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SHORT COMMUNICATION

Screening for Acute Malnutrition Using Family Mid-Upper Arm Circumference in Somali Region of Ethiopia

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ABSTRACT

Background: In spite of the decentralization of diagnosis and treatment of severe acute malnutrition from the strictly hospital-based approach for all cases to community-based approach, only about 10%-15% of the estimated 16.5 million children suffering from severe acute malnutrition have access to treatment. The study assessed the use of Family Mid Upper Arm Circumference (Family -MUAC) for screening of acute malnutrition in Somali Region of Ethiopia.
Methods: This study used mix of qualitative and quantitative methods of data collection and analysis to describe the process and outcome of a pilot project using mentor mothers to screen for acute malnutrition among children under five using Family MUAC. This was conducted in 5 districts (woredas) of Somali Region of Ethiopia.
Results: Between 73 and 91 percent of the mentor mothers across the five project sites were able to correctly use the MUAC tape immediately after the training. Children correctly diagnosed as severe acute malnutrition (SAM) during the first month of the project by the mentor mothers ranged from 70.0 % to 83.8%, but the accuracy of measurement reduced at the end of the 6 months project period to between 59.8% and 66.7% across the 5 project woredas (districts). The SAM referrals by mentor mothers contributed between 10% and 36.2% of all cases of SAM admitted in the project woredas over the 6 months period.
Conclusion: This study demonstrated the ability of mentor mothers to use the color coded MUAC tape to detect severe acute malnutrition among children.

Introduction

There has been increasing decentralization of diagnosis and treatment of severe acute malnutrition in the last 20 years from the strictly hospital-based approach for all cases to community-based approach, 'Community Based Management of Acute Malnutrition' which has led to scale up of response (1, 2). In spite of this decentralization, studies have shown that only about 10%-15% of the estimated 16.5million children suffering from

severe acute malnutrition have access to treatment and the continued gaps in coverage requiring strategic methods to expand access to services (3, 4). The use of mid-upper arm circumference (MUAC) tape to detect malnutrion can be performed by minimally trained personnel which has led to the current recommendations for community health workers (CHWs) to screen for malnutrition using the MUAC tapes (5, 6).

In addition, in order to improve utilization and coverage of nutrition services, mothers and caregivers are being trained to detect and refer children suffering from acute malnutrition to treatment services, both within their homes and within their communities using the MUAC tapes (7-10). The results of this approach have been evidenced in peer-reviewed articles, which have effectively demonstrated that family members are able to screen their children to the same sensitivity as Community Health Workers (CHWs) using variety of approaches (7, 8, 10).

Somali region of Ethiopia has the highest prevalence of wasting at 21.1% compared to 7.2% national average and contributes approximately 25% of the total burden of wasting in the country (11). Like other nutrition program, there are concern about the coverage of Community Based Management of Acute Malnutrition services with many eligible children not accessing the services because of poor coverage of screening.

This study documented the pilot of family MUAC using mentor mothers' approach as part of a nutrition intervention project focused on anticipatory activities to mitigate the impact of potential drought related malnutrition in 5 at risk project woredas(districts) in the region.

Materials and Methods

The study used mix of both qualitative and quantitative methods. The qualitative data was collected from the project document review and the quantitative data from retrospective review of the nutrition data extracted from the project health facilities and records. The extracted data were entered into a Microsoft Excel spreadsheet and univariate analysis was done by generating frequencies and proportions and variables presented in graphs.

Results

This is divided into two themes: (1) Process for the introduction of the screening for malnutrition using family MUAC by mentor mothers (2) Programme achievements

(1). Process for introduction of screening for malnutrition using family MUAC by mentor

mothers include the following activities: The project was conducted between February 2021 and September 2021.

Stakeholders' meetings: At the beginning of the project, sensitization meetings were held with stakeholders at the regional and woreda levels to have a common understanding about the pilot project. The stakeholders engaged included the regional health bureau, woreda (district) health teams, the kebele (sub-district) administrators and selected members of the communities both men and women in the project woredas. This was to ensure adequate sensitization and awareness of the community members, approval and support from the health administrators on the community approach to screening for malnutrition using the family MUAC tapes by the mentor mothers and the value of the early detection of acute malnutrition.

Identification and selection of the mentor's mothers: 100 mentor mothers were selected from each of the five project woredas/districts of Hargelle, Jarati and Dolo-bay in Afdher zone and Dolo-ado and Bokolmayo in Liban zone in Somali Region of Ethiopia. The selection was done by the two local implementing non-governmental organizations (NGOs) engaged by UNICEF in consultation with the kebele (subdistrict) administrators in the woredas. The mentor mothers are influential respected matured women leaders, some of them are members of the Health Development Army (HDA) in their communities. The HDA are community volunteers, mainly females, 'multi-purpose' and cohesive, enabling community participation in improving their health and wellbeing in a holistic manner. They support the health extension workers in a context of vast catchment areas and dispersed populations to provide health promotion and preventive messages as part of the community health system (12). Each of the mentor mothers was assigned to between 20-30 households in their communities depending on the geographical spread of the community in the kebele they lived.

Training of mentor mothers: They were trained during a 4-day training on Maternal Infant and Young Child Nutrition (MIYCN) education and counselling using picture chart and counselling cards developed from the national guideline and on the use of UNICEF colour-coded Mid-Upper -Arm Circumference (MUAC) tape to screen children 6-59months for acute malnutrition. The training was conducted by health extension workers with support from the woreda nutrition officers and nutrition focal persons from the NGOs. The training included practical session and demonstration in the communities. After the training the mentor mothers

were provided with colour-coded MUAC tapes and the MIYCN picture charts and counseling cards.

Implementation of community-based screening and referral: The mentor mothers visited each household in their assigned areas on monthly basis and screened all eligible children(6-59months) for malnutrition and provided MIYCN counselling to pregnant women and mothers / caregivers in every household in the targeted communities. They also facilitated the referral of malnourished children to the nearest health facility for appropriate care. These mentor mothers were supervised and monitored by the health extension workers (HEWs) in the health facilities in their catchment area and this strengthened referral linkages between the community and health facilities. Each mentor mother screened between average of 50 and 75 children 6months-59months monthly depending on the population of the eligible children in the households in their catchment areas.

Each child screened to have malnutrition by the mentor mothers, MUAC red or yellow was provided with a referral card that the caregivers took to the nearest health facilities. On arrival at the health facilities, the health extension workers (HEWs) recorded the assessment done by the mentor mothers as indicated in the referral card in the health facility register designed for the project. Thereafter the HEWs reassessed the child using MUAC tape and recorded his /her findings and verified the accuracy of the measurement done by the mentor mothers and then provided with appropriate treatment. In most health facilities there were no Supplementary feeding program supplies for children with acute moderate malnutrition (MAM) and mothers were only provided with nutrition education and counselling. However, all children confirmed with severe acute malnutrition (SAM) were admitted and commenced on treatment. The HEWs also used the opportunity when the child was accompanied by the mentor mother to reinforce the skills and competencies of the mentor mothers on the use of the colour coded MUAC tape.

As part of the monitoring system, a register with

a sample shown in Figure 1 is used in all the health facilities which has the details of the child referred and the MUAC measurement by mentor mothers and verification by the health extension workers are recorded in the register.

The mentor mothers also helped to follow up children on treatment during their monthly household visit to prevent default and ensured completion of treatment. They also provided IYCF counselling to mothers/care giver so as to improve on treatment outcomes and prevent other children from becoming malnourished through appropriate feeding practices.

Follow-up and monitoring visits: The HEWs and the implementing NGOs conducted monthly follow up and supportive supervision visit to the mentor mothers to monitor and observe their activities, both MUAC screening and MIYCN counselling and education sessions they provided in their assigned households. This is to ensure the quality of the project implementation.

(2). Programme achievements: This was analysed from the data extracted from two records:

(1) Register at the health facilities which captured the record of all children with SAM referred by the mentor mothers based on their measurement using the color coded MUAC tape and verification of the accuracy of measurement done by the health extension workers and (2) The Therapeutic Feeding Program (OTP data) from the 5 piloted woreda between April 2021 and September 2021.

Figure 1 shows the sample of the health facility register used to capture the children screened and referred to the health facilities by the mentor mothers.

Accuracy of MUAC measurement by mentor mothers after training: Figure 2 shows the proportion of mentor mothers from the 5 project woredas who correctly used the coded MUAC tape to screen for acute malnutrition immediately after the training. 91 percent of the mentor mothers in Dolo Bay used the tape correctly followed by mothers in Dollo Bay woreda and 73percent in Hargelle immediately after the training

Accuracy of MUAC measurement by mentor

	Name of Health Facility:				ZONE			Woreda			
	Month :			Year							
SN	Name of children	Age	sex	Name of kebele	Name of mentor mothers	**Measurement by Mentor Mothers**			**Verification of measurement by Health Extension workers**			**Remarks**
						MUAC YELLOW	**MUAC RED**	**PEDAL OEDEMA**	**MUAC YELLOW**	**MUAC RED**	**PEDAL OEDEMA**	
1												
2												
3												
4												

Figure 1: Health facility register for referal cases by mentor mothers.
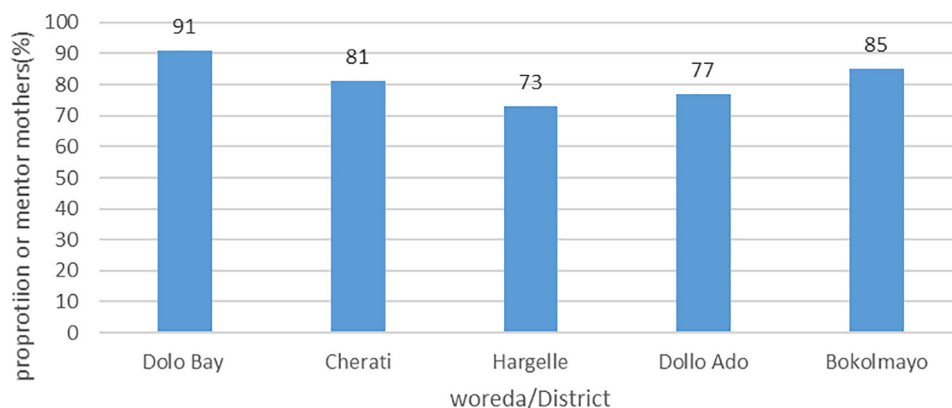
Figure 2: Proportion of mentor mothers who correctly used MUAC tape immediately after training (n=100).
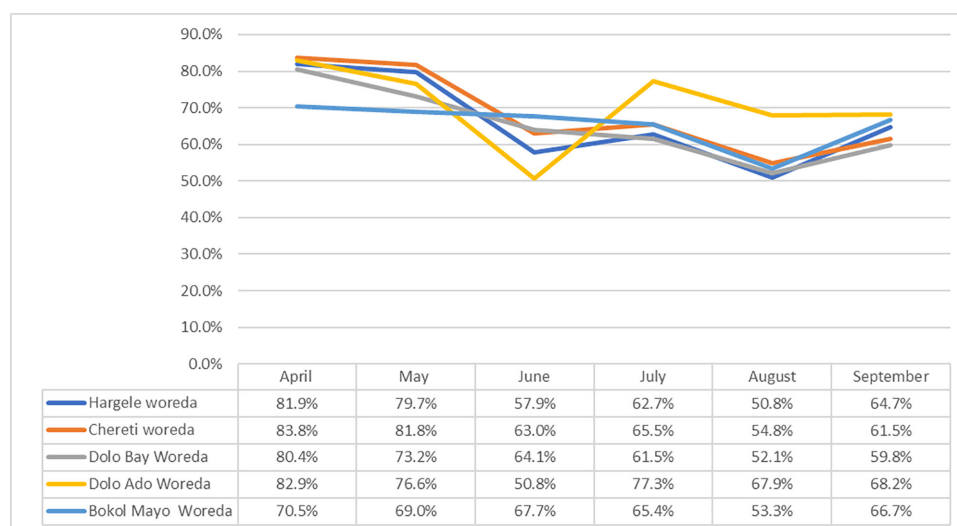

Figure 3: Severe Acute Malnutrition measurement accuracy by mentor mothers (April '21- Sept '21).

mothers during the project period: Figure 3 shows that proportion of children accurately detected to have severe acute malnutrition by mentor mothers using the color coded MUAC tapes upon verification by the health extension workers during the 6 months project period. It shows that number of children correctly diagnosed as severe acute malnutrition during the first month of the project ranged from 70.0 % to 83.8% across the 5 project woredas. However, this accuracy of measurement by mentor mothers reduced at the end of the 6 months project period to between 59.8% and 66.7% across the 5 project woreda. A major observation was that no child was reported with oedema.

Contribution of SAM cases referred by mentor mothers to woreda total SAM admission: Table 1 shows the contribution of the children detected as having severe acute malnutrion during screening by mentor mothers and referred to the health facilities to the total severe acute malnutrition cases admitted in woredas during the 6 months project period. It shows that SAM referrals by mentor mothers contributed between 10% in Bokolmayo woreda and 36.2% in Dolo Bay woreda over the 6 months period.

Discussion

The study demonstrated the ability of mothers to use the color coded mid-upper arm circumference (MUAC) tape to detect severe acute malnutrition among children as previously documented in other studies (9, 10). However, in this study mentor mothers were used unlike most studies where individual mothers/care givers were trained to measure their own children nutritional status(7, 8, 13).The approach of mentor mothers was adopted in this pilot project because it was much easier and feasible to train and supervise them than training and supervising all mothers in the project areas at the same time in view of the wide geographical spread of the communities and limited number of health extension workers needed for supervision and monitoring of the mothers in addition to their routine activities in the health posts.

This study found that between 73 and 91 percent of the mentor mothers across the five project sites were able to correctly use the MUAC tape immediately after the training which is similar to the finding from a rapid review of family MUAC projects in Senegal and Madagascar which showed

Table 1: SAM cases referred by mentor mothers Vs Woreda Total SAM cases

Month	DoloBay Woreda			Cherati Woreda			Hargelle Woreda			Dolo Ado Woreda			Bokolmayo Woreda		
	Verified SAM referrals by mentor mothers	Woreda Total SAM cases admission	% mentor mother contribution	Verified SAM referral by mentor mothers	Woreda Total SAM cases admission	% mentor mother contribution	Verified SAM referrals by mentor mothers	Woreda Total SAM cases admission	% mentor mother contribution	Verified SAM referrals by mentor mothers	Woreda Total SAM cases admission	% mentor mother contribution	Verified SAM referrals by mentor mothers	Woreda Total SAM cases admission	% mentor mother contribution
April	119	135	88.1	31	80	38.8	59	76	77.6	68	147	46.3	31	237	13.1
May	101	148	68.2	27	108	25.0	55	140	39.3	59	141	41.8	20	245	8.1
June	66	104	63.5	17	108	15.8	33	150	22.0	32	105	30.5	21	149	14.1
July	72	467	15.4	19	92	20.7	37	139	26.6	34	186	18.3	17	137	12.4
August	63	256	24.6	17	120	14.17	31	237	13.1	53	251	21.1	16	173	9.3
Sept	61	221	27.6	16	131	12.2	33	216	15.3	45	146	30.8	16	274	5.8
Total	482	1331	36.2	127	639	19.9	248	958	25.9	291	976	29.8	121	1215	10.0

SAM: Severe acute malnutrition

that between 60% and 93% the mothers correctly identified acute malnutrition after the training (9).

The study shows that the accuracy of the MUAC measurement by the mentor mothers within the first month of the pilot was about 80% which is similar to findings in a rapid review which reported that in a project by an NGO, 86% of self-referrals to health facilities were recorded as correct admissions, 79% in Malawi, 80% in South Sudan and 100% in Ethiopia (9). However, it is higher than finding in a study in Chad which reported that 63.2% of all children identified as having SAM by the mothers were confirmed as having SAM at a health centre (14).

The accuracy of measurement by the mentor mothers however decreased over the project period from about 80% to about 60% by the end of the 6 months project period. This is similar to the findings from other studies which reported that the capacity of caregivers declined as time passed after the initial training and suggested the need for regular refresher training and supervision and motivation (9, 15).

The study shows that between 10% and 36% of all SAM admission in the project woredas were referral by mentor mothers, this is similar to findings from other studies which reported that between 13% and 38% of admission were referred by mothers in projects in Burkina Faso, Senegal and Niger (9, 16).

The study did not measure the outcome or recover rate or effect of early detection among children referred by mentor mothers unlike study in Burkina Faso which showed that children of caretakers who received MUAC training were more likely to recover, which could be explained by better care-seeking behavior resulting from such trainings (16). Likewise, a study in Niger reported fewer complicated cases and hospital admissions among mother referred cases (8). However, with the Maternal Infant and Young Child Nutrition (MIYCN) counselling and education provided by the mentor mothers in addition to screening for malnutrition, there are possibility of better outcome among the children referred by them in our study.

There are concerns about the sustainability of this approach being a project-based intervention after the expiration of the project period if the mentor mothers will continue to conduct screening in the respective households they are assigned. There is need to ensure the family MUAC is fully integrated into the health system and adequate support and motivation provided to ensure sustainability of the initiative. A previous study in India reported that seven months after an MUAC mothers training, only 30% of mothers reported having ever measured their children (10). The study also reported that screening by mothers stopped at the end of the

project in the absence of partners and suggested the need to identify how to best motivate and engage caregivers to participate in MUAC measurements and addressing any barriers or stresses created by this additional responsibility (10).

A major observation in the study was that no child was identified with oedema by the mentor mothers, and this requires further review to assess the competency of the mentor mothers in detecting oedema among malnourished children.

Conclusion and Recommendation

The study collaborated the findings of the capacity of mothers to use the family MUAC to detect severe acute malnutrion among their children however, their capacity decreased gradually after the initial training. There is need for regular refresher training and supervision and appropriate incentives for motivation to sustain their capacity.

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Disclaimer

The view expressed in the article are that of the authors and not of the affiliated institutions

Conflict of Interest

None declared.

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