

Improving complementary feeding through home fortification in Malawi



A mother and child in Lilongwe during feeding time, Malawi, 2022

© UNICEF/Khanyizira

KEY MESSAGES

- This article provides insight on the successes and challenges involved in introducing micronutrient powders (MNPs) at household level to improve complementary feeding practices.
- The use of MNPs for home fortification was found to be acceptable in Malawian communities.
- Community-based distribution methods were preferred, but multiple delivery modes or access points for MNPs facilitated greater coverage and relieved the burden on community-level health workers.

Beverly Shaila Laher is a Doctoral Research Fellow at Kamuzu University of Health Sciences in Lilongwe, Malawi.

Benson Kazembe is Nutrition Specialist at UNICEF in Lilongwe, Malawi.

Blessings Hendrina Likoswe is a Doctoral Research Fellow at Kamuzu University of Health Sciences in Lilongwe, Malawi.

Thembikile Nyasulu is a Research Associate at Kamuzu University of Health Sciences in Lilongwe, Malawi.

Lusungu Chitete is Nutrition Specialist at UNICEF in Lilongwe, Malawi.

Blessings Muwalo is Deputy Director of Nutrition, Department of Nutrition, HIV and AIDS, Ministry of Health.

Mamadou Ndiaye is Chief of Nutrition at UNICEF in Lilongwe, Malawi.

John Phuka is an Associate Professor at Kamuzu University of Health Sciences in Lilongwe, Malawi.

We would like to acknowledge UNICEF for funding the project. A special thank you to Kamuzu University of Health Sciences and Department of Nutrition, HIV and AIDS, Ministry of Health for the administrative support. Additionally, we are gratefully to all implementing partners, district level personnel and study participants.

Background

In Malawi, the rates of stunting and anaemia among children under the age of five are high (36% and 63% respectively), which can lead to a significant loss in intellectual potential and future production (Government of Malawi, 2015). Complementary feeding practices are poor, with only 17.3% of Malawian children aged 6–23 months receiving an appropriate minimum dietary diversity (MDD), 36.8% a minimum meal frequency (MMF) and 8.7% a minimum acceptable diet (MAD) (Government of Malawi, 2021).

Knowledge gaps, food insecurity and food availability challenges are key contributing factors that limit the quality of diets in the country (Jones, 2015). Access to nutritious foods is also affected by seasonal fluctuations, and in Malawi rates of undernutrition differ between lean and post-harvest seasons (Chikhungu and Madise, 2014). These factors result in poor complementary diets and limited intake of micronutrients, which then lead to poor child growth and development. Humanitarian disasters also continue to occur with increasing frequency and intensity. The country has been heavily affected by cyclones and disease outbreaks, which increase nutrition vulnerability and affect complementary feeding practices.

Fortifying complementary foods at home is an effective intervention for improving the micronutrient intake of children in the complementary feeding period. Micronutrient powders (MNPs) have been shown to significantly improve haemoglobin levels and to reduce the prevalence of iron deficiency anaemia and retinol deficiency (Tam et al, 2020). When combined with nutrition education, MNPs can improve linear growth and other child feeding practices (Lanou et al, 2019).

The provision of MNPs has the potential to contribute to improving nutrition, especially in countries with multi-layered complementary feeding challenges and countries in fragile settings. Malawi's national Multi-Sector Nutrition Strategic Plan 2018–2022 aims to promote home fortification of complementary foods with MNPs.

This article presents results from a participatory process review of Malawi's programme for improving complementary feeding through the introduction of local MNPs ('Ndisakanizeni'), which was piloted in two districts of the country.

Programme description

In 2016, the Ministry of Health, in collaboration with UNICEF, initiated a programme for improving the quality of complementary feeding through home fortification with MNPs and enhancing caregivers' understanding of optimal nutrition and standard infant and young child feeding (IYCF) practices. It was initially implemented for 18 months as a feasibility study in two districts: Nkhata Bay was chosen to represent hard-to-reach environments in Malawi, while Ntcheu was chosen as it had better access to services.

MNP distribution and nutrition counselling

The MNPs were distributed from a centralised location to the health facilities. Three distribution channels were used for bi-monthly delivery of MNPs and related nutrition counselling from the health facilities to the caregivers. These channels included routine delivery at the health facilities; growth monitoring sessions facilitated by health surveillance assistants (HSAs); and care group platforms conducted by volunteers (cluster leaders/promoters) in the community.

During the distribution, the caregivers were counselled to provide one MNP sachet every other day, or 3–4 sachets a week to be consumed by the children. One MNP sachet consisted of 15 micronutrients and vitamins, including vitamin A (400 µg), iron (10 mg) and zinc (4.1 mg).

Programme training

Programme implementers were trained using a cascading model, from national to community level. Training topics included nutrition and IYCF, complementary feeding and the proper use of MNPs, screening and enrolment, distribution, supervision, and reporting. Supportive monitoring was done at all levels, with more frequent supervision during the initial deployment and less frequently after six months.

Community awareness and sensitisation

Community leaders were sensitised at the traditional authority level through meetings with area development committees. Subsequently, community sensitisation meetings were conducted at group village level. Information, education and communication (IEC) materials were also produced and distributed (without pre-testing) to support training and counselling activities.

Methods of programme review

In August 2019, using a mixed methods participatory process review, we collected data from 600 caregivers of children aged 6–23 months from the two implementing districts. The observations from the two districts were ecologically compared¹ to gain insights on the effects of product delivery and the acceptability of the products. The sample size used was calculated to predict an MNP coverage of 37.5%, with a precision of ±7% and with a 95% confidence level. Using ENA software, we randomly selected 10 clusters at the health facility level in each district. In each health facility cluster, we then selected, also randomly, 30 grouped villages using a probability proportional sampling technique. One village was then randomly selected from each of the 30 grouped villages, and 10 caregivers with children aged 6–23 months were chosen from the selected villages.

The quantitative caregiver questionnaire comprised seven modules designed to assess utilisation, acceptability and adherence of the MNP product and programme, as well as IYCF knowledge and practices. Quantitative data were analysed using descriptive statistics. Chi-square and t-tests were used to compare MNP coverage, IYCF practices, utilisation and adherence according to district for ecological differentiation and generation of lessons to guide further implementation.

Qualitative data were collected through key informant interviews (n = 64), focus group discussions (n = 10) and direct observation at community, health facility, district, implementing partners and national levels. The qualitative questionnaire comprised semi-structured guides with open-ended questions, focus group discussions and checklists for direct observation.

Table 1 Comparison of MNP coverage indicators by district

	Ntcheu (n = 253)	Nkhata Bay (n = 282)	p-value
Report ever receiving a packet of MNP, N (%)	162 (64.0)	200 (70.9)	0.09
Report child ever consuming MNP with complementary foods, N (%)	152 (60.1)	199 (70.6)	0.01
Report child is still consuming MNP with complementary foods (among those who ever consumed MNP with complementary foods), N (%)	74 (48.7)	139 (69.9)	<0.0001

Table 2 Comparison of complementary feeding indicators according to MNP consumption

	Ever consumed MNP with complementary foods (n = 351)	Never consumed MNP with complementary foods (n = 184)	
Minimum Dietary Diversity (MDD ^a), N (%)	258 (73.5)	131 (71.2)	0.57
Number of food groups consumed (out of 7), Mean ± SD	4.41 ± 1.46	4.04 ± 1.59	<0.01
Minimum Meal Frequency (MMF ^b), N (%)	188 (54.8)	108 (60.0)	0.26
Minimum Acceptable Diet (MAD ^c), N (%)	143 (40.7)	79 (42.9)	0.62

^a Proportion of children aged 6–23 months who received foods from at least four food groups during the previous day

^b Proportion of breastfed and non-breastfed children aged 6–23 months who receive solid, semi-solid or soft foods (but also including milk foods for non-breastfed children) the minimum number of times or more

^c Proportion of children aged 6–23 months who had at least the MDD and the MMF during the previous day

Qualitative data were analysed using NVivo software. Data were organised into themes, for which a coding framework was developed.

All data collection tools were translated into the local language before validation by the MNP taskforce and data collection team and pre-tested in two health facilities that were not part of the intervention.

Results and outcomes

Demographic characteristics

Of the 600 caregivers surveyed, 70% had obtained a primary school education and over 50% spoke Chichewa. Over half the children (51%) whose caregivers were interviewed were female and aged between 12 and 23 months.

Programme coverage, equity and delivery of MNPs to beneficiaries

Overall, more than 60% of the study participants in both districts reported ever receiving an MNP packet or their child ever consuming MNPs with complementary foods. Table 1 summarises the differences in coverage between the two districts. Coverage was significantly higher in Nkhata Bay compared to Ntcheu for children ever consuming MNP and children still consuming MNP. On the other hand, there were no observed significant differences in coverage based on demographic factors: child's sex, caregiver education and caregiver walking distance to health facility.

Programme implementers nevertheless revealed, through qualitative assessments, inequitable distribution of MNPs and of support to hard-to-reach areas because of access challenges resulting from fuel, terrain and human resource constraints.

More than 80% of the caregivers received MNPs from HSAs at growth monitoring sessions,

while 20% received them through the health facilities or care group promoters. All three channels of delivery were well accepted by the caregivers and programme implementers.

Complementary feeding practices and use of MNPs

Three complementary feeding indicators were assessed, and results showed that over 70% of the children in both districts achieved MDD. There was no significant difference in MDD, MAD or MMF between children who had ever consumed MNPs compared to children who had never consumed MNPs (Table 2). However, MNP consumption was positively associated with the consumption of a higher number of food groups. More children who were consuming MNPs were still being breastfed (95%) compared to children who had stopped consuming MNPs (85%).

Utilisation of micronutrient powders and adherence by caregivers

Caregivers found that MNPs were acceptable and compliance with the administration guidelines of MNPs was good; they reported that their child consumed an average of one sachet per day. Based on caregiver self-reporting, the *Ndisakanizeni* powder was rarely shared with non-eligible children (3%) or thrown away. However, about 40% of caregivers did not adhere to the mixing instructions, adding MNPs to food that was too hot or not mixing it homogeneously.

Effectiveness of community sensitisation on the utilisation of MNPs

Although poor retention of information by caregivers was mentioned, IEC materials were mostly perceived as useful and contributed to the high

¹ The ecological approach is understood as a method by which comparisons are measured at population/group level in different geographic regions or countries.



A demonstration of how to add MNPs to a child's food in Lilongwe, Malawi, 2022
© UNICEF/Khanyizira

acceptability of MNPs and the dispelling of rumours. Of caregivers, 40% were aware of negative rumours surrounding MNPs, although only 11% decided not to use the *Ndisakanizeni* powder based on these rumours. HSAs were identified as the preferred communication channel for MNP messages by 80% of caregivers.

Programme training and implementation supervision

Programme implementers reported the two days of training received were too short and not comprehensive enough. Attendance was low. Only 47% and 43% of programme implementers reported attending and/or leading a cooking demonstration in Nkhata Bay and Ntcheu respectively. Overall, only 69% of caregivers received training on *Ndisakanizeni* powder, which was higher in Nkhata Bay (73.3%) than in Ntcheu (63%). In Nkhata Bay, supportive supervision was facilitated by partners (World Relief and Save the Children) through the provision of vehicles and other materials. The same support was not available in Ntcheu.

“Of course, the main problem why the health surveillance assistants are not being supervised is because we do not have enough resources. Although it is included in the work plan, how can we implement it without resources? There is no money set apart for supervision.”

-The Hunger Project, Implementing Partner, Ntcheu

Lessons learned

This programme review highlighted several lessons that could be adapted to similar programmes, or emergency contexts in the future.

Successes

The programme reached equitable coverage in terms of child sex, caregiver education levels and caregiver walking distance to the health facility. The latter reflects the widespread use (80%) of community outreach sessions to distribute MNPs.

The combination of different channels of distribution (growth monitoring sessions, care group promoters or health facilities) was positively perceived by the caregivers and implementers and found to be an effective approach given the strengths and weaknesses of each channel – these findings are in line with micronutrient distribution in Cambodia, as featured in Field Exchange issue 59², where a combination of channels increased coverage and cost effectiveness. The diversity of distribution channels was also considered a means to lower the risk of distribution channel collapse in case of an emergency.

The programme was effective in empowering the programme extension workers and the caregivers. The extension workers showed high knowledge retention on the use of MNPs and IYCF, and caregivers mostly administered the MNPs according to instructions. Overall, there were positive attitudes and perceptions about the programme among caregivers. Although rumours made their way to the communities, they had little effect on the decisions made by the caregivers to feed *Ndisakanizeni* powder to their children.

Challenges

Programme implementers reported more district-level supportive supervision, community-level cooking demonstrations and attendance at caregiver trainings in Nkhata Bay compared to Ntcheu, which could be contributing factors to the observed differences in coverage between the two districts. This is despite Ntcheu being chosen as a district with better access to services.

Across both districts, several challenges and gaps were identified in both programme conception/design and implementation/programme delivery. These gaps represented missed opportunities to promote community engagement, sustainability, and ownership. Challenges included poor supply chain management, gaps in capacity building and supervision and weakness in the integration of the MNP programme into other IYCF programmes. Addressing these challenges is important, not only to ensure the quality of

the programme but also to strengthen the resilience of the programme to possible shocks.

Conclusion

This programme for improving the quality of complementary feeding through home fortification with MNPs showed encouraging initial results. This participatory review has provided useful lessons on strengthening the programme to potentially contribute to improving complementary feeding practices while ensuring the system in place can remain functioning in case of an emergency.

Overall, the programme was well received by the target population. However, this study illustrated the implementation challenges that need to be overcome to ensure optimum uptake of MNPs and improve complementary feeding practices. A weak delivery system might easily reduce MNP distribution, coverage, uptake and level of complementary feeding and diversification. The uptake could have been better in both districts had there been adequate and regular capacity building and supervision of implementers to ensure high-quality messaging; a pre-tested, integrated social behavioural change communication approach; sufficient, uniform logistical support; and strengthened supply chain management.

For more information, please contact John Phuka at johnphuka@gmail.com

² <https://www.enonline.net/fex/59/micronutrientcambodia>

References

- Chikhungu LC and Madise NJ (2014) Seasonal variation of child under nutrition in Malawi: Is seasonal food availability an important factor? Findings from a national level cross-sectional study. *BMC Public Health*, 14, 1146. <https://doi.org/10.1186/1471-2458-14-1146>
- Government of Malawi (2015) Malawi Demographic and Health Survey 2015–16. National Statistics Office and ICF. Zomba, Malawi, and Rockville, MD, USA.
- Government of Malawi (2021) Malawi. Multiple Indicator Cluster Survey 2019–20, Survey Findings Report. National Statistical Office. Zomba, Malawi.
- Jones A (2015). “Household Food Insecurity Is Associated with Heterogeneous Patterns of Diet Quality Across Urban and Rural Regions of Malawi.” *World Medical & Health Policy* 7(3): 234–54.
- Lanou HB, Osendarp S, Argaw A, De Polnay K, Ouédraogo C, Kouanda S and Kolsteren P (2019) Micronutrient powder supplements combined with nutrition education marginally improve growth amongst children aged 6–23 months in rural Burkina Faso: A cluster randomized controlled trial. *Maternal & Child Nutrition*, 15(4), e12820. <https://doi.org/10.1111/mcn.12820>
- Shafique S, Sellen DW, Lou W, Jalal CS, Jolly SP and Zlotkin SH (2016) Mineral- and vitamin-enhanced micronutrient powder reduces stunting in full-term low-birth-weight infants receiving nutrition, health, and hygiene education: A 2 × 2 factorial, cluster-randomized trial in Bangladesh. *The American Journal of Clinical Nutrition*, 103(5), 1357–1369. <https://doi.org/10.3945/ajcn.115.117770>
- Tam E, Keats EC, Rind F, Das JK and Bhutta A (2020) Micronutrient supplementation and fortification interventions on health and development outcomes among children under-five in low- and middle-income countries: A systematic review and meta-analysis. *Nutrients*, 12(2), 289. <https://doi.org/10.3390/nu12020289>