Effectiveness of a homemade supplementary food in the management of severe acute malnutrition in 2-5 year old children in the Kopay MOH area

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Keywords: moderate acute malnutrition (MAM), homemade supplementary food (HMSF), children under five years, weight gain

Abstract

Introduction
Reducing wasting in children under 5 years is a challenge in Sri Lanka. Management strategy of moderate acute malnutrition (MAM) is to have target food supplementation as energy dense snacks.

Objectives
To assess the feasibility, acceptability and effectiveness, of a homemade supplementary food (HMSF) in the management of moderate acute malnutrition in 2-5 year old children.

Methods
A community based quasi experimental study was carried out from October to December 2014. The test population (n=275) were 2-5 year old children with MAM from Kopay MOH area. The control group (n=285) were children of similar age with MAM from Uduvil, Nallur area. HMSF consisted of a pre-packed cereal mixture (50g), with sugar (20g) and scraped coconut (20g) added at home (calorie content =500 kcal/90g), as a daily snack to the intervention group. Baseline weight and monthly weight gain was measured using standard calibrated weighing scales. Compliance and any acute illnesses were monitored weekly by calling or visiting households. Average weight gain of both groups was analysed using independent sample t-test. The acceptability and feasibility of the HMSF was assessed by focus group discussions with the PHMs and the mothers.

Results:
Mean age of test group and control group was 42.6 months and 43.1 months respectively. There was no difference in the baseline weight of the two groups (95%CI -0.059-0.416: p=0.14). The mean weight gain in the test group and control group after 3 months was 688.5g (SD=437gm) and 583g (SD=461gm) respectively (p=0.006). The mean gain in length in the test group and control group after 3 months was 1.5cm (SD=0.93cm) and 1.66cm (SD 1.3 cm) (p=0.234) respectively.

Conclusions and Recommendations:
This HMSF was effective, feasible and acceptable in improving weight in MAM children under the age of five years.

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Introduction

Undernutrition is defined as insufficient provision of energy and nutrients (such as good quality proteins with an adequate balance of essential amino acids, vitamins and minerals) and an inability to meet the requirements necessary to ensure growth, maintenance and specific functions of the body [1]. Acute undernutrition in children has two main manifestations; (i) macronutrient deficiency presenting as protein energy malnutrition (ii) micronutrient deficiencies, commonly iron, iodine, vitamin A and zinc deficiency. Acute undernutrition affects weight in a short period of time and is referred to as wasting. If uncorrected, wasting leads to chronic undernutrition, and affects length/height, which is referred to as stunting. Moderate acute undernutrition in children is defined as a weight for height below -2SD (standard deviation) but above -3SD of the median of the WHO child growth standard.

Global data in 2011 indicates that 101 million children were underweight, 165 million stunted and 43 million overweight or obese in the under-five population [2]. Acute malnutrition affects 10% of the world’s children under five [3]. Prevention of early childhood undernutrition leads to important health, education and economic benefits [4].

The two main strategies to overcome this situation are poverty alleviation and targeted nutritional intervention [3]. Home based management of acute malnutrition using food supplementation, with or without behaviour change, has improved the nutritional status of under five children in Cambodian urban poor communities and in migrant communities in the Dominican Republic and Haiti [5,6]. Social and economic policies of the country should be changed, in addition to health and nutrition intervention, in order to achieve a sustainable reduction in undernutrition [7].

Evaluation of ‘Thriposha’, a supplementary food used in Sri Lanka, indicated that only 50% of the target group received the supplement. Ineffective distribution and sharing at household level further reduced its effectiveness [8,9]. The World Food Programme distributed fortified corn soya blend to 33 identified MOH areas in Sri Lanka. However, baseline and post intervention surveys showed no direct nutritional improvement and there was family sharing at the household level [10].

The national rates of underweight, stunting and wasting of the under-five age group for 2012 were 17.2%, 11.4% and 14.0% respectively. The rates for Nuwara Eliya District for the same year were 21.5%, 18.8% and 22% respectively compared to 11.5%, 5.1%, and 9.6% for Gampaha District. This shows the wide disparity existing between different districts [11,12].

The nutritional status of under five children in Sri Lanka is intractable and static for the last 3 decades, although National as well as District level programmes were redesigned as part of Millennium Development Goal 1 (MDG1) which is reduction of under-five undernutrition by 40% [13, 14]. This study aims to assess the feasibility, acceptability and effectiveness of a homemade supplementary food (HMSF) to improve weight gain in children between the ages two to five years with moderate acute malnutrition (MAM).
Methods
A community based, quasi experimental study was designed. Study population and matched control population was recruited from Medical Officer of Health (MOH) regions in the Jaffna District of Sri Lanka (Figure 1).

The study was conducted from 1\textsuperscript{st} October to 31\textsuperscript{st} December 2014 in three MOH areas of the Jaffna District where the nutrition rehabilitation programme for undernourished children conducted by the State / World Bank (funded by JICA) was not carried out, in order to prevent contamination.

Inclusion criteria for the intervention group were children aged 2-5 years residing in the Kopay MOH area under the care of area Public Health Midwives (PHMs) for at least 6 months with weight for height \(<\text{-2SD} \text{ and } \geq \text{-3SD} \text{ from the median of the World Health Organization (WHO) Child Growth Standards.}

Inclusion criteria for the control group were children aged 2-5 years residing in the Uduvil and Nallur MOH areas, under the care of area PHMs for at least 6 months with weight for height \(<\text{-2SD} \text{ and } \geq \text{-3SD} \text{ from the median of the World Health Organization (WHO) Child Growth Standards.}

Sample size was calculated expecting a 50% cure rate among the intervention group using the following formula [15].

\[ N = \frac{\left( z_{\alpha} \sqrt{P(1-P)\frac{1}{q_1} + \frac{1}{q_2}} \right) + \left( z_{\beta} \sqrt{P_1(1-P_1)\frac{1}{q_1} + P_2(1-P_2)\frac{1}{q_2}} \right)^2}{(P_1 - P_2)^2} \]

\(N\) = total number of subjects in each group
\(q_1 = q_2:1:1\) equal proportions of both intervention and non-intervention groups
\(P_1\) = Proportion of MAM children -14.3\% (Jaffna District nutrition month data 2013)
\(P_2\) = Proportion of MAM children after 3 months of intervention- 7\%
\( Z_\alpha = \) The standard normal deviation for alpha taken as 1.96
\( Z_\beta = \) The standard normal deviation for beta taken as 90%

Calculated sample size for each group was 263 children. After adding 10% for possible non-responders the final sample size was 289 in each arm. A consecutive sample of children who fulfilled the inclusion criteria were recruited for the intervention arm and the control arm of the study.

Apart from the socio-demographic details, a pre-tested, interviewer administered questionnaire was administered by trained PHMs to collect 24 hour dietary recall data, food diversity, personal hygienic practices and nutrition related knowledge of mothers.

### Table 1. Composition of homemade supplementary food

<table>
<thead>
<tr>
<th>Composition of HMSF</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parboiled rice</td>
<td>200g</td>
</tr>
<tr>
<td>Green gram</td>
<td>100g</td>
</tr>
<tr>
<td>Bengal gram</td>
<td>100g</td>
</tr>
<tr>
<td>Black gram</td>
<td>100g</td>
</tr>
<tr>
<td>Sesame seeds</td>
<td>50g</td>
</tr>
<tr>
<td>Groundnut</td>
<td>50g</td>
</tr>
<tr>
<td>Total</td>
<td>600g</td>
</tr>
<tr>
<td>Carbohydrate</td>
<td>59.5%</td>
</tr>
<tr>
<td>Protein</td>
<td>17.85%</td>
</tr>
<tr>
<td>Fat</td>
<td>14.50%</td>
</tr>
<tr>
<td>calorie density</td>
<td>440Kcal/100g</td>
</tr>
</tbody>
</table>

The homemade supplementary food mixture (Table 1) was prepared under the direct supervision of the MOH and PHI in two grinding mills close to the MOH office to ensure correct composition and cleanliness.

The roasted and ground cereal mixture was packed and labelled. The product was distributed to the mothers of the intervention group bi-weekly. This HMSF has been approved by the Industrial Technology Institute of Sri Lanka (World Bank project I.D. 121571).

The quantity of each serving of HMSF was determined after conducting a pilot test of the snack among preschool children \((n=36)\) in Kopay MOH area. They were given a snack made of ground cereal mixture \((100g)\) with added sugar \((40g=2\) teaspoons) and scraped coconut \((40g=2\) teaspoons). The food bag was weighed after the meal and the mean weight consumed was calculated \((mean=90g, 95\% C.I 88-90)\).

Therefore, the intervention group was given 50g ground cereal mixture\( (measured\) and pre-packed) mixed with 20g \((2\) teaspoons) sugar and 20g\((2\) teaspoons) scraped coconut \(\text{total} = 90g\).
The HMSF was given to the children at home as a daily snack, either in the morning or evening for 12 consecutive weeks. Compliance was assessed weekly by contacting the mothers via telephone and/or through home visits by PHMs. Any acute illnesses were documented. Height was measured at the start and end of the study period according to the Nutrition Rehabilitation Programme guidelines [16]. Weight of children were measured at baseline and monthly thereafter by the PHMs (Figure 2).

The independent sample t-test was applied for comparison of the 2 groups using SPSS 21. Compliance with the supplementary food and the type and duration of acute illnesses were analysed using mean differences.

Ethical approval for the study was obtained from the Ethics Review Committee of Faculty of Medicine, University of Colombo and administrative clearance was obtained from the Regional Director of Health Services, Jaffna.

There was no loss to follow up in both groups during the 3 months study period.

**Results**

All children were of Tamil ethnic origin and 92% of them were Hindus while others were Christians. The respondents were the mothers of the children.

There was no significant difference in the socio-demographic characteristics of the intervention and control groups such as age, sex, birth weight, birth order and household wealth index.

Socioeconomic characteristics were also similar in both groups, except for the father's occupational status (Table 2). There was no significant difference between the two groups in dietary diversity (p= 0.713).
Table 2 Distribution of socio demographic characteristics of the study groups

<table>
<thead>
<tr>
<th>Characteristics &amp; Subjects</th>
<th>Intervention group (N=275)</th>
<th>Control group (N=285)</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age group</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>23 - 36 Months</td>
<td>85 (30.9)</td>
<td>71 (24.9)</td>
<td>$X^2=5.744$</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>df=3</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>P=0.125</td>
</tr>
<tr>
<td>37 - 48 Months</td>
<td>86 (31.3)</td>
<td>116 (40.7)</td>
<td></td>
</tr>
<tr>
<td>49 - 60 Months</td>
<td>89 (32.4)</td>
<td>83 (29.1)</td>
<td></td>
</tr>
<tr>
<td>Sex</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>149 (54.2)</td>
<td>132 (46.3)</td>
<td>$X^2=4.283$</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>df=2</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>P=0.117</td>
</tr>
<tr>
<td>Female</td>
<td>126 (45.8)</td>
<td>152 (53.3)</td>
<td></td>
</tr>
<tr>
<td>Birth Weight (g)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;2500</td>
<td>71 (25.8)</td>
<td>61 (21.4)</td>
<td></td>
</tr>
<tr>
<td>&gt;2500 &amp; above</td>
<td>204 (74.2)</td>
<td>224 (78.6)</td>
<td></td>
</tr>
<tr>
<td>Education level of the father</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No schooling</td>
<td>9 (1.6)</td>
<td>11 (2)</td>
<td>$X^2=1.345$</td>
</tr>
<tr>
<td>Year 1-5</td>
<td>20 (3.6)</td>
<td>23 (4.1)</td>
<td>df=5</td>
</tr>
<tr>
<td>Year 6-10</td>
<td>108 (19.3)</td>
<td>99 (17.7)</td>
<td>p=0.93</td>
</tr>
<tr>
<td>GCE (O/L)</td>
<td>92 (16.4)</td>
<td>103 (18.4)</td>
<td></td>
</tr>
<tr>
<td>GCE (A/L)</td>
<td>36 (6.4)</td>
<td>38 (6.8)</td>
<td></td>
</tr>
<tr>
<td>Tertiary education</td>
<td>10 (1.8)</td>
<td>11 (2)</td>
<td></td>
</tr>
<tr>
<td>Education level of the mother</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No schooling</td>
<td>3 (0.9)</td>
<td>5 (0.9)</td>
<td>$X^2=4.180$</td>
</tr>
<tr>
<td>Year 1-5</td>
<td>11 (2)</td>
<td>18 (3.2)</td>
<td>df=5</td>
</tr>
<tr>
<td>Year 6-10</td>
<td>86 (15.4)</td>
<td>98 (17.5)</td>
<td>p=0.524</td>
</tr>
<tr>
<td>GCE (O/L)</td>
<td>117 (20.9)</td>
<td>108 (19.3)</td>
<td></td>
</tr>
<tr>
<td>GCE (A/L)</td>
<td>47 (8.4)</td>
<td>41 (7.3)</td>
<td></td>
</tr>
<tr>
<td>Tertiary education</td>
<td>11 (2)</td>
<td>15 (2.7)</td>
<td></td>
</tr>
<tr>
<td>Occupation of the father</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Legislators, senior officials, managers</td>
<td>3 (0.5)</td>
<td>7 (1.3)</td>
<td>$X^2=25.990$</td>
</tr>
<tr>
<td>Professionals</td>
<td>1 (0.2)</td>
<td>13 (2.3)</td>
<td>df=10</td>
</tr>
<tr>
<td>Technicians and associate professionals</td>
<td>5 (0.9)</td>
<td>7 (1.3)</td>
<td>p=0.004</td>
</tr>
<tr>
<td>Clerks</td>
<td>1 (0.2)</td>
<td>2 (0.4)</td>
<td></td>
</tr>
<tr>
<td>Service workers, shop and market sales workers</td>
<td>43 (7.7)</td>
<td>54 (90.6)</td>
<td></td>
</tr>
<tr>
<td>Skilled agricultural and fishery workers</td>
<td>15 (2.7)</td>
<td>17 (3.0)</td>
<td></td>
</tr>
<tr>
<td>Craft and related trade workers</td>
<td>16 (2.9)</td>
<td>18 (3.2)</td>
<td></td>
</tr>
<tr>
<td>Plant and machine operators and assemblers</td>
<td>18 (3.2)</td>
<td>14 (2.5)</td>
<td></td>
</tr>
<tr>
<td>Elementary occupations</td>
<td>98 (17.5)</td>
<td>95 (17)</td>
<td></td>
</tr>
<tr>
<td>Armed forces and others</td>
<td>75 (13.4)</td>
<td>51 (9.1)</td>
<td></td>
</tr>
<tr>
<td>unemployed</td>
<td>7 (1.3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Occupation of the Mother</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Legislators, senior officials, managers</td>
<td>3 (0.5)</td>
<td>3 (0.5)</td>
<td>$X^2=6.247$</td>
</tr>
<tr>
<td>Professionals</td>
<td>5 (0.9)</td>
<td>5 (0.9)</td>
<td>df=9</td>
</tr>
<tr>
<td>Technicians and associate professionals</td>
<td>1 (0.2)</td>
<td>4 (0.7)</td>
<td>p=0.715</td>
</tr>
<tr>
<td>Clerks</td>
<td>2 (0.4)</td>
<td>2 (0.4)</td>
<td></td>
</tr>
<tr>
<td>Service workers, shop and market sales workers</td>
<td>7 (1.3)</td>
<td>11 (2.0)</td>
<td></td>
</tr>
<tr>
<td>Skilled agricultural and fishery workers</td>
<td>1 (0.2)</td>
<td>0 (0)</td>
<td></td>
</tr>
<tr>
<td>Craft and related trade workers</td>
<td>2 (0.4)</td>
<td>2 (0.4)</td>
<td></td>
</tr>
<tr>
<td>Plant and machine operators and assemblers</td>
<td>1 (0.2)</td>
<td>2 (0.4)</td>
<td></td>
</tr>
<tr>
<td>Elementary occupations</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td></td>
</tr>
<tr>
<td>Armed forces and others</td>
<td>8 (1.4)</td>
<td>3 (0.5)</td>
<td></td>
</tr>
<tr>
<td>Unemployed (House Wife)</td>
<td>245 (43.8)</td>
<td>253 (45.2)</td>
<td></td>
</tr>
</tbody>
</table>
Table 3 shows the average group weights of the intervention and control children at the beginning and at the end of each month during study period.

### Table 3: Comparison of weight gain in the intervention and control groups

<table>
<thead>
<tr>
<th>Average weight of children (Kg)</th>
<th>Intervention group (SD) (n=275)</th>
<th>Control group (SD) (n=285)</th>
<th>Significance</th>
<th>Mean Difference (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before intervention</td>
<td>11.20 (1.48)</td>
<td>11.02 (1.37)</td>
<td>t=1.48</td>
<td>df =558</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>p=0.14</td>
<td>0.18 (-0.06-0.42)</td>
</tr>
<tr>
<td>At the end of 1 month</td>
<td>11.53 (1.51)</td>
<td>11.20 (1.39)</td>
<td>t=2.74</td>
<td>df =558</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>p=0.006</td>
<td>0.34 (0.10-0.58)</td>
</tr>
<tr>
<td>At the end of 2 months</td>
<td>11.69 (1.49)</td>
<td>11.41 (1.42)</td>
<td>t=2.333</td>
<td>df =558</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>p=0.020</td>
<td>0.29 (0.05-0.53)</td>
</tr>
<tr>
<td>At the end of 3 months</td>
<td>11.89 (1.50)</td>
<td>11.60 (1.41)</td>
<td>t=2.294</td>
<td>df =558</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>p=0.022</td>
<td>0.28 (0.04-0.53)</td>
</tr>
</tbody>
</table>

At the beginning of the study the mean weight of the intervention group and the control group was 11.2kg and 11.02kg respectively. At the end of the first month, the mean weight of the intervention group and control group was 11.53kg and 11.20kg respectively showing a significant difference between the two groups (p=0.006). The difference in weight gain continued to be evident at the end of the second and third months (p=0.020, p=0.022 respectively).

Figure 3 illustrates the difference in rate of weight gain between the intervention and control groups.

**Figure 3: comparison of rate of weight gain**

The rate of weight gain was higher in the intervention group at the end of the first month following the introduction of HMSF.
Table 4 shows the pattern of adherence to the home made supplementary food in the intervention group.

**Table 4: Adherence to Homemade supplementary food**

<table>
<thead>
<tr>
<th>Type of compliance with the HMSF</th>
<th>Frequency</th>
<th>N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use of HMSF for main meal</td>
<td>Always</td>
<td>(6)2.2%</td>
</tr>
<tr>
<td></td>
<td>Most of the time</td>
<td>(13)4.7%</td>
</tr>
<tr>
<td></td>
<td>Some days</td>
<td>(67)24.4%</td>
</tr>
<tr>
<td></td>
<td>Never</td>
<td>(189)68.7%</td>
</tr>
<tr>
<td>Added scraped coconut/sugar to HMSF</td>
<td>scraped coconut only</td>
<td>(10.4%)</td>
</tr>
<tr>
<td></td>
<td>Sugar only</td>
<td>(5)1.8%</td>
</tr>
<tr>
<td></td>
<td>both sugar &amp; scraped coconut</td>
<td>(269)97.8%</td>
</tr>
<tr>
<td>Child ate supplementary food during illness as usual</td>
<td>Yes</td>
<td>(153)55.6%</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>(122)44.4%</td>
</tr>
<tr>
<td>Stopped supplementary food due to intolerance</td>
<td>No</td>
<td>(275)100.0%</td>
</tr>
<tr>
<td>Child couldn’t eat due to supply issues</td>
<td>No</td>
<td>(275)100.0%</td>
</tr>
</tbody>
</table>

HMSF was not the main meal in nearly 70% of children. Ninety-eight percent of children consumed added sugar and scraped coconut. There were no supply issues and no one stopped the HMSF due to intolerance. One child was temporarily asked to stop HMSF for 4 days due to a suspected allergic reaction by a paediatrician, but later it was reintroduced under the paediatrician’s observation.

Table 5 shows the effect of other factors that may influence weight gain during the study period.

**Table 5: Comparison of positive and negative confounders of weight gain in the control group**

<table>
<thead>
<tr>
<th>Confounders</th>
<th>Mean (days)</th>
<th>Mean Difference. (95% CI)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>‘Thriposha’ vs. weight gain</td>
<td>40 (range 13-77)</td>
<td>0.03754 (-0.0687-0.14379)</td>
<td>p=0.488</td>
</tr>
<tr>
<td>Respiratory infection vs. weight gain</td>
<td>4 (3 days)</td>
<td>0.07823 (0.0024-0.15405)</td>
<td>p=0.043</td>
</tr>
<tr>
<td>Fever days vs. weight gain</td>
<td>2 days (3 days)</td>
<td>0.0425 (-0.03568-0.12068)</td>
<td>p=0.286</td>
</tr>
<tr>
<td>Diarrhoea vs. weight gain</td>
<td>3 days (1 day)</td>
<td>0.05610 (-0.03339-0.14559)</td>
<td>p=0.219</td>
</tr>
</tbody>
</table>

Concurrent respiratory infection had a significant effect (p= 0.043) on weight gain. Eating “Thriposha” and diarrhoeal or febrile illness did not have a significant influence on the children’s weight gain during the study period.
The children ate more than half of the given HMSF on average for 60 days (median = 80 days, S.D=32 days) which indicates good compliance with the HMSF.

The focus group discussions with the PHMs and the mothers indicated very high acceptability as well as sustainability of this intervention and household sharing was minimal.

Table 6 shows the proportion of children who achieved normal nutritional status in both groups during the study period according to WHO height and weight chart.

<table>
<thead>
<tr>
<th>Table 6: Proportion of children who achieved normal nutritional status (&gt;-2SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Intervention group</strong></td>
</tr>
<tr>
<td>normal nutritional status</td>
</tr>
<tr>
<td>improved nutritional status</td>
</tr>
<tr>
<td>acute severe malnutrition</td>
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</tbody>
</table>

*Intervention group (n=275) **Control group (n=285)

There was no significant difference in the average weight of the two groups of MAM children at the beginning of the study (mean difference=0.1785, 95%CI -0.059-0.416: p=0.14). At the end of 3 months about 57.5% of the intervention group achieved normal nutritional status compared to 38.6% of the control group (p<0.001, 95%CI 10.8-27.01). Four (1.45%) children in the intervention group deteriorated and developed acute severe malnutrition compared to 16(5.61%) in the control group (p<0.01). The net positive effect on nutritional status is 98.55%.

The mean difference in height (+0.1154) between the two groups was not significant during the short study period of three months (95CI 0.30 – 0.74, p=0.234).

**Discussion**

Reducing the number of underweight children among the under-five population has been a challenge for Sri Lanka for decades, despite several government nutrition intervention programmes such as ‘Thriposha’, “super cereal plus”, “poshana malla”, and “Samurdhi” for underprivileged populations.

In this study, more than half (57.5%) the children in the intervention group achieved normal nutritional status (weight for height Z-score ≥ -1) at the end of 3 months. Nutrition supplementation for 159 children under four years with MAM in urban, poor Cambodia showed that 55% (n= 87) achieved normal nutritional status after 14 weeks, which is similar to data from our study [3]. The same study indicated a 5.6% rate of case fatality during the 14 weeks [3], whereas no case fatalities occurred in the current study. Migrant workers’ children under the age of 18 years (of whom 59% were <5 years) in the Dominican Republic were given food supplementation for 1 year from 2005 – 2006 which led to a reduction in acute malnutrition from 40% to 23% (p=0.001) and chronic
malnutrition from 33% to 18% (p=0.003), probably due to the longer duration of food supplementation [9].

A cluster randomized trial in Haiti comparing behaviour change communication for 6-23 month children and a recuperative model for children aged 6–60 months showed that children who were continuously exposed to the behaviour change model showed improvement in their weight for age and weight for height after 3 years (p<0.001)[10].

The views of the PHMs pertaining to the newly introduced homemade supplementary food suggest that, though the availability, accessibility, affordability, feasibility were high in this HMSF, motivation of the parents, firm encouragement and monitoring / supervision for non-sharing at household level by the health staff were vital for the success of the programme.

**Conclusions**
This study shows that homemade supplementary food is effective in improving weight gain in children aged 2-5 years with moderate acute malnutrition. The programme was feasible and acceptable. The results of this study indicate a long awaited solution to a major challenge faced by Sri Lanka, besides a way to achieve MDG target 1. This solution comes from within the community and is based on an evidence based intervention teamed with health promotion. Preparation of HMSF and feeding the child requires a positive and permanent behaviour change on the part of the principal caretaker. This intervention is likely to bring about a positive impact, when facilitated and monitored by the primary health care team more specifically the PHMs, as the ownership of the nutritional activity is with the community.

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**References**


