
In the Name of God

Assessing the Prevalence and Treatment of Malnutrition in Hospitalized Children in Mofid Children's Hospital During 2015-2016

Farid Imanzadeh M.D.

Associate Professor of Gastroenterology (Peds)

Pediatric Gastroenterology, Hepatology and

Nutrition Research Center,

Shahid Beheshti University of Medical Sciences

Tehran, Iran

Introduction

- Malnutrition is defined as suffering from lack or excess of energy, protein and other nutritional supplements, which will cause measurable complications, growth disorders or unwanted clinical outcomes.
- Malnutrition is one of the most important causes of disease exacerbation in hospitalized children
- Hospital staff, including doctors, nurses and clinical nutrition experts, should have a determinant key role in early diagnosis and proper treatment of malnutrition in hospitalized children.

- According to the data available in medical references, and considering the developmental level of countries, 21%–80% of hospitalized children in developing countries suffer from malnutrition

- Despite recent advances in diagnosis and treatment of malnutrition, the prevalence of malnutrition in hospitalized children has shown no significant decrease

- Malnutrition in children, especially in hospitalized cases, leads to different unwanted outcomes including:
- electrolyte-water disorders, poor response to respiratory supports, decreased therapeutic response to medical treatments and chemotherapies, immune deficiency and increased rates of septicemia, and wound and catheter infections (Short term)
- Malnutrition will furthermore have worrisome effects on child growth in long term.

- Considering the harmful effects of malnutrition on children's quality of life, and the preventable short term and long-term complications of malnutrition by early diagnosis and proper treatment, identification of children with malnutrition since their admission should be mandatory.

- Therefore, nutritional screening in hospital wards is logical and necessary.

Nutrition risk screening

- Nutrition risk screening (NRS) means using a simple and rapid method at time of admission and also during hospitalization.
- It has the ability of identifying children with malnutrition or children at risk.
- In this screening method, 2–3 questions are asked about nutritional status, and anthropometric indices are measured.
- An educated healthcare provider, nurse or clinical nutritional expert can perform the screening process

- Special Nutritional Screening tools such as NRS, STRONGkids, PYMS (Pediatric Yorkhill Malnutrition Score) and STAMP (Screening Tool for Assessment of Malnutrition in Pediatrics) have been used in many developed countries
- Since most of the studies about malnutrition have been performed in European countries, and the studies in Iran have used their specialized and localized tools, we decided to perform the present research.
- A localized and standardized tool was prepared by the Center for Disease Control (CDC) in Ministry of Health and Medical Education (MOHME) section.

Aim of study

- It was necessary to perform a study to evaluate this nutritional screening tool
- The aim of this research was to determine the prevalence of malnutrition in hospitalized children 1 month to 18 years of age.

- This study was performed in Mofid children's hospital in Tehran, Iran.
- from November 2015 to February 2016

Patients and Methods

- Children aged 1 month to 18 years (n = 1186), admitted to medical and surgery wards of Mofid children's hospital, were included in the study.
- All patients of medical and surgical wards in Mofid children's hospital, except for those who met the exclusion criterion, entered the study.
- The exclusion criteria were admission duration less than 48 hours, Ketogenic diet, neonatal intensive care unit (NICU) and pediatric intensive care unit (PICU) admission, and emergency department and neonatal department hospitalization.
- The patient data was entered in questionnaires. The questionnaire was inserted in the patient's admission file and was completed by the medical intern or resident who had admitted the patient after consent was obtained

The questionnaire was comprised of 3 parts

(1) the general demographic data (file number, age, gender, and the primary diagnosis,

(2) anthropometric data (weight, height or length, head circumference in 2-year olds or younger children, weight for length z-score for 2 years old or younger children, and BMI for children over 2 years of age, and

(3) questions about patient nutritional condition, loss of appetite, recent weight loss or any surgical operations

- Patient age range was from 30 days to 18 years
- They were divided into 2 groups: one group consisted of patients 2 years old and younger, and the second group consisted of patients older than 2 years.
- BMI was calculated for all children older than 2 years, and the charts were completed totally matched to WHO and CDC standards.
- the weight for length index for 1–24 months old children
- The “2 years old” cut-off point was chosen because before 2 years of age, rapid changes in weight makes the BMI parameter an unreliable way for monitoring nutritional status

Nutritional Condition Evaluation

- According to the comprehensive database of WHO, Z score <-2 (weight for length, weight for age, height for age, and BMI) was defined as moderate under-nutrition, and Z score <-3 was defined as severe under nutrition. Also, Z score above 2 was defined as overweight.
- It should be noted that Z score between -1 and 2 is considered normal

- Patients who had severe malnutrition (Z score <-2 in general cases and Z score <-1 in CF and malignancies), underwent nutritional interventions after an accurate and complete nutritional consult.

- By means of referral charts and tables based on needed calorie, lipids, proteins, and micronutrients, a complete and applicable enteral diet was designed for each case based on patient's age and gender.

- The patients were divided into 2 groups according to the chronicity and acuity of the underlying disease/s. All details about evaluating anthropometric indices and hospitalization-induced malnutrition were calculated in both groups of acute and chronic diseases.

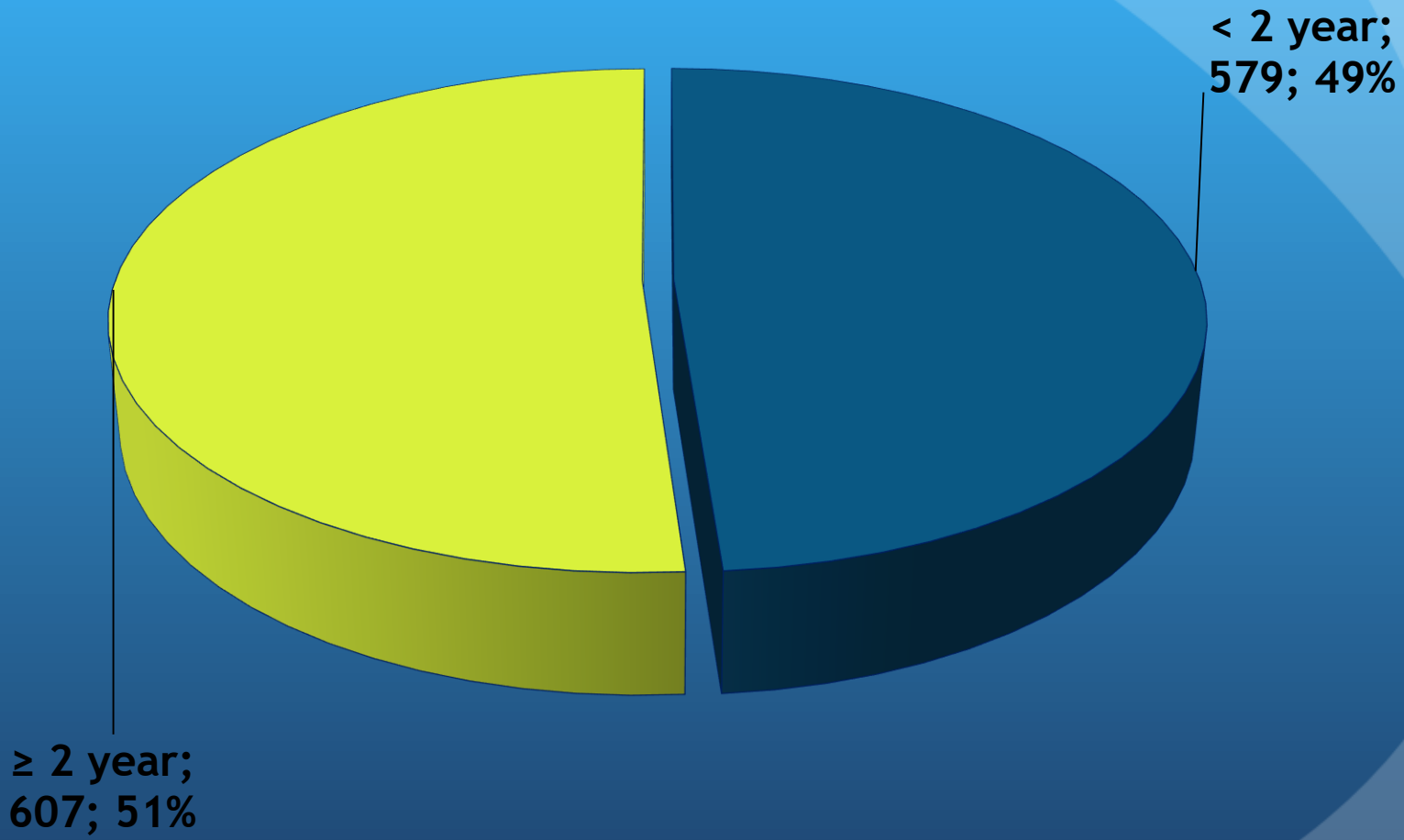
Data Analysis

- The data was entered into SPSS version 22.0 (Chicago, IL, USA).
- Quantitative variables were expressed as mean, standard deviation, and domain. Qualitative variables were expressed as descriptive statistics such as numbers and percentages.
- The relation between chronicity of underlying disease/s and undernutrition was analyzed by Fisher exact test.
- Comparison of BMI and weight before and after admission (the baseline and the follow-up visits) was done with repeated measurements.
- P values less than 0.05 were considered statistically significant.

Results

- In this study, 2467 patient admission files (November 2015 - February 2016) were reviewed.
- Among them, 1281 cases were omitted from the study by exclusion criteria (age less than 30 days, emergency or neonatal department or NICU admission, hospitalization less than 48 hours, and ketogenic diet).
- Finally, 1186 patients entered the study

Age Groups



Patients ≥2 Years

- The mean age of the patients over 2 years was 77.1 ± 14.3 months with the range of 25–216 months.

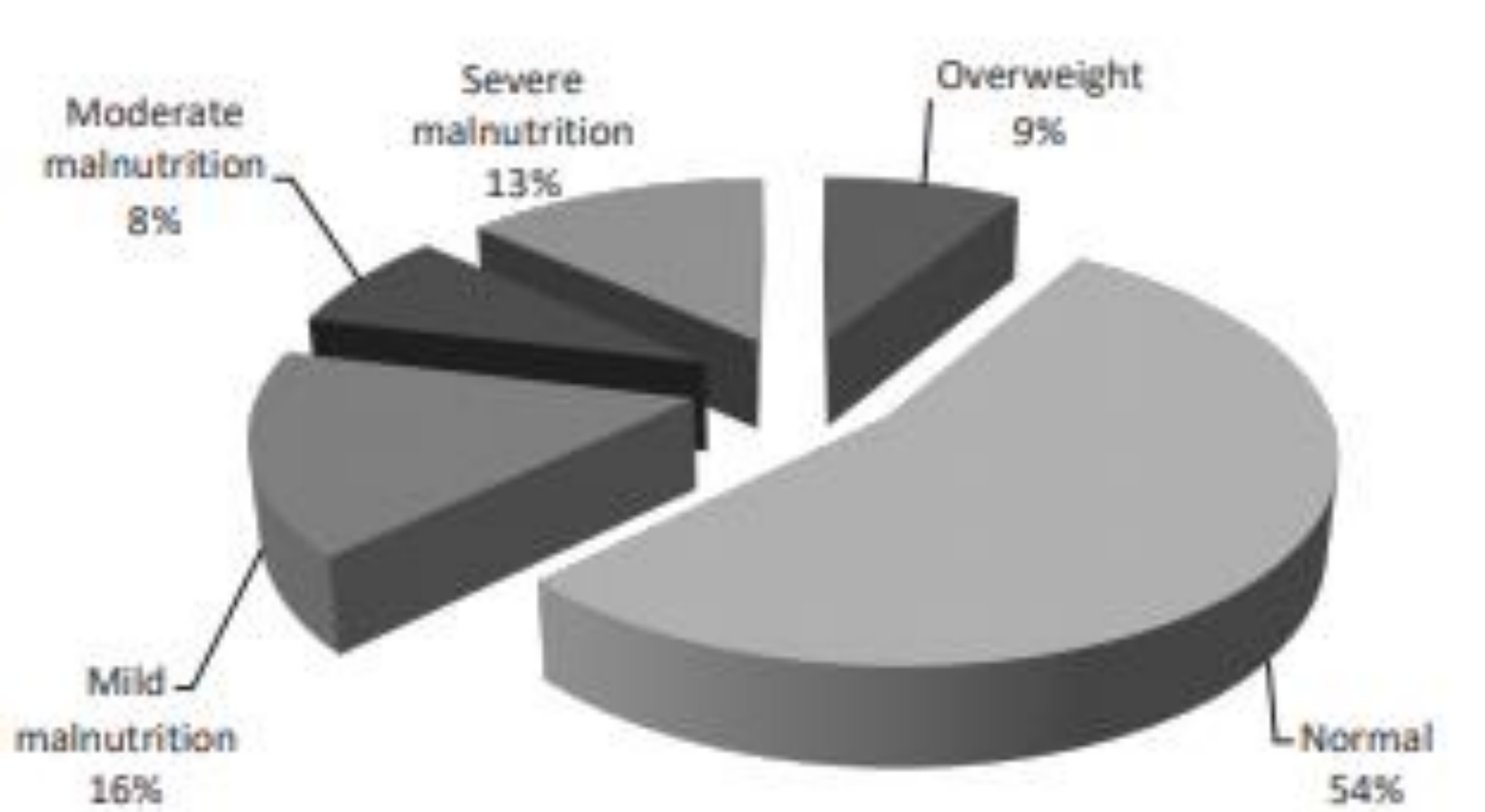


Figure 1. Distribution of frequency Percentage of Malnutrition Prevalence and its Severity In Children Over 2 Years of Age at Time of Admission Based on Body Mass Index (BMI) Z Score.

- Among patients ≥2 years who entered the study, 176 (29%) suffered from chronic disease/s, and 431 (71%) had an acute illness.

- No significant meaningful relation was identified between malnutrition prevalence and chronicity of the illness (P = 0.215).

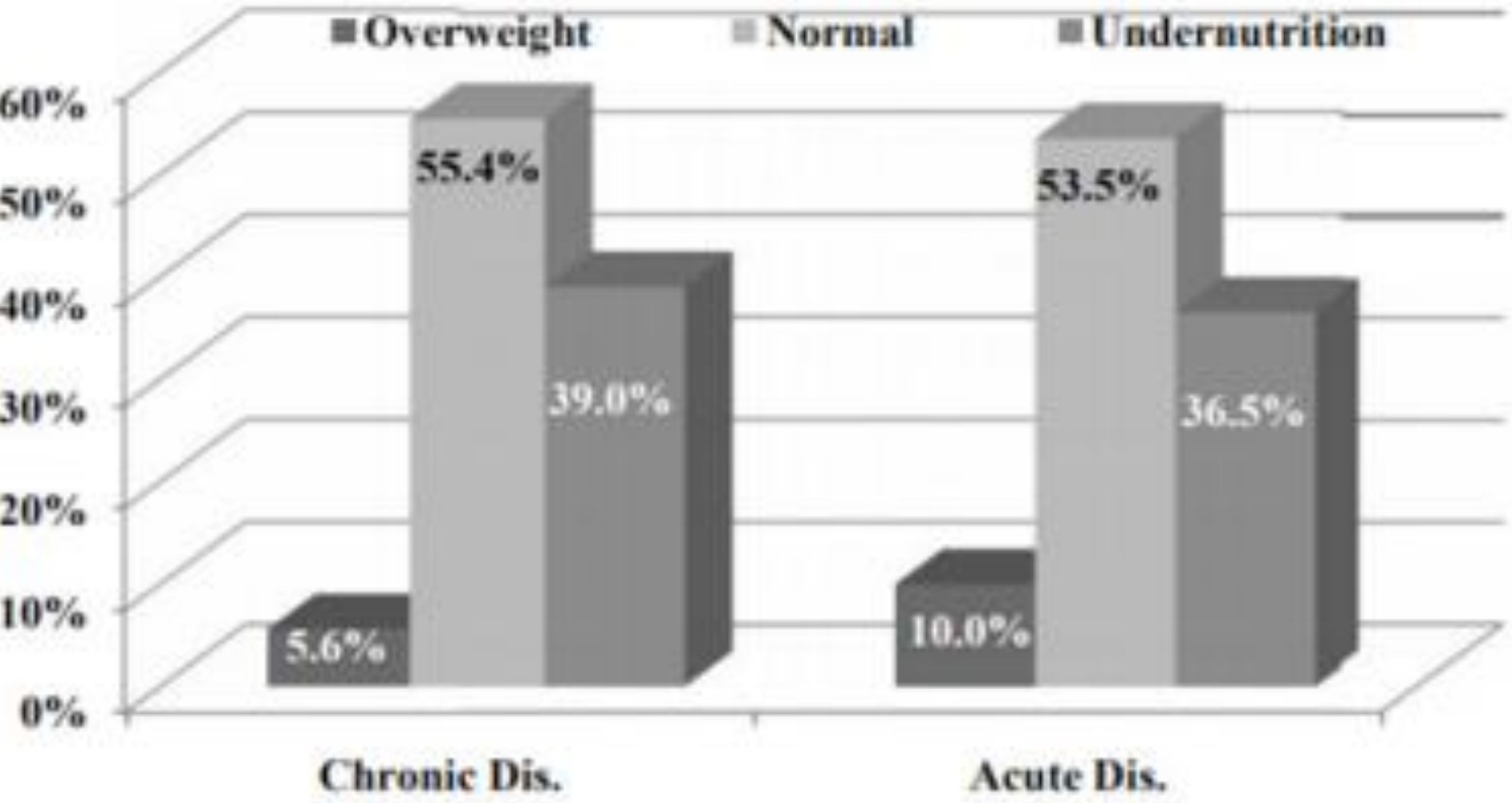


Figure 3. Distribution of Frequency Percentage of Malnutrition n Children Over 2 Years of Age According to Disease Condition Acute or Chronic). Dis. = disease.

Nutritional intervention

- Nutritional consultation was done for 29 patients.
- Among them, 7 patients (1.2%) were given nutrition/diet therapy, 2 patients (0.3%) were asked to follow dietary recommendations, and 20 patients (3.3%) were given both diet therapy and dietary advice.
- Comparison of patients' weights at time of admission with their weights 1, 2 and 3 months after the first nutritional consultation showed a statistically meaningful difference ($P < 0.001$)

Patients <2 years

- The mean age of the patients less than 2 years was 9.5 ± 6.8 months.

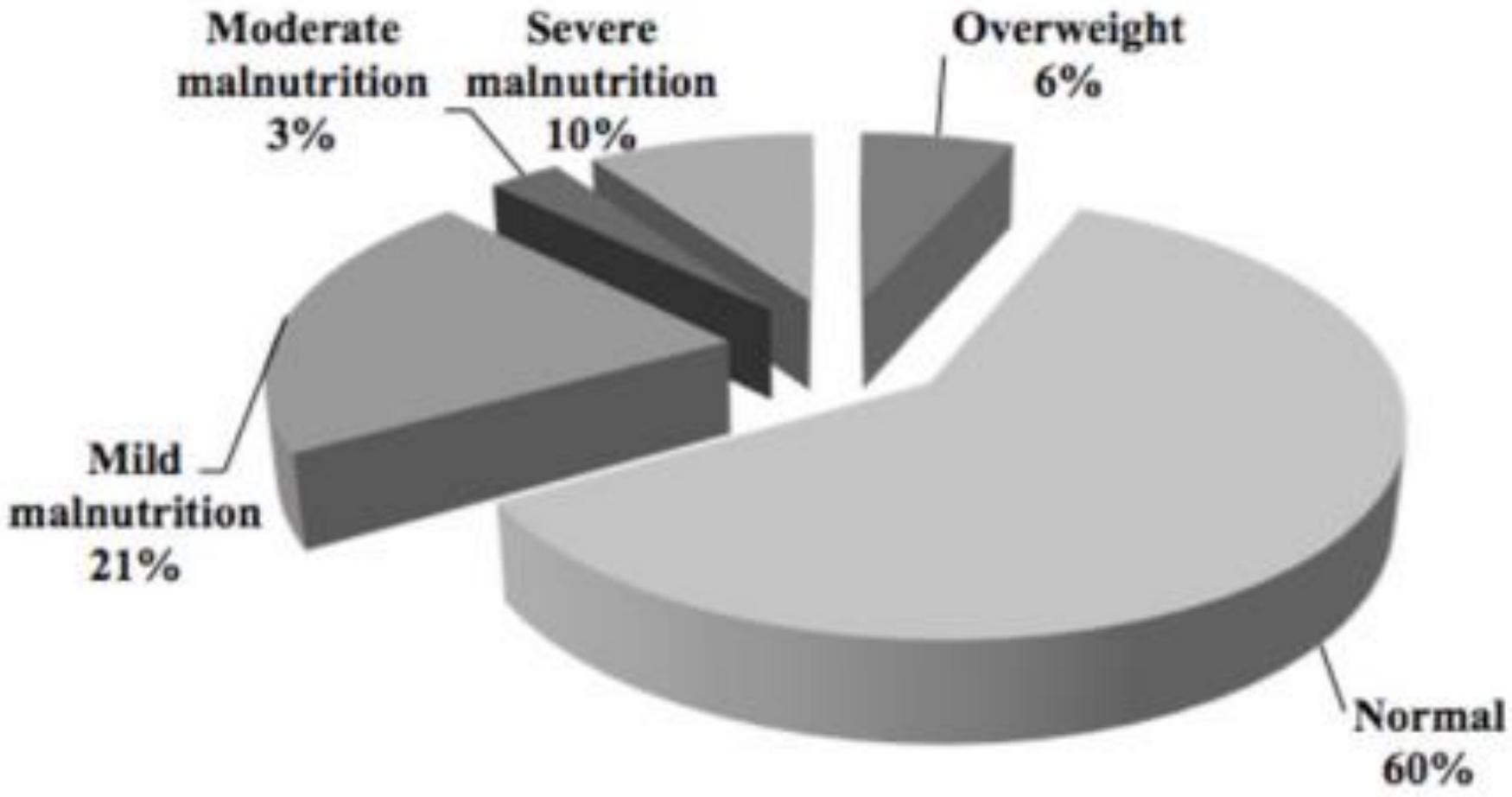


Figure 2. Distribution of Frequency Percentage of Malnutrition Prevalence and its Severity in Children Under 2 Years of Age at Time of Admission Based on Weight for Length Z Score.

- Overall, 176 patients (35.5%) had chronic disease/s and 320 patients (64.5%) had an acute illness.

- There was no statistically meaningful relation between malnutrition prevalence and chronicity of the disease ($P = 0.715$).

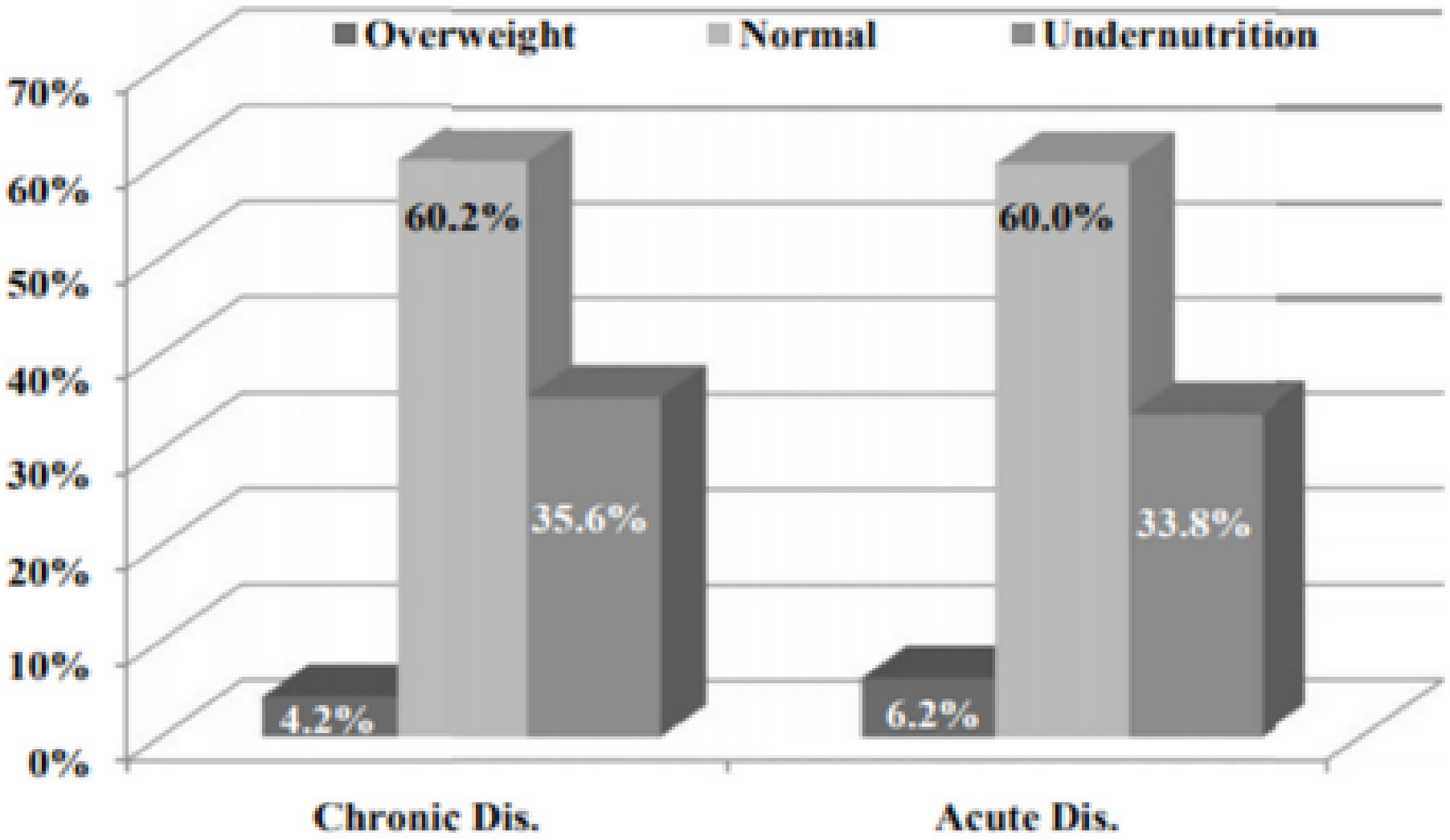
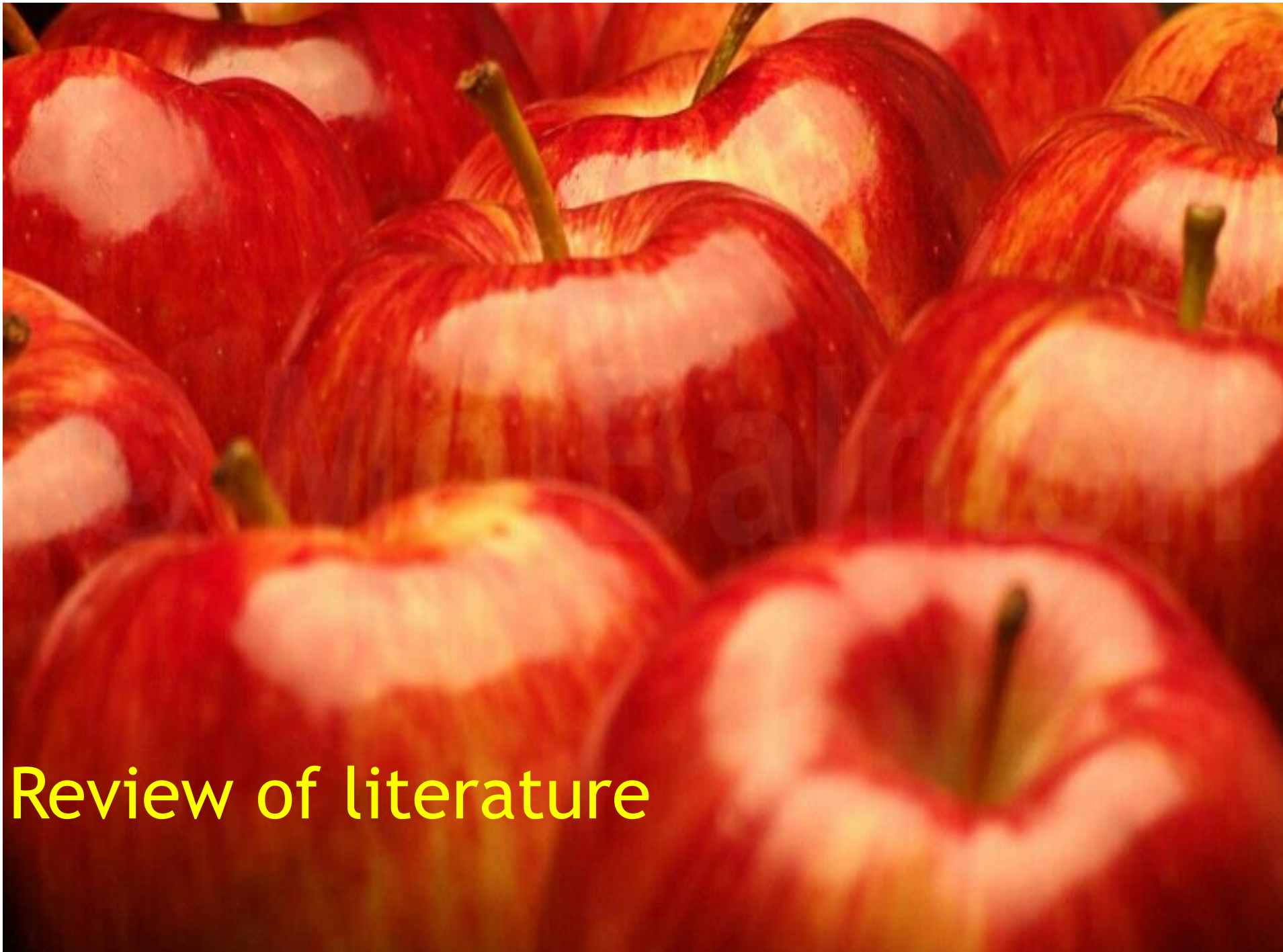


Figure 4. Distribution of Frequency Percentage of Malnutrition in Children Less Than Years of Age According to Disease Condition (Acute or Chronic). Dis. = disease.

- Twenty-two patients (4.4%) were referred for nutritional consultation in which 3 of them were given nutrition diet therapy; fourteen patients (2.8%) were recommended nutritional advice, and 5 patients (1%) had both.


Review of literature

Authors	Main title	City of study	Age of patients	Number of patients	Variables & results	Year
Taheri et al	Nutritional status of hospitalized children	Birjand	1-36 mo	360	Wt/ht (32.4 %) Ht/age (58.6%) Wt/Age (68.6%) Relations	1383 (3 mo)
Mahdavi et al	Nutritional status of hospitalized children	Tabriz	2-12 year	140	Wt/ht (32.2 %) Ht/age (30.7%) Wt/Age (48.6%) TSFT (14.3%)	2008
Vahidi et al	Nutritional status of hospitalized and OPD children	Kerman	6-24 mo	560 in each group	Gomez: Hospitalized(76.2%) vs. OPD(60.5%) Waterlow: Hospitalized(73.7%) vs. OPD(57.5%)	1380 (1 year)
Kapsi et al.	Nutritional status of hospitalized child	Turkey	Mean (5.8+/_ 4.9 year)	511	Acute (23.9%) Chronic(21.1%) acute on chronic (7.3%) Waterlow : Mild (39%) Moderate(12%) Severe (1.7%)	2015
Berkley et al.	Nutritional status of hospitalized child	Sub Saharan Africa	12-59 mo	8190	Expire: (4.4%) WHZ<-3 (16%) MUAC< 11.5 Cm(14.3%) **(As practical screening tools)**	1999-2002 (3 year)
Gia et al.	Nutritional status of hospitalized children and clinical outcome	China	>2 year	1325	*STRONGkids :* High risk: 121 (9.1%) Moderate risk(43.3%) Severe risk (47.6%)	2013

Evaluation of nutritional status in children hospitalized in Mofid Children's Hospital, Tehran, Iran

Ali-Akbar Sayyari[1], Farid Imanzadeh[1], Mehdi Moradi[1], Hazhir Javaherizadeh[2], Ahmad-Reza Shamshiri[3]

[1]Department of Pediatric Gastroenterology, Mofid Children's Hospital, Shahid Beheshti University of Medical Sciences, Tehran, Iran

[2]Faculty of Medicine, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran

[3]Pediatric Infectious Research Center, Mofid Children's Hospital, Shahid Beheshti University of Medical Sciences, Tehran, Iran

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Conclusions: Calorie intake < 50%, disease severity, length of hospital stay, diarrhea, and dyspnea were significantly higher among cases with weight reduction ≥ 2% than cases with weight reduction < 2%.

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Nutritional status of children hospitalized in Tabriz Paediatric Hospital, Islamic Republic of Iran, 2008

A.M. Mahdavi,[1] A. Ostadrahimi[2] and A. Safaiyan[1]

ABSTRACT This study aimed to evaluate the nutritional status of children consecutively admitted as inpatients to Tabriz Paediatric Hospital in the north-west of the Islamic Republic of Iran between June and August 2008. A total of 140 children aged 2–12 years were included. Patients' weight, height and triceps skinfold thickness (TSFT) were measured, and nutritional status was evaluated. Evaluation of weight-for-age, height-for-age, weight-for-height and TSFT showed that 48.6%, 30.7%, 32.2% and 14.3% of the patients, respectively, were malnourished. Malnutrition among hospitalized children is worthy of attention, and effective strategies for systematic screening and treatment of malnutrition need to be developed and implemented.

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Assessment of nutritional status and nutritional risk in hospitalized Iranian children

Vesal Moeeni, Tony Walls, Andrew S Day (andrew.day@otago.ac.nz)

Department of Paediatrics, University of Otago, Christchurch, New Zealand

Methods: The anthropometry of hospitalized and healthy children from the same community was determined.

Results: 119 inpatients were recruited along with a comparison group of 100 children. The prevalence of under-nutrition in the inpatient group was 25.2% and 3% in the community group ($p < 0.0001$). Obesity / overweight was more prevalent in the community group than the inpatients (22% versus 2.5%: $p = 0.04$). Severely malnourished children had a longer hospital stay than those with normal nutrition ($p < 0.0001$). The nutritional risk score tools identified between 83% and 90% of the malnourished patients in the moderate and high-risk groups.

Conclusion: The STRONGkids tool correlated more strongly with anthropometric measurements than the other tools. The length of hospital stay was associated with risk status ($p = 0.004$)

In conclusion

- according to the results of our study, children admitted for different indications should be evaluated from the point of view of growth indices to prevent or treat under nutrition.
- The main purpose of malnutrition diagnosis is to follow patients to prevent disease progression

limitations in our study

There were some limitations in our study that should be considered in future studies:

1) In acute illnesses, appetite is mostly affected by the condition and also medical treatments. As a result, nutritional interventions may be less acceptable by the children due to poor appetite.

2) Some patients, mostly in the acute illness group, did not take part in follow-up visits

3) Some of the hospital wards did not cooperate well in filling the nutritional questionnaires or did not perform nutritional consultation for patients.


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for Your
Attention