

Nutritional Status of Children in Two Districts of the Mountain Region of Nepal

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ABSTRACT

Background: Nutritional status is a prime indicator of health. Generally, three anthropometric indicators are often used to assess nutritional status during childhood and adolescence: underweight (weight-for-age), stunting (height-for-age) and thinness (BMI-for-age). Malnutrition in children is a major public health problem in many developing countries. This study was conducted to assess nutritional status among children attending health camps in two mountainous districts in Nepal.

Methods: Five hundred and seventy five children below 15 years of age attending the medical camp in Humla and Mugu districts in October 2011 were assessed for nutritional status. For children less than five years, weight for age, weight for height and height for age as per WHO classification, and for children between five to 15 years age specific values of height, weight and Body Mass Index (BMI) were calculated.

Results: In Humla district, 28.2% children were undernourished, 8.8% wasted and 22.4% stunted in less than five years. In the same age group, 31.7% children were undernourished, 9.4% wasted and 29.4% stunted in Mugu district. In the age group five to 15 years, thinness was seen in 22.4% and 29.4% children in Humla and Mugu respectively.

Conclusions: Malnutrition (underweight, stunting, wasting and thinness) still constitutes a major health problem among Nepalese children, particularly in mountainous regions.

Keywords: Nutritional status, stunting, thinness, underweight, wasting

INTRODUCTION

Nutritional status is recognized to be a prime indicator of health of individuals or community.¹ Growth assessment is the single measurement that best defines health and nutritional status of children, because disturbances in health and nutrition, regardless of their etiology, invariably affect child growth.²

Nutritional status of children under five in Nepal is very poor. The 2006 Nepal Demographic and Health Survey (NDHS) found 45% and 43% of children below the age of 5 years to be underweight and stunted, respectively.

But in mountain region, these figures are much higher (50.4% underweight and 56.1% stunted).³ Growth and development in these regions are clearly affected by high-altitude exposure to hypoxia, nutritional stress, cold or a combination of these factors. However, the 2011 NDHS survey found 29% children below the age of 5 years to be underweight, 8% severely underweight, 11% wasted, 3% severely wasted, 41% short for their age and 16% severely stunted.⁴

For children, anthropometric deficits vary with ecological zone, in that stunting and underweight are

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more prevalent in the Mountains and Hills and wasting in the Terai.⁵ Medical camps in various specialties on a regular basis are very popular in the developing countries to provide basic healthcare to poor and marginalized areas of Nepal.⁶ However well planned and organized health camps covering the whole of Nepal and its needy population appear lacking.⁷

This study was done to know the nutritional status of children in two districts of the mountain region of Nepal.

METHODS

This study was conducted in 575 children below 15 years of age attending the medical camp from 12th-16th October, 2011 organized by the Nepal Army in Humla and Mugu districts of Nepal. Children coming to seek medical facility and their accompanying healthy siblings as well as healthy children accompanying their mothers seeking medical facility were included in the study. Consent was taken from the parents and the older children themselves before the assessment. Age in months for children less than five years and in completed years for children more than five years were recorded from the birth dates. Those children whose exact birth dates were not known were excluded from the study. Body weight was recorded to the nearest 0.1kg using a digital weighing scale. The body length and height were measured nearest to 0.5cm by standard technique using infantometer in recumbent position in children less than 24 months and stadiometer in older children. Nutritional status of the children in less than five years were expressed by weight for age, weight for height and height for age classification of WHO¹². Weight for age classification of Indian Academy of pediatrics (IAP) and GOMEZ were also calculated. Nutritional status of children between five to 15 years was expressed by age specific values of height, weight and Body Mass Index (BMI). BMI was calculated as weight in kg divided by square of height in meter. The standards used were the WHO 50th percentile growth chart.

Demographic description of Humla and Mugu: Humla and Mugu belong to the least developed districts of Nepal in terms of human development indicators. According to a recent assessment of the development status of Nepal's districts, Mugu is the last of the 75 districts and Humla occupied the 74th position.⁸ The families are usually large and the average number of individuals per family is six.⁹

There are chronic food shortages: these districts have been experiencing cereal deficits since the 1970s, and agricultural production is insufficient to cover the needs of a growing population. Hunger periods usually

are in February-April (before harvest of winter crops as wheat and barley) and around August (before harvest of summer crops as rice and millet). The most important food gap is the one that follows the winter.¹⁰ There is no management of safe drinking water. The hygiene practices are very poor (no use of soaps because too expensive, no frequent use of ashes). The toilets (pit latrines) are extremely rare and defecation is in open-air area, streets, and fields or close to a water point.⁹

Very little research has been conducted on the growth and nutritional status of children living on mountainous areas.¹¹

RESULTS

There were 245 children from Humla and 330 from Mugu. Figure 1 shows the sex distribution in different age groups. The WHO Classification of Malnutrition in less than five years age group is depicted in Table 1. Figure 2 shows IAP weight for age classification of malnutrition and Figure 3 GOMEZ weight for age classification. Age specific values of height, weight and BMI in children between five to 15 years is shown in Table 2.

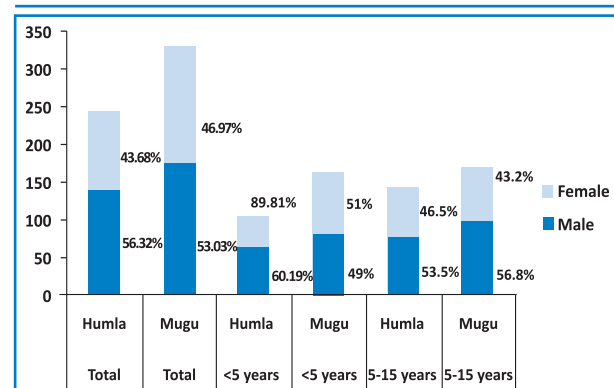


Figure 1. Sex distribution of children according to age.

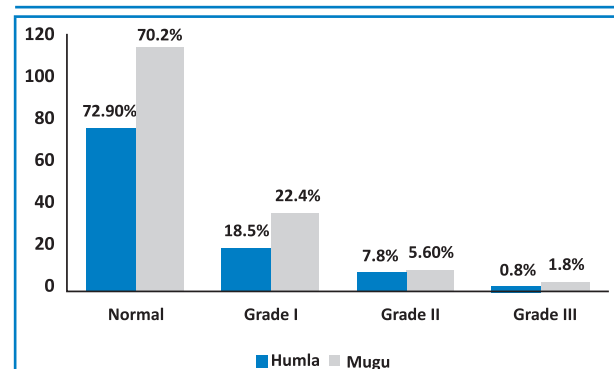


Figure 2. Malnutrition (IAP Classification) of children less than 5 years of age.

Table 1. Distribution of children less than five years (WHO classification of Malnutrition).

		Humla			Mugu		
		Male	Female	Total	Male	Female	Total
		62 (60.19%)	41 (39.81%)	103	79 (49%)	82 (51%)	161
Wt for age	Reference						
>80%	Normal	41 (39.8%)	33 (32.05%)	74 (71.85%)	54 (33.5%)	56 (34.8%)	110 (68.3%)
60-80%	Undernutrition	20 (19.38%)	8 (7.8%)	28 (27.18%)	25 (15.5%)	24 (14.9%)	49 (30.4%)
<60% without edema	Marasmus	1 (0.97%)	0	1 (0.97%)	0	2 (1.3%)	2 (1.3%)
Total undernutrition		21 (20.4%)	8 (7.8%)	29 (28.15%)	25 (15.5%)	26 (16.2%)	51 (31.7%)
Ht for age	Reference						
≥90%	Normal	46 (44.6%)	34 (33%)	80 (77.6%)	55 (34.1%)	59 (36.5%)	114 (70.6%)
85-89% (-2to-3SD)	Stunting	11 (10.7%)	6 (5.9%)	17 (16.6%)	17 (10.6%)	13 (8.1%)	30 (18.7%)
<85% (<-3SD)	Severe stunting	5 (4.9%)	1 (0.9%)	6 (5.8%)	7 (4.4%)	10 (6.3%)	17 (10.7%)
Total stunting		16 (69.6%)	7 (30.4%)	23 (22.4%)	24 (15%)	23 (14.4%)	47 (29.4%)
Wt for Ht	Reference						
≥80%	Normal	56 (54.3%)	38 (36.9%)	94 (91.2%)	73 (45.3%)	73 (45.3%)	146 (90.6%)
70-79% (-2to-3SD)	Wasting	5 (4.9%)	3 (2.9%)	8 (7.8%)	6 (3.7%)	7 (4.4%)	13 (8.1%)
<70% (<-3SD)	Severe Wasting	1 (0.97%)	0	1 (0.97%)	0	2 (1.3%)	2 (1.3%)
Total Wasting		6 (5.9%)	3 (2.9%)	9 (8.8%)	6 (3.7%)	9 (5.7%)	15 (9.4%)

Table 2. Distribution of children between 5-15 years as per age specific values of height, weight and BMI.

		Humla			Mugu		
		Male	Female	Total	Male	Female	Total
		76 (53.5%)	66 (46.5%)	142	96 (56.8%)	73 (43.2%)	169
Wt for age	Reference						
>80%	Normal	36 (25.4%)	42 (29.5%)	78 (54.9%)	44 (26%)	45 (26.7%)	89 (52.7%)
60-80%	Undernutrition	38 (26.8%)	23 (16.2%)	61 (43%)	49 (29%)	27 (16%)	76 (45%)
<60% without edema	Marasmus	2 (1.4%)	1 (0.7%)	3 (2.1%)	3 (1.8%)	1 (0.5%)	4 (2.3%)
Total undernutrition		40 (28.2%)	24 (16.9%)	64 (45.1%)	52 (30.8%)	28 (16.5%)	80 (47.3%)
Ht for age	Reference						
>90%	Normal	56 (39.4%)	53 (37.2%)	109 (76.6%)	64 (37.9%)	60 (35.4%)	124 (73.3%)
85-89% (-2to-3SD)	Stunting	14 (9.9%)	13 (9.2%)	27 (19.1%)	25 (14.8%)	11 (6.5%)	36 (21.3%)
<85% (<-3SD)	Severe stunting	6 (4.3%)	0	6 (4.3%)	7 (4.2%)	2 (1.2%)	9 (5.4%)
Total stunting		20 (14.2%)	13 (9.2%)	33 (23.4%)	32 (19%)	13 (7.7%)	45 (26.7%)
BMI for age	Reference						
5-85 percentile	Normal	62 (43.64%)	50 (35.23%)	112 (78.87%)	77 (45.6%)	58 (34.28%)	135 (79.88%)
<5 percentile	Thinness	14 (9.86%)	16 (11.27%)	30 (21.13%)	19 (11.24%)	15 (8.88%)	34 (20.12%)

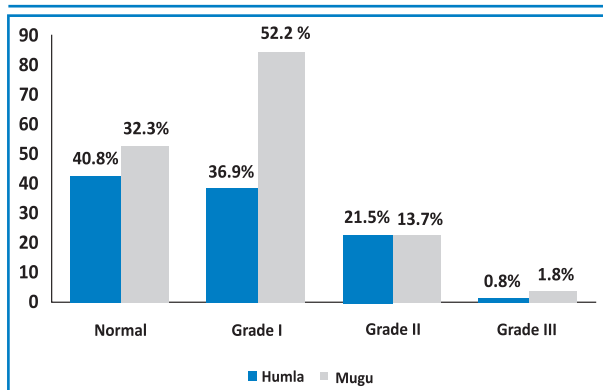


Figure 3. Malnutrition (GOMEZ classification) in children less than 5 years of age.

DISCUSSION

Protein-energy malnutrition affects more than a third of the world's children. Nearly 80% of affected children live in Asia, 15% in Africa, and only about 5% in Latin America. Most countries in Asia have high or very high prevalence of underweight, stunting and wasting, the prevalence being far higher in Southern Asia. South-eastern Asia ranks second in the descending order of prevalence of underweight and third for wasting and stunting.²

Health and nutritional status are two crucial and interlinked aspects of human development, which in turn interact with demographic variables in important ways.¹³ In children, the three most commonly used anthropometric indices are weight-for-height, height-for-age, and weight-for-age. Deficit in height-for-age is called stunting and indicates chronic malnutrition. Deficit in weight-for-height is called wasting and indicates acute malnutrition. Deficit in weight-for-age is often referred to as underweight and reflects low weight-for-height, low height-for-age, or both (global malnutrition). Weight-for-age is thus not a good indication of recent nutritional stress in the population.¹⁴

BMI is an index of current energy deficit because it is computed from current weight and current height of children. As low BMI is the indicator of current energy deficit, early detection of low BMI for age and expeditious correction of it is likely to be the most effective intervention for preventing stunting.¹⁵ While there is a global acceptance that body mass index (BMI) should be used for assessment of obesity/adiposity in children,¹⁶ there has not been a similar consensus regarding use of BMI for assessment of under nutrition in children.¹⁷

Generally, three anthropometric indicators are often used to assess nutritional status during childhood and adolescent stage: underweight (weight-for-age), stunting (height-for-age) and thinness (BMI-for-age).¹⁸ In our study, 28.2% children of Humla and 31.9% of

Mugu were undernourished. According to Nepal DHS 2011 preliminary report, 29% children below five years are underweight, which is almost similar to our study. But it has also mentioned that more than one-third children in the mountain are underweight,⁴ which is more as compared to our study. This difference could be due to a smaller sample size of our study. The exact population of children in Humla and Mugu is not known, but the overall population of Humla was 50,858 and Mugu was 55,286 as per Central Bureau of Statistics Nepal 2011.¹⁹ In a nutritional assessment study done by Rijal P et al,²⁰ they found that 28.9% children attending out-patient department in a hospital in Kathmandu were undernourished, 12.5% children stunted and 14.2% wasted. The findings may have differed with our study in view of different population groups (Sub-urban versus mountainous). Another study on nutritional assessment in a rural area of Pakistan, done by Masood showed that 53.8% of children had malnutrition,²¹ which was much more as compared to our study. In another study on malnutrition done in India, 26.6% children were underweight,¹⁷ which was almost similar as compared to our study.

Our study showed 8.8% and 9.4% children to have wasting, out of which 0.9% and 1.3% children were severely wasted in Humla and Mugu respectively. This is less as compared to the 2011 NDHS preliminary report where 11% of children were wasted and 3% severely wasted.⁴ But, a survey done from March - April 2007 in Humla and Mugu districts had also shown 8.7% children between 6 months to 59 months to be having moderate wasting and 0.6% as severe wasting, which is similar to our study.⁹

In our study, 21.13% children of Humla and 20.12% children of Mugu in the age group between five to 15 years were found to be thin. In a comparative study done in early adolescent school girls of West Bengal, India, the overall prevalent rate of thinness was 20.2%, which is also similar to our study.²² Singh J, in his study among tribal ethnic children in Assam, India, also found the prevalence of thinness to be 25.99%.²³ In another study done by Mushtaq et al in Lahore, Pakistan, 10% children aged 5-12 years were found to be thin.²⁴ The lesser incidence of thinness as compared to our result may have occurred due to large number of urban children included in the study.

CONCLUSIONS

The study shows that malnutrition (underweight, stunting, wasting and thinness) still constitute major health problems among Nepalese children, particularly in mountainous regions. Besides providing basic healthcare to poor and marginalized areas of Nepal, medical camps

can also aid in the assessment of nutritional status of those areas.

Prevention of malnutrition in children should be given a high priority in the implementation of ongoing health care programmes, and particular attention has to be given to the rural population. Further studies using the Z score to find out the prevalence of malnutrition in this region is recommended.

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