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## A Prospective Study on Management of Diseases in Malnourished Children (Under 5 Years) In a Tertiary Care Hospital

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### ABSTRACT:

Malnutrition refers to deficiencies, excesses or imbalances in a person's energy and/or nutrient intake. It is majorly classified into two parts – under-nutrition and over-nutrition. In 2022, 22.3 per cent, or more than one in five children under age five worldwide, had stunted growth. The present study was conducted in the Department of Pediatrics, ACSR government hospital, Nellore. The study was conducted for six months. One ninety-two patients are included in our study, and malnutrition-related diseases are managed and treated. The objective of the study is to assess the severity of diseases in malnourished children under 5 years and also to provide facility-based management to children with Severe acute malnutrition (SAM) and Moderate acute malnutrition (MAM). Our study concludes that boys (54.2%) are affected more when compared with girls. 1–2-year-old children (30.7%) are more prone to diseases. LRTI (28.64%) is the common disease seen in malnourished children.

**Keywords:** Malnutrition, management, immunity, diseases, severe acute malnutrition, moderate acute malnutrition.

## 1. Introduction

An imbalance between the nutrients your body receives and the nutrients it need to function results in malnutrition. Malnutrition encompasses two broad categories of conditions. Forms of "undernutrition" include stunting (low height for age), wasting (low weight for height), underweight (low weight for age), and micronutrient deficiencies or insufficiencies (a lack of necessary vitamins and minerals). Obesity, excess weight, and noncommunicable illnesses linked to diet (including cancer, diabetes, heart disease, and stroke) comprise "overnutrition". People worldwide are impacted by malnutrition (Hay *et al.*, 2019). Though the UNICEF-WHO-World Bank Group Joint Malnutrition Estimates for 2023 indicate a decrease in the prevalence of stunting since 2000, in 2022 more than one in five children under five; 148.1 million were stunted, and at least 45.0 million experienced wasting at any given time. Conversely, from 33.0 million in 2000 to 37.0 million in 2022, more children under the age of five globally suffer from overweight. A medical centre that admits and treats children with severe acute malnutrition (SAM) is called the Nutrition Rehabilitation Centre (NRC). NRCs are primarily set up on the campuses of district hospitals and community health centers. Children diagnosed with Severe Acute Malnutrition (SAM) are hospitalised to and treated in the Nutrition Rehabilitation Centre (NRC), a department of a medical facility. Admitted children get medical and nutritional therapy care in accordance with the established admission criteria. After leaving the NRC, the kid stays in the Nutrition Rehabilitation programme until they meet the program's specified discharge requirements (Mathew *et al.*, 2018). Along with curative care, a strong emphasis is placed on timely, sufficient, and age-appropriate feeding of children as well as enhancing the abilities of mothers and other carers to provide comprehensive, age-appropriate care and feeding practices. Also, via counselling and support, attempts are made to increase mothers' and carers' capacity to recognise their child's nutritional needs and health issues. Acute respiratory tract infections are a primary cause of death in children. Any infectious condition affecting the upper or lower respiratory tract is referred to as a respiratory tract infection. RTIs are frequently transferred via an infected person's coughs and sneezes. One of the most frequent causes for physician consultations in children is respiratory tract infections. Malnutrition is strongly and consistently associated with mortality from respiratory infections; moreover, malnutrition is thought to be a more significant risk factor for pneumonia than for diarrhoea. Poverty, minimal family income, low parental education, not breastfeeding, and most importantly, malnutrition are risk factors for respiratory infections. An illness that can attack one or both lungs is called pneumonia (Sasaran *et al.*, 2020). It results in the accumulation of fluid or pus in the lungs' air sacs, or alveoli. Pneumonia caused by bacteria or viruses can spread easily. This implies that they can pass from person to person by way of airborne particles that are inhaled during a cough or sneeze. Gastroenteritis, often called stomach flu is a common illness that can include abdominal cramping, vomiting, diarrhea, and nausea. It's typically not severe and lasts for a few days. The majority of children recover at home by getting lots of rest and fluids. An unsettled stomach is called gastritis (Leung *et al.*, 2019). When something irritates the lining of the stomach, it occurs. A number of factors, including food and drink, medications, infections, and illnesses, can result in gastritis. UTIs are common infections caused by bacteria that enter the urethra and infect the urinary system. These germs are usually from the skin or the rectum. While the infections can affect any region of the urinary tract, bladder infections (cystitis) are the most prevalent form. Another kind of UTI is pyelonephritis, or kidney infection. Children get urinary tract infections (UTIs) frequently. These occur when kidney or bladder infections are caused by bacteria (germs) (Minardi *et al.*, 2019). Children with epilepsy suffer from a neurological disorder that results in seizures. It is among the most prevalent nerve system illnesses. It impacts people of all racial and ethnic

backgrounds, both adults and children. Seizures come in several forms. The region and extent of the brain affected, as well as the events that transpire during the seizure, determine the type of seizure. Focal (partial) seizures and generalised seizures are the two primary types of epileptic seizures (Gamit *et al.*, 2021).

## 2. Research Methodology

### Place of the Study

The present study conducted in A.C Subba Reddy (ACSR) Government General Hospital (GGH), a tertiary care teaching hospital, Nellore, Andhra Pradesh.

### Period of the Study

The duration of the study was 6 months from September 2023- February 2024

### Type of the Study

A prospective observational study (Pizzol *et al.*, 2021).

### Study Population

The participants in the study are pediatrics.

This study focuses on 192 children under the age of 6 months to 5 years and counselling was done (Mohseni *et al.*, 2020).

### Statistical Analysis

Data was entered into MS-Excel sheet.

Descriptive statistics was used to analyse the data.

Results was expressed in percentages (Daures *et al.*, 2022).

### Research Approach

We have conducted this research based on mixed method approach.

When conducting a mixed method study, both quantitative and/or qualitative data are gathered and analysed in a single study. The data are prioritised, collected concurrently or sequentially, and integrated at one or more points during the research process (Aydin *et al.*, 2023). Through the identification of patterns and generalisations as well as in-depth understanding of participants viewpoints, mixed approaches offer a more comprehensive picture.

According to our thesis, quantitative research aids in the computation of numerical data, anthropometric values, elevation of standard deviation, and dosage of prescribed medications, while qualitative research assists in identifying the physical symptoms, behavioural activity, and nutritional status of children (Makori *et al.*, 2024 and Knappett *et al.*, 2024).

### Patient Selection Criteria (Prasadajudio *et al.*, 2023 and Aydin *et al.*, 2019)

Patients are enrolled in the study based on inclusion and exclusion criteria.

The inclusion criteria are designed to reliably, uniformly, and objectively identify the research population.

A few traits or circumstances that exclude the recruited group from the study are included in the exclusion criteria.

### Inclusion criteria

Patients with Severe acute malnutrition and Moderate acute malnutrition (Audi *et al.*, 2024).

Patients of age above 6 months and below 5 years.

Patients with diseases associated with malnutrition.

Children whose standard deviation is  $>1$  (Guduru *et al.*, 2023).

Patients who are willing to participate in the study.

### Exclusion criteria

Children of age below 6 months and above 5 years.

Patients with diseases not associated with malnutrition (Kirolos *et al.*, 2021).

Children whose standard deviation (SD) is in median and below median range.

Patients who are not willing to give consent (**Karunanayake *et al.*, 2017**).

### Study Procedure

The in-depth research procedure for this study will be limited for patients who are in age groups of 6months – 5 years.

Moreover, we tried to figure out which disease is occurring more in this age span children.

Based on inclusion and exclusion criteria patients were included in the study.

Patient details such as demographic details and disease status and type of malnutrition are collected.

### Study Materials

Informed consent form.

Patient data collection form.

Patient counselling form (Das *et al.*, 2019).

### Method of Study

After obtaining informed consent (written consent from literate subjects and verbally informed consent from illiterate subjects) 192 subjects were enrolled in the study through the prospective observational method (Sravani *et al.*, 2024).

After explaining the details of the study, a comprehensive case history was collected.

Basic data on age, sex, education, nutritional status, economic status, child developing milestones and past medical and medication history, diet and physical activity were collected from all the subjects (El-Rebigi *et al.*, 2024).After enrolling the patients, the physical examination is done to assess the severity of diseases. Physicians diagnose the disease based on the patient chief complaints and evaluate it with individual management plans (Dobner *et al.*, 2018).

## 3. Results and Discussion

### Gender wise distribution

Table 1 show the study has been conducted among 192 people among these 88 (45.8%) were girls and 104 (54.2%) were boys.

Table (1) Gender-wise distribution of people enrolled in the study

Gender	No. of Patients	Percentage (%)
Girls	88	45.8
Boys	104	54.2
Total	192	100

### Age Wise Distribution

Table 2 show out of 192 people, 34 (17.7%) people were in the age group of 6m-1y, 59 (30.7%) people were in the age group of 1y-2y, 28 (14.6%) people were in the age group of 2y-3y, 23(12.0%) people were in the age group of 3y-4y, 48 (25.0%) people were in the age group of 4y-5y.

Table (2) Age-wise distribution of people enrolled in the study

Age	Girls	Boys	Total	Percentage (%)
6m-1y	15	19	34	17.7
1y-2y	23	36	59	30.7
2y-3y	10	18	28	14.6
3y-4y	12	11	23	12.0

4y-5y	28	20	48	25.0
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### Type of malnutrition

Table 3 show out of 192 people, 113 (58.9%) patients are diagnosed with SAM, among them 58 were boys and 55 were girls and 79 (41.1%) people are diagnosed with MAM, among them 46 were boys and 33 were girls.

Table (3) Type of malnutrition observed in the people enrolled in the study

Type of Malnutrition	Boys	Girls	Total	Percentage (%)
SAM	58	55	113	58.9
MAM	46	33	79	41.1

### Type of community

Table 4 show out of 192 people, 119 (61.9%) are living in rural community and 73 (38.1%) are living in urban community.

Table (4) Type of community observed in the people enrolled in the study

Type of Community	No. of Patients	Percentage (%)
Rural	119	61.9
Urban	73	38.1

### MUAC score

Table 5 show out of 192 children, 32 (16.66%) are in 1 SD, 47 (24.47%) are in 2 SD, 51 (26.58%) are in 3 SD, 62 (32.29%) are in 4 SD.

Table (5) MUAC score observed in the people enrolled in the study

Muac	No. of Patients	Percentage (%)
1 SD	32	16.66
2 SD	47	24.47
3 SD	51	26.58
4 SD	62	32.29

### Complications of malnutrition

Table 6 show several types of complications are observed in our study along with malnutrition such as hypothermia observed in 53 (27.60%) people, hypoglycemia observed in 30 (15.62%) people, dehydration observed in 65 (33.85%) people, electrolyte imbalance observed in 24 (12.50%) people, micronutrient deficiencies observed in 20 (10.41%) people.

Table (6) Malnutrition complications observed in the people enrolled in the study

Complications	No. of Patients	Percentage (%)
Hypothermia	53	27.60
Hypoglycemia	30	15.62
Dehydration	65	33.85
Electrolyte imbalance	24	12.50
Micronutrient deficiencies	20	10.41

### Gender Wise Distribution of Diseases:

Table 7 show out of these 192 cases, we observed different types of diseases in malnourished children. URTI is found in 33 (17.2%) people, among them 18 were boys and 15 were girls. LRTI is found in 55 (28.64%) people, among them 22 were boys and 33 were girls. AGE is found in 39 (20.3%) people, among them 25 were boys and 14 were girls. Gastritis is found in 24 (12.5%) people, among them 14 were boys and 10 were girls. UTI are found in 25 (13.02%) people, among them 16 were boys and 9 were girls. Seizures are found in 16 (8.3%) people, among them 9 were boys and 7 were girls.

Table (7) Gender- wise distribution of diseases in malnourished people enrolled in the study

Disease	Boys	Girls	Total	Percentage (%)
URTI	18	15	33	17.2
LRTI	22	33	55	28.64
AGE	25	14	39	20.3
Gastritis	14	10	24	12.5
UTI	16	9	25	13.02
Seizures	9	7	16	8.3

### Age wise distribution of diseases

Table 8 show out of 192 children, 34 (17.7%) people were in the age group of 6m-1y, among them 7 URTI, 10 LRTI, 6 AGE, 3 Gastritis, 4 UTI, 4 Seizures, 59 (30.7%) people were in the age group of 1y-2y, 28 (14.6%) people were in the age group of 2y-3y, 23(12.0%) people were in the age group of 3y-4y, 48 (25.0%) people were in the age group of 4y-5y.

Table (8) Age- wise distribution of diseases in malnourished people enrolled in the study

Age	Urti	Lrti	Acute Ge (Age)	Gastritis	Uti	Seizures	Total	Percentage (%)
6m-1y	7	10	6	3	4	4	34	17.7
1-2y	11	16	12	8	7	5	59	30.7
2-3y	4	7	6	4	5	2	28	14.6
3-4y	4	5	6	3	3	2	23	12.0
4-5y	7	17	9	6	6	3	48	25.0

## 4. Conclusion

This study was a prospective observational study, where we collected data from malnourished children with different diseases. We have analyzed 192 patient data based on inclusive and exclusive criteria. Boys (54.2%) were affected more when compared to girls (45.8%). Children at the age group of 1-2-years (30.7%) were affected more with these diseases. Severe acute malnutrition (58.9%) was seen more in children. And hence it is necessary to evaluate Severe Acute malnutrition in malnourished patients for early diagnosis and treatment of patients. Children living in rural areas (61.9%) are affected more with malnutrition. Majority of children Mid upper arm circumference (MUAC) scored was found to be 4 SD (32.29%). Dehydration (33.85%) is one of the common complications seen in malnourished children. Lower respiratory tract infections (LRTI) (28.64%) are the most common disease seen in malnourished children. It is very important to rule out the underlying cause of the disease and provide personalized treatment regimen based on their demographic details. Identifying the exact cause makes it easy to treat lower respiratory tract infection and any other diseases in its early stages and reduces morbidity and mortality rate in malnourished

children. The clinical pharmacist has to educate the people regarding the complications and consequences of malnutrition and how it affects other systems if left untreated.

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### **Conflict of Interest Yes**

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