Nutritional Status of Children Under Five Years of Age and Factors Associated in Padampur VDC, Chitwan

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ABSTRACT

Background: Malnutrition is a major underlying cause of the child morbidity and mortality in Nepal. Factors that contribute to malnutrition are many and varied, so multifaceted strategies are required to combat it. It is therefore important to determine its causative factors before appropriate intervention can be implemented. This analysis tries to analyze the factors associated with nutritional status among children of under five years of age so that nutritional intervention can be better designed.

Methodology: A community based cross-sectional descriptive survey using a structured questionnaire and measurements of weight and height to determine the nutritional status of underfive children and factors associated with it. A structured questionnaire was then administered to the mothers in their home settings. Anthropometric measurement was then used to determine if children were underweight (weight-for-age), wasting (weight-for-height) and stunting (height-for-age) based on CDC/WHO reference. Logistic regression statistical tool was used to analyze the influence of different predictors.

Results: Prevalence of underweight, stunting and wasting was 22.7%, 37.3% and 25.7% respectively. Study indicated that the risk of stunting increases with age. Socioeconomic status was most important factors associated with stunting, underweight and wasting. Meeting the minimum dietary diversity, minimum meal frequency and minimum acceptable diet was associated with better nutritional status of children.

Conclusion: Results of this study indicate that undernutrition is still an important problem among children under five years of age in Padampur VDC, Chitwan. Furthermore, this malnutrition was found to be a result of maternal, socio-economic and child individual factors.

Key words: Underweight, stunting, wasting, nutritional status

INTRODUCTION

The nutritional status of children is important as it determines their health, physical growth and development, academic performance and progress in life. All children have the right to adequate nutrition, which is essential for attainment of the highest standard of health. (1) Moreover, good nutrition has been reported to be the corner stone for survival, health and development in the current and succeeding generations. (2) Among children in developing countries, malnutrition is an important factor contributing to illness and death. Malnutrition during childhood can also affect growth potential and the risk of morbidity and mortality in later years of life. Malnutrition among children is rampant among the South Asian countries. About half of all children deaths are associated with malnutrition, of which three quarters are linked to mild and moderate forms. (3)

There is wide variation in the state of malnutrition throughout Nepal, both ecologically and regionally. Stunting, 49 percent, is more common in mountain areas than in the terai, but underweight, 39 percent, and wasting, 13 percent, are more common in the terai than in the mountain areas. (4) Factors that contribute to malnutrition are many and varied, so multifaceted strategies are required to combat it. It is therefore important to determine its causative factors before appropriate intervention can be implemented. This analysis tries to analyze the factors associated with nutritional status among children of under five years of age so that nutritional intervention can be better designed.

METHODS

A community based cross-sectional descriptive survey using a structured questionnaire and measurements of weight and height to determine the nutritional status of underfive children and factors associated with it. It was carried out in Padampur VDC of Chitwan district during august-september 2010, is inhabited mainly by Tharu caste. A sample size of 150 under five children was taken based on national prevalence of underweight that is 39% (4) and with 8% precision at 95% confidence interval.

$$n = z2pq/d2 = 143$$

With 5% of the total sample size was added as an attrition rate, the actual sample of the study was 150 children. Study units were selected randomly from the list of total number of under-five children in the study VDC which was available from the Padampur Sub health Post.

Weight for age, weight for height and height for age z scores were based on CDC/WHO reference data. A cut off of -2 z-score was used to define under nutrition for binary logistic regression. All the covariates were entered and analyzed in SPSS version 17. Anthropometric data were calculated by Epi-Info 3.5.1 NutStat programme. Both bivariate and multivariate analyses are employed to identify the socioeconomic, maternal and child feeding practices related

factors associated with nutritional status of children. These analyses were focused on two outcomes of nutritional status of children; whether they are undernourished (for each of stunting, underweight and wasting) or not. For those variables with more than two categories, odds ratio was calculated using one of the categories as reference group. P-values less than 0.05 are considered as significant. Because of differences in sample size of variables related to child feeding practices and other variables, these variables included separately in multiple logistic regression analysis.

RESULTS

Nutritional status:

The prevalence of stunting, underweight and wasting in Padampur VDC was found to be 22.7%, 37.3% and 25.7% respectively.

Table 1: Distribution of stunting, wasting and underweight

Nutritional status		Frequency (%)
1. stunting		n=150
	severe stunting	10 (6.7)
	moderate stunting	24 (16.0)
	normal	116 (77.3)
2. Underweight		n=150
	severe underweight	16 (10.7)
	moderate underweight	40 (26.7)
	normal	94 (62.8)
3. wasting		n=148
	severe wasting	8 (5.4)
	moderate wasting	30 (20.3)
	normal	110 (74.3)

There is, on average, downward sift of curves throughout the under five age. Height for age curve stabilizes around -1.50 till the age of 36 months. After that there is decrease in z-score as age increases and again increase when child reach 48 months. But for weight for age there is continuous decrease of mean z-score till the 36 months and then curve goes downward before going up. Weight for height curve showed mean z-score positive till the age of 12 months, then stabilizes at around -1.00 till 36 months and finally goes upward after 36 months. (Figure 1)
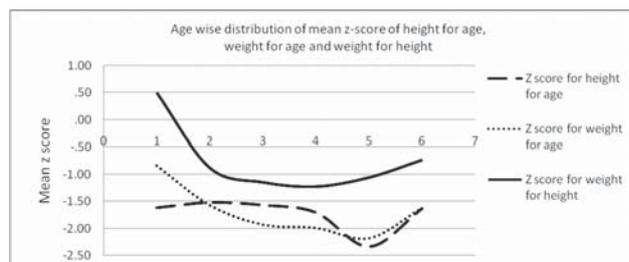

Figure 1: Age wise distribution of mean z-score of height for age, weight for age and weight for height.

Characteristics of the study population:

Of the total children included in the study, 66 (41.3%) were girls and 88(58.7%) were boys. The mean (± SD) age of the children was 25.67 (± 14.19) months with females 26.33 (±15.39) months being slightly older than male 25.20 (±13.35) months. Disadvantaged ethnic group formed the majority (80%) in the study population and the rest formed advantaged ethnic group (20%). Additionally 50.7% of the children's mother had only a secondary or higher education, while 26.7% had a primary education and 22.7% were illiterate. Furthermore, 50.7% of the children's mothers were farmers while 40% were housewives. Majority of the children (88%) living in family having up to two children while only 12% were living in the family having three or more children. One third of the children were born when mother's age was less than 20, while two thirds were born when mother's age was 20-35 years. Nearly 4 of 5 children 6-36 months whether currently breastfeeding or not had got at least minimum frequency as defined in study. Similarly 2 out of 5 children 6-36 months didn't eat more than 3 different groups of foods out of 7 food groups as recommended by WHO, during the 24 hours preceding the interview. Only 52% children had got minimum acceptable diet during 24 hours prior to data collection.

Factors associated with Undernutrition in children

Binary logistic regression analysis was used to identify the characteristics that were related to nutritional status of children. The variables that were found to be significant factors of undernutrition are presented in table 2,3,4,5 and 6.

Factors associated with stunting

The multivariate analysis revealed that children's age, occupation of mother and socioeconomic status were significantly related to stunting (table 2). Children's age is found to be significantly related to stunting. In comparison of first year of life, children were at 6.27 and 13.3 times more risk of being stunting in second and fifth year respectively. Children with mother doing other occupation were in 0.27% more risk than children with mother, who were housewives. As compared to the rich socioeconomic status, children from the poor socioeconomic status were 2.551 times more likely to stunting. The association between stunting with minimum dietary diversity and minimum meal frequency was also found statistically significant (table 3). Risks of stunting were 6.324 times (OR= 6.324, CI=1.992-20.072, p= 0.029) higher in children who didn't met minimum dietary diversity requirement than in children who met. Similarly risks of stunting is also higher (OR= 3.615, CI= 1.140-11.458, p= 0.002) in children who didn't get minimum times of meal in comparison to children who get minimum times of meal.

Table 2: Adjusted distribution of stunting status of children by socioeconomic, maternal and child related factors (n=150)

Survey Variables	OR	95% CI for OR		p-value
		Lower	upper	
Children's age in month				
0-12	-	-	-	-
12 - 24	6.279	1.462	26.971	0.013
24 - 36	1.102	0.267	4.542	0.893
36 - 48	8.153	1.836	36.211	0.006
48 - 60	13.534	1.794	102.106	0.012
Occupation of mother				
housewife	-	-	-	-
others	0.271	0.100	0.734	0.010
Socioeconomic status				
Poor	2.551	0.606	10.735	0.202
medium	6.138	1.788	21.074	0.004
rich	-	-	-	-

Table 3: Adjusted distribution of stunting status of children by factors related to child feeding practices (n=100)

Survey Variables	OR	95% CI for OR		P-value
		Lower	upper	
Minimum Dietary diversity				
Not met	6.324	1.992	20.072	0.029
met	-	-	-	-
Minimum meal frequency				
Not met	3.615	1.140	11.458	0.002
met	-	-	-	-

Factors associated with underweight

The multivariate analysis revealed that ethnicity, educational level of mother and socioeconomic status were significantly related to underweight (table 4). Disadvantaged ethnic groups were found protective against underweight than advantaged ethnic group (OR = 0.247, p = 0.004). Risks of underweight were 0.194 and 0.131 times lower for children of mothers attended primary and secondary/or more level of education respectively, comparing to the children of illiterate mothers. As compared to the rich socioeconomic status, children from the poor socioeconomic status were 7.626 times (OR= 7.626, CI= 2.532-22.967, p = <0.001) more likely to underweight. The association between stunting with minimum dietary diversity and minimum meal frequency was also found statistically significant (table 5). Risks of stunting were 2.369 times higher in children who didn't get minimum dietary diversity than in children who get. Similarly risks of stunting is also higher (OR = 3.461 with 95% CI, p = 0.017) in children who didn't get minimum times of meal in comparison to children who get minimum times of meal.

Table 4: Adjusted distribution of underweight status of children by socioeconomic, maternal and child related factors (n=150)

Survey Variables	OR	95% CI for OR		P-value
		Lower	upper	
Ethnicity				
Advantaged ethnic group	-	-	-	-
Disadvantaged ethnic group	0.247	0.094	0.645	0.004
Educational level of mother				
No formal education	-	-	-	-
Primary	0.179	0.060	0.531	0.002
Secondary or above	0.364	0.145	0.914	0.031
Socioeconomic status				
Poor	7.626	2.532	22.967	0.000
medium	1.477	0.574	3.799	0.419
rich	-	-	-	-

Table 5: Adjusted distribution of underweight status of children by factors related to child feeding practices (n=100)

Survey Variables	OR	95% CI for OR		p-value
		Lower	upper	
Minimum Dietary diversity				
Not met	2.369	0.991	5.664	0.530
met	-	-	-	-
Minimum meal frequency				
Not met	3.461	1.252	9.569	0.017
met	-	-	-	-

Factors associated with wasting:

The multivariate analysis revealed that occupation of mother and socioeconomic status were significantly related to wasting (table 6). Variables related to child feeding practices were not statistically significant (p>0.05) with wasting of children.

Table 6: Adjusted distribution of wasting status of children by socioeconomic, maternal and child related factors (n=148)

Survey Variables	OR	95% CI for OR		p-value
		Lower	upper	
Occupation of mother				
housewife	-	-	-	-
others	23.614	4.642	120.124	0.000
Socioeconomic status				
Poor	15.961	3.292	77.399	0.001
medium	0.248	0.078	0.785	0.18
rich	-	-	-	-

DISCUSSION

The Nepal Demographic Health Survey (NDHS) report 2006 estimated that 49%, 39% and 13% of children in Nepal found to have stunting, underweight and wasting. In the current study, the prevalence of stunting, underweight and wasting

in Padampur VDC was found to be 22.7%, 37.3% and 25.7% respectively. The prevalence of underweight, an indication of both chronic and acute malnutrition, was higher compared to stunting and wasting in community though is similar with national prevalence of underweight as found in 2006. The prevalence of wasting in study community is 13% higher than national prevalence and is 8% higher than wasting prevalence in Terai region. This may be because wasting, which is an indicator of acute nutritional deficiency, reportedly occurs due to recent illness (e.g. diarrhea, febrile illness etc).

The findings of this study indicated that the risk of stunting increases with age, consistent with other studies. (3, 5) Children in the youngest age group 0-12 months had a significantly lower risk of stunting than children in the older age group. It is likely that nursing during early life is protective and that stunting becomes more likely as the child becomes more dependent for caloric intake on foods that have to be grown or bought.

Mother's education is positively related to the better nutritional status of children however association is significant only in case of underweight. A similar association between maternal education and child underweight was also observed in some studies conducted in Nepal and India. (5, 6) Ethnicity is a major factor affecting many aspects of health status. Children from disadvantaged ethnic groups were found to have significantly lower rate of underweight when compared with children of advantaged ethnic group; differ to earlier reports. (3, 5) This might be due to study sample with 4:1 distribution of children of advantaged group to that of disadvantaged. Sah, (3) in his study in Dhanusha, did not find a significant relationship between ethnicity and child malnutrition.

No relationship was found between nutritional status of children and age of mother when child was born, child morbidity (diarrhoea and febrile illness) during 14 days prior to data collection. Nor was the nutritional status of children in this study significantly different according to gender. Other studies conducted in Nepal and India. (7, 8) show that the prevalence of malnutrition was similar in both the genders in this age group.

Socioeconomic status, a composite indicator of available cultivable land, food sufficiency and housing type, was most important factors associated with all stunting, underweight and wasting. It was found that children of household having poor socioeconomic status were almost three times more at risk of being stunted, about eight times more at risk of underweight and about sixteen times more at risk than the children of household having rich socioeconomic status population. A study carried out in the urban area of Africa regarding socioeconomic determinants of nutritional status also showed that children in the family with poor socioeconomic status were at 2 times high risk of being stunted. (9)

Regarding the occupation of mother, it was further categorized as housewives and others for the convenience of analysis. The association of mother's occupation with stunting and wasting found significant. Children with housewife mother have higher chance of stunting while lower chance of wasting than children with mother's occupation other than housewife. The association of mother's occupation with stunting is supported by the study carried out in Lalitpur, Nepal. (10) Similarly the association found between mother's occupation and wasting is consistent with some studies (9, 10)

Meeting the minimum dietary diversity, minimum meal frequency and minimum acceptable diet is associated with better nutritional status of children. (5) In final model of logistic regression analysis, study found that only minimum dietary diversity and minimum meal frequency were associated with stunting and underweight in children, while having minimum acceptable diet is not significantly associated with stunting, underweight and wasting.

CONCLUSION

In conclusion, the results of this study indicate that undernutrition is still an important problem among children under five years of age in Padampur VDC, Chitwan. Furthermore, this malnutrition was found to be a result of maternal, socio-economic and child individual factors. These findings are of great importance because they identify potential actions that can be used to improve the nutritional status of children. Immediate interventions targeted to community management of acute malnutrition might be appropriate to manage wasting, which is an indication of acute malnutrition in study community. As the prevalence of stunting increases with age, may be due to inappropriate complementary feeding, nutrition education in community may be helpful. Socioeconomic status of household have significant role in nutritional status of children, implementation of poverty reduction strategies and programs could also serve as a long-term solution to the problem.

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