

Early detection and nursing management of malnutrition under the age of five

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ABSTRACT

Malnutrition in children under five is a major worldwide health issue, accounting for approximately half of the total deaths in this age range. It encompasses undernutrition, nutritional deficiencies, and growth stunting. Early diagnosis with anthropometric, clinical, and nutritional assessments is critical for timely management. Nursing management is critical for therapeutic feeding, preventing issues that arise, caregiver knowledge, and community-based treatments. Community awareness programs and home visits help in identifying vulnerable children and improving family practices related to nutrition. Early intervention can significantly reduce child morbidity and mortality associated with malnutrition. Collaborative efforts between healthcare providers, families, and community organizations are necessary for better child health outcomes. Therefore, strengthening nursing care and early detection strategies is vital in combating malnutrition among children under five years of age. This article includes a thorough discussion of early detection approaches and evidence-based nursing interventions for treating malnutrition in children under the age of five. This article outlines the many types of malnutrition in children, their causes, interventions at the level of primary healthcare, and suggestions for addressing malnutrition in children.

Keywords: WHO, Stunting, Malnutrition, Caretakers, Under nutrition, Underweight, Wasting, Breastfeeding

INTRODUCTION

Malnutrition is described as a medical condition caused by a lack or overabundance of one or more necessary nutrients (World Health Organization (WHO), 2020). It is an important threat to public health, especially in developing countries such as India (NFHS-5, 2021). Children under the age of five are particularly vulnerable due to their rapid growth and increasing nutritional needs (United Nations International Children's Emergency Fund (UNICEF), 2020). Protein-Energy Malnutrition (PEM) is characterised principally by Kwashiorkor and marasmus, both of which cause severe mortality and morbidity (Nelson Textbook of Paediatrics, 2020). Poor feeding practices, recurring illnesses, poverty, and a lack of maternal knowledge are major contributing factors (Park, 2021). The early years of childhood, which are among the most essential periods of life, can have a significant impact on one's long-term health (Moridi G et al., 2009; Mohseni M et al., 2018). The initial 1,000 days of life are critical, and poor nutrition during this period can result in irreversible growth retardation, as well as impairments in cognitive ability and performance (Danaei G et al., 2016; Mohseni M et al., 2017; Mohseni M et al., 2019). Growth monitoring during childhood is one of the most significant health care methods for children, and growth disorders are the earliest visible signs of medical, social, and, most importantly, nutritional difficulties (Hatami H et al., 2004). Undernutrition accounts for over half of all deaths among children under the age of five. Children who suffer from malnutrition are more likely to die from common diseases and recover more slowly if they become infected. Malnutrition in children also impairs cognitive-sensory function, limiting

their ability to live a productive and efficient life (Liu L et al., 2000). Many factors contribute to this type of malnutrition, including inadequate prenatal care, low literacy among family members, inadequate community health dysfunctions (injustice, war, natural disasters, etc.), unhealthy environments, poor household nutrition, frequent and severe infections, insufficient food supply, and poverty, in particular (Muller O et al., 2005). Despite its importance and role in the development of major diseases, malnutrition is still underappreciated (Schaible UE et al., 2007). Children tend to be susceptible to macro- and micronutrient deficits as a result of elevated food demand during their developmental years (Clark H et al., 2020; Pomati M et al., 2020). Malnutrition in children under the age of five causes underweight, stunting, wasting with or without oedema (formerly known as marasmus and kwashiorkor, respectively), and even death (Tebeje NB et al., 2017). On April 1, 2016, the United Nations General Assembly declared a decade of nutrition action to end all types of malnutrition by 2025 (Black MM et al., 2020). The relevant nutritional outcome targets by 2030 are also set by the Sustainable Development Goal (SDG)-2 (end hunger, achieve food security, and improve nutrition), SDG-3 (ensure a healthy life and promote well-being for all ages), and the Global Strategy for Women's, Children's, and Adolescents' Health (Hone T et al., 2018). Despite generous support from the UNICEF, WHO, and World Bank for nutritional freedom, we are still a long way from a world free of malnutrition (UNICEF, 2020). The WHO study issued in March 2020 found insufficient progress toward the World Health Assembly's 2025 targets and the SDGs set for 2030 (Pomati M et al., 2020). As reported to the WHO Organization 2020 report, around 144 million children under the age of five have stunted growth, 47 million are wasted, 14.3 million are severely wasted, and 38.3 million are overweight or obese. According to the 2016 South African Demographic and Health Survey, the prevalence rate of wasting was 2.5%, underweight was 6%, and stunting remained high at 27.0% among children under the age of five (May J et al., 2020). Approximately 45% of deaths reported among children under the age of five are due to undernutrition.

CAUSES OF MALNUTRITION

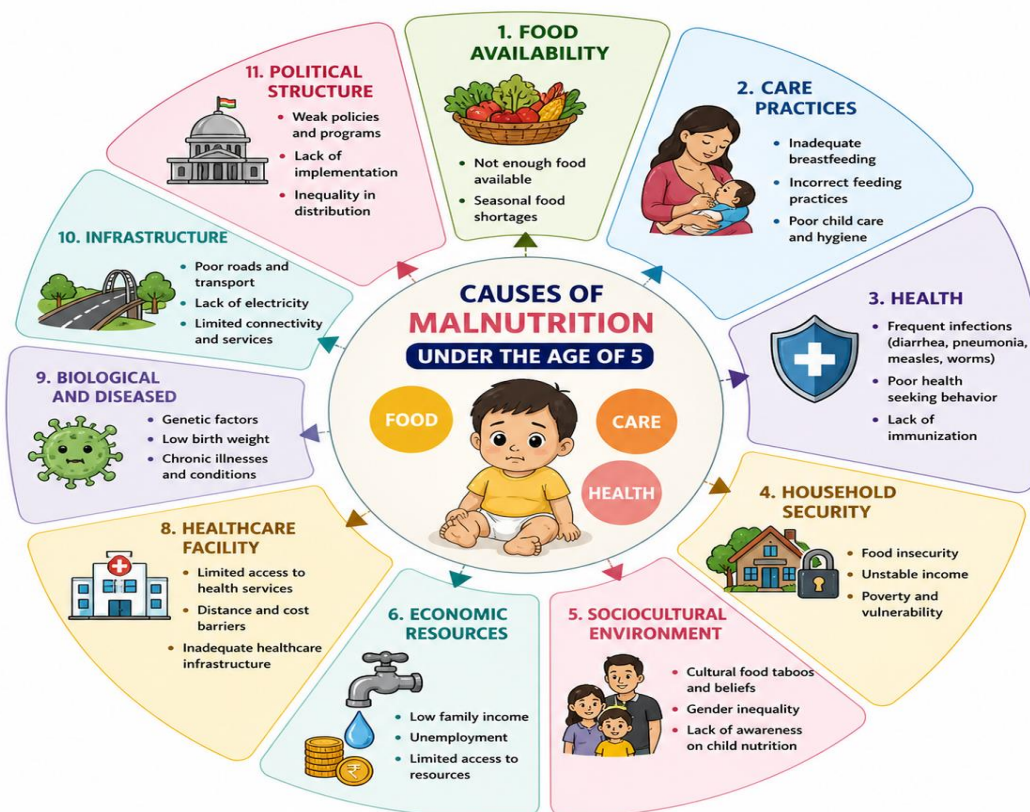
According to UNICEF's conceptual framework, malnutrition is caused by a variety of interconnected factors that operate at the immediate, underlying, and basic levels. Figure 1 briefly demonstrates the causes of malnutrition. Immediate causes include food (dietary intake), care (child care practices), and health (disease condition). Food intake refers to the amount and quality of food consumed by the child. Inadequate intake of calories, proteins, and micronutrients directly leads to malnutrition (WHO, 2020; Black et al., 2013). Poor infant feeding practices, such as failure to exclusively breastfeed and delayed complementary feeding, also contribute to undernutrition (Victora et al., 2016). Care includes feeding practices, hygiene, and emotional support provided to the child. Lack of maternal knowledge, improper feeding frequency, or neglect can contribute to malnutrition (Engle et al., 1999; UNICEF, 2019). A child's health status also greatly affects nutritional outcomes. Recurrent infections reduce appetite and nutrient absorption while increasing metabolic demand (Black et al., 2008). Diseases such as diarrhoea are major contributors to malnutrition (Guerrant et al., 2008).

Underlying causes include household food security, economic resources, water and sanitation, healthcare facilities, and biological or disease-related factors. Household food security ensures continuous access to sufficient and nutritious food, whereas food insecurity caused by poverty or unemployment is a major determinant of malnutrition (FAO, 2017; Smith & Haddad, 2015). Family income affects the ability to purchase nutritious food, access healthcare, and maintain proper living conditions, and low socioeconomic status is strongly associated with a higher prevalence of malnutrition. Safe drinking water and adequate sanitation are essential for preventing infections, while poor sanitation contributes to repeated illnesses that negatively affect nutritional utilization (WHO, 2020; Spears et al., 2013). Availability and accessibility of healthcare services support immunization, early diagnosis, and treatment of diseases, whereas lack of healthcare access increases the risk of malnutrition (UNICEF, 2019; WHO, 2020). Children with low birth weight, chronic illnesses, or recurrent infections are more susceptible to malnutrition (Black et al., 2013; Victora et al., 2008).

Basic or structural causes include cultural food practices, sociocultural environment, political structure, and infrastructure. Cultural beliefs and dietary taboos may limit the consumption of nutritious foods such as meat, eggs, and vegetables (FAO, 2017; Pelto et al., 2003). Maternal

education, gender norms, and family structure also influence child nutrition, and higher maternal education is associated with better nutritional outcomes (UNICEF, 2019; Caldwell, 1979). Government policies related to food distribution, healthcare, and nutrition programmes significantly influence malnutrition rates (WHO, 2020; FAO, 2017). Infrastructure such as roads, markets, hospitals, and water supply systems determines access to essential services, while poor infrastructure contributes to food insecurity and inadequate healthcare access (World Bank, 2020).

Cross-cutting factors include availability and utilization. Availability refers to the supply of food, healthcare, and community services. Even when households have income, a lack of available resources can contribute to malnutrition (FAO, 2017). Utilization refers to how effectively the body uses consumed nutrients and depends on health status, sanitation, hygiene, and feeding practices (WHO, 2020; UNICEF, 2019).



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median (Clark H et al., 2020). Figure 2 depicts the pattern of malnutrition in children under the age of five. Under nutrition is an extremely common type of malnutrition in children below five years of age. It occurs when a child does not receive enough energy and nutrients for proper growth and development. Wasting, also known as acute malnutrition is defined as low weight-for-height, where the weight-for-height Z-score is less than -2 standard deviations from the median of the reference population. This indicates an acute under nutrition status that measures body mass with height and describes the current nutritional status of a child (Clark H et al., 2020). A young child who experiences moderate-to-severe wasting episodes is more likely to die (Abate KH et al., 2019). Poor access to proper healthcare, lack of food security, ineffective feeding methods, a monotonous diet with low nutrient density, and inadequate water, sanitation, and hygiene services are the major underlying causes of wasting. Severe wasting episodes decrease a child's immunity, making them vulnerable to long-term developmental delays and an increased risk of mortality (Koetaan D et al., 2018). According to the WHO 2020 report, among the 47 million children under the age of five who were wasted, 14.3 million were severely wasted, with Africa accounting for more than one-third of the cases. Stunting, also referred to as chronic malnutrition, is defined as being shorter for a given age and reflects long-term nutritional deficiency. Stunting (height-for-age) in children is characterised by a Z-score less than -2 standard deviations from the median of the reference population. It indicates linear growth retardation and cumulative growth deficits due to chronic malnutrition (Vollmer S et al., 2017). Stunting is commonly associated with poor socioeconomic conditions, inadequate maternal

health and nutrition, inappropriate feeding practices, and recurrent illnesses during early life (May J et al., 2020). Linear growth is a strong predictor of disease, mortality, and learning capacity later in life. Stunting is largely irreversible and particularly harmful during the first 1000 days after conception (Adair LS et al., 2013). It significantly affects both the physical and cognitive development of children (Mkhize M et al., 2020). According to the UNICEF, WHO, and World Bank Group 2020 report, approximately 144 million children under the age of five are stunted worldwide. Although the prevalence of stunting is declining globally, Africa continues to show increasing numbers of stunted children. Between 2000 and 2019, the number of stunted children under five in Africa increased from 49.7 million to 57.5 million (UNICEF, 2020). During the same period, Southern Africa alone reported an increase of 100,000 stunted children under five years of age (Clark H et al., 2020).

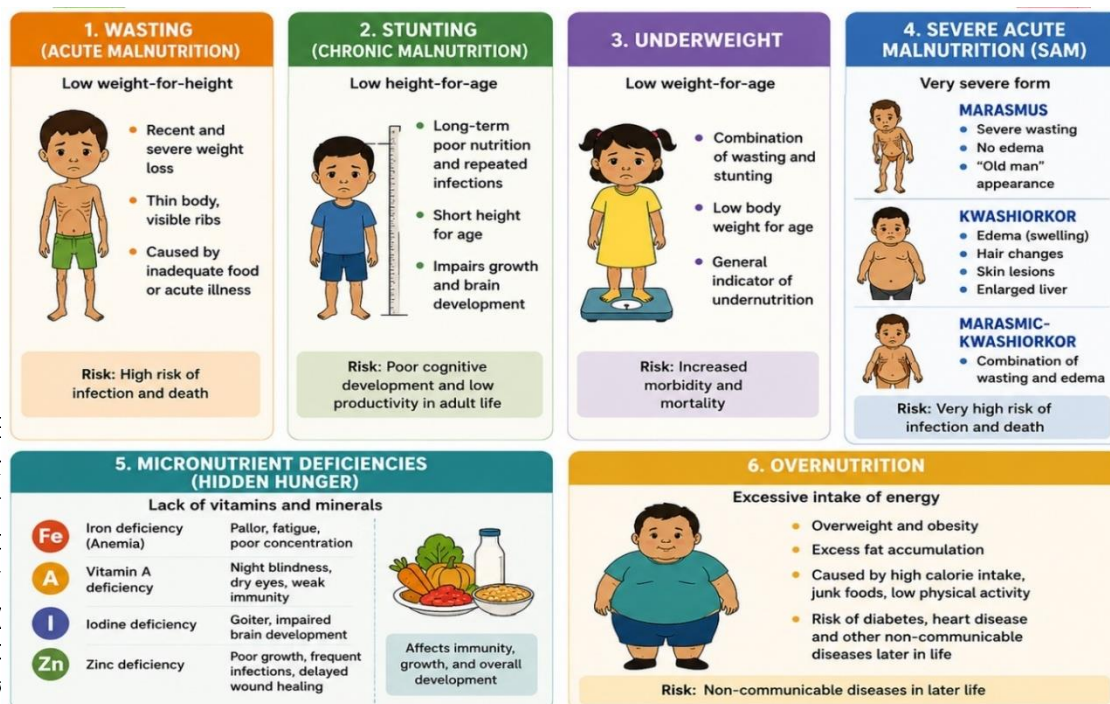
Underweight is defined as low body weight for age and reflects both chronic and acute malnutrition. Children under five years are considered underweight when their weight-for-age Z-score is less than -2 standard deviations from the median of the reference population. This condition is a combined measure of both stunting and wasting, meaning that an underweight child may be stunted, wasted, or both (Desyibelew HD et al., 2020).

Severe Acute Malnutrition (SAM) is a serious condition that requires urgent medical attention. SAM is defined as severe wasting with a weight-for-height or weight-for-length Z-score less than -3 standard deviations, a mid-upper arm circumference of less than 115 mm, or the presence of bilateral nutritional oedema compared to the reference population median (Das JK et al., 2020). Childhood malnutrition is classified by WHO criteria into acute and chronic malnutrition. Acute malnutrition is further categorised according to severity into Moderate Acute Malnutrition (MAM), where the weight-for-height or weight-for-length Z-score lies between -3 and -2 standard deviations, and Severe Acute Malnutrition (SAM) as described above (Clark H et al., 2020).

Overnutrition, although less common, is becoming increasingly prevalent among young children. It refers to excessive calorie intake resulting in overweight and obesity. A child is classified as overweight when the weight-for-height Z-score is more than $+2$ standard deviations above the median of the reference population. Overweight is now considered a new face of childhood malnutrition. Globally, approximately 38.3 million children are overweight, representing an increase of 8 million cases since 2000. The rise in overweight and obesity has been linked to increased consumption of processed foods and reduced physical activity (Zhang N et al., 2018).

Micronutrient deficiencies, also known as hidden hunger, occur even when calorie intake is adequate but essential vitamins and minerals are lacking. Iron deficiency is a common nutritional disorder that leads to anaemia. Iron is necessary for red blood cells to transport oxygen from the lungs to the rest of the body. An iron-deficient diet can lead to anaemia, a condition in which the body does not produce enough healthy red blood cells. Vitamin A deficiency primarily affects vision and immune function. According to Merck (2010) and Akram et al. (2020), symptoms include poor night vision, blindness, dry skin, respiratory infections, and weakened immunity. Iodine deficiency impairs thyroid gland function because iodine is essential for the production of thyroid hormones that regulate body metabolism. Iodine deficiency can lead to intellectual disability and poor thyroid function (Merck, 2010; Hassan et al., 2020). Zinc deficiency also has significant health effects, as zinc is essential for immune function, cell growth, and wound healing. Signs of zinc deficiency include recurrent infections, hair loss, poor appetite, impaired taste and smell, and delayed wound healing (Merck, 2010; Akram et al., 2020).

PEM is a broad category that includes marasmus and kwashiorkor. Protein malnutrition, also referred to as starvation, is described as a diet lacking all major macronutrients, including proteins, carbohydrates, and fats (United Nations World Food Programme). There are three forms of PEM in children: acute malnutrition, characterised by rapid weight loss or failure to gain weight; chronic malnutrition, resulting from prolonged inadequate nutrition leading to impaired linear growth; and combined acute and chronic malnutrition, which may present as wasting, stunting, or both (United Nations World Food Programme).



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widely accepted and reliable method for diagnosing malnutrition. Underweight, stunting, and wasting are identified using indicators such as weight-for-age, height-for-age, and weight-for-height. Measuring the Mid-Upper Arm Circumference (MUAC) is a straightforward, rapid, and inexpensive procedure, especially in community settings. MUAC readings less than 11.5 cm indicate severe acute malnutrition (United Nations Children's Fund; WHO). Furthermore, clinical examination serves as another important method of early detection. Physical signs include visible wasting, bilateral pitting oedema, changes in hair structure and colour, skin lesions, and behavioural abnormalities such as irritability and lethargy. These markers provide immediate confirmation of nutritional deficiencies and help identify children who require urgent care (WHO; Indian Academy of Pediatrics (IAP)). Moreover, dietary assessment plays a crucial role in understanding whether a child's nutritional intake is adequate. Common procedures include 24-hour food recall, feeding frequency assessment, and evaluation of breastfeeding and complementary feeding practices. This method helps identify gaps in nutritional intake and inappropriate feeding behaviours, which are key contributors to malnutrition (IAP; United Nations Children's Fund). Additionally, the appetite test is highly useful in identifying severe acute malnutrition. It assesses a child's ability to consume therapeutic food, helping to determine the severity of the condition and appropriate treatment approach. Poor appetite is considered a warning sign indicating the need for immediate medical intervention (WHO). Finally, screening for risk factors is an essential component of early detection. Low birth weight, recurrent illnesses, poor socioeconomic conditions, lack of immunization, and inadequate maternal knowledge all increase the risk of malnutrition. Identifying these indicators helps in early identification of high-risk children and timely intervention (Robert E. Black; United Nations Children's Fund).

Table 1: Early detection methods for malnutrition under the age of five

Early Detection Method	Procedure/Assessment	Purpose/Findings	Author/Source
Growth Monitoring	Regular measurement of weight and height and plotting on growth charts	Detects growth faltering, underweight, and delayed growth	K. Park; WHO

Early Detection Method	Procedure/Assessment	Purpose/Findings	Author/Source
Weight-for-Age Measurement	Compare the child's weight to the conventional age reference.	Identifies underweight children	WHO
Height-for-Age Measurement	Measure height and length according to age.	Detects stunting (chronic malnutrition)	WHO; UNICEF
Weight-for-Height Measurement	Compare weight with height standards	Identifies wasting (acute malnutrition)	WHO
Mid-Upper Arm Circumference (MUAC)	Measure its circumference of an upper arm area with MUAC tape.	Detects severe acute malnutrition; MUAC <11.5 cm indicates SAM	UNICEF; WHO
Clinical Assessment	Observe oedema, visible wasting, hair and skin changes, lethargy	Identifies physical signs of malnutrition	WHO
Dietary Assessment	Evaluate feeding patterns and food intake with a 24-hour recall.	Identifies nutritional deficiencies and poor feeding habits	Indian Academy of Paediatrics
Breastfeeding Assessment	Assess breastfeeding technique and frequency	Detects inadequate breastfeeding practices	UNICEF
Appetite Test	Check the child's ability to consume therapeutic food	Helps assess the severity of acute malnutrition	WHO
Assessment of Risk Factors	Assess low birthweight, illnesses, poverty, and immunization status.	Identifies children at high risk of malnutrition	Black et al.; UNICEF
Developmental Assessment	Assess physical and mental developmental milestones	Detects delayed growth and development due to malnutrition	IAP
Laboratory Investigations	Hemoglobin test and micronutrient assessment	Detects anemia and vitamin/mineral deficiencies	WHO
Immunization Status Check	Review vaccination records	Identifies risk of infections contributing to malnutrition	WHO; UNICEF
Community Screening Programs	Conduct nutritional screening camps in communities	Early identification of malnourished children	WHO

NURSING MANAGEMENT OF MALNUTRITION

Effective nursing management of malnutrition in under-five children involves a systematic, evidence-based and holistic approach that focuses on assessment, stabilization, rehabilitation, prevention, and family-centred care. It ensures not only survival but also optimal growth, development, and long-term well-being of the child. The key components of nursing management include initial assessment and diagnosis, nutritional management, management of dehydration, management of infections, micronutrient supplementation, temperature maintenance, emotional and developmental support, health education and counselling, follow-up and community care, and preventive strategies. To begin with, initial assessment and diagnosis form the foundation of nursing management. The first stage in nursing management is to thoroughly assess the child's condition. This includes determining height, weight and Mid-Upper Arm Circumference (MUAC), as well as recognizing symptoms like wasting,

oedema, and lethargy. Nurses also evaluate hydration, infection status, and feeding history to identify the severity of malnutrition. Proper assessment assists in arranging proper treatment and care (WHO; IAP). Following assessment, nutritional management plays a central role in recovery. Nutritional rehabilitation is the foundation of malnutrition treatment. During the stabilization phase, children are given therapeutic meals like F-75, which are low in protein and calories yet easily digestible. Once the child has stabilized, the rehabilitation phase begins with high-energy meals such as F-100 or Ready-to-Use Therapeutic Food (RUTF), which stimulate rapid weight gain. Nurses ensure that feeding is done in small, frequent doses and assess the child's tolerance of the diet (WHO; United Nations Children's Fund). In addition, management of dehydration is essential to prevent complications and mortality. Children who are malnourished are at a significant risk of dehydration, particularly from diarrhoea. Nurses carefully administer Oral Rehydration Solution (ORS) to prevent over hydration, which can be particularly harmful in severely malnourished children. Monitoring fluid intake and output is vital for maintaining optimum hydration levels (WHO). Moreover, management of infections is crucial due to reduced immunity in malnourished children. Malnourished children have compromised immune systems, making them more prone to illnesses including pneumonia, diarrhoea, and tuberculosis. Nurses play an important role in the early detection and treatment of infections by delivering medications, maintaining hygiene, and monitoring vital signs. Prompt care of infections is critical for recovery (United Nations Children's Fund; IAP).

Additionally, micronutrient supplementation is required to correct hidden deficiencies. Malnourished children frequently lack important vitamins and minerals. Nurses administer supplements such as Vitamin A, iron (after stabilization), folic acid, and zinc to treat deficiencies and boost immunity. These supplements are provided according to prescribed guidelines to ensure safe and effective treatment (WHO; K. Park). Another important aspect is temperature maintenance, which is vital for survival. Malnourished children are more likely to develop hypothermia due to a lack of body fat and energy. Nurses keep the child warm by providing adequate clothing, comfortable bedding, and maintaining room temperature. Preventing hypothermia is necessary for recovery and survival (WHO). Furthermore, emotional and developmental support is essential for holistic recovery. In addition to medical care, emotional support is critical for the healing of malnourished children. Nurses encourage mother-child bonding, provide play therapy, and engage children in stimulating activities to improve emotional wellbeing and cognitive development. A supportive environment promotes rehabilitation and overall growth (United Nations Children's Fund). Similarly, health education and counselling empower caregivers to prevent recurrence. Nurses teach caregivers about optimal breastfeeding techniques, appropriate introduction of complementary feeding, balanced diet, and hygienic practices. Counselling helps improve feeding practices and prevents recurrence of malnutrition. Educating mothers and families is a key component of long-term management (IAP; United Nations Children's Fund). In addition, follow-up and community care ensure continuity of treatment. Regular follow-up is required to assess the child's progress and ensure long-term rehabilitation. Nurses monitor growth measurements, verify immunization records, and provide ongoing nutritional guidance. Community-based management programmes help reach children who do not require hospitalization but still need care and monitoring (WHO; United Nations Children's Fund). Finally, prevention strategies are essential to reduce the burden of malnutrition. Nursing management also emphasises prevention through promotion of exclusive breastfeeding for the first six months, appropriate complementary feeding, vaccination, and hygiene practices. Early identification of at-risk children and community awareness campaigns play an important role in reducing malnutrition rates (K. Park; WHO). For a brief reference, Table 2 presents the nursing management of malnutrition in children under the age of five.

Table 2: Nursing management of malnutrition for children under the age of five

Nursing Management Area	Nursing Interventions	Purpose/Outcome	Author/Source
Assessment and Monitoring	Measure weight, height, MUAC, monitor vital signs, assess edema and dehydration	To identify severity of malnutrition and monitor progress	WHO

Nursing Management Area	Nursing Interventions	Purpose/Outcome	Author/Source
Nutritional Therapy	Provide therapeutic feeds (F-75, F-100, RUTF), give small frequent feeds	To restore nutritional status and promote weight gain	WHO; UNICEF
Management of Hypoglycemia	Give glucose or frequent feeding, monitor blood sugar levels	To prevent low blood sugar and complications	WHO
Management of Hypothermia	Keep child warm with blankets and warm environment	To maintain normal body temperature	WHO
Management of Dehydration	Administer ORS carefully, monitor fluid intake and output	To restore fluid balance safely	WHO
Infection Control	Administer antibiotics as prescribed, maintain hygiene and isolation if needed	To treat and prevent infections	UNICEF; IAP
Micronutrient Supplementation	Provide Vitamin A, iron, folic acid, zinc supplements	To correct nutritional deficiencies	K. Park; WHO
Feeding Support	Encourage breastfeeding and appropriate complementary feeding	To improve nutritional intake	UNICEF
Emotional Support	Provide love, care, play therapy, and mother-child interaction	To promote emotional and mental well-being	UNICEF
Health Education	Teach caregivers about nutrition, hygiene, and feeding practices	To prevent recurrence of malnutrition	IAP
Growth Monitoring	Record weight regularly and plot growth charts	To evaluate recovery and development	K. Park
Follow-Up Care	Schedule regular follow-up visits and community monitoring	To ensure continuous improvement	WHO; UNICEF
Immunization Support	Check and update immunization status	To reduce risk of infections	WHO
Referral Services	Refer severe cases to higher healthcare centres	To provide advanced treatment when needed	WHO

METHODS FOR PREVENTION OF MALNUTRITION BY NURSES AMONG CHILDREN

Malnutrition in children under the age of five is a major public health issue that impairs immunity, healthy growth, and overall well-being. Nurses help prevent malnutrition by providing health education, growth surveillance, food assistance, and community-based efforts. Preventive nursing care reduces infant morbidity and death while promoting healthy childhood development. (WHO).The major preventive strategies include promotion of exclusive breastfeeding, education on complementary feeding, growth monitoring and regular screening, immunization and infection prevention, nutrition and health education, micronutrient supplementation, management of common childhood illnesses, maternal education and counselling, community-based nutritional programs, and follow-up and home visits.To begin with, promotion of exclusive breastfeeding is one of the most effective preventive measures. Nurses recommend that mothers exclusively breastfeed their babies for the initial six months of life simply because breast milk contains all of the nutrients and antibodies

needed for optimal growth and immunity. Nurses teach mothers proper breastfeeding practices, posture, and rate of feeding. Exclusive breastfeeding also lowers the incidence of illnesses like diarrhoea and pneumonia, among others, which are key contributors to malnutrition (United Nations Children's Fund; WHO). In addition, education on complementary feeding plays a crucial role after infancy. After six months of age, mother's milk alone is inadequate to meet the child's nutritional demands. Nurses teach caregivers how to introduce complementary feeding at the appropriate time while continuing breastfeeding for two years or more. They advise families on adequate nutrition rich in proteins, carbohydrates, vitamins, and minerals, using locally accessible foods (IAP; K. Park). Furthermore, growth monitoring and regular screening are essential for early detection and prevention. Periodic growth surveillance is an effective preventive approach. Nurses evaluate height, weight, and MUAC and graph the results on growth charts to detect early signs of growth faltering. Early identification allows for timely management before severe malnutrition develops (WHO). Moreover, immunization and infection prevention significantly reduce the risk of malnutrition. Frequent infections raise the chances of malnutrition in children. Nurses ensure that children are fully immunized in accordance with national vaccination schedules and advise caregivers on infection prevention practices such as hand washing, safe drinking water, and sanitation. Infection prevention promotes proper nutrition and healthy growth (United Nations Children's Fund). Additionally, nutrition and health education empower families to maintain proper dietary practices. Nurses play an important role in avoiding malnutrition by providing health education. Nurses educate caregivers about balanced nutritional needs, feeding frequency, hygienic practices, and the necessity of micronutrients, including iron, vitamin A, and zinc. They also educate families on spotting early indicators of malnutrition and seeking medical care immediately (Indian Academy of Paediatrics). Similarly, micronutrient supplementation helps prevent hidden deficiencies. Nurses participate in programs that provide Vitamin A supplements, folic acid and iron tablets, and deworming treatments to prevent micronutrient shortages. These interventions boost children's immune systems, growth, and overall health (WHO; K. Park). In addition, management of common childhood illnesses is essential in preventing nutritional deterioration. Timely treatment of illnesses, including diarrhoea, respiratory tract infections, and high fevers, is critical for preventing malnutrition. Nurses teach caretakers about ORS, zinc-based treatment, and the importance of continuing feeding during illness. Proper illness management avoids nutritional decline (WHO; United Nations Children's Fund). Furthermore, maternal education and counselling have a strong impact on child nutrition outcomes. Maternal education has a direct impact on children's diet and care. Nurses advise mothers on maternal nutrition during pregnancy and lactation, birth spacing, pregnancy planning, and childcare practices. Educated women are more likely to adopt appropriate feeding and hygiene behaviours (Robert E. Black). For a brief illustration, refer to Table 3 for prevention methods of malnutrition by nurses among children. Moreover, community-based nutritional programs extend preventive care beyond health facilities. Nurses are actively involved in community health programmes such as growth monitoring sessions, school health initiatives, Anganwadi services, and awareness campaigns. These programmes help identify at-risk children early and promote nutrition education in the community (United Nations Children's Fund; WHO). Finally, follow-up and home visits ensure continuity of care and sustained improvement. Home visits and follow-up care allow nurses to assess the child's nutritional progress and reinforce healthy practices among caregivers. Regular follow-ups ensure continuity of care and help prevent recurrence of malnutrition (Indian Academy of Paediatrics).

Table 3: Prevention Methods of Malnutrition by Nurses Among Children

Prevention Area	Nursing Interventions	Purpose/Benefits	Author/Source
Exclusive Breastfeeding Promotion	Educate mothers on breastfeeding exclusively for the first six months and proper breastfeeding practices.	Provides essential nutrients and immunity, prevents infections	WHO; UNICEF
Complementary Feeding Education	Educate caregivers regarding the timely adoption of	Ensures adequate nutrition for growth and	IAP; K. Park

Prevention Area	Nursing Interventions	Purpose/Benefits	Author/Source
	supplementary nutrition after six months.	development	
Growth Monitoring	Measure weight, height, and MUAC regularly and maintain growth charts	Early identification of growth faltering and malnutrition	WHO
Immunization Support	Ensure complete vaccination according to schedule	Prevents infections contributing to malnutrition	UNICEF; WHO
Nutrition and Health Education	Educate families about a healthy diet, hygiene, and feeding methods.	Improves nutritional awareness and healthy practices	Indian Academy of paediatrics
Micronutrient Supplementation	Provide iron, vitamin A, zinc, folic acid, and deworming services	Prevents vitamin and mineral deficiencies	WHO; K. Park
Management of Childhood Illnesses	Educate about ORS, zinc therapy, and continued feeding during illness.	Prevents nutritional deterioration during infections	WHO; UNICEF
Maternal counselling	Consult mothers about food, child care, birth timing, and family planning.	Improves maternal and child health practices	Black et al.
Community Nutrition Programs	Participation in Anganwadi-based services, growth tracking camps, and awareness programmes.	Promotes community-level prevention and early detection	UNICEF; WHO
Home Visits and Follow-Up Care	Conduct additional visits to assess child development and reinforce health education.	Prevents recurrence of malnutrition	IAP
Hygiene and Sanitation Promotion	Teach handwashing, safe water use, and food hygiene practices	Reduces infections and improves child health	WHO
Early Risk Identification	Identify children with low birth weight, recurrent infections, or poor socioeconomic conditions	Enables early intervention and prevention	UNICEF; Black et al.

SUCCESSFUL CASES OF NURSING MANAGEMENT OF MALNUTRITION

Historical hospital-based evidence plays a crucial role in understanding the effectiveness of nursing interventions in the management of malnutrition among children under five. These documented successful cases from various tertiary care and teaching hospitals highlight the importance of timely assessment, WHO guideline-based therapeutic feeding, infection control, and continuous nursing care in improving recovery outcomes, reducing complications, and decreasing mortality. The following are selected historical hospital-based successful cases of nursing management of malnutrition among children under five.

Table 4: Historical Hospital-Based Successful Cases of Nursing Management of Malnutrition Among Under-Five Children

Hospital / Centre Name	Case / Study Details	Nursing Management Provided	Outcome / Result	Authors / References
L.L.R. and	Children aged 6	Nurses provided	Significant	Anand Shukla

Hospital / Centre Name	Case / Study Details	Nursing Management Provided	Outcome / Result	Authors / References
Associated Hospitals	months to 5 years with SAM were taken using F-75 and F-100 therapeutic meals.	medical feeding, evaluated hydration, bacterial infections, and weight growth.	improvement in weight gain among hospitalized SAM children	& Y. K. Rao
Government Medical College Hospital	54 SAM children were admitted to the Nutritional Rehabilitation Centre (NRC)	Nurses monitored MUAC, feeding, oedema, and nutritional rehabilitation	Average weight gain and improvement in MUAC were observed after the intervention	Dinesh Kumar Meena et al.
SRG Hospital and Medical College	Protocol-based treatment of SAM children in the malnutrition treatment corner	Nurses gave F-75/F-100 diets, evaluated problems, and offered follow-up treatment.	Improved nutritional recovery and better clinical outcomes	Rajendra P. Nagar et al.
S.S.S.G. Hospital	60 under-five SAM children managed in the Nutrition Rehabilitation Centre	Nurses followed WHO protocols, monitored feeding tolerance, and managed infections	The majority of children recovered from marasmus and kwashiorkor	Rinki H. Shah & Bakul B. Javdekar
Hindu Rao Hospital	SAM children with complications admitted in tertiary care NRC	Nursing care included antibiotics, nutritional therapy, and caregiver counselling	Successful management of SAM cases with improved recovery rates	Alka Mathur et al.
Cheluvamba Hospital	SAM Ward treated nearly 200 malnourished children aged 6 months to 5 years	Nurses and dieticians provided nutritional rehabilitation, monitoring, and maternal counselling	Most children recovered well with significant daily weight gain	Dr. Pradeep N & S. Divyashree
LG Hospital	A child with severe malnutrition and Vitamin A deficiency, causing vision loss	Nutritional rehabilitation, multidisciplinary nursing care, Vitamin A therapy, supportive care	The child's eyesight was saved after stabilisation and treatment	Dr. Rushil Ambani & Dr. Anupama Mahant
S.C.B. Medical College and Shishu Bhawan	Evaluation of Nutrition Rehabilitation Centre for SAM children	Nurses performed monitoring, feeding support, and caregiver education	NRC showed effective improvement in the management of malnutrition	Mayadhar Panda et al

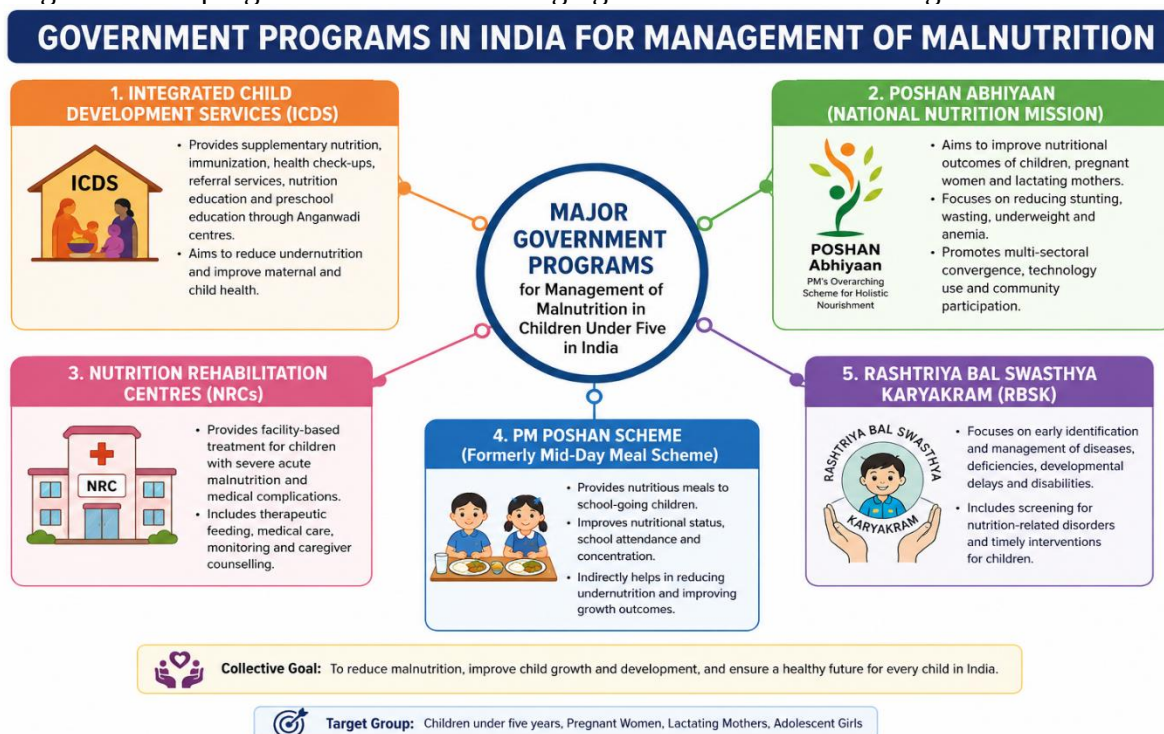
COMMUNITY-BASED INTERVENTIONS FOR MALNUTRITION IN CHILDREN UNDER FIVE IN INDIA

Community-based interventions are critical for early detection, prevention, and management of malnutrition in children under the age of five (Mathur et al., 2018). Community health professionals, such as ASHAs, Anganwadi workers, and nurses, play a crucial role in these treatments by monitoring growth, providing nutrition counselling, making home visits, and referring patients to treatment. Community-Based Management of Acute Malnutrition enables uncomplicated cases of severe acute malnutrition to be handled at home through regular follow-up and nutritional supplementation. (Pati

et al., 2018). Participatory learning and action in women's groups and counselling during home visits increase caregivers' breastfeeding techniques, complementary feeding, hygiene, and healthcare-seeking behaviour (Gope et al., 2019). Collaboration among healthcare providers, NGOs, and local government authorities has improved early detection and treatment of malnourished children in urban informal settlements and rural communities (More et al., 2018). Collaboration among frontline health and nutrition workers improves follow-up care and service delivery among tribal populations. (Sinha & Sanyal, 2025).

GOVERNMENT PROGRAMS IN INDIA FOR MANAGEMENT OF MALNUTRITION

The major programs include Integrated Child Development Services (ICDS), POSHAN Abhiyaan (National Nutrition Mission), NRCs, PM POSHAN Scheme, and Rashtriya Bal Swasthya Karyakram (RBSK). To begin with, ICDS is one of the most comprehensive child welfare programmes in India. ICDS uses Anganwadi centres to provide supplementary nutrition, immunization, health check-ups, referral services, preschool instruction, and nutrition advice. ICDS is regarded as one of the most significant child development programs aiming at reducing child malnutrition and enhancing maternal-child health outcomes (Kapur & Suri). In a similar vein, POSHAN Abhiyaan strengthens nutritional outcomes through coordinated action. POSHAN Abhiyaan was started to enhance nutritional outcomes for children, pregnant women, and breastfeeding mothers through multi-sectoral collaboration and technology-based monitoring systems. The programme focuses on lowering stunting, wasting, underweight prevalence, and anaemia among children and women (Kapur & Suri). Moving forward, NRCs provide specialised facility-based care for severely malnourished children. NRCs offer facility-based care for children with severe acute malnutrition and medical complications (UNICEF India; Kalawati Saran Children's Hospital). Throughout hospitalization, nurses in NRCs evaluate therapeutic nutrition, hydration status, infections and provide caregiver education, ensuring comprehensive recovery (Mathur et al., 2018). On the other hand, the PM POSHAN Scheme contributes to improving nutritional intake among school-going children. The PM POSHAN Scheme promotes nutritional supplements for school-aged children and indirectly helps to reduce childhood undernutrition and poor growth outcomes (Kapur & Suri). Lastly, the RBSK focuses on early identification and management of childhood health issues. RBSK focuses on the early diagnosis and therapy of deficiencies, illnesses, developmental delays, and disabilities among children, particularly nutrition-related disorders (Kapur & Suri). In Fig 3, a brief introduction about the government programs in India for managing malnutrition under the age of five.



multiple
 effective
 ≥ most
 ≥ food,
 among

children under the age of five (Pati et al.). In close relation to this, lack of awareness among caregivers

significantly affects child feeding practices. Many caregivers lack basic knowledge of breastfeeding, supplemental feeding, hand hygiene, and nutritious diets, contributing to poor nutritional practices (Gope et al.).

From a health system perspective, inadequate healthcare infrastructure further worsens the situation. Rural and tribal communities frequently experience shortages of skilled healthcare staff, medical supplies, and nutrition rehabilitation facilities, resulting in delayed diagnosis and treatment (UNICEF India; Kalawati Saran Children's Hospital). Alongside this, poor coordination between departments also acts as a major barrier. Weak coordination across health, nutrition, sanitation, and social welfare departments affects the successful implementation of nutrition programs (Sinha & Sanyal). Cultural influences also play a significant role in shaping feeding practices. Cultural beliefs and feeding practices such as traditional food taboos, delayed supplementary feeding, and misconceptions about child nutrition may contribute to malnutrition (More et al.). Lastly, monitoring and follow-up problems reduce the effectiveness of existing interventions. Inadequate anthropometric assessment, insufficient record management, and infrequent home follow-up visits decrease the efficiency of community-based nutrition programmes (Mathur et al.).

ETHICAL CONSIDERATIONS IN NURSING CARE OF MALNOURISHED CHILDREN

At the outset, respect for human dignity is essential in all nursing interventions. Nurses should give respectful and empathetic care to all children, irrespective of race, sex, socioeconomic class, or geographical background (International Council of Nurses, 2021). In continuation, informed consent ensures transparency and trust in care delivery. Before beginning therapy, caregivers and parents should be properly informed about therapeutic feeding, drugs, treatment methods, and referrals (International Council of Nurses, 2021). Equally important, confidentiality must be maintained throughout the treatment process. Nurses are obligated to protect the confidentiality and privacy of the child's family and medical information (International Council of Nurses, 2021). In the same direction, non-discrimination ensures equitable access to healthcare services. Healthcare services must be provided to all undernourished children without distinction (International Council of Nurses, 2021). From a clinical standpoint, beneficence and non-maleficence guide safe and effective nursing practice. Nurses ought to provide evidence-based nutritional care that benefits the child and prevents future injury or complications (Mathur et al.). Beyond direct care, advocacy is a key responsibility of nurses. Nurses should support children in accessing government support programs, nutrition services, immunizations, and sanitary conditions (UNICEF India; Kalawati Saran Children's Hospital). In conclusion, cultural sensitivity strengthens family cooperation and care outcomes. Nurses must uphold cultural values while educating families about appropriate feeding practices and nutrition management (More et al.).

CONCLUSION

Early detection and effective nursing interventions for malnutrition among children under 5 years are critical for morbidity, reducing mortality and developmental problems (Mathur et al., 2018). Growth-monitoring, nutrition advice, women's group involvement, and home visits are examples of community-based interventions that have dramatically improved nutritional outcomes for disadvantaged populations (Gope et al., 2019). Government initiatives such as ICDS, POSHAN Abhiyaan, Nutrition Rehabilitation Centres, and RBSK have reinforced India's attempts to reduce child malnutrition through integrated service delivery. (Kapur & Suri, 2020). Nurses are responsible for nutritional analysis, caregiver education, supportive feeding, infection control, referral, and continued care (UNICEF India & Kalawati Saran Children's Hospital, 2020). Yet, poverty, food insecurity, insufficient healthcare infrastructure, low awareness, and cultural obstacles continue to impede efficient management (Pati et al., 2018). Ethical nursing care that stresses dignity, equality, confidentiality, and advocacy is required to improve child health outcomes and support long-term nutritional well-being. (International Council of Nurses, 2021).

Abbreviations	Full forms
IAP	Indian Academy of Pediatrics
ICDS	Integrated Child Development Services

MAM	Moderate acute malnutrition
MUAC	Mid-Upper Arm Circumference
NRCs	Nutrition Rehabilitation Centres
ORS	Oral rehydration salt
PEM	Protein-Energy Malnutrition
RBSK	Rashtriya Bal Swasthya Karyakram
RUTF	Ready-to-Use Therapeutic Food
SAM	Severe acute malnutrition
SDG	Sustainable Development Goal
UNICEF	United Nations International Children's Emergency Fund
WHO	WHO

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