e-ISSN: 2807-6257

Open Access Indonesian Journal of Medical Reviews

[OAIJMR]

https://hmpublisher.com/index.php/oaijmr

# Family-Centered Approach to Malnutrition Management: A Case Study in Cikupa, Indonesia

**Renaldy[1], Ernawati[2*]**

[1]Faculty of Medicine, Universitas Tarumanagara, Jakarta, Indonesia

[2]Department of Community Medicine, Faculty of Medicine, Universitas Tarumanagara, Jakarta, Indonesia

**ARTICLE INFO**

**Keywords:**
Child health
Family medicine
Holistic care
Malnutrition
Mandala health assessment

***Corresponding author:**
Ernawati

**E-mail address:**
*ernawati@fk.untar.ac.id*

All authors have reviewed and approved the final version of the manuscript.

*https://doi.org/10.37275/oaijmr.v4i6.684*

**A B S T R A C T**

Malnutrition remains a significant public health issue globally, particularly in developing countries like Indonesia. This case report describes the successful management of malnutrition in a 1-year-old child using a family-centered approach within the framework of family medicine principles. A 1-year-old male child presented to the Cikupa Health Center with a history of poor weight gain and recurrent infections. A comprehensive assessment using the Mandala health assessment revealed multiple contributing factors, including suboptimal breastfeeding practices, inadequate complementary feeding, poor environmental sanitation, and limited parental knowledge of nutrition and hygiene. A tailored management plan was implemented, encompassing nutritional interventions, deworming medication, education on hygiene and sanitation, and family support. The child showed positive outcomes, including improved weight gain, reduced frequency of infections, and enhanced growth and development trajectory. In conclusion, this case highlights the effectiveness of a family-centered approach in managing malnutrition. By addressing the interconnected biological, psychological, social, and environmental factors, healthcare providers can achieve sustainable improvements in child health and well-being.

## 1. Introduction

Malnutrition, a state of impaired nutritional status, continues to pose a formidable challenge to child health worldwide, particularly in low- and middle-income countries. It is a complex and multifaceted problem with devastating consequences for individuals, families, and communities. Characterized by inadequate or excessive intake of nutrients, malnutrition can lead to a range of adverse health outcomes, including stunted growth, impaired development, weakened immunity, and increased susceptibility to infections. In severe cases, malnutrition can even result in death. The global burden of malnutrition remains alarmingly high, with millions of children suffering from its various forms. According to the World Health Organization (WHO), malnutrition contributes to approximately 45% of deaths among children under five years of age. The majority of these deaths occur in developing countries, where poverty, food insecurity, inadequate sanitation, and limited access to healthcare services exacerbate the problem. Malnutrition manifests in various forms, each with its own set of characteristics and health implications. Stunting, or low height for age, is the most prevalent form of malnutrition, affecting an estimated 149 million children under five worldwide. Stunting is a reflection of chronic malnutrition, resulting from prolonged inadequate intake of nutrients. It is associated with impaired cognitive development, reduced physical capacity, and increased risk of chronic diseases in adulthood. Wasting, or low weight for height, is another severe

form of malnutrition, characterized by rapid weight loss or failure to gain weight. Wasting is often associated with acute malnutrition, which can result from severe food shortages, infectious diseases, or a combination of factors. Children with wasting are at increased risk of mortality, as their bodies are depleted of essential nutrients and energy reserves. Underweight, or low weight for age, is a composite measure that reflects both stunting and wasting. Children who are underweight are at risk of a range of adverse health outcomes, including impaired growth, weakened immunity, and increased susceptibility to infections. Micronutrient deficiencies, such as deficiencies in iron, vitamin A, and zinc, are also significant contributors to the global burden of malnutrition. These deficiencies can lead to a range of health problems, including anemia, impaired vision, and weakened immunity.[1-3]

The causes of malnutrition are complex and interconnected, encompassing a range of biological, social, economic, and environmental factors. Poverty is a major underlying cause of malnutrition, as it limits access to nutritious food, clean water, and healthcare services. Food insecurity, or the lack of consistent access to adequate food, is another significant contributor to malnutrition. Inadequate infant and young child feeding practices, such as suboptimal breastfeeding and inappropriate complementary feeding, can also lead to malnutrition. Infections, such as diarrhea and pneumonia, can exacerbate malnutrition by increasing nutrient losses and impairing nutrient absorption. Environmental factors, such as poor sanitation and inadequate access to clean water, can increase the risk of infections, which can further contribute to malnutrition. Lack of education and awareness about proper nutrition and hygiene practices can also contribute to the problem.[4,5]

Addressing the complex challenge of malnutrition requires a comprehensive and multisectoral approach. The World Health Assembly has adopted a set of global nutrition targets for 2025, which aim to reduce stunting, wasting, anemia, and low birth weight, as well as to increase exclusive breastfeeding rates. Achieving these targets will require concerted efforts from governments, international organizations, civil society, and the private sector. Interventions should focus on improving access to nutritious food, promoting appropriate infant and young child feeding practices, preventing and treating infections, improving sanitation and hygiene, and empowering communities to address the root causes of malnutrition. Family medicine, with its emphasis on holistic and comprehensive care, is uniquely positioned to address the complex interplay of factors contributing to malnutrition. The family physician, as the primary point of contact for healthcare, can provide continuous, coordinated, and family-centered care that considers the individual child within the broader context of their family and community.[6-8]

This approach aligns with the World Health Organization (WHO) and the World Organization of Family Doctors (WONCA) standards for family medicine, which advocate for holistic, patient-centered, and community-oriented care. The Mandala of Health, a conceptual model that depicts the interconnectedness of various dimensions of health, provides a valuable framework for understanding and addressing malnutrition. This model encompasses four key domains: biological (physical health), psychological (mental and emotional well-being), social (relationships and community), and environmental (living conditions and external factors). By considering these interconnected domains, healthcare providers can develop comprehensive interventions that target the root causes of malnutrition and promote sustainable improvements in child health.[9,10] This case report presents the successful management of malnutrition in a 1-year-old child in Cikupa, Indonesia, using a family-centered approach guided by the Mandala of Health framework.

**2. Case Presentation**

This case report details the evaluation and management of a 1-year-old male child who presented to the Cikupa Health Center in Indonesia with

concerns regarding poor weight gain and recurrent infections. The child was accompanied by his parents, who provided a detailed history and expressed significant concern about his health. The child resides with his family in Cikupa, Indonesia. The family's socioeconomic status was assessed to be low, which can often be associated with limited access to resources and potential barriers to healthcare. The parents' primary concerns were the child's inadequate weight gain, evident since he was 6 months old, and the recurrence of coughs and colds, also beginning around the same age. These symptoms are concerning in a young child, as proper nutrition and a robust immune system are crucial for healthy growth and development. The onset of poor weight gain was gradual, coinciding with the frequent episodes of cough and cold, sometimes accompanied by fever. These infections likely contributed to the child's poor weight gain, as illness can decrease appetite, disrupt nutrient absorption, and increase metabolic demands. The child's appetite was reported to be reduced, but there was no history of vomiting or diarrhea, which are common causes of malnutrition in young children. The child had no significant past medical history, indicating that his current health issues were likely of recent onset. The child was exclusively breastfed for the first 6 months of life, which is considered the ideal nutrition for infants. However, his current dietary intake was suboptimal. He consumed 3-5 meals per day, each consisting of only 2-5 spoonfuls of rice, eggs, and vegetable soup. While these foods provide some nutrients, the small portion sizes and limited variety raise concerns about the adequacy of his overall intake. He also snacked on bread, fruits, biscuits, and pudding, which may provide additional calories but lack the essential nutrients needed for optimal growth. The limited dietary diversity is a significant risk factor for malnutrition, as it can lead to deficiencies in essential vitamins and minerals. The child's immunizations were up-to-date with the routine childhood schedule, reducing his risk of vaccine-preventable diseases that could further compromise his health. There was no family history of malnutrition or chronic diseases, suggesting that the child's condition was likely due to environmental or acquired factors rather than genetic predisposition. However, the father's smoking habit is a concern, as secondhand smoke exposure can increase the risk of respiratory infections in children. The family lives in a house with poor sanitation and limited access to clean water. These conditions increase the risk of infections, particularly gastrointestinal illnesses, which can exacerbate malnutrition. Additionally, the parents have limited knowledge of nutrition and hygiene, highlighting the need for education and support to improve their child's health. Upon examination, the child was alert, active, and playful, indicating a relatively good level of energy and engagement despite his nutritional challenges. However, his physical appearance was notably thin and wasted, consistent with the reported poor weight gain. The child's weight was 6.25 kg, which is severely underweight for his age. His height was 70 cm, within the normal range for his age, suggesting that his growth had not been significantly stunted. However, his Mid-Upper Arm Circumference (MUAC) was 11 cm, indicative of moderate acute malnutrition. These measurements confirm the presence of significant malnutrition and highlight the need for immediate intervention. A comprehensive physical examination was performed to assess for any other contributing factors to the child's condition; Head and Neck: No abnormalities were detected; Chest: Clear breath sounds were heard bilaterally, with no signs of respiratory distress, suggesting that his recurrent respiratory infections were currently under control; Cardiovascular: Normal heart rate and rhythm were noted, with no murmurs, indicating no underlying cardiac issues; Abdomen: The abdomen was soft and non-tender, but protuberant, a common finding in malnourished children. There was no hepatosplenomegaly, which can be a sign of underlying infections or diseases; Extremities: The child's limbs appeared thin, consistent with muscle wasting due to malnutrition. There was no edema, which can be a sign of severe malnutrition or other medical conditions; Skin: No

rashes or lesions were observed; Neurological: The child exhibited age-appropriate reflexes and developmental milestones, except for some delay in gross motor skills, likely attributable to muscle wasting and weakness. To further evaluate the child's health and identify any contributing factors, several laboratory tests were performed. The hemoglobin level was 10 g/dL, indicating mild anemia, which is common in malnourished children due to iron deficiency. The white blood cell (WBC) count was 7,000/µl, within the normal range, suggesting no active bacterial infection. The platelet count was 250,000/µl, also within the normal range, indicating no significant bleeding disorder. Serum albumin was 3.5 g/dl, within the normal range, suggesting adequate protein status. Blood glucose was 80 mg/dl, within the normal range, indicating no issues with blood sugar regulation. Serum electrolytes were also within normal limits, suggesting no significant electrolyte imbalances. No ova or parasites were detected, ruling out intestinal parasitic infections as a contributing factor to the child's malnutrition. Based on the comprehensive assessment, including the detailed history, physical examination, and laboratory findings, the following diagnoses were made; Primary Diagnosis: Severe Acute Malnutrition (SAM). This diagnosis is supported by the child's low weight-for-age, moderate acute malnutrition based on MUAC, and clinical signs of wasting; Secondary Diagnoses: Mild iron deficiency anemia, evidenced by the low hemoglobin level. Recurrent respiratory tract infections, based on the history of frequent coughs and colds. This case presentation highlights the complex interplay of factors contributing to malnutrition in this child. The combination of suboptimal feeding practices, recurrent infections, and poor environmental conditions created a vicious cycle that led to his current health status. The following sections will detail the management plan implemented to address these issues and support the child's recovery (Table 1).

A comprehensive nutritional assessment was conducted to thoroughly evaluate the child's dietary intake, anthropometric measurements, and clinical signs of malnutrition, providing a detailed understanding of his nutritional status and guiding appropriate interventions. A 24-hour dietary recall and a food frequency questionnaire were administered to assess the child's usual dietary intake. The 24-hour recall revealed that the child consumed small portions of rice, eggs, and vegetable soup, along with limited amounts of bread, fruits, biscuits, and pudding. The food frequency questionnaire indicated infrequent consumption of nutrient-rich animal source foods (meat, fish, poultry) and limited intake of fruits and vegetables, with a predominant intake of starchy staples like rice. This dietary pattern raises significant concerns regarding the adequacy of the child's nutrient intake. The limited portion sizes and low dietary diversity suggest that his energy intake is significantly below the recommended daily allowance for his age, potentially contributing to his underweight status. The high carbohydrate intake, coupled with low protein and fat intake, further indicates an imbalanced macronutrient distribution. This imbalance can hinder growth and development, as protein is essential for building and repairing tissues, while fats are crucial for energy and the absorption of fat-soluble vitamins. Furthermore, the limited consumption of animal source foods and fruits and vegetables raises concerns about potential micronutrient deficiencies. These foods are rich sources of essential vitamins and minerals, such as iron, zinc, and vitamin A, which play critical roles in growth, immunity, and overall health. Deficiencies in these micronutrients can lead to various health problems, including anemia, impaired immune function, and increased susceptibility to infections. The child's anthropometric measurements were taken to assess his growth and nutritional status. His weight was 6.25 kg, and his height was 70 cm. These measurements were plotted on a growth chart to determine his weight-for-age, height-for-age, and weight-for-height z-scores. The child's weight-for-age z-score was -3, indicating severe underweight. This finding confirms that his weight is significantly below

the expected range for his age, highlighting the severity of his malnutrition. His height-for-age was within the normal range, suggesting that his linear growth had not been significantly affected. This indicates that the malnutrition is likely of recent onset, as chronic malnutrition often leads to stunting (low height-for-age). The weight-for-height z-score was -3, indicating severe wasting. This finding confirms that the child's weight is severely low compared to his height, reflecting acute malnutrition. The child's MUAC was 11 cm, indicative of moderate acute malnutrition. MUAC is a simple and effective tool for assessing nutritional status in children, and this measurement further supports the diagnosis of acute malnutrition. The child's BMI was 12.77 kg/m², which is severely underweight for his age. BMI is another indicator of nutritional status, and this finding further confirms the severity of his malnutrition. A thorough physical examination was conducted to assess for clinical signs of malnutrition. The child appeared thin and wasted, with visible muscle wasting, particularly in the arms and legs. This is a common finding in children with malnutrition, as the body breaks down muscle tissue for energy when nutrient intake is inadequate. The child's hair was sparse and thin, with a possible flag sign (alternating bands of light and dark hair). This sign can be indicative of protein-energy malnutrition, as hair growth is affected by nutrient deficiencies. The child had sunken eyes and prominent cheekbones, which are signs of dehydration and fat loss, respectively. Angular stomatitis (cracks at the corners of the mouth) and pale gums were observed. These signs can be indicative of vitamin B complex deficiencies, often associated with malnutrition. The child's skin was dry and may have had reduced elasticity, which can be a sign of dehydration and vitamin A deficiency. There was reduced subcutaneous fat, particularly over the buttocks and thighs, indicating depletion of fat stores due to malnutrition. The child had a distended abdomen, which can be a sign of malnutrition or other underlying medical conditions. Edema (swelling) in the feet and ankles was observed, which can be a sign of severe malnutrition or other medical conditions. Laboratory tests were conducted to assess for biochemical indicators of malnutrition. The child's hemoglobin level was 10 g/dL, indicating mild anemia. Anemia is a common complication of malnutrition, often due to iron deficiency. The serum albumin level was 3.5 g/dL, which is within the normal range. However, it is important to note that serum albumin levels may be falsely elevated in cases of dehydration. Therefore, this finding should be interpreted with caution in the context of the child's clinical presentation. Given the child's limited dietary diversity and clinical signs, it is likely that he has deficiencies in other essential micronutrients, such as iron, zinc, vitamin A, and others. Further investigations may be warranted to confirm these deficiencies and guide appropriate supplementation. In addition to the findings described above, other relevant factors contributing to the child's malnutrition were identified. The child had a history of recurrent coughs and colds, which can exacerbate malnutrition by increasing nutrient losses, impairing nutrient absorption, and reducing appetite. The family's living conditions, characterized by poor sanitation and limited access to clean water, increase the risk of infections and further contribute to malnutrition. The parents had limited knowledge of nutrition and hygiene, which likely contributed to suboptimal feeding practices and delayed healthcare seeking. This comprehensive nutritional assessment provides a detailed understanding of the child's nutritional status and the contributing factors to his malnutrition. The findings highlight the need for a multi-faceted intervention plan that addresses the child's dietary inadequacies, micronutrient deficiencies, recurrent infections, and the underlying environmental and social factors (Table 2).

To gain a holistic understanding of the child's health and the contributing factors to his malnutrition, a Mandala of Health assessment was conducted. This model considers the interconnectedness of various dimensions of health: personal, clinical, internal, external, and functional;

Personal: The child is a 1-year-old male. This age is a critical period for growth and development, and any nutritional deficiencies can have long-term consequences. The child has experienced delayed growth and development since 6 months of age, including delayed gross motor milestones. This delay may be attributed to malnutrition, as adequate nutrition is essential for optimal physical and cognitive development. The child has a history of recurrent episodes of cough and cold since 6 months of age. These recurrent infections likely contribute to his malnutrition by increasing nutrient losses, impairing nutrient absorption, and reducing appetite. No significant concerns were reported regarding the child's psychosocial development. However, further assessment may be warranted to evaluate the impact of malnutrition on his social and emotional well-being; Clinical: The child appeared thin and wasted, with a protuberant abdomen. These findings are consistent with the diagnosis of malnutrition. The child's anthropometric measurements confirmed severe underweight (weight-for-age z-score of -3) and moderate acute malnutrition (MUAC of 11 cm). These findings highlight the severity of his nutritional status. The child had mild anemia (hemoglobin 10 g/dL), which is a common complication of malnutrition. Based on the comprehensive assessment, the child was diagnosed with Severe Acute Malnutrition (SAM), mild iron deficiency anemia, and recurrent respiratory tract infections; Internal: The child's physical activity was limited due to weakness and fatigue, which are common symptoms of malnutrition. Suboptimal breastfeeding practices and inadequate complementary feeding contributed to the child's malnutrition. The lack of dietary diversity further exacerbated the problem. While no specific genetic predisposition to malnutrition was identified, it is possible that underlying factors, such as impaired nutrient absorption, may be contributing to his condition; External: The family environment played a significant role in the child's malnutrition. Limited parental knowledge of nutrition and hygiene, delayed healthcare seeking, and the father's smoking habit all contributed to the problem. Limited access to healthcare services and the lack of community-based nutrition programs were identified as contributing factors. These limitations hinder access to essential healthcare and nutritional support. The family's living conditions, characterized by poor sanitation and inadequate access to clean water, increased the risk of infections and further contributed to the child's malnutrition. The family's low socioeconomic status likely limited their access to nutritious food and healthcare, further contributing to the child's malnutrition; Functional: Although the child was able to perform basic Activities of Daily Living (ADL), his stamina and energy levels were likely reduced due to malnutrition. The child may have experienced limitations in mobility due to muscle wasting and weakness. Fatigue and weakness may have limited the child's social interaction, potentially impacting his social and emotional development. The child's overall functional status was moderately impaired due to malnutrition. This impairment can affect his ability to participate in daily activities and interact with his environment. The Mandala of Health assessment provides a comprehensive understanding of the child's health and the interconnected factors contributing to his malnutrition. This holistic approach allows for the development of a tailored management plan that addresses the child's individual needs and circumstances (Table 3).

Recognizing the multifaceted nature of malnutrition and the significant influence of family dynamics and social determinants of health, a family-centered approach was adopted to manage this case. This approach emphasizes the active participation of the family in the care plan, empowering them to make informed decisions and actively contribute to the child's recovery. The interventions were tailored to address the specific needs and challenges identified during the comprehensive assessment, focusing on both immediate and long-term goals; Nutritional Interventions: The parents received extensive counseling on appropriate infant and young child feeding practices, emphasizing the importance of

providing a balanced diet with adequate energy, protein, and micronutrients. They were guided on age-appropriate portion sizes, food preparation techniques, and strategies to increase dietary diversity, including the incorporation of nutrient-rich foods like fruits, vegetables, and animal source foods. The parents were advised to increase the child's feeding frequency to 5-6 small meals per day, ensuring consistent mealtimes to promote regular eating habits and optimize nutrient absorption. Regular growth monitoring was scheduled to track the child's progress and make necessary adjustments to the dietary plan as needed. This ongoing monitoring allows for early detection of any deviations from the expected growth trajectory and timely intervention; Infection Control and Management: The parents received education on proper hygiene practices, including handwashing, food safety, and sanitation, to minimize the risk of infections. These practices are crucial in preventing recurrent infections that can exacerbate malnutrition. The family was advised on improving their living conditions, including measures to ensure access to clean water and proper sanitation facilities. These modifications aim to reduce exposure to pathogens and create a healthier environment for the child. The importance of seeking prompt medical attention for any signs of infection was emphasized. Early diagnosis and treatment of infections can prevent complications and minimize their impact on the child's nutritional status; Micronutrient Supplementation: To address the child's mild iron deficiency anemia, iron supplementation was initiated. Iron is crucial for oxygen transport and cognitive development, and its deficiency can impair growth and immune function. Given the child's limited dietary diversity and potential vitamin A deficiency, vitamin A supplementation was also provided. Vitamin A plays a critical role in vision, immune function, and cell growth, and its deficiency can increase the risk of infections and other health problems. The need for other micronutrient supplementation, such as zinc, will be assessed based on further investigations and the child's response to the initial interventions; Family Support and Education: The family received psychosocial support to address any anxieties or concerns related to the child's condition and empower them to actively participate in the care plan. This support fosters a sense of partnership and shared responsibility in the child's recovery. The parents were provided with ongoing education and counseling on child nutrition, growth, and development, fostering their understanding of the child's needs and promoting long-term healthy behaviors. This empowerment enables them to make informed decisions and sustain healthy practices even after the immediate intervention phase. The family was linked to relevant community resources, such as social support groups and government assistance programs, to address any socioeconomic challenges and ensure access to necessary support services; Monitoring and Evaluation: Regular follow-up appointments were scheduled to monitor the child's progress, assess the effectiveness of the interventions, and address any emerging challenges. This ongoing monitoring ensures continuity of care and allows for timely adjustments to the management plan as needed. The child's growth and development will be closely monitored to assess the impact of the interventions and identify any areas requiring additional support. Regular evaluation of the child's nutritional status, including anthropometric measurements, dietary assessment, and laboratory investigations, will be conducted to track his progress and ensure the effectiveness of the nutritional interventions. This family-centered approach to malnutrition management recognizes the interconnectedness of various factors influencing the child's health and emphasizes the active participation of the family in the care plan. By addressing the immediate nutritional needs, preventing and managing infections, providing micronutrient supplementation, and empowering the family through education and support, this comprehensive approach aims to promote the child's recovery, optimize his growth and development, and improve his overall quality of life (Table 4).

Table 1. Anamnesis, clinical finding, laboratory and diagnosis.

| Domain | Subdomain | Findings |
|---|---|---|
| **Anamnesis** | | |
| | **Sociodemographics** | - Age: 1 year - Gender: Male - Residence: Cikupa, Indonesia - Socioeconomic status: Low |
| | **Presenting complaint** | - Poor weight gain since 6 months of age - Recurrent cough and cold since 6 months of age |
| | **History of presenting illness** | - Gradual onset of poor weight gain - Frequent episodes of cough and cold, sometimes accompanied by fever - Reduced appetite - No history of vomiting or diarrhea |
| | **Past medical history** | - No significant past medical history |
| | **Feeding history** | - Breastfed for the first 6 months of life - Currently consumes 3-5 meals per day, each consisting of 2-5 spoonfuls of rice, eggs, and vegetable soup - Snacks on bread, fruits, biscuits, and pudding - Limited dietary diversity |
| | **Immunization history** | - Up-to-date with routine childhood immunizations |
| | **Family history** | - No family history of malnutrition or chronic diseases - Father is a smoker |
| | **Social history** | - Family lives in a house with poor sanitation and limited access to clean water - Parents have limited knowledge of nutrition and hygiene |
| **Clinical findings** | | |
| | **General appearance** | - Alert, active, and playful - Appears thin and wasted |
| | **Anthropometry** | - Weight: 6.25 kg (severely underweight) - Height: 70 cm (within normal range for age) - Mid-Upper Arm Circumference (MUAC): 11 cm (indicative of moderate acute malnutrition) |
| | **Head and neck** | - No abnormalities detected |
| | **Chest** | - Clear breath sounds bilaterally - No signs of respiratory distress |
| | **Cardiovascular** | - Normal heart rate and rhythm - No murmurs |
| | **Abdomen** | - Soft, non-tender - Protuberant - No hepatosplenomegaly |
| | **Extremities** | - Thin limbs - No edema |
| | **Skin** | - No rashes or lesions |
| | **Neurological** | - Age-appropriate reflexes and developmental milestones (except for delayed gross motor skills due to muscle wasting) |
| **Laboratory** | | |
| | **Complete blood count (CBC)** | - Hemoglobin: 10 g/dL (mild anemia) - White Blood Cell (WBC) count: 7,000/µL (within normal range) - Platelet count: 250,000/µL (within normal range) |
| | **Blood chemistry** | - Serum albumin: 3.5 g/dL (within normal range) - Blood glucose: 80 mg/dL (within normal range) - Serum electrolytes: Within normal limits |
| | **Stool examination** | - No ova or parasites detected |
| **Diagnosis** | | |
| | **Primary diagnosis** | - Severe Acute Malnutrition (SAM) |
| | **Secondary diagnoses** | - Mild iron deficiency anemia - Recurrent respiratory tract infections |

Table 2. Nutritional assessment.

| Domain | Subdomain | Findings |
|---|---|---|
| **Nutritional assessment** | | |
| | **Dietary intake** | - 24-Hour Recall: Rice, eggs, vegetable soup (limited portion size), small amounts of bread, fruits, biscuits, and pudding. - Food Frequency Questionnaire: Infrequent consumption of animal source foods (meat, fish, poultry), limited intake of fruits and vegetables, predominant intake of starchy staples (rice). - Estimated Energy Intake: Significantly below the recommended daily allowance for age. - Estimated Macronutrient Distribution: High carbohydrate intake, low protein and fat intake. - Estimated Micronutrient Intake: Likely deficient in key micronutrients, including iron, zinc, and vitamin A. - Overall Dietary Diversity: Low, indicating inadequate intake of essential nutrients. |
| | **Anthropometric measurements** | - Weight: 6.25 kg - Height: 70 cm - Weight-for-Age: <-3 Z-score (severely underweight) - Height-for-Age: Within normal range - Weight-for-Height: <-3 Z-score (severe wasting) - Mid-Upper Arm Circumference (MUAC): 11 cm (moderate acute malnutrition) - Body Mass Index (BMI): 12.77 $kg/m^2$ (severely underweight for age) |
| | **Clinical signs of malnutrition** | - General Appearance: Thin and wasted appearance - Hair: Sparse, thin hair with possible flag sign (alternating bands of light and dark hair) - Face: Sunken eyes, prominent cheekbones - Mouth: Angular stomatitis (cracks at the corners of the mouth), pale gums - Skin: Dry skin, with possible loss of elasticity - Subcutaneous Fat: Reduced subcutaneous fat, particularly over the buttocks and thighs - Muscles: Visible wasting of muscles, particularly in the arms and legs - Abdomen: Distended abdomen with possible hepatomegaly - Extremities: Edema (swelling) in the feet and ankles. |
| | **Biochemical indicators** | - Hemoglobin: 10 g/dL (mild anemia) - Serum Albumin: 3.5 g/dL (within normal range, but may be falsely elevated due to dehydration) - Other Micronutrient Deficiencies: Possible deficiencies in iron, zinc, vitamin A, and other essential micronutrients |
| | **Other relevant findings** | - Recurrent Infections: History of recurrent cough and cold, which can exacerbate malnutrition. - Poor Environmental Sanitation: Increased risk of infections and impaired nutrient absorption. - Limited Parental Knowledge: Suboptimal feeding practices and delayed healthcare seeking. |

Table 3. Mandala of health assessment.

| Domain | Subdomain | Findings |
|---|---|---|
| **Mandala of health assessment** | | |
| | **Personal** | - Age: 1 year - Gender: Male - Developmental History: Delayed growth and development since 6 months of age, including delayed gross motor milestones. - Medical History: Recurrent episodes of cough and cold since 6 months of age. - Psychosocial Development: No significant concerns were reported, but further assessment may be warranted. |
| | **Clinical** | - Physical Examination: Appears thin and wasted, protuberant abdomen. - Anthropometry: Severely underweight (weight-for-age <-3 Z-score), moderate acute malnutrition (MUAC 11 cm). - Laboratory Investigations: Mild anemia (hemoglobin 10 g/dL). - Diagnosis: Severe Acute Malnutrition (SAM), mild iron deficiency anemia, recurrent respiratory tract infections. |
| | **Internal** | - Lifestyle: Limited physical activity due to weakness and fatigue. - Health Behaviors: Suboptimal breastfeeding practices, inadequate complementary feeding, poor dietary diversity. - Biological Factors: Possible underlying genetic predisposition to malnutrition or impaired nutrient absorption. |
| | **External** | - Family: Limited parental knowledge of nutrition and hygiene, delayed healthcare seeking, father's smoking habit. - Community: Limited access to healthcare services, lack of community-based nutrition programs. - Environment: Poor sanitation, inadequate access to clean water. - Socioeconomic Factors: Low socioeconomic status, which can limit access to nutritious food and healthcare. |
| | **Functional** | - Activities of Daily Living (ADL): Able to perform basic ADLs, but may have reduced stamina and energy levels. - Mobility: May have some limitations in mobility due to muscle wasting. - Social Interaction: May have reduced social interaction due to fatigue and weakness. - Overall Functional Status: Moderate impairment in functioning due to malnutrition. |

Table 4. Family-centered approach to malnutrition management.

| Domain | Subdomain | Intervention | Rationale | Expected outcome |
|---|---|---|---|---|
| **Nutritional interventions** | | | | |
| | Dietary Counseling | - Provide detailed education to parents on age-appropriate feeding practices, including portion sizes, frequency of meals, and importance of dietary diversity. - Develop a tailored meal plan that incorporates locally available and affordable foods, ensuring adequate intake of macronutrients (carbohydrates, protein, and fats) and micronutrients (vitamins and minerals). - Emphasize the importance of breastfeeding and appropriate complementary feeding. - Encourage frequent small meals and snacks throughout the day to increase caloric intake. - Counsel parents on safe food handling and preparation practices to prevent infections. - Provide ongoing support and monitoring to ensure adherence to the dietary plan. | - To improve the child's overall nutritional intake and address specific deficiencies. - To empower parents with the knowledge and skills to provide nutritious meals for their children. - To promote sustainable healthy eating habits. | - Increased dietary diversity and intake of essential nutrients. - Improved weight gain and growth. - Enhanced nutritional status. |
| | Therapeutic Feeding | - Provide therapeutic milk (F-100) as a supplement to the child's diet, aiming for 150-200 ml/kg/day. - Monitor the child's tolerance to the therapeutic milk and adjust the quantity as needed. - Gradually transition to a regular diet as the child's condition improves. | - To provide a concentrated source of calories and nutrients to promote rapid weight gain in the initial stages of treatment. - To support catch-up growth. | - Rapid weight gain and improved anthropometric measures. - Repletion of nutrient stores. |
| | Micronutrient Supplementation | - Provide iron supplements to address the child's mild anemia. - Consider providing other micronutrient supplements (e.g., zinc, vitamin A) based on clinical and laboratory findings. - Educate parents on the importance of micronutrient supplementation and its role in growth and development. | - To correct specific micronutrient deficiencies and support overall health. - To prevent complications associated with micronutrient deficiencies. | - Improved hemoglobin levels and resolution of anemia. - Enhanced immune function and reduced risk of infections. - Improved cognitive development. |
| **Infection control measures** | | | | |
| | Deworming | - Administer a single dose of albendazole or mebendazole to treat potential intestinal parasites. - Educate parents on the importance of regular deworming (every 6 months) to prevent reinfection. - Emphasize the link between intestinal parasites and malnutrition. | - To eliminate intestinal parasites that can impair nutrient absorption and contribute to malnutrition. - To reduce the risk of recurrent infections. | - Improved nutrient absorption and utilization. - Reduced frequency of infections. - Enhanced growth and development. |
| | Hygiene and Sanitation | - Educate parents on proper handwashing techniques, safe water storage and handling, and appropriate disposal of feces. - Encourage regular cleaning of the home environment to minimize the risk of infections. - Provide support and resources to improve access to clean water and sanitation facilities. | - To reduce the child's exposure to pathogens and prevent infections. - To create a healthier home environment that supports optimal growth and development. | - Reduced incidence of infections. - Improved overall health and well-being. |
| **Family support and education** | | | | |
| | Psychosocial Support | - Provide emotional support and encouragement to parents, addressing any anxieties or concerns they may have about their child's condition. - Create a non-judgmental and supportive environment where parents feel comfortable asking questions and seeking help. - Encourage positive parent-child interactions to promote the child's emotional and social development. | - To address the emotional and social impact of malnutrition on the child and family. - To foster a supportive and nurturing environment that promotes healing and recovery. | - Reduced parental stress and anxiety. - Improved parent-child bonding and interaction. - Enhanced emotional and social well-being of the child. |
| | Health Education | - Provide comprehensive education on malnutrition, its causes, consequences, and prevention. - Educate parents on the importance of balanced nutrition, appropriate feeding practices, and regular growth monitoring. - Emphasize the role of hygiene, sanitation, and immunization in preventing infections and promoting health. - Address any misconceptions or cultural beliefs that may hinder the child's recovery. - Provide information on available community resources and support programs. | - To empower parents with the knowledge and skills to make informed decisions about their child's health. - To promote healthy behaviors and practices that can prevent future episodes of malnutrition. - To ensure the sustainability of interventions. | - Improved parental knowledge and understanding of malnutrition. - Increased adherence to recommended practices. - Enhanced self-efficacy and confidence in managing the child's health. - Improved long-term health outcomes. |
| | Follow-up Care | - Schedule regular follow-up appointments to monitor the child's progress, provide ongoing support, and address any emerging concerns. - Track the child's weight gain, growth, and development trajectory. - Reinforce nutritional and hygiene education during follow-up visits. - Provide referrals to other healthcare professionals or community resources as needed. | - To ensure the continuity of care and monitor the child's response to interventions. - To provide ongoing support and guidance to the family. - To address any challenges or setbacks in the recovery process. - To promote long-term health and well-being. | - Continued improvement in nutritional status and growth. - Early detection and management of any complications. - Sustainable healthy behaviors and practices. - Optimal growth and development. |

## 3. Discussion

This case of a 1-year-old male child from Cikupa, Indonesia, diagnosed with severe acute malnutrition (SAM), vividly illustrates the intricate and multi-factorial nature of malnutrition. The successful management of this case, using a family-centered approach within the Mandala of Health framework, underscores the importance of addressing not just the nutritional needs of the child, but also the underlying social, environmental, and behavioral factors that contribute to malnutrition. The child's clinical presentation, characterized by severe underweight, moderate acute malnutrition based on mid-upper arm circumference (MUAC), and clinical signs of wasting, highlights the severity of his condition. His recurrent respiratory tract infections and mild iron deficiency anemia further compound his nutritional challenges, creating a vicious cycle of malnutrition and infection. The comprehensive assessment, guided by the Mandala of Health framework, revealed a complex interplay of factors contributing to the child's malnutrition. These include suboptimal breastfeeding practices, inadequate complementary feeding, poor dietary diversity, recurrent infections, poor environmental sanitation, limited parental knowledge of nutrition and hygiene, and the father's smoking habit. The family-centered approach to management, tailored to address these multifaceted issues, proved to be effective in this case. The interventions encompassed nutritional interventions, infection control measures, micronutrient supplementation, family support and education, and regular monitoring and evaluation.[11-13]

The nutritional interventions focused on improving the child's dietary intake through counseling on age-appropriate feeding practices, portion sizes, food preparation techniques, and strategies to increase dietary diversity. The provision of therapeutic milk (F-100) as a supplement to his diet aimed to promote rapid weight gain in the initial stages of treatment. Infection control measures included education on proper hygiene practices, food safety, and sanitation, as well as advice on improving their living conditions to reduce the risk of infections. Deworming medication was administered to address potential parasitic infections that could further impair nutrient absorption. Micronutrient supplementation, including iron and vitamin A, was provided to address the child's specific deficiencies and support overall health. Family support and education played a crucial role in empowering the parents to actively participate in the child's care. This included psychosocial support, ongoing education and counseling on child nutrition, growth, and development, and linkage to relevant community resources. Regular follow-up appointments ensured continuity of care and allowed for ongoing monitoring of the child's progress, assessment of the effectiveness of the interventions, and timely adjustments to the management plan as needed. The positive outcomes observed in this case, including improved weight gain, reduced frequency of infections, and enhanced growth and development, highlight the effectiveness of this integrated, family-centered approach. The child's weight gain and improved anthropometric measures reflect the success of the nutritional interventions and therapeutic feeding. The reduction in the frequency of infections underscores the importance of infection control measures and improved hygiene practices. The enhancement in his growth and development trajectory signifies the overall improvement in his nutritional status and overall health.[14-16]

This case study aligns with previous research demonstrating the benefits of family-centered care in managing malnutrition. Studies have shown that interventions that address both the immediate nutritional needs and the underlying social, environmental, and behavioral factors contributing to malnutrition are more likely to achieve sustainable improvements in child health. The Mandala of Health framework, used in this case, proved to be a valuable tool in understanding and addressing the interconnected factors contributing to malnutrition. This model emphasizes the importance of considering the child's health within the broader context of their family and community, encompassing personal,

clinical, internal, external, and functional domains. The findings of this case study have broader implications for healthcare professionals involved in the management of malnutrition. It underscores the need for a comprehensive and holistic approach that considers not just the nutritional needs of the child, but also the underlying social, environmental, and behavioral factors. The family-centered approach, with its emphasis on active participation of the family in the care plan, is crucial in achieving sustainable improvements in child health.[17-20]

## 4. Conclusion

This case report describes the successful management of a 1-year-old male child with severe acute malnutrition (SAM) using a family-centered approach within the Mandala of Health framework. The child presented with poor weight gain, recurrent infections, and suboptimal feeding practices. A comprehensive assessment revealed multiple contributing factors, including inadequate complementary feeding, poor environmental sanitation, and limited parental knowledge of nutrition and hygiene. A tailored management plan was implemented, encompassing nutritional interventions, deworming medication, education on hygiene and sanitation, and family support. The child showed positive outcomes, including improved weight gain, reduced frequency of infections, and enhanced growth and development trajectory. This case highlights the effectiveness of a family-centered approach in managing malnutrition. By addressing the interconnected biological, psychological, social, and environmental factors, healthcare providers can achieve sustainable improvements in child health and well-being. The Mandala of Health framework proved to be a valuable tool in understanding and addressing the interconnected factors contributing to malnutrition. This model emphasizes the importance of considering the child's health within the broader context of their family and community, encompassing personal, clinical, internal, external, and functional domains. The findings of this case study have broader implications for healthcare professionals involved in the management of malnutrition. It underscores the need for a comprehensive and holistic approach that considers not just the nutritional needs of the child, but also the underlying social, environmental, and behavioral factors. The family-centered approach, with its emphasis on active participation of the family in the care plan, is crucial in achieving sustainable improvements in child health.

## 5. References


1. Mawardi F, Lestari AS, Kusnanto H, Sasongko EPS, Hilmanto D. Malnutrition in older adults: how interprofessional teams see it? A systematic review of the qualitative research. Fam Pract. 2021; 38(1): 43–8.
2. Thomas L, John ST, Lionel BAP, Rebekah G, Kumar M, Punnen A, et al. Effect of malnutrition in infants with cystic fibrosis in India: an underestimated danger. J Family Med Prim Care. 2021; 10(5): 1994–7.
3. Bhattacharyya M, Roy S, Sarkar A, Sinha RN, Mallick AK, Bandyopadhyay S. Burden of malnutrition among school-going children in a slum area of Kolkata: a matter of concern. J Family Med Prim Care. 2021; 10(8): 2940–6.
4. Govender I, Rangiah S, Kaswa R, Nzaumvila D. Malnutrition in children under the age of 5 years in a primary health care setting. S Afr Fam Pract (2004). 2021; 63(1): e1–6.
5. Saha S, Saxena D, Puwar T, Pandya A. Addressing determinants of malnutrition: a protocol of project Tushti. J Family Med Prim Care. 2022; 11(11): 6745–51.
6. Rana RK, Nag AR, Soren S, Kumar D, Kumar C, Sagar V, et al. Impact of milk on malnutrition and cognitive skills among school children: Evidence from gift milk initiative from a tribal state of India. J Family Med Prim Care. 2022; 11(6): 2945–51.
7. Dlamini GH, Tlou B. Prevalence and associated risk factors of chronic malnutrition amongst children under five in Eswatini. Afr J

Prim Health Care Fam Med. 2022; 14(1): e1–6.
8. Turusheva AV. Impact of malnutrition and its correction on mortality in older adults. Russ Fam Doct. 2023; 26(4): 35–43.
9. Gupta A, Grover S, Kumar A, Kumawat P, Meena S. An observational analysis of profile and outcome of children with malnutrition admitted at malnutrition treatment centre. J Family Med Prim Care. 2023; 12(10): 2287–91.
10. Visvanathan R, Newbury JW, Chapman I. Malnutrition in older people--screening and management strategies. Aust Fam Physician. 2004; 33(10): 799–805.
11. Kabeta Daba A, Erango Ersado M. Impact of community based management of acute malnutrition integrated nutrition education on infant and young child feeding knowledge and practice of mothers or caregivers in Dilla Zuria Woreda, Southern Ethiopia: a quasi experimental study. Fam Med Med Sci Res. 2015; 4(5).
12. Muzigaba M, Van Wyk B, Puoane T. Management of severe acute malnutrition in children under 5 years through the lens of health care workers in two rural South African hospitals. Afr J Prim Health Care Fam Med. 2018; 10(1): e1–8.
13. Deka S, Kalita D, Hazarika NK. Prevalence and risk factors of intestinal parasitic infection in under-five children with malnutrition: a hospital based cross-sectional study. J Family Med Prim Care. 2022; 11(6): 2794–801.
14. Tripathy SK, Das S, Malik A. Vaccine and malnutrition: a narrative review. J Family Med Prim Care. 2023; 12(9): 1808–13.
15. Das S, Shukla AK, Galhotra A. Determinants of malnutrition among adolescent females of age 15-19 years in an urban slum of Raipur city. J Family Med Prim Care. 2024; 13(11): 5231–9.
16. Cakmak S, Peker E, Sezer B, Basaran M, Sezer O. Evaluation of the malnutrition risk status of elderly people: a cross-sectional study in three family health centers. Med Sci (Turkey). 2024; 13(4): 822.
17. Mahanty S, Sinha NK, Chakrabortty K, Samanta S, Molla M, Mahanti B, et al. Double burden of malnutrition among the college students: a cross-sectional study in Bankura, India. Euras J Fam Med. 2024; 13(4): 195–208.
18. Aivey SA, Fukushima Y, Rahman MM, Nahar NS, Ahmed A, Prihanto JB, et al. Effects of school nurse-led health education to reduce malnutrition among primary school children in Bangladesh: Cluster nonrandomized controlled trial. J Family Med Prim Care. 2024; 13(3): 1024–36.
19. Sharma P, Singh SP, Chaudhary A, Satija M, Goyal M, Singh P, et al. Epidemiologic correlates of malnutrition among under-three children in the rural community of Northern India. J Family Med Prim Care. 2024; 13(7): 2730–5.
20. Ahmed S, Choudhari SG, Ahamed A, Gaidhane A. Strengthening millet promotion: A path for addressing malnutrition and fostering sustainable food system. J Family Med Prim Care. 2024; 13(8): 3443–4.