Oral nutritional supplementation in paediatric feeding difficulties: a South African pharmacist's evidence-based review

N Schoeman

Clinical Pharmacist, Zuid Afrikaans Hospital, South Africa

Corresponding author, email: nicolene@zah.co.za

Abstract

Objective: This narrative review evaluates the evidence for oral nutritional supplementation (ONS) in paediatric patients with feeding difficulties, commonly known as picky eating, and emphasises the pharmacist's role in identifying risk factors, guiding supplementation, and optimising nutritional outcomes.

Methodology: A comprehensive literature search was conducted using PubMed, Scopus, and the Cochrane Library through 2024, focusing on studies addressing the prevalence, causes, and consequences of picky eating in children and the clinical impact of ONS and pharmacist-led interventions.

Key findings: Picky eating is a prevalent issue in children and may contribute to nutritional deficiencies and growth concerns, particularly in low- to middle-income countries (LMICs), such as South Africa, where food insecurity and limited dietary diversity exacerbate the nutritional risk. Evidence suggests that, when used appropriately in at-risk populations, ONS can support catch-up growth, improve micronutrient status, and enhance appetite.

Key conclusions: Pharmacist-driven nutritional screening and ONS support, when targeted to high-risk populations, can be pivotal in mitigating paediatric malnutrition in LMICs like South Africa.

https://doi.org/10.36303/SAPJ.2842

The global burden of malnutrition

Malnutrition continues to be a leading public health concern, particularly in ow- to middle-income countries (LMICs) across Asia and sub-Saharan Africa. According to the United Nations Children's Fund (UNICEF), approximately 45 million children under the age of five were wasted (low weight-for-height) in 2022, and 148 million were stunted (low height-for-age), both of which reflect chronic undernutrition during critical growth periods.[1]

The COVID-19 pandemic further exacerbated global food insecurity, pushing an additional 150 million people into hunger between 2019 and 2021. By the end of 2021, 828 million people were affected globally—425 million in Asia and 278 million in Africa—casting serious doubt on the world's ability to meet the Zero Hunger target set for 2030.[2]

South Africa's nutritional landscape

In South Africa, undernutrition remains widespread despite numerous public health interventions. The link between food insecurity and poor nutritional outcomes is well established; recent Human Sciences Research Council (HSRC) data found that 63.5% of households experience food insecurity, and 17.5% face severe levels.[3]

In households where at least one child under five is stunted, the rate of food insecurity soars to 83.3%. Each year, an estimated 1 000 children in South Africa die from preventable acute malnutrition. In comparison, around 2.7 million children under six live in poverty-stricken homes unable to meet their basic nutritional needs.[3]

The COVID-19 pandemic has intensified this crisis, with rising food prices and worsening food inflation compounding the issue. Recent figures indicate that 28.8% of children under five are stunted—a strong indicator of chronic nutritional deprivation.[3]

Stunting hampers both physical and cognitive development and contributes to a cycle of poverty and poor health outcomes.[3]

Provinces like KwaZulu-Natal, Gauteng and the Western Cape report some of the highest childhood hunger rates. The 2024 South African Early Childhood Review echoes these concerns, noting a significant increase in severe acute malnutrition between 2020 and 2023. In the 2022/23 period alone, over 15 000 children required hospital treatment for severe malnutrition.[4]

Understanding picky eating in context

Picky eating is a behavioural feeding difficulty most often observed in toddlers and preschoolers, generally emerging between one and three years of age. Up to 62% of healthy children in this age group show some form of feeding difficulty, with food refusal and selective eating being the most common.[5]

Although research from high-income countries has generally concluded that picky eating rarely leads to significant malnutrition, these findings may not be generalisable to LMICs.

In countries like South Africa, where dietary diversity is often poor, food security is fragile, and access to supplements or fortified foods is limited, the impact of picky eating may be more severe.[5,6] For instance, Wright et al.[7] found that 11% of picky eaters were under the 5th percentile for weight, while earlier studies linked early feeding difficulties with later diagnoses of failure to thrive.[5]

A cross-sectional study of preschoolers in Cape Town demonstrated that picky eating was associated with lower intakes of iron and vitamin A—micronutrients already identified as commonly deficient in national dietary studies.[8] Data from the South African National Health and Nutrition Examination Survey (SANHANES) show widespread micronutrient deficiencies among children, particularly iron (17–28%), vitamin A, and zinc, especially in rural and peri-urban communities reliant on maize-heavy diets, which impair zinc absorption due to phytate content.[10] Additionally, Nogueira-de-Almeida et al.[5] found that picky eaters consume fewer key micronutrients such as Vitamin D, C, folate, iron, zinc, and calcium.

Reviewing and weighing the evidence

While Huynh et al.[10] and other studies demonstrated growth improvements with oral nutritional supplementation (ONS) plus dietary counselling in picky eaters, recent evidence suggests benefits may be limited to children with more severe deficiencies or malnutrition risk.

Mixed findings from recent trials

- A 2023 randomised controlled trial conducted in Brazil reported that supplementation in picky eaters led to weight gain through increased height rather than fat accumulation, as indicated by stable BMI z-scores and body fat percentage. Micronutrient inadequacies declined during the 180-day intervention, and appetite improved over time, highlighting a distinct advantage of using ONS with counselling compared to counselling alone.[5]
- In India, a 2021 study observed improved weight outcomes in children whose weight-for-height fell between the 3rd and 15th percentiles. However, no significant increase in height was seen during the 90-day intervention period. The study concluded that ONS, alongside dietary counselling, was more effective than counselling alone in supporting catch-up growth in children with picky eating and nutritional risk.[11]
- Conversely, Yackobovitch-Gavan et al.[12] found that children who were consistent consumers of ONS over one year experienced increases in height without corresponding changes in BMI, suggesting linear growth rather than weight gain.

Benefits and limitations of supplementation in picky eaters

Effective management of picky eating requires a holistic, multi-pronged approach. This includes nutrition education, tailored dietary counselling, and—in selected cases—the addition of ONS or multivitamin/mineral supplements (MVMs).[11]

Table I: Pharmacist-guided approach to paediatric nutritional supplementation

Step	Approach	Action
1	Identify the clinical need	Initiate supplementation only when a child is at risk of nutrient insufficiency or deficiency due to:[11] Picky eating and food refusal Allergies and food intolerances Restrictive dietary patterns Formula- or breastmilk-only feeding > 6 months without appropriate complementary foods Documented micronutrient deficiencies or faltering growth
2	Match supplement choice to risk profile	Tailor supplement recommendations to the child's specific dietary gaps, cultural context, and identified nutrient risk factors. See Table II for common nutrient avoidance patterns and recommended supplements.
3	Promote safe supplement use	Pharmacists support safe and effective supplementation through caregiver education and individualised guidance: Recommend age-appropriate products, avoiding nutrient duplication or megadosing Guide correct dosing, timing, and monitor for side effects Reinforce a "food-first" philosophy and promote dietary diversity Refer to dietitians, paediatricians, or specialists when growth concerns persist Consider taste, texture, and formulation (liquid vs. chewable) to improve adherence
4	Encourage ongoing monitoring	While pharmacists may not conduct clinical assessments, they play a critical role in caregiver education and follow-up recommendations: **Growth monitoring**: Encourage caregivers and healthcare providers to plot weight-for-age, height-for-age, and BMI-for-age on WHO growth charts to track progress. **Anthropometrics**: When indicated, advise on the role of mid-upper arm circumference (MUAC) and skinfold measurements in assessing nutritional status. **Biochemical markers**: Educate caregivers to consult with clinicians about lab tests like haemoglobin (Hb), serum 25(OH) D, zinc, and ferritin levels before starting or adjusting supplements. **Adherence checks**: Counsel caregivers to observe for taste preferences, gastrointestinal tolerance, and adherence patterns. **Duration and reassessment**: Recommend follow-up after 3 months to evaluate benefits and identify any side effects. **Total nutrient intake**: Help caregivers understand the importance of tracking cumulative nutrient intake when using multiple fortified products (e.g. formula + cereal + multivitamin) to prevent accidental overdosing.

Table II: Common nutrient deficiencies in picky eaters – food avoidance patterns, South African risk factors, and suggested supplements[5]

Nutrient deficiency	Associated avoidance	SA-specific risk factors	Suggested supplement
Iron	Red meat, green veg	Low meat intake, helminth burden	Iron drops/syrup
Vitamin A	Orange/yellow fruits, liver	Low veg diversity, maize-heavy diets	Vitamin A capsules or multivitamins
Zinc	Animal protein	A maize-based diet, stunting	Zinc syrup/tablet
Vitamin C	Citrus, berries, and tomatoes	Seasonal availability, poverty	Chewable Vitamin C
Calcium & Vitamin D	Dairy, sun exposure	Lactose intolerance, limited outdoor time	Combined Ca/Vit D syrup or chewable
B-complex	Whole grains, meats	Highly refined diets	B-complex multivitamin

Although not recommended for routine use in all picky eaters, several studies confirm ONS's safety and benefit as part of a broader nutrition strategy, particularly in undernourished children.[10]

ONS formulae with balanced energy, vitamins, and minerals have also been shown to correct specific nutrient deficiencies and maintain nutritional status during periods of increased risk.[5]

However, a 2020 *Paediatrics* review emphasised that food-first strategies remain the preferred approach for managing picky eating in otherwise healthy children.[6]

Globally, the research landscape is still heavily skewed toward high-income settings, often featuring small, homogenous samples and short-term interventions. This limits generalisability to diverse, resource-constrained populations. There is a critical need for longitudinal, context-specific studies in low-income and rural South African communities. These should examine how feeding behaviours, cultural food practices, and socioeconomic factors shape child nutrition outcomes.

Types of nutritional supplements

Oral Nutritional Supplements (ONS): Sterile liquids, powders, or semi-solids that provide energy, protein, and essential vitamins and minerals. Used to support growth in children with poor appetite or feeding difficulties. Examples: Pediasure®, Nutridrink®, Lifegain Junior.

Multivitamin-Mineral Supplements (MVMs): Products containing essential vitamins (like A, D, C, B-complex) and minerals to support immunity, growth, and brain development.

Navigating paediatric supplements: A clinical decision-making approach

Pharmacists are uniquely positioned to guide parents toward evidence-based, individualised supplementation strategies, especially given the growing market for child-targeted supplements, including powders, shakes, chewables, and gummies.

While these products are widely accessible, their use should not be routine or indiscriminate. Instead, supplementation should be based on clinical need, dietary context, and growth patterns.

The following structured approach (Table I) outlines how pharmacists can proactively ensure safe, effective, and appropriate supplement use in children. It provides a stepwise framework to identify need, match supplement type to risk, educate caregivers, and support ongoing monitoring and follow-up.

Conclusion

Picky eating in children is often perceived as a benign phase of development. Still, in settings with high food insecurity and limited access to nutrient-dense foods, it can seriously threaten growth and health. Emerging evidence supports using ONS, particularly in children at nutritional risk, to address growth faltering and micronutrient deficiencies. While international research provides promising findings, it must be interpreted cautiously in South Africa due to differing socioeconomic, dietary, and healthcare realities. Pharmacists, as accessible healthcare providers, play a pivotal role in the early identification of feeding difficulties, risk stratification, and tailored supplementation. By leveraging their clinical knowledge and communication skills, pharmacists can bridge gaps in paediatric nutrition care, support caregivers, and contribute meaningfully to national efforts in reducing childhood malnutrition.

References

1. UNICEF, WHO & World Bank Group, 2023. Levels and trends in child malnutrition: Key findings of the 2023 edition of the Joint Child Malnutrition Estimates. [Internet] Available from: https://data.unicef.org/resources/jme-report-2023/. Accessed 5 May 2025.
2. FAO, 2023. The State of Food Security and Nutrition in the World 2023. [Internet] Available from: https://openknowledge.fao.org/items/c0239a36-7f34-4170-87f7-2fcc179ef064. Accessed 5 May 2025.
3. Gray N. 2024. South Africa's malnutrition crisis: Why a cheaper basket of healthy food is the answer. The Conversation. [Internet] Available from: https://hsrc.ac.za/news/food-security/the-conversation-south-africas-malnutrition-crisis-why-a-cheaper-basket-of-healthy-food-is-the-answer/. Accessed 5 May 2025.
4. Ilifa Labantwana, 2024. South African Early Childhood Review 2024. [Internet] Available at: https://ilifalabantwana.co.za/wp-content/uploads/2024/07/SA-early-childhood-review-2024-FINAL.pdf. Accessed 5 May 2025.
5. Nogueira-de-Almeida CA, Del Ciampo LA, Martinez EZ, et al. Clinical evolution of preschool picky eater children receiving oral nutritional supplementation during six months: A prospective controlled clinical trial. Nutrients. 2023;15(4):671. https://doi.org/10.3390/children10030495.
6. Kerzne B, Milano K, MacLean WC, et al. A practical approach to classifying and managing feeding difficulties. Pediatrics. 2015;135(2):344-53. https://doi.org/10.1542/peds.2014-1630.
7. Wright CM, Parkinson KN, Shipton D, Drewett RF. How do toddler eating problems relate to their eating behaviour, food preferences, and growth? Pediatrics. 2007;120(4):e1069-e75. https://doi.org/10.1542/peds.2006-2961.
8. Gray N, Thwala M, Lombard M. Feeding difficulties and nutrient intake in a sample of South African children aged 2 to 5 years attending private preschools in Cape Town. South African Journal of Clinical Nutrition, 2020;33(4):143-9.
9. Shisana O, Labadarios D, Rehle T, et al. 2014. South African National Health and Nutrition Examination Survey (SANHANES-1). Cape Town: HSRC Press.
10. Huynh DT, Estorninos E, Capeding MR, Oliver JS, Low YL. The impact of oral nutritional supplementation and dietary counselling on growth and health outcomes in picky-eating children at nutritional risk: A randomized controlled trial. International Journal of Food Sciences and Nutrition. 2015;66(4):452-9.
11. Khanna D, Yalawar M, Saibaba PV, et al. 2023. Oral nutritional supplementation improves growth in children at malnutrition risk and with picky eating behaviours. Nutrients, [e-journal] Available from: https://www.mdpi.com/2072-6643/15/4/671. Accessed 5 May 2025.
12. Yackobovitch-Gavan M, Phillip M, Shalitin S. Nutrition supplementation affects body composition and appetite in undernourished children. Pediatric Research, 2014;75(1-2):86-92.