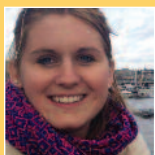


Treatment of moderate acute malnutrition using food products or counselling: A systematic review

Mothers feeding their children supplementary food in a MAM treatment programme in Sierra Leone

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Location: *Global*

What we know: There is a lack of international guidance on the most appropriate treatment for moderate acute malnutrition (MAM).

What this article adds: A 2018 systematic review synthesised current evidence on outcomes of MAM children treated with food interventions compared to no treatment or management with nutrition counselling. Since only one eligible study was identified, inclusion criteria were widened and 11 studies finally included. Seven studies found food products to be superior in terms of anthropometric outcomes compared to counselling and/or micronutrient powder supplementation; two studies found no significant benefit of a food product intervention compared to control; and two studies were inconclusive. Outcomes are likely influenced by type of supplementary food provided, dosage and length of treatment, as well as quality, content and adherence to counselling programmes. More research is needed in this area, especially studies that measure food insecurity and functional outcomes beyond anthropometric gains.

Introduction

There is currently a lack of international guidance on the most appropriate treatment for moderate acute malnutrition (MAM) and there are discrepancies in national treatment strategies. Some national guidelines for MAM treatment recommend the provision of supplementary food products, whereas others recommend that caregivers of MAM children should be provided with nutrition counselling alone. There is some debate about the necessity of supplementary foods for MAM and whether they result in better outcomes than no treatment or management with nutrition counselling. With the rise of non-communicable diseases in low-income settings and lack of understanding of the exact causes, confidence is needed in the effectiveness of MAM interventions to optimise immediate survival as well as long-term health (Shrimpton and Rokx, 2012). Moreover, food product interventions can be costly and unsustainable; therefore, concrete evidence is needed to establish their impact on child health outcomes compared to alternative methods.



Child eating ready-to-use therapeutic food in a treatment programme in Sierra Leone

LEONE ©Alyssa Los, Project Peanut Butter

This review aims to identify and synthesise the current evidence on outcomes of MAM children treated with food interventions compared to no treatment or management with nutrition counselling. Through identifying the current state of knowledge and highlighting evidence gaps, we hope to inform future research and international guidelines for the treatment of MAM.

Methods

We conducted a systematic literature review in October 2018, identifying studies that compared the treatment of MAM children (aged 6-59 months) with food products versus management with counselling or no intervention, using a predefined Population, Interventions, Control and Outcome (PICO) framework (Table 1). We searched Pubmed, Cochrane and ScienceDirect databases, as well as resources catalogued on the following websites: ENN, Valid International, Evidence Aid and State of Acute Malnutrition.

Results

We screened a total of 673 abstracts and identified one study that met the PICO framework. Due to this very limited number of eligible studies, we widened the inclusion criteria and identified two studies that provided micronutrient supplement powders to the control group, and eight studies that did not enrol children based on current, common definitions of MAM; however MAM children were part of the sample. For example, enrolment based on low weight-for-age or mid-upper arm circumference (MUAC) <12.9cm.

Seven of the 11 studies found food products to be superior with regard to anthropometric outcomes compared to counselling and/or micronutrient powder supplementation; two of the studies found no significant benefit of a food product intervention compared to control; and two of the studies were inconclusive. A summary of the results is presented in Table 2.

Discussion

The majority of studies in this review found

that food products resulted in greater anthropometric gains than counselling or micronutrient interventions. This was especially true if the supplementary food provided was of suitable quality and provided to the child for an adequate duration.

Lack of adherence to counselling programmes may be one of the limitations influencing their effectiveness among control groups in these studies. The “per protocol” analysis by Nikiéma *et al* (2014) suggests that, if adhered to, the counselling programme may be as effective as the food intervention. One other study also stated high defaulting in the counselling group (Hossain and Ahmed, 2014); however no other studies presented per protocol analyses. Finding ways to improve adherence to counselling interventions needs to be explored. The standardisation of quality and content of nutrition counselling interventions also requires consideration.

It is important to note that the study by Nikiéma *et al* (2014) was conducted in a “relatively food secure” context, which may be an important consideration for effective counselling interventions. One other study states that it was conducted in a relatively food-secure setting, taking

place in an urban area of Iran (Javan *et al*, 2017). They found food supplementation with counselling to be superior to multivitamins and counselling; although there was some spontaneous recovery (WHZ>-2) (32%) in the counselling group, this was much lower than in the food supplementation group (80%). Three studies mention that their study populations are likely to be food insecure. Roy *et al* (2005) suggest that, although food supplementation had the best weight gain, an “intensive counselling” group still had better weight gain than the “standard counselling” group, despite low food security, whereas Christian *et al* (2015) conclude that counselling alone is not sufficient in areas of food insecurity.

Not all studies in this review found food supplements to be superior to nutrition counselling. The type of supplementary food provided, as well as the dosage and length of treatment, may influence their effectiveness. Studies specifically highlighted the micronutrient content and protein quality of supplements as likely significant factors. The majority of studies provided supplements for at least three months; however, one study provided one sachet of ready-to-use therapeutic food (RUTF) for 14 days and was found to be ineffective at preventing SAM in MAM children recovering from illness (van der Kam, 2017).

The results of this review suggest that food supplementation is superior for anthropometric improvements compared to counselling and/or micronutrients when the type of supplementary food provided, dosage and length of treatment are adequate. The quality, content and adherence to counselling programmes also requires consideration. These results can be used to guide policymakers when improving recommendations for MAM treatment. Researchers should also take note as there is currently a paucity of studies on this topic, especially those using standard definitions of MAM and recovery, as well as a lack of studies including measures of food security and important functional outcomes beyond anthropometric proxies.

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Table 1 PICO framework for search strategy

Population	Intervention	Comparison	Outcome
Children with MAM* (6-59 months)	Ready-to-use supplementary foods (RUSF)	Nutrition counselling alone	Recovery Weight gain MUAC improvement
*defined as mid-upper arm circumference (MUAC) ≥11.5cm to <12.5 cm and/or weight-for-height z-score (WHZ) ≥-3 to <-2, or weight-for-height (WFH) ≥70 to <80%, and absence of bilateral oedema	Lipid-based nutrient supplements (LNS)	No intervention	Non-recovery/Non-response Default Deterioration into SAM Relapse Death
	Fortified blended foods such as Supercereal Plus		Length of stay Tolerance and acceptability Morbidity
	Ready-to-use therapeutic foods (RUTF)		
	Other macronutrient food supplements		

Table 2 Summary of review results

Author, Year, Study design	Location and sample size	Target age and admission criteria	Study groups	Food product better than control?
Nikiéma <i>et al</i> , 2014, Cluster RCT	Burkina Faso N=1,974	6-24 months, WHZ <-2 & ≥ -3	RUSF vs Super Cereal Plus vs counselling	Yes – better anthropometric recovery due to lower default
Micronutrients provided to control groups				
Hossain <i>et al</i> , 2012, 2014, 2016 (conference abstracts) Cluster RCT	Bangladesh N=227	6-24 months, WHZ<-2 & ≥ -3	Cereal-supplement vs cereal-supplement & psychosocial stimulation vs health education	Maybe – Not possible to distinguish between benefits of supplement vs psychosocial stimulation
Javan <i>et al</i> , 2017, RCT	Iran N=70	9-24 months, WHZ <-2 & ≥ -3 & referred for treatment	Blended flour, multivitamins & counselling vs multivitamins supplement & counselling only	Yes – better recovery, weight gain and WHZ gain
Target participants not based on current MAM definitions				
van der Kam <i>et al</i> , 2016, RCT	Nigeria N=2,213 (25% of sample had MAM at enrolment)	6-59 months, Diagnosed with malaria, diarrhoea, or LRTI MAM= WHZ <-2 & ≥ -3, & MUAC>11.5cm	RUTF (14 days) vs MNP vs no intervention	No – incidence of SAM was same for RUTF group compared to MNP group and to control group
Roy <i>et al</i> . 2005, Cluster RCT	Bangladesh N=282	6-24 months, Weight-for-age 61% - 75% of median (NCHS)	Supplementary food & intensive education vs intensive education vs counselling	Yes – better immediate and sustained recovery
Fauveau <i>et al</i> , 1992, RCT	Bangladesh N=134	6-12 months, MUAC >11.0 & <12.9cm, & living in bamboo structure	Supplementary food vs counselling	Maybe – Food group have larger weight gain in first 3 months but not for the whole 6 months
Target participants not based on current MAM definitions and micronutrients provided to control groups				
Hossain <i>et al</i> , 2011, RCT	Bangladesh N=507 (81% of sample had WHZ<-2 at baseline)	6-24 months, WAZ<-3 (NCHS) & recovered from diarrhoea at the hospital	Cereal-supplement vs cereal-supplement & psychosocial stimulation vs health education	Yes – better WHZ and HAZ gain.
Heikens <i>et al</i> , 1989, RCT	Jamaica N= 82	3-36 months, WAZ <80% of median (NCHS)	Supplementary food & multivitamins vs multivitamins only	Yes – better WAZ after 3 months but no difference after 6 months. Better HAZ after 6 months.
Preventative trials: majority adequately nourished children in sample				
Schlossman <i>et al</i> , 2017, Pilot cluster RCT	Guinea Bissau N=681	6-59 months, WHZ<2 or WAZ<1 or HAZ<2	RUSF 15% protein vs RUSF 30% protein vs no intervention	No – controls improved an equal extent to food group
Christian <i>et al</i> , 2015, Cluster RCT	Bangladesh N=5,421	6 months, All infants aged 6 months in the catchment area	RUSF-rice vs RUSF-chickpea vs RUSF-soy vs WSB++ vs counselling	Yes – for soy-based RUSF No benefit of WSB++ over counselling
Grellety <i>et al</i> , 2012, Prospective cohort	Niger N=2238 (18% of sample WHZ<-2)	6-23 months, All children 60-80cm length	RUSF vs no intervention	Yes – better MUAC and WHZ gain and lower mortality rate

*RCT= randomised controlled trial. MNP= micronutrient powder. LRTI = lower respiratory tract infection. WSB++ = fortified wheat-soy blended flour. Z-scores are generated using WHO 2006 reference, unless otherwise stated.

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