



CAPACITY BUILDING IN THE MANAGEMENT OF SEVERE ACUTE MALNUTRITION: EXPERIENCES FROM UGANDA

FLORENCE M. TURYASHEMERERWA*

World Health Organisation Country Office for Uganda, Prince Charles Drive, Kampala
Email: flo.kinyata@gmail.com

HANA BEKELE

World Health Organisation Country Office for Zimbabwe, Harare
Email: bekeleh@who.int

JULIET BATARINGAYA

World Health Organisation Country Office for Uganda, Prince Charles Drive, Kampala
Email: bataringayaj@who.int

WONDIMAGEGNEHU ALEMU

1163 Hidden Spirit Trl. Lawrenceville, GA, 30045

ABSTRACT

Purpose: To share experiences on the capacity building of health workers in the treatment protocols for the management of children with severe acute malnutrition (SAM) in Uganda.

Design: With financial support from the Global Affairs Canada, the World Health Organization provided technical expertise to update Uganda treatment guidelines and training materials for SAM in line with global guidance. In addition, the health workers received training and mentorship on the use of the updated guidelines. This was followed by support supervision to assess the case fatality rate from SAM, and understand the issues experienced in improving the care for SAM children.

Findings: A total of 153 health workers were trained in the training of trainers, and 15 in training of facilitators' workshops. The average pre- and post-test scores were 60% and 85%, respectively, for the training of facilitators and 56% and 68% respectively, for the training of trainers. A total of 521 health workers were mentored at their respective health care facilities. The average case fatality rate was 16.5% and 0.5% at two major hospitals. Effective management of SAM centred around the technical capacity, structure and processes involved.

Value: The results highlight the need for commitment to reduce deaths from children with SAM. An approach that looks beyond training and considers all components of the health care system is important.

Keywords: severe acute malnutrition; capacity building; Uganda; case fatality rate

*Corresponding author

BACKGROUND

For many years, the importance of malnutrition as a cause of child death and as an impediment to human and economic development was largely ignored. However, the need for urgent action is now being accepted, and the prevention and treatment of malnutrition are increasingly seen as an integral part of national and international health and development agendas (WHO, 2012; Jackson and Ashworth, 2015). In other words, investment in mainstreaming nutrition to tackle malnutrition in all its forms is now regarded as a key pillar in reducing child morbidity and mortality, without which sustainable development is not feasible. Interventions to address malnutrition have been identified (Bhutta et al., 2008; Bhutta et al., 2013), and global objectives and nutrition targets have been set (WHO, 2014). In addition, a list of 5 targets with 22 indicators has been developed under the second sustainable development goal, to end hunger, improve nutrition, and promote sustainable agriculture (Wüstefeld et al., 2015).

Critical to the attainment of the nutrition targets and development objective, however, is the addressing of all forms of malnutrition: of notable concern is severe acute malnutrition (SAM). SAM, defined as a weight-for-height z-score (WHZ) of < -3 , affects at least 19 million children under 5 years of age, whose risk of death is approximately 10-fold higher than that of children with $WHZ \geq -1$ (WHO, 2013; Bhutta et al., 2013). Most reviews have shown persistent high rates of case fatality rates (CFR) among SAM children since the 1950s (Cook, 1971; Schofield and Ashworth, 1996; Fergusson and Tomkins, 2009; Trehan and Manary, 2015; Lenters et al., 2013). In 2013, global treatment protocols for the management of SAM were updated in a bid to reduce the CFR. Although the effectiveness of these protocols has been established, few health workers are trained in providing care to children with SAM.

For most forms of health care, health workers are usually the first point of contact for young children and their families in their community. Through the health sector, there is a potential for the prevention and management of SAM services to reach large numbers of children in remote, rural, and disadvantaged communities where few other services exist. However, basic training curricula for many primary health workers often do not include

the essential knowledge or build the necessary skills of health workers to manage SAM children (Jackson et al., 2006; Jackson, 2001, 1996). Hence, there are many missed opportunities for health care workers to build on their competencies to adequately manage children with SAM. Despite this, several commitments to reduce the CFR from SAM have been echoed at various meetings and conferences (Schofield et al., 2011). At the 26th International Paediatrics Congress in Johannesburg in 2010, paediatricians resolved that the prevention and treatment of malnutrition would become a core competency for all paediatricians and other health workers. Later the same year, nutritionists meeting at the African Nutrition and Epidemiology Conference in Nairobi, Kenya, made a similar declaration. In 2005, the International Union of Nutrition Sciences launched the International Malnutrition Task Force to ensure that the treatment and management of malnutrition be actively supported as an important aspect of care. This would include advocating that the management of malnutrition be made a core competency in medical curricula (Jackson et al., 2006).

While pre-service training for care for the prevention and management of SAM should be a long-term goal, in-service training will always be necessary for rolling out new interventions to existing health services. In-service guidelines discuss best practices pertaining to training approaches, strategies, content, and mechanisms to ensure health worker performance is improved.

In 1999, the World Health Organization (WHO) published guidelines (*Management of severe malnutrition: a manual for physicians and other senior health workers*) to improve the treatment and reduce mortality for SAM at first referral level hospitals (WHO, 1999); this was to improve the management of children with SAM. Although the WHO Training Course materials on Management of Severe Malnutrition have been used in the training of health workers in several Asian and African countries, all cases of severe malnutrition were admitted and managed as in-patients. Exclusive in-patient management of severe malnutrition does not enable a large proportion of children to be managed due to limited hospital bed capacity and coverage, an inherent limitation of this mode of care (Collins et al., 2006a, Collins et al., 2006b).

Over the last decade, new evidence supporting the management of children with SAM has

emerged and member States requested WHO to update their 1999 document. The revised document (*Updates on the management of severe acute malnutrition in infants and children*) presents the updated evidence and practice for key interventions in the care of children with SAM related to areas that were prioritised by the guideline development group (WHO, 2013). In this guideline update, WHO endorsed community-based management for uncomplicated SAM, while still advising that children who are severely malnourished and have medical complications, such as severe oedema, should be treated in an appropriate health facility. Other guidance includes the use of Ready-to-Use Therapeutic Food (RUTF) in the treatment of SAM children. RUTFs are nutrient-dense products that are formulated as lipid pastes, bars or biscuits that provide a specified amount of high quality protein, energy and micronutrients, depending on the target population (Briend et al., 1999). Other specific aspects of the in-patient management of SAM, including approaches to treating infections, IV fluid for shock, management of diarrhoea in SAM, and management of micronutrient deficiencies as well as antibiotic use in SAM management, have also been reviewed (WHO, 2013).

With the developments in the management of children with SAM, management guidelines and training materials in Uganda have also been revised and updated with the current guidance. In this paper, we present the experiences from Uganda and lessons learned from the capacity building of health workers in the management of children with SAM using the updated guidelines.

METHODS

Review of the Guidelines and Training Materials

Through the Accelerated Nutrition Improvement (ANI) project, (funded by Global Affairs Canada) the World Health Organization (WHO) provided technical and financial support to the Ministry of Health Uganda. In collaboration with other implementing partners and UN organisations, they updated the IMAM guideline and training materials. This work was done in review workshops covering periods of five days each. The review highlighted new updates in the management

of severe acute malnutrition (SAM), highlighting new recommendations in eight key areas:

1. admission and discharge criteria for children aged 6–59 months with SAM;
2. where to manage children with SAM and oedema;
3. the use of antibiotics in management of SAM in outpatient care;
4. vitamin A supplementation in treatment of children with SAM;
5. therapeutic feeding approaches in the management of SAM in children aged 6–59 months;
6. fluid management of children with SAM;
7. management of HIV infected children with SAM; and
8. the identification and management of infants less than six months of age with SAM.

The stakeholders' workshops yielded updated national guidelines on the Integrated Management of Acute Malnutrition (IMAM) and related training materials.

Training of Health Workers on In-Patient Management of SAM

The training of health workers was conducted in three groups; these included the training of facilitators, training of trainers in the ANI districts, and regional training of trainers. For each of the training sessions, participants were divided into groups of six, led and assisted by a facilitator. The role of the facilitator was to introduce the modules, answer participants' questions, lead group discussions, role play and provide individual feedback. The content in the modules was delivered through a mixture of methods. Each of these methods is discussed below.

Reading of Modules

The course was structured into seven modules with a general introduction. The modules were as follows:

- Module 1: Nutrition assessment and classification of acute malnutrition;
- Module 2: Management of medical complications;
- Module 3: feeding;

Module 4: management of infants less than six months;

Module 5: Daily care;

Module 6: monitoring and problem solving;

Module 7: psychosocial support and involving mothers in care.

Within each group, the participants read through the modules as scheduled on the timetable, taking time to understand the aspects on nutrition assessment, details on medical complications and feeding; they then practiced with the written exercises given within the modules.



Individual Feedback

The facilitator guided the participants through individual exercises in each module while giving guidance.



Group Discussions and Role Play

Discussions were held within the same group led by the facilitator on concepts that needed emphasis, exercises and sharing of experiences.

Video Demonstrations

Video demonstrations on the transformation of a malnourished child from admission up to four weeks in management, emergency care, teaching mothers on home feeding and mental development in a child with SAM were shown. These provided real life situations/examples on what can be done at the health facilities.



Clinical Practice Sessions

In order to have hands-on skills with the training content, there were four scheduled clinical sessions throughout the training course as follows.

Clinical Session One: Tour of Nutrition Wards

Here the participants observed the admissions area to appreciate how the triage is done to identify emergency cases. In addition, observations were made on the organisation of the nutrition ward, food preparation area, preparation of therapeutic feeds and health education sessions.

Clinical Session Two: Nutrition Assessment, Classification of Acute Malnutrition and Management of Medical Complications

In this session participants took anthropometric assessments of the mid-upper arm circumference, weight and height, and categorised them to get nutrition status indicators for SAM. Clinical signs of complicated SAM such as hypoglycaemia, hypothermia, shock, dehydration, corneal ulceration, very severe anaemia, cardiac failure, dermatitis, or lack of appetite, were also reviewed by observed different patients. These observations were documented in a critical care pathway form (CCP).

Clinical Session Three: Feeding and Daily Care

In this session, observations were made of mothers and health workers performing the appetite test

for RUTF, and measuring and serving feeds to SAM children. In addition, health workers were observed as they participated in daily tasks, including the measurement of respiratory and pulse rates and temperature, and administration of eye drops, antibiotics, and multivitamins. Supplementary feeding techniques for SAM children below six months of age were also observed. This information was recorded on a CCP.

Clinical Session Four: Ward Management

Using a ward management checklist, this session involved a review of the 24-hour feed intake charts for SAM children, and planning for individual and ward feeds. In addition, this session involved an observation of education sessions in preparation for discharge.

Health Facility-Based Mentorships

Health facility-based mentorships for the proper management of children with SAM were undertaken at selected health facilities across the country. Using a pre-tested mentorship tool based on the ten steps for the care of children with SAM in the guidelines, a team of four, comprising national and regional facilitators in different regions, worked hand-in-hand with the respective districts. They mentored a total of 521 health facility staff from 30 health facilities (14 in the Eastern and 16 in the Western regions). Those mentored included front-line health workers (medical officers, clinical officers, nurses of all cadres and nutritionists) stationed at the health facility entry care points. These entry points included out-patient department, ante-natal care, young child clinic, early infant diagnosis and in-patient department, with an emphasis on the paediatric ward and nutrition units. At each of these places, observations on the gaps in the current practices were made and bespoke actions carried out.

Case Fatality Rate

A retrospective record review of all hospital admissions for SAM for the period July 2015 to March 2016 was undertaken. Data from the case records were extracted into structured forms that were based on the WHO guidelines for the management of SAM (WHO, 1999). These had been previously validated for the same age group in Tanzania (IMTF and Muhimbili National Hospital, 2010). The forms were pre-tested before use.

Qualitative data from in-depth interviews with health workers were noted down.

The case fatality rate per year was calculated as (Number of deaths of SAM for that year / Total admissions for SAM for that year) *100.

Results

The results in Table 1 show that the trainees included all health professionals that are involved in the care of children with SAM, including nutritionists, nurses and doctors. In the facilitator training, the nutritionists accounted for just over half of all the participants present. However, in the training of trainers, the number was only a tenth of the total number of attendees.

Table 1 Background of the Trainees

Training of Facilitators		
<i>Cadre of participants</i>	<i>Number</i>	<i>Percentage</i>
Nursing officer	3	20.0
Nutritionist	8	53.3
Medical Officer	4	26.7
Total	15	100.0
Training of Trainers		
Enrolled nurse	16	10.5
Nursing officer	46	30.1
Nutritionist	15	9.8
Clinical officer	21	13.7
Medical Officer	43	28.1
Tutors	12	7.8
Total	153	100

Source: Devised by author.

Training of Facilitators and Trainers

Participants improved and gained knowledge in the management of SAM as per the current guidelines; this was evident in pre- and post-test assessments. For the training of facilitations, the average pre- and post-test scores were 60% and 85%, respectively. The pre- and post-test scores for the training of trainers were lower at 56% and 68%, respectively.

Health Facility Based Mentorships

A total of 521 health workers were mentored across 30 health facilities covering the Eastern

and Western regions of the country. The following themes emerged from these mentorships:

Technical Capacity and Skills in Managing SAM Children

- there was a big knowledge gap in the identification and management of specific medical complications associated with SAM, including dehydration, severe anaemia, and shock, among others;
- there was a knowledge gap among staff with only a few trained on a nutrition package. This led to a lack of ownership of the services as any case of malnutrition is asked to wait and see the staff trained in nutrition;
- there is a large number of facilities that are inadequately staffed with limited diversity in cadres. This strains the routine screening at all entry points; low staffing also affects milk preparation, administering and monitoring, which greatly compromises management.

Clinical Guidelines, Equipment and Supplies

- the health facilities were poorly stocked in the basic equipment essential in the preparation of feeds, such as kettles, calibrated jugs, and dietary scales, among others.
- there were no clinical guidelines or other materials in nearly all the health facilities visited.

Infrastructure and Systems

- in some health facilities, there was limited physical space for children, making it difficult to allocate space for the nutrition section;
- there is no community follow up for discharged patients;
- there were no demonstration gardens, play materials or toys to improve the mental development of the children with SAM during recovery.

Case Fatality Rate

- the average case fatality rate ranged from 16.5% to 0.55%.

DISCUSSION

Our results show that the capacity building of health workers in the management of SAM improved health worker's knowledge of the subject.

However, follow up support supervision identified that an average case fatality rate of 16.5% at one of the hospitals was too high and unacceptable (Ashworth et al., 2003). A string of issues that health workers face in improving the care of SAM children also existed. Therefore, while training approaches have been emphasised (Schofield et al., 2011; Karaolis et al., 2007; Ashworth et al., 2004; Deen et al., 2003), the reported challenges to the effective management of SAM are multiple and may require a systemic approach to reduce deaths from SAM.

In Uganda, Bachou (2008) reduced the CFR from indiscriminate use of intravenous infusions and blood transfusions, but the overall CFR from SAM did not change (Bachou, 2008) when health workers were trained. A reduced CFR associated with training in the management of SAM was not sustained in South Africa (Ashworth et al., 2004). Karaolis et al. (2007) explained that the gains often made through training are eroded by unresponsive health care systems, while Puoane et al. (2008) and Giugliani et al. (2010) reported that training alone was not always sufficient to ensure correct care for SAM children; they recommended team work, supervision, audit and feedback be strengthened (Karaolis et al., 2007; Puoane et al., 2008; Giugliani et al., 2010)

In some places, low morale related to poor wages have forced some better trained and qualified staff to migrate to countries with better wages or to join the private sector, both of which contribute to weakening the government health care systems (Ashworth et al., 2004). While our investigations were not focussed on health worker immigration, Ogilvie et al. (2007) estimated that health professional migration, especially among nurses, was a big challenge in sub-Saharan Africa (Ogilvie et al., 2007). Health professional migration is not well documented in Uganda, but reports of health workers leaving for better paying jobs with non-governmental hospitals exist, and this creates staff shortage (Okello et al., 1998). The clinician-patient ratio was an evident gap during the health facility mentorships. For SAM children, who need around the clock feeding and care, this poses an increased risk of death as shown by the large numbers of children who die at night (Ashworth et al., 2004).

For most of the health facilities visited in this mentorship, there were no clinical guidelines or other training materials on the management of SAM children. Although the country has now revised materials that are not yet in print, the lack of the old ones may also mean that these will

not necessarily be available at these facilities. A review on how health worker performance can be improved and maintained in low resource settings concluded that having clinical guidelines in place and training without additional interventions such as supervision, audit and feedback, was generally ineffective (Rowe et al., 2005).

Supervision, audit and feedback are likely to address multiple determinants of performance, creating positive outcomes. For example, supervision, if done correctly, can also provide professional development and improve both health workers' job satisfaction and performance (Ashworth et al., 2004). Potter and Brough (2004) also emphasised an approach that looks beyond training and considers all the components of the health care system in order to improve the effectiveness of health service delivery. The health care system has different components, including structural and technical, all of which are likely to influence the outcome of the health care given (Donabedian, 1997). By applying a systemic approach the weaknesses of each component can be identified to get an understanding of the problems that can then be solved in a logical approach. In relation to the reduction of CFR, for example, Bachou (2008) reduced CFR from infusions and transfusions but not the overall CFR from SAM. Ashworth et al. (2004) reported an unsustainable reduction in CFR in a South Africa study when the doctors trained in the management of SAM were transferred. Our capacity building and support supervisions have also showed us that training was not enough to reduce the CFR among SAM children. Other issues, such as team work, communication, and supervision, all of which have been associated with deaths among SAM children (Puoane et al., 2008) have been recommended.

While the treatment for SAM is crucial, the prevention at the community level emphasised in the revised guidelines and training materials should be prioritised. However, more often than not, under-resourced poorly functioning health care systems dominate many district health care systems, and these result in inadequate outcomes from interventions to alleviate the burden of childhood under-nutrition (Ashworth et al., 2008; Puoane et al., 2008; Ashworth et al., 2004). Insufficient community monitoring and follow up, to identify and carry out the timely referral of SAM children or those at risk of SAM, are limiting in poorly functioning health care systems, as also identified in our support supervision. Without efficient refer-

ral systems, under-nutrition may not be reversed when it is most needed, within the first two years of a child's life. Even if they survive an episode of SAM, if under-nutrition is not corrected, affected children may face long-term health and economic consequences (Victora et al., 2008).

Where community health workers do not exist, carers may also have little contact with formal health services. However, if they exist, and nutrition interventions are done properly, they should improve carers contact with health services and increase maternal knowledge; this should then translate into reduced morbidity and mortality (Ashworth et al., 2008). Evidence shows a reluctance by carers to make use of the health care system (Konde-Lule et al., 2010; Rutebemberwa et al., 2009). In properly functioning health care systems, community-based health workers or community volunteers exist and help promote good family care, deliver simple curative interventions, and refer all cases of ill health to the health facility in a timely way, in addition to carrying out community sensitisation. A lack of formal contact between communities and first level referral health care facilities, may contribute to an untimely seeking of health care, especially in communities where health seeking behaviour may already be low. Young children with better health service utilisation are more likely to have a better nutritional status and survival (Ashworth et al., 2008).

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CONCLUSION

Although there was an overall knowledge gain from training, the issues in the effective management of children suffering from SAM are multiple. While training is very important as a short-

term measure, there is a need to review medical curricula to make this in-service; this would then target a larger mass of health care workers. In addition, there is a need to galvanise increased commitment and resources to building capacity in health care systems to improve the care of SAM children. Finally, an approach that looks beyond training and considers all the components of the health care system in order to improve the effectiveness of health service delivery for SAM children is necessary.

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BIOGRAPHICAL NOTES

Dr Florence M. Turyashemerwa has a PhD in Public Health Nutrition from the University of Southampton, UK. She has worked in the area of maternal and young child nutrition and research for the past 13 years, supporting the implementation of evidence-based nutrition interventions. More recently her work has focussed on supporting nutrition interventions in infant and young child feeding, the management of children with severe acute malnutrition, and strengthening of the national nutrition surveillance systems. Her recent research has focussed on managing children with severe acute malnutrition and the impact of integrated interventions in health, nutrition and agriculture on the maternal and young child nutrition status in the most critical period of child development, the first 1,000 days.

Dr Juliet Bataringaya has master's training in Health Policy, Planning and Financing as well as Epidemiology from the London School of Hygiene and Tropical Medicine. She also has additional short course training in Health Financing, Results Based Financing, Human Resources for Health, Quality of Care, Civil Registration and Vital Statistics, Health Care Evaluation and Leadership and Management. She has worked in the area of health system strengthening for the past 15 years, supporting countries in the African Region to develop policies, strategic plans, M&E plans and an analysis of the performance of their health systems. At WHO Uganda, she provided overall leadership and coordination for the implementation of the Accelerated Nutrition Improvement project. Her focus is now on strengthening country capacity for designing, implementing and measuring improvements in quality of care alongside scaling up access to health services at the national and sub-national level within the context of Universal Health Coverage and SDGs.

Dr Hana Bekele works for the World Health Organization. She leads programmes to strengthen routine nutrition information systems and the scaling up of nutrition in East and Southern Africa. She also served as technical lead on quality of care for child health programmes under a regional centre and quality of

care project, and as a researcher at the former Ethiopian Nutrition Institute leading studies on food consumption, iron deficiency anaemia in women, and vitamin A deficiency in children. She also collaborated on the writing of manuscripts on the evaluation of vitamin A supplementation programmes, performance of outpatient therapeutic programmes, and assessment of iron deficiency anaemia in women in Ethiopia. She contributed to the development of training tools on essential nutrition actions, and served as a trainer to build capacities of health workers in the region. Dr Bekele graduated in Medicine from Addis Ababa University and specialised in public health at Heidelberg University; she received a PhD in nutritional science from Oklahoma State University.

Dr. Wondimagegnehu Alemu is a medical doctor and Public Health specialist who brings over 3 decades

of experience in global health with focus in public health surveillance and disease control. He has worked in various capacity at Ministry of Health of Ethiopia before joining World Health Organization at the Regional Office for Africa (AFRO) as a medical officer. He led and coordinated the design, conceptualization, development and implementation of the Regional Integrated Disease Surveillance Strategy in the African region for over 10 years. Since 2008, he is serving the organization as head of WHO Country office in Sierra Leone (06/2008 – 3/2013), Uganda (04/2013 to 11/2016) and currently in Nigeria. Dr Alemu has authored and/or co-authored over 30 scientific papers on various topics including surveillance and outbreak response and contributed in other WHO publications. His research interest is public health surveillance and disease, prevention and control and health systems strengthening.