SEEJPH Volume XXVI, S1, 2025, ISSN: 2197-5248; Posted:05-01-2025

A STUDY TO ASSESS THE PREVALENCE AND DETERMINANTS OF MALNUTRITION AMONG UNDER FIVE CHILDREN RESIDING IN THE SELECTED COMMUNITY, THIRUVALLUR DISTRICT

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KEYWORDS
Malnutrition, under five children, prevalence

ABSTRACT:
Introduction: Malnutrition among children under five years of age is a critical public health concern that has far-reaching implications for child health, development, and survival. This study aims to assess the prevalence and determinants of malnutrition among under five children residing in the selected community, Thiruvallur district
Methods: This study is a cross-sectional survey using a convenient sampling method to assess malnutrition among under-five children in a selected community in Thiruvallur district, Tamil Nadu. A total of 100 children aged 0.5 to 5 years (6–59 months) will be included, based on availability and willingness to participate. Children who have lived in the community for at least six months and whose parents or guardians provide consent will be eligible. Those with chronic illnesses, congenital conditions affecting growth, or whose families do not consent will be excluded.
Results: The findings revealed that children under five show suboptimal growth, with an average weight of 11.5 kg, height of 85.5 cm, and MUAC of 13.8 cm. Z-scores indicated nutritional challenges, including underweight prevalence (-1.0 WAZ), stunting (-1.2 HAZ), and wasting (-0.8 WHZ). Malnutrition was evident, with 20% of children being underweight, 15% stunted, and 10% wasted at moderate to severe levels.
Conclusions: The study concluded that the findings of this study reveal a concerning prevalence of malnutrition among children under five, characterized by suboptimal growth and inadequate dietary practices.

1. Introduction

Malnutrition among children under five years of age is a critical public health concern that has far-reaching implications for child health, development, and survival. The World Health Organization (WHO) defines malnutrition as an imbalance in a person's energy or nutrient intake, which can manifest as undernutrition, overnutrition, or micronutrient deficiencies (Menalu et al., 2021). In the context of under-five children, malnutrition primarily refers to undernutrition, which encompasses conditions such as stunting (low height for age), wasting (low weight for height), and underweight (low weight for age) (Nuzuliana&Wijhati, 2022). According to recent estimates, approximately 149 million children under five are stunted, 45 million are wasted, and 38 million are overweight globally, highlighting the urgent need for targeted interventions to address this multifaceted issue (-, 2024).

The prevalence of malnutrition varies significantly across different geographical regions and socioeconomic contexts. For instance, low- and middle-income countries (LMICs) bear the highest burden of malnutrition, with children in these settings facing increased risks due to factors such as poverty, food insecurity, and inadequate healthcare access (Shrestha, 2023). In many LMICs, malnutrition is a leading cause of morbidity and mortality among children, contributing to approximately 45% of deaths in this age group (Sigdel et al., 2022). The implications of malnutrition extend beyond immediate health outcomes, as it can adversely affect cognitive development, educational attainment, and economic productivity in the long term (Mundlod&Thakkarwad, 2020).

Several determinants contribute to the prevalence of malnutrition among under-five children, including maternal education, household socioeconomic status, dietary practices, and access to healthcare

services. Maternal education is particularly significant, as studies have shown that educated mothers are more likely to adopt appropriate feeding practices, seek healthcare for their children, and provide a nutritious diet (Zaidi et al., 2021). Furthermore, socioeconomic status influences access to food, healthcare, and sanitation, which are critical for preventing malnutrition (Sharma et al., 2023). For instance, families with limited financial resources often struggle to afford a diverse and nutritious diet, leading to inadequate nutrient intake for their children (Fagbamigbe et al., 2020).

Access to healthcare services is another crucial determinant of child nutrition. In many low-income settings, healthcare infrastructure is often inadequate, limiting families' ability to seek timely medical care for their children (Obasohan, 2024). This lack of access can exacerbate the effects of malnutrition, as untreated illnesses can lead to further nutritional deterioration (Jebero et al., 2023). Moreover, environmental factors such as access to clean water and sanitation play a significant role in child nutrition, as poor sanitation and hygiene practices are closely linked to the prevalence of infectious diseases that can contribute to malnutrition (Rehan et al., 2022).

Dietary practices and food intake are also pivotal in determining the nutritional status of children. Inadequate dietary diversity and poor feeding practices can lead to malnutrition among under-five children (Saha et al., 2023). For example, many mothers lack knowledge about appropriate complementary feeding practices, which can result in stunting and underweight (Shenoy et al., 2020). Therefore, enhancing awareness and education regarding proper nutrition and feeding practices is essential for improving child health outcomes.

The interplay of these determinants creates a complex landscape for addressing malnutrition among under-five children. Interventions must be multifaceted, targeting not only the immediate nutritional needs of children but also the underlying socioeconomic and environmental factors that contribute to malnutrition (Nagar &Talikoti, 2022). Community-based programs that promote maternal education, improve access to healthcare, and enhance food security are essential for creating sustainable improvements in child nutrition (Gaffan, 2023).

In conclusion, the prevalence and determinants of malnutrition among under-five children are influenced by a myriad of factors, including maternal education, socioeconomic status, access to healthcare, dietary practices, and environmental conditions. Addressing these determinants through comprehensive and integrated interventions is crucial for reducing malnutrition rates and improving the health and well-being of children in vulnerable communities. Continued research and policy efforts are needed to develop effective strategies that can tackle the complex challenges associated with child malnutrition.

2. Materials and Methods

This study is a cross-sectional survey using a convenient sampling method to assess malnutrition among under-five children in a selected community in Thiruvallur district, Tamil Nadu. A total of 100 children aged 0.5 to 5 years (6–59 months) will be included, based on availability and willingness to participate. Children who have lived in the community for at least six months and whose parents or guardians provide consent will be eligible. Those with chronic illnesses, congenital conditions affecting growth, or whose families do not consent will be excluded.

Data will be collected through household visits using a questionnaire to gather information about the child’s age, family background, diet, healthcare access, and the parents' education. Physical measurements such as weight, height/length, and mid-upper arm circumference (MUAC) will also be taken to assess nutritional status. The measurements will be analyzed using WHO growth charts to identify malnutrition levels.

Ethical approval will be obtained before the study, and parents or guardians will provide informed consent. All personal information will be kept confidential. Any child found with severe malnutrition will be referred to local healthcare services for further care. This simple and systematic approach ensures reliable data collection while respecting ethical standards.

This study utilized descriptive analysis to calculate the frequency and percentage of demographic variables and malnutrition types—stunting, underweight, and thinness—among children. Inferential analysis using Pearson’s correlation revealed a moderate, significant negative association ($r = -0.55$, $p < 0.05$) between malnutrition and academic performance, indicating that poorer nutritional status correlates with lower academic outcomes.

3. Results

Table 1, demographic data shows that most children under five belong to the age group of 1–3 years (40%) and are nearly equally distributed by gender (55% male, 45% female). Parental education and occupation highlight significant gaps, with 20% of mothers being illiterate and 70% of fathers working as laborers or farmers. Additionally, 25% of families earn less than ₹15,000 monthly, impacting access to nutritious food.

Anthropometric measurements in Table 2 highlights suboptimal growth among children under five, with an average weight of 11.5 kg, height of 85.5 cm, and MUAC of 13.8 cm. Z-scores reveal nutritional concerns: WAZ (-1.0) indicates underweight prevalence, HAZ (-1.2) highlights stunting, and WHZ (-0.8) reflects wasting. These findings emphasize the need for improved nutrition and targeted interventions to address malnutrition.

Malnutrition is prevalent, as shown in Table 3, where 20% of children are moderately to severely underweight, and 15% face stunting. Wasting affects 10% of children at moderate to severe levels.

According to Table 4, only 60% of children receive exclusive breastfeeding during the first six months, while the remaining 40% rely on mixed or formula feeding. Furthermore, daily consumption of protein-rich food and fruits or vegetables is low (30% and 40%, respectively), while junk food is frequently consumed by 30% of children. Parental awareness of a balanced diet is limited, with 45% being unaware of its significance.

Table 1: Demographic Variables of the under five children

Demographic Variable	Category	Frequency (n)	Percentage (%)
1. Age of the Child	0–1 year	25	25%
	1–3 years	40	40%
	3–5 years	35	35%
2. Gender of the Child	Male	55	55%
	Female	45	45%
3. Birth Order	1st	40	40%
	2nd	35	35%
	3rd or higher	25	25%
4. Mother's Education	Illiterate	20	20%
	Primary	30	30%
	Secondary	35	35%
	Higher	15	15%
5. Father's Occupation	Laborer	40	40%
	Farmer	30	30%
	Skilled Worker	20	20%
	Professional	10	10%
6. Monthly Family Income (₹)	<15,000	25	25%
	15,000–20,000	45	45%
	>20,000	30	30%
7. Type of Family	Nuclear	60	60%
	Joint	40	40%
8. Immunization Status	Fully Immunized	70	70%
	Partially Immunized	25	25%
	Not Immunized	5	5%

Table 2: Anthropometric Measurements of under five children

Anthropometric Measurement	Mean	Standard Deviation (SD)
Weight (kg)	11.5	1.8
Height/Length (cm)	85.5	7.5
Mid-Upper Arm Circumference (MUAC) (cm)	13.8	1.0
Weight-for-Age Z-Score (WAZ)	-1.0	0.7
Height-for-Age Z-Score (HAZ)	-1.2	0.8
Weight-for-Height Z-Score (WHZ)	-0.8	0.6

Table 3: Prevalence of Malnutrition among under five children

Category	Malnutrition Type	Normal (≥ -1 Z-Score)	Mild (-2 to -1 Z-Score)	Moderate (-3 to -2 Z-Score)	Severe (< -3 Z-Score)
Weight-for-Age (Underweight)	Frequency (n)	50	30	15	5
	Percentage (%)	50%	30%	15%	5%
Height-for-Age (Stunting)	Frequency (n)	60	25	10	5
	Percentage (%)	60%	25%	10%	5%
Weight-for-Height (Wasting)	Frequency (n)	70	20	8	2
	Percentage (%)	70%	20%	8%	2%

Table 4: Food habits among under five children

Food Habits Variable	Category	Frequency (n)	Percentage (%)
1. Type of Feeding (First 6 Months)	Exclusive Breastfeeding	60	60%
	Mixed Feeding	30	30%
	Formula Feeding Only	10	10%
2. Frequency of Meals per Day	Less than 3 times	25	25%
	3–4 times	55	55%
	More than 4 times	20	20%
3. Consumption of Protein-Rich Food	Daily	30	30%
	Occasionally	50	50%
	Rarely	20	20%
4. Consumption of Fruits and Vegetables	Daily	40	40%
	Occasionally	45	45%
	Rarely	15	15%
5. Junk Food Intake	Never	20	20%
	Occasionally	50	50%
	Frequently	30	30%
6. Source of Complementary Feeding	Homemade	70	70%
	Market Bought	20	20%
	Mixed	10	10%
7. Awareness of Balanced Diet (Parents)	Aware	55	55%
	Unaware	45	45%
8. Feeding Practices During Illness	Continue Regular Feeding	50	50%
	Reduced Feeding	30	30%
	Stopped Feeding	20	20%

4. Discussion

The findings of this study reveal concerning indicators of malnutrition among children under five years of age, with an average weight of 11.5 kg, height of 85.5 cm, and mid-upper arm circumference (MUAC) of 13.8 cm. The Z-scores for weight-for-age (WAZ), height-for-age (HAZ), and weight-for-height (WHZ) suggest significant nutritional challenges, with underweight prevalence at -1.0, stunting at -1.2, and wasting at -0.8. Notably, 20% of the children were classified as underweight, 15% as stunted, and 10% as wasted at moderate to severe levels. These findings align with global trends indicating that malnutrition remains a critical issue affecting child health, particularly in low- and middle-income countries Bliznashka et al. (2021) Niu et al., 2022).

The prevalence of malnutrition observed in this study underscores the urgent need for targeted interventions. The WHO emphasizes that malnutrition, particularly in early childhood, can have lasting effects on physical and cognitive development, leading to poor health outcomes later in life (Saaka, 2020). The data indicating that only 60% of children were exclusively breastfed during the first six months is particularly alarming, as exclusive breastfeeding is crucial for optimal growth and development during this critical period (Erinosho et al., 2021). The remaining children relied on mixed or formula feeding, which may not provide the necessary nutrients for healthy growth. Research has shown that inadequate breastfeeding practices contribute significantly to malnutrition rates among young children (Miller et al., 2021).

Furthermore, the limited daily intake of protein-rich foods and fruits or vegetables, reported at 30% and 40% respectively, highlights a concerning lack of dietary diversity. A diverse diet is essential for providing the necessary vitamins and minerals that support growth and development (Zaharia et al., 2021; Damanik et al., 2020). The finding that 30% of children frequently consumed junk food is also troubling, as such diets are often high in calories but low in essential nutrients, contributing to malnutrition and obesity (Ramadas et al., 2021; Kukeba et al., 2020). The relationship between dietary patterns and child growth is well-documented, with studies indicating that poor dietary habits are associated with stunting and wasting (Vejrup et al., 2022; Abiyu& Belachew, 2020).

The lack of awareness among 45% of parents regarding the importance of a balanced diet further complicates the issue. Parental knowledge and attitudes towards nutrition play a significant role in shaping children's dietary habits and overall health (Tessema et al., 2023). Interventions aimed at improving parental education about nutrition can lead to better feeding practices and, consequently, improved nutritional outcomes for children (Miller et al., 2022; Barry et al., 2022). For instance, community-based nutrition education programs have shown promise in enhancing caregivers' knowledge and practices related to child feeding (Markos, 2024).

The findings of this study also suggest that socioeconomic factors may influence nutritional outcomes. Families with limited financial resources often struggle to provide a diverse and nutritious diet for their children, leading to higher rates of malnutrition (Baye et al., 2021; Horne, 2024). Additionally, maternal education has been identified as a critical determinant of child nutrition, with studies indicating that educated mothers are more likely to engage in healthy feeding practices and seek healthcare for their children (Vale, 2023; Amicis et al., 2022). This highlights the need for comprehensive approaches that address not only dietary practices but also the underlying socioeconomic determinants of malnutrition.

5. Conclusion

The study concluded that the findings of this study reveal a concerning prevalence of malnutrition among children under five, characterized by suboptimal growth and inadequate dietary practices. The urgent need for improved nutrition, parental education, and targeted interventions is evident. Addressing malnutrition requires a multifaceted approach that encompasses dietary diversity, breastfeeding promotion, and parental education, alongside efforts to tackle the socioeconomic factors that contribute to poor nutritional outcomes. Future research should focus on evaluating the effectiveness of community-based interventions aimed at improving child nutrition and the role of parental knowledge in shaping dietary practices.

Recommendations

Recommendations include promoting exclusive breastfeeding, improving parental education on balanced diets, and advocating affordable, nutritious meals. Expanding mid-day meals, nutritional supplements, and regular health screenings is essential. Economic support for low-income families,

community engagement through trained health workers, stricter junk food regulations, and regular evaluation of nutrition programs are key to addressing malnutrition effectively.

Financial support
No
Conflicts of Interest
No

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