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**Original Research Article**

# A prospective study to determine social demographic pattern in severe acute malnutrition in 6 months to 5 years aged children

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## ABSTRACT

**Background:** Burden of malnutrition is much higher in South Asia as compared to that in Africa and rest of the World. South Asia contributes to about 60% of the cases. Education of women has been seen to be the most effective in improving child's health. Present study is done to evaluate social demographic pattern in cases of severe acute malnutrition.
**Methods:** Present study is prospective observational comparative study conducted at Department of Pediatrics included 175 cases after taking a informed written consent from the parent. Out of which 22 were lost to follow up and remaining 153 cases were analysed and further evaluated in the study
**Results:** Cases who were from 6 month to 24 months of age were 73.2% (n=112) and rest of them were above 24 months of age. Girls were 53.6 % and 46.4% were boys. Percentage of illiterate mother was 41.2%, till primary were 28.8% and Only 10.4% of mothers were graduate. Nearly 50% of the households had per capita income less than or equal to 1000.
**Conclusions:** SAM was more common in children < 24 months of age, boys and girls were almost equally affected. Maternal literacy and low per capita income was an important factor associated with SAM patients.

**Keywords:** Maternal literacy, Per capita income, Severe Acute Malnutrition, Social demographic

## INTRODUCTION

UNICEF, WHO and The World Bank, in their jointly published estimates have stated that adequate nutrition is essential in early childhood to ensure healthy growth, proper organ formation and function, a strong immune system, and neurological and cognitive development. Economic growth and human development require well-nourished populations who can learn new skills, think critically and contribute to their communities.[1]

Malnutrition is a broad term commonly used as an alternative to undernutrition but technically it also refers to over-nutrition. In this study the term malnutrition refers to under-nutrition. Malnutrition and malnourishment are synonyms of under-nutrition and undernourishment, respectively.[2] Malnutrition is often a consequence of low dietary intake of various nutrients and diseases. The effects of malnutrition especially in young children are overwhelming although often these effects may not be attributable to malnutrition because people may not know about the link.[3]

Burden of malnutrition is much higher in South Asia as compared to that in Africa and rest of the World.4South Asia contributes to about 60% of the cases. The prevalence of underweight and stunting in South Asia has been recorded as 46% and 44 % respectively. This is

"very high" public health problem according to UNICEF.[5]

Acute malnutrition or wasting (and / or oedema) occurs when an individual suffers from current, severe nutritional restrictions, a recent bout of illness, inappropriate childcare practices or, more often, a combination of these factors. It is characterized by extreme weight loss, resulting in low weight for height, and/or bilateral oedema, and, in its severe form, can lead to death. Acute malnutrition reduces resistance to disease and impairs a whole range of bodily functions.[6] When food intake or utilization (e.g. due to illness) is reduced, the body adapts by breaking down fat and muscle reserves to maintain essential functions, leading to wasting.

The body also adapts by decreasing the activity of organs, cells and tissues, which increases vulnerability to disease and mortality. For reasons not completely understood, in some cases, these changes manifest as nutritional oedema. A 'vicious cycle' of disease and malnutrition is often observed once these adaptations commence.[6]

Many studies have tried to estimate various risk factors for malnutrition. Education of women has been seen to be the most effective in improving child's health. Her health care seeking attitude, how they utilize available health resources in response to their children's illnesses, nutrition related knowledge and practices is strongly associated with child's nutritional status .General negative mindset over utilization of health facilities has also greatly influenced child's health.[7]

Socio-demographic factors like female gender, father doing labour mother's and father's education, wealth index, sanitation status, source of drinking water, total number of children ever born to a woman, family type and size, mother's type of work, ownership of land and life stock etc., have also been seen to affect mortality and morbidity in Severe Acute Malnutrition children.[7,8] Infants not exclusively breastfed for 6 months, late introduction of complementary feeding have also been found to be associated with Severe Acute Malnutrition patients.[9]

## METHODS

### *Study design*

This study is prospective observational comparative study. It is conducted at Department of Pediatrics, FH Medical College and Hospital and S.N. Medical College and Hospital.

This study had a duration of one year (Jan 2018 to Dec 2018). In this study total of 175 cases were included in the present study after taking a informed written consent from the parent. Out of which 22 were lost to follow up. Thus, 153 cases were analysed and further evaluated in the current study.

### *Inclusion criteria*

Patients aged 6-60 months, who fulfilled the World Health Organisation protocol of Severe Acute Malnutrition presented in the Emergency or the Outpatient Department of the Pediatrics in FHMC and SNMC were included.

### *Exclusion criteria*

All the Severe Acute Malnourished patients, aged 6-60 months, having congenital or acquired organic gastrointestinal problem which decrease the oral intake of feeding and absorption as well as problems were excluded from the study.

### *Data collection*

For all the children in the study, detailed history and clinical examination were performed and was recorded in the proforma. The study subjects so selected were managed according to the protocol of treating unit under the supervision of the senior faculty. All relevant investigations were performed, using appropriate methods. Samples were collected and evaluated on the first day of admission. Based on this detailed clinical evaluation and relevant investigations, final diagnosis were made and therapies were given. The hospitalized subjects were followed up till the final outcome.

An informed consent was taken from all the parents of patients enrolled in the study

### *Statistical analysis*

The data was evaluated in the predesigned proforma, data were entered into MS Excel and analyzed using SPSS 20 for windows 7, chi square test.

## RESULTS

A total of 175 cases were enrolled in the present study, out of which 22 were lost to follow up thus only 153 cases were included for analysis.

**Table 1: Age and sex distribution.**

| Age (months) | n=153 | | % | | Total |
|---|---|---|---|---|---|
| | Boys (n=71) | Girls (n=82) | Boys | Girls | |
| 6-24 months | 53 | 59 | 47.3 | 52.7 | 112 |
| 25-60 months | 18 | 23 | 43.9 | 56.1 | 41 |

***Age and sex distribution***

Cases who were from 6 month to 24 months of age were 73.2% (n=112) and rest of them were above 24 months of age. Girls were 53.6 % (n=82) and 46.4% (n=71) were boys (Table 1).

***Mortality***

Five Patients died during the hospital stay. Four patients were below 24 months and one patient died in 25-60 months age group (Table 2).

**Table 2: Mortality distribution with age and sex.**

| | Boys | Girls | Total |
|---|---|---|---|
| 6-24 Months | 1 | 3 | 4 |
| 25-60 Months | 0 | 1 | 1 |
| Total | 1 | 4 | 5 |

***Maternal literacy***

Percentage of illiterate mother was 41.2% (n=63) and 28.8% (n=44) had studied till primary. Only 10.4% (n=16) of mothers were graduate (Table 3).

**Table 3: Maternal literacy.**

| Literacy | n=153 | % |
|---|---|---|
| Illiterate | 63 | 41.2 |
| Primary | 44 | 28.8 |
| Intermediate | 30 | 19.6 |
| Graduate | 16 | 10.4 |

***Locality***

Only 26.8% (n=41) of cases were living in a rural area while 61.4% (n=94) were living in urban area. Whereas, 11.8% of cases were residing in urban slum (Table 4).

**Table 4: Locality.**

| Residence | n=153 | % |
|---|---|---|
| Urban | 94 | 61.4 |
| Rural | 41 | 26.8 |
| Urban Slum | 18 | 11.8 |

***Water supply***

Tap water was being used by 45.7% (n=70) of households and 9.1% (n=14) were using tube well. Hand pump was used by 20.3% (n=31) and 23.6% were using well as primary source of water (Table 5).

***Per capita income***

Per capita income of 18.3% (n=28) households was less than or equal to 500, 31.4% (n=48) had per capita income in the range of 501-1000, 22.9% (n=35) between 1001-1500 and 18.9% (n=29) between 1501-2000. Only 8.5% (n=13) had per capita income of more than 2000.

**Table 5: Sources of water supply.**

| Water source | n=153 | % |
|---|---|---|
| Tap | 70 | 45.7 |
| Well | 36 | 23.6 |
| Tube Well | 14 | 9.1 |
| Hand Pump | 31 | 20.3 |
| Other Source | 2 | 1.3 |

Nearly 50% (n=76) of the households had per capita income less than or equal to 1000 (Table 6).

**Table 6: Per capita income**

| Income | n=153 | % |
|---|---|---|
| 0-500 | 28 | 18.3 |
| 501-1000 | 48 | 31.4 |
| 1001-1500 | 35 | 22.9 |
| 1501-2000 | 29 | 18.9 |
| >2000 | 13 | 8.5 |

## DISCUSSION

A total of 175 cases were enrolled in the present study, out of which 22 were lost to follow up thus only 153 cases were included for analysis. Cases between 6 to 60 months were included in the study. Children less than 6 months were not included in the study as criteria of classifying patients as SAM below 6 months was subjective rather than objective (visible severe wasting and bilateral nutritional edema).

Cases between 6 month to 24 months of age were 73.2% (n=112) and rest of them were above 24 months of age. Girls were 53.6 % (n=82) and 46.4% (n=71) were boys. There was not much difference in the cases of SAM on the basis of the gender. The gender ratio of this study was similar to findings of Kumar et al, Bernal et al, Bachou et al, Irena et al, and Roy et al.[10-14] Odebode et al, and Ayaya et al, reported severe malnutrition to be more common in girls than boys.[15,16] Sunguya et al, found frequency to be more in boys than girls.[17] In the present study, most of the patients were less than 24 months of age (73.2%) as was also reported by Amsalu et al, Mahgoub et al, Sunguya et al, Hossain et al, and Bernal etal.[11,17-20] Roy et al, also found only 4% of cases more than 24 months of age in their study.[14]

In the present study, percentage of illiterate mother was 41.2% (n=63) and 28.8% (n=44) had studied till primary. Only 10.4% (n=16) of mothers were graduate. Ayaya etal16 also identified maternal education as an important factor contributing to SAM. In the present study, maximum enrolled patients belonged to urban area 61.4%% (n=94). Only 26.8% of cases came from rural

area and 11.8% of cases from urban slums. This discrepancy can be explained by the fact that catchment area of SNMC and FHMC belong to urban area. Approximately, 45% of the patients were using tap water as a source of water usage. In 18.3% cases, per capita income was Rs.500 or less. Nearly 50% had per capita income of Rs. 1000 or less. Low socioeconomic status and poverty was found to be associated with SAM. Similarly, Ayaya et al, found significant association between poverty and SAM patients.[16]

## CONCLUSION

The study concluded that SAM was more common in children <24 months of age, boys and girls were almost equally affected. Maternal literacy and low per capita income was an important factor associated with SAM patients.

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