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# MATERNAL NUTRITION KNOWLEDGE AMONG CAREGIVERS OF MALNOURISHED UNDER-FIVE CHILDREN: A QUALITATIVE HOSPITAL-BASED STUDY IN RURAL SOUTH AFRICA

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## Abstract

***Background:*** *Child malnutrition remains a preventable contributor to under-five morbidity and mortality in rural South Africa. Although updated global and South African guidance emphasises prevention, early identification, breastfeeding support, safe complementary feeding and timely referral, caregiver knowledge and care-seeking pathways remain uneven in resource-constrained settings [1].*

***Aim:*** *To explore caregivers' feeding practices, understanding of malnutrition, home responses to childhood illness and pathways to formal care among under-five children admitted for nutritional rehabilitation.*

***Setting:*** *A rural district hospital serving low-income communities in King Cetshwayo District, KwaZulu-Natal, South Africa.*

***Methods:*** *A qualitative descriptive study was conducted with purposively selected mothers and primary caregivers of under-five children admitted with malnutrition. Ten unstructured face-to-face interviews were conducted in isiZulu, audio-recorded, transcribed, translated into English and analysed using qualitative content analysis. Rigour was strengthened through an audit trail, reflexive notes, de-identification of transcripts and language verification.*

***Results:*** *Four interrelated themes were identified: feeding practices; caregiver knowledge of malnutrition; interventions undertaken after recognising illness; and access to health care services. Caregivers described early introduction of thin cereal-based feeds, formula dilution, low dietary diversity, limited recognition of danger signs, reliance on home or traditional remedies, and delayed care seeking shaped by poverty, cultural explanations of illness and fear of negative staff attitudes.*

***Conclusion:*** *In this rural setting, inadequate nutrition knowledge was not a stand-alone problem; it operated with poverty, sociocultural illness interpretations and perceived health-system barriers. Routine primary health care should therefore combine practical feeding counselling, safe formula-preparation support, ORS demonstration, culturally respectful harm-reduction messages and respectful provider-caregiver communication.*

***Contribution:*** *The study provides context-specific evidence on how caregiver knowledge, household constraints and care-seeking decisions interact before hospital admission, offering practical entry points for strengthening PHC-based prevention and early management of child malnutrition in rural South Africa.*

## INTRODUCTION

Malnutrition is a pathological state arising from inadequate, excessive or imbalanced nutrient intake and poor diet quality. In young children, the most clinically urgent forms are wasting, severe acute malnutrition (SAM), underweight, stunting and micronutrient deficiencies. Severe acute malnutrition in children aged 6-59 months is commonly identified by a mid-upper arm circumference below 115 mm, a weight-for-height z-score below -3, or the presence of bilateral pitting oedema, and these criteria remain central to community screening and clinical management [1].

Globally, undernutrition remains closely linked with preventable child illness, delayed growth, impaired neurodevelopment and increased mortality risk. Current guidance no longer treats wasting only as an inpatient problem; it emphasises prevention, early detection, continuity of care after discharge, relapse reduction, social support and integration with routine child-health services [1]. This shift is important for rural South African settings where late presentation is often the visible endpoint of earlier household-level difficulties in feeding, illness recognition and access to care.

Infant and young child feeding (IYCF) is a modifiable pathway through which families, communities and PHC services can reduce malnutrition risk. The World Health Organization recommends exclusive breastfeeding for the first six months, continued breastfeeding with nutritionally adequate and safe complementary foods from six months, responsive feeding, dietary diversity and hygiene in food preparation [2]. In practice, however, caregivers experiencing poverty may rely on thin maize-meal porridge, diluted formula, tea, sugar water or monotonous starchy foods, not because they do not care, but because knowledge, affordability and access constraints intersect.

South Africa carries a persistent double burden of malnutrition, where chronic undernutrition coexists with overweight and obesity. UNICEF's 2024 child food poverty analysis reported that 23% of children in South Africa live in severe child food poverty, meaning they consume foods from two or fewer food groups per day [3]. This matters because poor dietary diversity directly limits protein, energy, iron, zinc, vitamin A and other micronutrients required for immune function, growth and recovery after infection.

KwaZulu-Natal remains a critical context for child nutrition research because rural poverty, high caregiver unemployment, food insecurity, infectious disease burdens and travel barriers combine with uneven service access. Recent KwaZulu-Natal evidence indicates that acute malnutrition among under-five children is associated with poor diet quality, low household income and mixed feeding practices [4]. Hospital-based evidence from the province also shows that severe acute malnutrition continues to contribute substantially to under-five deaths despite guideline-driven inpatient management [5].

The HIV context adds further complexity. Updated HIV and infant-feeding guidance supports breastfeeding for mothers living with HIV when they are receiving and adhering to antiretroviral therapy, because breastfeeding provides major survival benefits while ART markedly reduces postnatal transmission risk [6]. Yet some caregivers continue to fear HIV transmission through breastfeeding, which may lead them to choose formula feeding even when formula is unaffordable, inconsistently prepared or diluted to make it last longer.

Care-seeking delay is rarely caused by one factor. Caregivers may first interpret weight loss, diarrhoea, vomiting, poor appetite or weakness through household experience, advice from elders, traditional childhood illness categories or fear of being blamed by health workers. These pathways are not peripheral to malnutrition management;

they shape when the child reaches formal care and how severe the illness is at presentation. Understanding these pathways is therefore essential for PHC services that aim to prevent malnutrition rather than only manage its complications.

This study explored caregivers' nutrition knowledge, feeding practices and care-seeking experiences for malnourished under-five children admitted to a rural district hospital in KwaZulu-Natal. The purpose was not to quantify prevalence, but to generate practice-relevant insight into how caregivers explain feeding decisions, recognise illness, respond at home and decide when to seek formal care. Such evidence can strengthen context-specific PHC counselling, referral and community engagement strategies.

## Methods

### Study design

A qualitative descriptive design was used to generate a close, practice-oriented account of caregivers' feeding practices, knowledge of malnutrition and care-seeking pathways. This design was appropriate because the study sought to describe experiences and meanings in accessible clinical language rather than generate a formal theory. Reporting was strengthened using qualitative reporting principles emphasising transparency of context, sampling, data collection, reflexivity, analysis and interpretation [7].

### Setting

The study was conducted at a rural district hospital in King Cetshwayo District, KwaZulu-Natal, South Africa. The hospital serves predominantly rural and low-income communities where households often face transport barriers, food insecurity and constrained access to regular child-health services. Interviews were conducted in a private office close to the paediatric ward to protect confidentiality while remaining feasible for caregivers whose children were admitted.

### Participants and sampling

Participants were mothers or primary caregivers aged 18 years and older whose children under five years were admitted for malnutrition between January and July 2017. Purposive sampling was used because the study required information-rich participants who were directly involved in feeding, daily care and decisions to seek help. Inclusion criteria were caregiver age of 18 years or older, child age under five years, admission for malnutrition, residence within the hospital catchment area and caregiver involvement in the child's care since birth. Caregivers of children aged five years or older, non-residents and caregivers not responsible for daily care were excluded.

Ten caregivers were interviewed. Data collection stopped when interviews no longer generated substantially new meanings across the main domains of feeding, illness interpretation, home response and access to care. The final sample size is defensible for a focused qualitative descriptive study with a narrow participant group and recurring patterns across interviews; however, it is reported transparently as a limitation because saturation claims in qualitative work should be aligned with study scope and information power rather than treated as a numerical rule [8].

### Recruitment and consent

Potential participants were identified from paediatric admission registers and dietetic records, with ward staff facilitating initial contact. The researcher explained the study purpose, voluntary participation, confidentiality, the right to decline questions and the right to withdraw without affecting the child's care. Written informed consent was obtained before each interview, including consent for audio-recording.

### Data collection

Unstructured, face-to-face interviews were conducted in isiZulu by a clinician-researcher fluent in the language. The interview prompts covered the child's usual feeding pattern, preparation of feeds and meals, caregivers' understanding of malnutrition, perceived causes and signs of illness, home or traditional remedies, and the sequence of events that led to hospital presentation. Interviews lasted approximately 30-40 minutes, were audio-recorded with permission and supported by field notes.

**Researcher reflexivity and trustworthiness**

The interviewer's clinician role was acknowledged as both a strength and a possible influence on participants' responses. Reflexive notes documented assumptions, the ward context, participant comfort and possible power dynamics. Trustworthiness was supported through private interviewing, verbatim transcription, translation checking by an independent bilingual language practitioner, de-identification, an audit trail linking codes to raw data and repeated engagement with transcripts before themes were finalised [9].

**Data management and analysis**

Audio recordings were transcribed verbatim and translated into English. A qualitative content analysis approach was used. Transcripts were read repeatedly to achieve immersion; meaning units were identified; similar units were coded; related codes were grouped into categories; and categories were organised into themes. Analysis was primarily deductive in that it was guided by the interview domains, but coding remained close to participant accounts so that unanticipated meanings could be retained. Four themes were finalised: feeding practices; caregiver knowledge of malnutrition; interventions undertaken after recognising illness; and access to health care services.

**Ethical considerations**

Ethical approval was obtained from the University of South Africa Health Studies Ethics Committee (HSHDC/614/2017). Gatekeeper permission was granted by the district hospital management and relevant provincial health authorities. Interviews were conducted at convenient times in a private space. No incentives were provided, although reasonable transport reimbursement was offered when return visits were required. Transcripts were de-identified, facility and personal identifiers were removed, and data were stored on password-protected devices accessible only to the research team.

**Results**

The analysis produced four interrelated themes that describe the pathway from household feeding and illness interpretation to formal care. Table 1 summarises the themes, subthemes and condensed illustrative quotations. Non-English illness terms are retained because they carry local meaning and are important for culturally safe counselling.

**Table 1: Themes, subthemes and condensed illustrative quotations**

| Theme | Subtheme | Condensed illustrative quotations |
|---|---|---|
| Feeding practices | Type of feed, frequency and amount | "I chose formula feeding because of my HIV status and fear of infecting my baby." "I cannot say exactly how many times I feed in a day; sometimes tea is given in the same bottle." "Milk is expensive; the scoops are reduced to make it last." |
| Feeding practices | Preparation of meals | "Maize-meal porridge started at two months because milk alone did not fill the baby." "Most days are porridge and mashed potatoes; affordable and easy to prepare." "A big pot of porridge is kept at room temperature for days." |

| | | |
|---|---|---|
| Knowledge about malnutrition | Understanding the child's condition | "The child was thought to not like food; the severity of illness was not recognised." |
| Knowledge about malnutrition | Causes and prevention | "Economic constraints led to diluting formula; half milk is better than water." "The grant does not cover needs; formula is very expensive." |
| Knowledge about malnutrition | Signs, symptoms and consequences | "Concern arose only when the child became very weak and inactive." "When there was no milk, weak tea or water was given; that is when the child became sick." |
| Interventions after recognising illness | Home care remedies | "Sugar-salt solution from the Road to Health Booklet was prepared and given in small amounts during vomiting." "Elders diagnosed isela and managed it using an enema." "Green stools were interpreted as inyoni and treated with an enema." |
| Interventions after recognising illness | Other interventions | "Mist Alba was given for biliousness; diarrhoea worsened." "After the enema failed, a traditional healer was consulted; no improvement followed." |
| Accessing health-care services | Reasons for bringing the child to hospital | "Hospital care was sought when the child became very weak, stopped eating and developed diarrhoea." |
| Accessing health-care services | Reasons for delayed access | "Fear of being shouted at by nurses contributed to delayed care-seeking." |



**Theme 1: Feeding practices**

Caregivers described feeding practices shaped by affordability, fear, household advice and limited practical counselling. Formula feeding was sometimes selected because of fear of HIV transmission. However, formula was often unaffordable, leading some caregivers to reduce scoops, stretch feeds or substitute tea and water. These practices reduce energy and nutrient density and increase the risk that a child already vulnerable to infection will enter a cycle of poor intake, diarrhoea, weakness and weight loss [2].

Complementary feeding practices were also problematic. Several caregivers introduced maize-meal porridge before six months because they perceived milk alone as insufficient. Diets were often dominated by porridge, potatoes and inexpensive starches, with little mention of animal-source foods, legumes, vegetables or fruit. This pattern reflects a structural problem as much as a knowledge problem: caregivers cannot

implement diversified feeding if nutritious foods are unavailable or unaffordable [3].

**Theme 2: Caregiver knowledge about malnutrition**

Caregivers often recognised that the child was not feeding well but did not initially interpret poor appetite, weight loss, persistent diarrhoea or weakness as danger signs. Some accounts suggested that malnutrition was understood as a feeding difficulty or child preference rather than a potentially life-threatening clinical condition. Recognition tended to occur late, once the child became severely weak, inactive or unable to eat.

The findings show that knowledge gaps were practical rather than purely informational. Caregivers needed clearer guidance on what adequate feeding looks like, what danger signs require immediate care, how to prepare formula safely when used, why tea and diluted formula are unsafe substitutes, and how to continue feeding during diarrhoea or vomiting. Routine child-health contacts therefore need demonstration-based counselling rather than generic advice.

**Theme 3: Interventions after recognising illness**

Before hospital admission, caregivers commonly tried home interventions. Some prepared sugar-salt solution after reading or remembering advice from the Road to Health Booklet. This is a protective practice when mixed correctly and used early, but caregivers' accounts suggested uncertainty about preparation, frequency and when to stop home management and seek care. PHC visits should therefore include practical ORS demonstration and danger-sign counselling [10].

Other responses were riskier. Some symptoms were interpreted through local childhood illness categories such as isela and inyoni, and enemas or traditional remedies were used before hospital care. These actions were not random; they reflected trusted household and community knowledge systems. However, enemas and irritant preparations can worsen dehydration or cause rectal injury, chemical colitis and other complications. Effective PHC counselling should not ridicule cultural explanations; it should respectfully explain risk and encourage early referral [11].

**Theme 4: Access to health care services**

Hospital care was usually sought when the child had become visibly very weak, stopped eating, developed persistent diarrhoea or failed to improve after home measures. This sequence indicates that caregivers did not necessarily reject formal care; rather, formal care was reached after household management had failed. By then, the child's condition was often advanced, increasing the burden on hospital services and reducing the margin for recovery.

Fear of being shouted at or judged by nurses contributed to delay. This point is central for PHC quality improvement. A technically correct nutrition message will fail if caregivers expect humiliation when they disclose formula dilution, early porridge use, traditional remedies or delayed attendance. Respectful communication is therefore not "soft" practice; it is a clinical intervention that can reduce delay and improve early presentation.

**Discussion**

This study shows that late presentation of malnourished under-five children in rural KwaZulu-Natal is produced by an interlocking pathway: household feeding constraints, limited recognition of malnutrition, culturally mediated illness interpretation, home or traditional interventions, fear of negative staff attitudes and delayed access to formal care. The results are consistent with newer evidence from KwaZulu-Natal showing associations between acute malnutrition, poor diet quality, low household income and mixed feeding practices [4].

The feeding findings reinforce the need to move beyond one-way nutrition education. Caregivers did not simply lack information; they were making feeding decisions under pressure. Formula dilution and reliance on thin cereal feeds were linked to affordability and household food insecurity. UNICEF's 2024 evidence that nearly one-quarter of South African children experience severe child food poverty makes it unrealistic to treat dietary diversity as an individual behavioural choice alone [3]. PHC counselling must therefore be linked with social protection, food support and referral to available community resources.

The HIV-related feeding findings are especially important. Fear of HIV transmission pushed some caregivers toward formula feeding, even when formula use was economically unsafe. Current guidance supports breastfeeding for mothers living with HIV when antiretroviral therapy is maintained and viral suppression is supported [6]. PHC services therefore need repeated, non-judgemental counselling that explains breastfeeding, ART adherence, infant prophylaxis where relevant and safe alternatives only when they are acceptable, feasible, affordable, sustainable and safe.

The study also exposes a weak point in routine child-health counselling: caregivers often acted only when illness became severe. This delayed recognition is dangerous because wasting and dehydration can deteriorate rapidly in young children. The updated WHO wasting guideline places greater emphasis on prevention, early identification and continuity of care, which aligns strongly with these findings [1]. The practical implication is that danger-sign counselling should be repeated at immunisation, growth monitoring, ART, postnatal and acute-care visits, not reserved for children already admitted.

Traditional interpretations and enemas should be addressed carefully. Dismissing local illness categories may push caregivers away from PHC services, while silence allows potentially harmful practices to continue. A more effective strategy is culturally respectful harm reduction: ask caregivers what they think is happening, acknowledge family advice, explain why enemas can worsen dehydration or injure the bowel, and give a clear threshold for urgent care. Evidence on enema-related injuries confirms that these practices can have devastating outcomes [11].

The health-system finding is blunt: if caregivers fear nurses, they delay. Respectful care is not optional courtesy; it changes care-seeking behaviour. Provider behaviour change, supportive supervision and communication training should therefore be part of malnutrition prevention. This is particularly important in rural settings where caregivers may already face transport costs, household responsibilities and anxiety about being blamed for poverty-driven feeding decisions.

The findings also fit wider South African evidence showing that SAM remains a significant contributor to under-five hospital mortality. KwaZulu-Natal referral-hospital data showed persistent SAM case-fatality concerns despite improvements in HIV-related outcomes [5]. Another South African hospital-based study reported high SAM prevalence and mortality linked with severe illness and sepsis [12]. These data strengthen the argument that earlier community and PHC-level prevention is necessary; hospitals are receiving children too late in the pathway.

For policy and practice, the central message is that malnutrition prevention must be integrated into routine PHC rather than treated as a separate vertical topic. Counselling should include age-appropriate breastfeeding and complementary feeding; safe formula preparation where formula is used; clear instruction on avoiding tea, juice and diluted feeds; ORS demonstration; danger-sign recognition; culturally sensitive discussion of traditional remedies; growth monitoring follow-up; and social support referral. These actions align with WHO complementary feeding guidance, WHO wasting guidance and South African PHC and paediatric treatment guidance [1].

**Strengths and limitations**

A key strength of the study is that interviews were conducted in isiZulu with caregivers directly responsible for feeding and daily care, allowing participants to describe practices and meanings in familiar language. The study also provides clinically useful insight into the sequence of decisions before admission, which is often missed in hospital records. Translation checking, reflexive notes and an audit trail strengthened credibility and dependability.

The main limitation is that data were collected in 2017 from one rural district hospital and involved a small purposive sample of ten caregivers. The findings are therefore not statistically generalisable. However, the purpose of qualitative description is transferability rather than prevalence estimation, and the core issues identified - poverty, low dietary diversity, mixed feeding, delayed recognition, cultural

interpretation and fear of staff judgement - remain highly relevant in light of 2023-2025 guidance and South African child food poverty evidence [3].

Another limitation is that only caregiver perspectives were included. Future research should include nurses, dietitians, community health workers, traditional health practitioners, elder caregivers and fathers or other household decision-makers. This would strengthen understanding of how counselling messages are received, modified or resisted across the household and community system.

**Recommendations for practice and research**

First, PHC facilities should embed a short, standardised but locally adaptable IYCF message into every under-five contact. The message should cover exclusive breastfeeding, complementary feeding from six months, continued breastfeeding, dietary diversity using affordable local foods, safe formula preparation when formula is used, and the risks of tea, juice and diluted feeds [2].

Second, nurses and community health workers should demonstrate ORS preparation rather than only telling caregivers to use it. Demonstration should be paired with three clear danger signs requiring immediate care: inability to drink or breastfeed, persistent vomiting or diarrhoea, and unusual weakness or lethargy. This recommendation is practical, low-cost and directly linked to the delays described by caregivers.

Third, PHC teams should adopt culturally respectful harm-reduction counselling on enemas and traditional remedies. The message should not insult caregivers or elders. It should explain that some remedies inserted through the anus can burn, injure or dehydrate the child, and that weakness, diarrhoea and refusal to feed require urgent clinical assessment.

Fourth, respectful provider-caregiver communication should be treated as a measurable quality-of-care issue. Facilities should include caregiver experience, fear of reprimand and counselling clarity in quality-improvement discussions. Staff training should emphasise that blaming caregivers for poverty-driven feeding practices is clinically counterproductive.

Fifth, future research should test co-designed community nutrition interventions involving mothers, elder caregivers and community health workers; compare rural and peri-urban care-seeking pathways; and evaluate whether respectful-care training reduces delayed presentation for childhood malnutrition. Mixed-method designs would be useful to connect lived experience with measurable outcomes such as age at presentation, MUAC at admission, relapse and follow-up attendance.

**Conclusion**

In this rural South African setting, child malnutrition reflected more than inadequate caregiver knowledge. It resulted from the interaction of poverty, constrained food choices, fear-driven feeding decisions, limited danger-sign recognition, culturally mediated home responses and perceived judgement within formal health services. A submission-ready interpretation of these findings is clear: PHC services must combine accurate nutrition guidance with practical demonstrations, respectful communication, culturally safe harm-reduction counselling and social support referral. Doing so can shorten the pathway from early symptoms to appropriate care and reduce the likelihood that children reach hospital only when malnutrition is already advanced.

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**Competing interests**

The authors declare that they have no financial or personal relationships that may have inappropriately influenced them in writing this article.

**Authors' contributions**

N.I.D. conceptualised the study, collected and analysed the data and prepared the initial manuscript. M.J.H. contributed to manuscript

refinement, critical review and preparation for journal submission. All authors approved the final manuscript.

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**Data availability**
The qualitative data are not publicly available because interview transcripts contain sensitive contextual information. De-identified excerpts may be made available from the corresponding author upon reasonable request and subject to ethics approval conditions.

**Disclaimer**
The views expressed in this manuscript are those of the authors and do not necessarily represent the official position of their affiliated institution or the study site.

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