

Management of severe acute malnutrition using the World Health Organisation's guidelines at Mogalakwena hospital, Limpopo Province, South Africa

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Abstract

This study assessed management of Severe Acute Malnutrition (SAM) by healthcare professionals using WHO guidelines in children 6-59 months of age. The study used a quantitative approach and a descriptive design to assess the abilities of 156 healthcare professionals to effectively apply WHO SAM guidelines using a self-administered questionnaire. The sampled participants consisted of 18 (12%) dietitians, 24 (15%) doctors, 2 (1%) paediatricians and 112 (72%) nurses. The results indicated that on the treatment of hypoglycaemia, only n=24 (15%) responded according to WHO guidelines, which is giving 10% glucose or sugar solution, and feeding F75 formula straightaway on admission, whereas n=69 (44%) reported that 10% glucose is given and n=32 (21%) reported the administration of F75 formula. In the correction of micronutrient deficiencies, n=109 (70%) of the healthcare professionals knew the guidelines as recommended by WHO. On initiating feeding, the majority n=88 (57%) of healthcare professionals were knowledgeable about initiating feeding or cautious feeding in children with severe malnutrition. Even though the results of the study showed that most of the healthcare professionals have knowledge of most of WHO guidelines when treating severely malnourished children, however there is still a cause for concern as n=136 (85%) of healthcare professional did not know the treatment of hypoglycaemia as recommended by WHO. In view of this there is still a need for continuous training for the development of healthcare professionals' knowledge, skills and resources that are required to treat this group of children.

Keywords: Severe malnutrition, healthcare professionals, micronutrient deficiencies, hypoglycaemia, cautious feeding.

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Introduction

Severe acute malnutrition remains the leading risk factor for morbidity and mortality in children less than five years of age in developing countries (Beiersmann, Bountogo, Tienrebogo, Louis, Gabrysch, Jahn & Muller, 2012; WHO, WFP, UNSSCN & UNICEF, 2007). These deaths are mostly preventable at hospital level (Puoane, Sanders, Chopra, Ashworth, Strasser et al., 2007). Hence its management plays a critical role in saving children's lives and working

towards achieving Millennium Development Goals (MDG), that is the first goal: eradicating extreme poverty and hunger, and also the fourth goal: reducing child mortality rates (Pronyk, Muniz, Nemser, Somers, McClellan, Palm et al., 2012; Puoane et al., 2007).

Childhood malnutrition is a major global health problem contributing to impaired intellectual development and disability in childhood, suboptimal adult work capacity and increased risk of diseases in adulthood (WHO, 2014a). Furthermore, malnutrition in children under the age of two years reduces their ability to learn throughout their lives (UNICEF, 2013). Children suffering from malnutrition start their lives with serious limitations such as impaired psychosocial and cognitive development (MHFI, 2011).

Globally, it is estimated that 178 million children under five years are stunted, 55 million are wasted and most of these children are from Sub-Saharan Africa and South-Central Asia (Bhutta & Salam, 2012).

In Africa, SAM affects almost 3% of children under the age of five at any given time and it is related to a hundred thousand children's death each year (Briend and Collins, 2010). Case fatality rates for SAM in African hospitals remain high, especially with underlying medical conditions, bacterial disease and HIV (Talbert, Tuo, Karisa, Chesaro, Ohuna, Ignas, Berkley, Toronto, Atkins & Maitland, 2012).

In South Africa, there was an increase in the number of under five children admitted with SAM from 14 847 to 15 910 between 2013/14 to 2014/15, while the case fatality rate has also increased from 11.3% to 11.6% between 2013/14 to 2014/15 (Massyn, Peer, Padarath, Barron & Day, 2015). The incidence of severe acute malnutrition in children under five years has remained the same at 4.5 per 1 000 (Day & Gray, 2016). The latter trend can be attributed to adoption and implementation of the WHO guidelines by the National Department of Health in 2005.

The malnutrition rate in Limpopo Province, South Africa still remains high in children under the age of five years. This is mainly due to poverty and lack of basic resources for nutritional well-being (Mamabolo, Albert, Steyn, Delemarre-Van de Waal & Leveitt, 2005), with data from 2014/15 showing that the number of admissions for SAM was 1 950 which was an increase from 1 880 in 2013/14. The case fatality rate from SAM in 2014/15 was 14.9% which was a reduction from 15.3% in 2013/14, however this is still above the national target of 8% (Massyn et al., 2015).

Mokgalakwena is one of the six sub-district found in the Waterberg district municipality. There is a paucity of studies on SAM in this sub-district, however

data from Waterberg district municipality indicate that SAM is still one of the nine leading causes of death in children under five, with the case fatality decreasing from 15.8% to 12.3% between 2013/14 and 2014/15 (Massyn et al., 2015). According to the deprivation index and socio-economic quintiles, Waterberg district is classified as quintile three which is average. Given the above data, it is safe for one to deduce that Mokgalakwena sub-district has highest rate of children suffering from SAM as it is the most populated sub-district of the six.

World Health Organization guidelines (for management of severe acute malnutrition) are systematically developed evidence-based statements which assist providers (Healthcare professionals), recipients (Patients and caregivers) and other stakeholders to make informed decisions about appropriate health interventions (WHO, 2014a). These sets of guidelines are for doctors, senior nurses and other senior health professionals responsible for the care of young children in hospitals at the first referral level in developing countries (WHO, 2014b). These guidelines were developed by WHO and international experts, and were first published in 1981 (WHO, 2014b). They were then peer reviewed and accepted in 1998 and thereafter published and implemented in 1999 (WHO, 2014b).

Effective implementation of WHO guidelines in the hospital settings by healthcare professionals should decrease death rates from SAM to at least 5% (Picot, Hartwell, Harris, Mendes, Clegg & Takeda, 2012). This recommendation is further supported by studies by Giugliani, Duncan, Harzheim, Breyse and Jarrige (2010), Bachman (2010), Weisstaub *et al.* (2008) and Bernal, Valasquez, Alcaraz and Botero (2008) who evaluated the effectiveness of WHO guidelines in hospitals for the management of SAM, and found that after implementation of the WHO guidelines, case fatality rates of children who suffered from SAM decreased significantly.

Despite the availability of WHO case management guidelines, poor health compliance with evidence-based standards is still a problem facing paediatric service delivery (Irimu *et al.*, 2012). This view is further supported by Nzioki, Irimu, Musoke and English (2009) as well as Weisstaub, Medina, Pizarro and Araya (2008) who assessed the implementation of WHO guidelines and showed that not all steps were implemented fully and there is reluctance from health professionals characterised by delayed initiation of feeds after admission.

Furthermore, Gathara, Opiyo, Wagai, Ntoburi, Ayieko, Opondo *et al.* (2011) and Nzioki *et al.* (2009) concluded that the quality of care given to children admitted with SAM is inadequate and often does not follow the WHO guidelines. There is a dearth of studies or literature on knowledge of SAM management by healthcare professionals. This is mainly attributed to less attention given to

knowledge of SAM management among healthcare professionals as it was assumed that they had adequate management knowledge, and more emphasis being placed on the effectiveness of treatment protocols or modalities that healthcare professionals use or give.

The purpose of this study was to assess the management of SAM by Healthcare professionals using WHO guidelines in children 6-59 months of age at Mokgalakwena sub-district Municipality hospitals in Limpopo Province of South Africa. The main objectives were to determine healthcare professionals' knowledge of management of SAM and how they manage children admitted to the paediatric ward with SAM using WHO guidelines. The study was also intended to assess the results achieved by healthcare professionals when managing severely malnourished children and to determine whether there are shortcomings in the management of SAM.

Methodology

Study approach and design

The study used a quantitative approach and a descriptive survey design to assess the management of SAM by healthcare professionals using WHO guidelines in children 6-59 months of age at Mokgalakwena sub-district municipality hospitals in Limpopo province.

The study population and sample selection

Mokgalakwena sub-district municipality has only three hospitals, Mokopane hospital, George Masebe hospital and Voortrekker hospital. A total sample size of 156 healthcare professionals that was comprised of 112 nurses, 24 doctors, two paediatricians and 18 dietitians, participated in the study. Due to small population size no sampling technique was used as the researcher selected all the doctors, nurses and dietitians who volunteered to participate in the study.

Data collection

Data were collected using a self-administered questionnaire. The researcher visited all three hospitals involved in the study, went to different sections where healthcare professionals were stationed, gave all participants who volunteered and who were present on the day of data collection a consent form to sign and a participants' information leaflet to read before data was collected. The self-administered questionnaires were subsequently given to all the participants and checked for completeness in order to facilitate data analysis.

Data management and analysis

All questionnaires were checked for completeness before computer data entry. The questionnaire data were entered or coded into IBM SPSS statistics software version 21 programme and analysed appropriately.

Validity and reliability

The researcher made sure that the modified questionnaire was structured and used in the same way at all times when data was collected. The questionnaire was piloted among 3 respondents in each category of the respondents before it was used for the main study. The researcher ensured reliability by clearly writing instructions and questions that were easily understood. The questionnaire included a lot of options to questions being asked; this aided in decreasing the sources of error (such as guessing). The questionnaire was well understood and there were no comments to address.

Internal consistency was assessed using the Cronbach's alpha and a value of 0.324 was recorded. The acceptable values of alpha ranges from 0.70 to 0.95. A low value of alpha could be due to a low number of questions, poor interrelatedness between items or heterogeneous constructs (Tavakol M & Dennick R, 2011). The researcher ensured content validity by making sure that the questions in the questionnaire were in line with the aim and objectives of the study. The researcher also modified a questionnaire which was validated and used in other previous related studies (Biggs, 2013), thereby ensuring criterion validity. The use of WHO guidelines for the management of severe malnutrition in young children also ensured consistent validity of the study since they were of international standard and adjudged to be applicable to all populations.

Ethical considerations

The protocol was granted ethics approval by the School of Health Care Sciences Research Committee (SHCSRC) and the Medunsa Research Ethics Committee (MREC), University of Limpopo (Medunsa campus) (MREC/H/75/2014). Permission to conduct the study was also obtained from the Department of Health and the respective Chief Executive Officers. The researcher informed the participants about the purpose, confidentiality and methods of the study, asked their permission to administer the questionnaires.

Results and Discussion

On average, n=89 (57%) healthcare professionals had knowledge of all WHO guidelines and implemented them when treating severely malnourished children. The guidelines in which most healthcare professionals excelled were correcting

micronutrients deficiencies, providing sensory stimulation and preparing for follow up after discharge (Figure 1). The former would help in improving children's micronutrients status, brain development and intelligence quotient (IQ), while sensory stimulation will assist in cognitive function and reduced depression, whereas the latter would aid in decreasing readmissions and relapses.

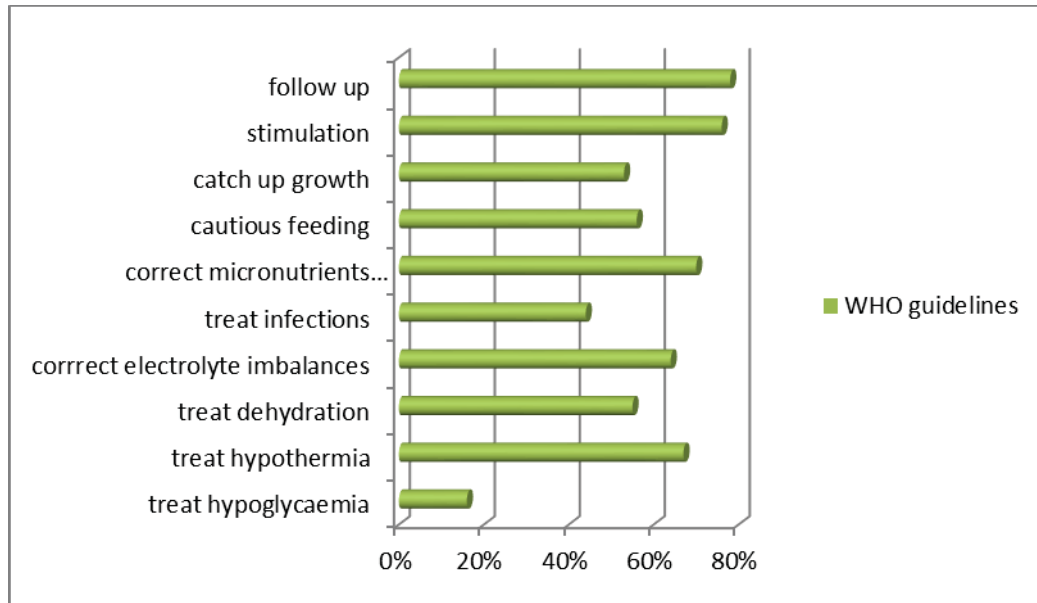


Figure 1: Implementation of WHO guidelines by healthcare professionals (n=156).

Treatment of hypoglycaemia

Sixty nine (44%) of healthcare professionals reported that 10% of glucose is given, whereas 32 (21%) stated that F75 formula should be administered, while 24 (15%) indicated that 10% glucose should be given, and F75 formula, and sugar solution should be provided to hypoglycaemic children on admission. The healthcare professionals performed poorly on this guideline as n=136 (85%) did not know the treatment of hypoglycaemia as recommended by WHO, which is supported by the findings of Younas *et al.* (2012) who observed late diagnosis and ineffective treatment of hypoglycaemia in malnourished children by healthcare professionals.

Treatment of infections

Sixty six (42%) healthcare professionals admitted that all severely malnourished children with signs of infections were offered broad spectrum antibiotics on the first day, good nursing care, rooms with less overcrowding and given the measles vaccine if not immunised. However, 64 (41%) healthcare professionals indicated that they gave only a broad spectrum of antibiotics on the first day to children who showed signs of infection, whereas five (3%) reported that they

were only provided with rooms with less overcrowding. The healthcare professionals performed poorly on this guideline as n=91 (58%) did not respond according to the WHO recommendation. This result is inconsistent with those studies of Nzioki *et al.* (2009), Karaolis *et al.* (2007), Bernal *et al.* (2008) and Giugliani *et al.* (2010), which reported that almost all (89.6% to 99.4%) severely malnourished children were offered routine broad spectrum antibiotics at admission. Poor management of malnutrition can have negative consequences for the patient, such as alteration of body function, weakened immune system and fatigue and apathy (Barker, Gout & Crowe, 2011). While poor management of the former can result in permanent neurologic damage, poor management for the latter could increase morbidity and length of hospital stay. From the above discussed findings, it is evident that not all healthcare professionals fully implemented WHO guidelines when treating malnourished children. This can have a negative impact as SAM remains the leading risk factor for morbidity and mortality in children under five years of age in developing countries (Beiersmann *et al.*, 2012). Healthcare professionals do have knowledge on the management of SAM using WHO guidelines; however, there are still gaps that need to be filled in order to improve the management of severely malnourished children at Mokgalakwena hospitals in Limpopo Province of South Africa.

Weight gain

Ninety six (62%) healthcare professionals reported that the average weight gain in severely malnourished children was 5g/kg/day, which is a poor weight gain by WHO standards, with 22% (n=34) reporting an average weight gain of 10g/kg/day, which is moderate according to WHO standards, whereas 7% (n=10) reported a weight gain of 15g/kg/day, that is considered good weight gain (Figure 2).

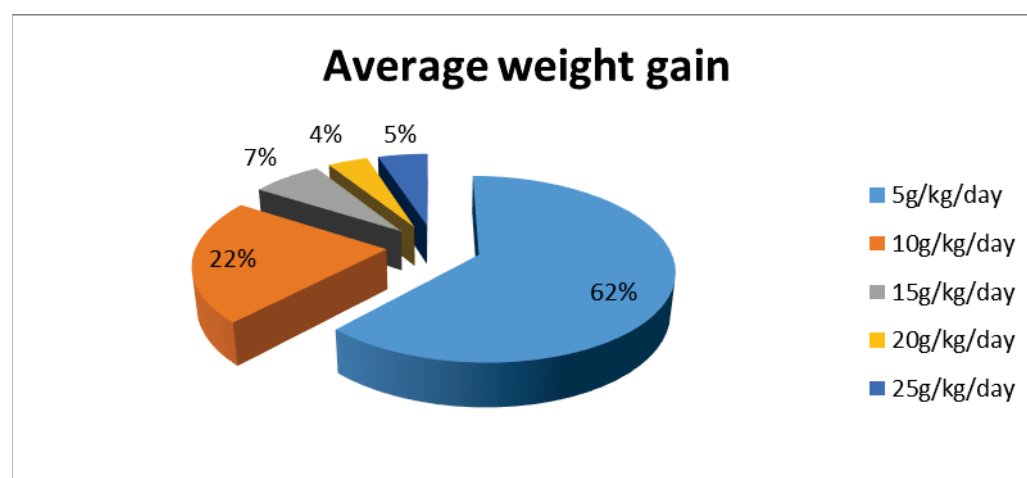


Figure 2: Average weight gain reported in children with malnutrition (n=156).

The majority n=96 (62%) of healthcare professionals reported an average weight gain of 5g/kg per day instead of 10g/kg per day which is recommended by WHO. This raises concerns that malnourished children are not gaining weight appropriately which puts them at risk of not catching up with their peers and they may have poor quality of life during adulthood, as malnutrition has been found to reduce learning in children and earnings in adults who have previously suffered from malnutrition (UNICEF, 2009).

Induction of new staff

One hundred and twenty six (81%) healthcare professionals responded that their new staff were inducted on management of severely malnourished children, the results of which may be due to the fact that new employees first need to adapt and learn how certain protocols and procedures are done. A total of 73% and 66% of the healthcare professionals reported that their facilities had basic resources and adequate personnel to enable them to treat or take care of severely malnourished children, respectively.

This will aid in providing good treatment to malnourished children, as there will be enough skilled healthcare professionals with basic resources to treat such children. However, Park *et al.* (2010) indicated that management of SAM is not sustainable in in-patients care due to scarcity or shortage of skilled health care professionals, with an estimated number of four doctors and 22 nurses per 100 000 patients.

Studies by Bernal *et al.* (2009), Nzioki *et al.* (2009) and Chary *et al.* (2013) further support the above findings, as they reported that most challenges encountered in management of SAM are inadequate and erratic healthcare professionals, poor care due to lack of knowledge, poor communication with caregivers, late diagnosis, delayed initiation of therapy and lack of a specialized malnutrition team to coordinate care.

The Waterberg District of Limpopo Province mainly consists of secondary hospitals, which generally have a small number of healthcare professionals. Therefore the present study findings can be generalised only within this district and cannot be used as a reference to all hospitals in the province. The results of this study have highlighted on the management gaps that healthcare professionals have when treating SAM children, achieved results of SAM management and shortcomings encountered during the treatment of SAM by health care workers. More studies with larger sample size, including different districts of Limpopo province are needed to further explore the management gaps of healthcare professionals when treating SAM and to facilitate generalization of the findings.

Conclusions and Recommendations

It is safe to conclude from the present findings, that most healthcare professionals had knowledge of the WHO guidelines when managing severely malnourished children. The majority of healthcare professionals showed that SAM children gained weight poorly and lastly, a small but significant number of healthcare professionals indicated that their facilities did not have basic resources and enough staff members to enable them to treat severely malnourished children. There is a need for healthcare professionals to improve or standardize the treatment being offered to malnourished children. This can be achieved through a structured programme of in-service training, attending of update seminars and congresses for SAM management and using the same protocols for the treatment of malnourished children.

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