutrition is not mere due to poor economic condition but is influenced by multiple factors and socio cultural aspects similar to findings from other part of Nepal.[9] Some studies have shown economic impact on probability of child being stunted and underweight.[11-13] Child with low birth weight were found to be more stunted than normal birth weight explaining the extended duration of effect on height for age but did not show significant relation as discussed in some literaures.[14] The finding related to birth spacing and family size did not show any association with nutritional status but had contributing number of effect on nutrition in our study. The study also demonstrated that child is not only effected with one indicator of malnutrition which can be evidenced by, more than 50% of children were stunted, underweight and wasted at the same time. As the study conducted in the rural hill community of the country, thus it defined the impact of socioeconomic inequality in malnutrition as present in the other developing world described by other studies.[7,15] The resultant inequality is much more pronounced for stunting followed by underweight and wasting in our context. Existing nutritional problem is not the acute onset but is progressively affecting the children with advancing age explaining the chronic effect on nutritional problem as stunting defines the long period of effect.

CONCLUSION

The nutritional problem is prevailing more among older children, especially stunting has more social dimension and to be dealt with broader biomedical sense. The study unveiled the importance and awareness regarding exclusive breast feeding, promotion of girl education and chronic illness management for the prevention under 5 children malnutrition. The study focused only on the possible contributing factors that could affect the nutritional status of children as the study was conducted for a very short period of time as part of epidemiological skill development programme in the health institution of BPKIHS Dharan, Nepal. To understand the better half for the existing barriers among rural community a longitudinal study and qualitative research with in depth analysis is important.

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