



**KNOWLEDGE, ATTITUDES AND PRACTICES OF HEALTH CARE
WORKERS ON MANAGEMENT OF SEVERE ACUTE MALNUTRITION AT
KAMUZU CENTRAL HOSPITAL, LILONGWE, MALAWI.**

MASTERS OF SCIENCE (CHILD HEALTH NURSING) THESIS

LUCY LUSEKERO CHITETE NGOMA (MRS)

UNIVERSITY OF MALAWI

KAMUZU COLLEGE OF NURSING

APRIL, 2018.



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BY

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**Submitted to the Faculty of Nursing, in partial fulfilment of the requirements for
the degree of Master of Science in Child Health Nursing.**

APRIL, 2018.

Declaration

I, Lucy Lusekero Chitete Ngoma, hereby declare that this thesis is a result of my original work and that I have not submitted it or any part of it for a degree at any other University of Malawi or any other University. Acknowledgements have been made for other people's work used in the thesis.

Name of Student: Lucy Lusekero Chitete Ngoma

Signature:

Date:

Certificate of Approval

The undersigned certify that this thesis represents the students own work and effort and has been submitted with our approval.

Signature

Date:

Mercy Pindani, PhD (Associate Professor)

Main Supervisor

Dedication

I dedicate this thesis to my husband Jonathan, my children Watson and Faith for their love, guidance and untiring support. To my mum and dad, thanks for the spiritual support and encouragement. May the God Almighty bless you all.

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Firstly, I thank God Almighty for seeing me through the entire period. He gave me knowledge, strength, good health and understanding to complete my studies.

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ABSTRACT

Introduction /Background

Malnutrition is responsible for 35% of deaths among children under five years of age globally (Black et al., 2008). In 2013, an estimated 2.9 million children under-five were admitted globally for treatment of severe acute malnutrition (UNICEF, 2015). The 2015 Malawi annual SAM burden was estimated at about 79, 301 under five children (Kouam, 2016). The need for health care workers to have knowledge in management of severe acute malnutrition has been emphasized in many studies. Evidence has shown that health care workers' knowledge in management of severe acute malnutrition promote good practices and positive attitudes which result in quality care hence decrease in mortality.

Objective

The aim of the study was to explore the knowledge, attitudes and practices of health care workers on management of severe acute malnourished children at Kamuzu Central Hospital.

Methodology

This was a cross sectional descriptive study. Participants were from the paediatric department. Simple random sampling was used to select 51 participants for the study. A structured questionnaire and observation checklist were used to collect data. 9 observations were done on actual provision of care. Analysis was done using the Statistical Package for Social Sciences (SPSS) version 20. Findings on knowledge, attitudes and practices of health care workers were presented in descriptive form using tables, graphs, charts and percentages.

Results

Majority of the participants were females with a ratio of 4:1. High number of participants were in the age range of 25-34. Overall, 65% of health care workers had inadequate knowledge in management of severe acute malnutrition. 75% of health care workers had positive attitudes towards management of severe acute malnutrition. In practice, health care workers did not follow the recommended guidelines in management of severe acute malnutrition. Correlation between knowledge and practices as well as attitude and practices was not significant ($p > 0.05$). Shortage of staff, lack of resources, lack of adequate space and lack of in-service trainings in management of SAM were some of the challenges mentioned by most respondents.

Conclusion and recommendations

Health care workers did not have adequate knowledge in management of severe acute malnutrition which led to substandard care. The study recommended in-service trainings of health care workers in management of SAM. Training institutions should also strengthen the pre-service curriculum on managing children with severe acute malnutrition.

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LIST OF ACROYNORMS

CMAM	Community Management of Acute Malnutrition
HCWs	Health care workers
HIV	Human Immunodeficiency Virus
HMIS	Health Management Information Systems
KAP	Knowledge, Attitudes and Practices
KCH	Kamuzu Central Hospital
MDHS	Malawi Demographic Health Survey
MUAC	Middle upper arm circumference
NSO	National Statistics Office
NRU	Nutritional Rehabilitation Unit
OTP	Outpatient Therapeutic Programme
SAM	Severe Acute Malnutrition
SFP	Supplementary Feeding Programme
RUTF	Ready-to-Use Therapeutic Foods
UNICEF	United Nations Children Fund
WHO	World Health Organisation

OPERATIONAL DEFINITIONS

Undernutrition/Malnutrition: It is a consequence of a lack of nutrients caused by inadequate dietary intake and/or disease (Ministry of Health & Ghana Health Services, 2012).

Acute malnutrition: It is a form of undernutrition/malnutrition defined by the presence of bilateral pitting oedema or wasting (low MUAC or low weight for height) (Ministry of Health & Ghana Health Services, 2012).

Severe acute malnutrition: It is defined as a very low weight for height (below - 3 z scores of median WHO growth standards), by visible severe wasting or by the presence of nutritional oedema (Ministry of Health, 2012). In children aged 6–59 months, an arm circumference less than 110 mm is also indicative of severe acute malnutrition (Ministry of Health, 2012).

Therapeutic feeds: Foods designed for therapeutic purposes as a form of dietary supplement. Examples are F75, F100 and RUTF.

Knowledge: The capacity to acquire, retain and use information (Lakhan & Sharma, 2010).

Attitudes: To see and interpret events according to certain predispositions (Lakhan & Sharma, 2010).

Practices: Application of rules and knowledge that leads to action (Lakhan&Sharma, 2010).

Health care workers: Doctors, nurses and clinicians who take care of severe acute malnourished children.

Caregiver: Is a parent or relative of a sick child who voluntarily assists in providing care.

CHAPTER ONE

INTRODUCTION AND BACKGROUND

1.1 Introduction

Malnutrition is one of the leading causes of morbidity and mortality in children in developing countries. In sub Saharan Africa, it is the third leading cause of death in children under-five years (Qamar, Saleem, & Bhutta, n.d.). Poor hospital care especially faulty case management, has been reported as the main cause of this high case fatality rate in resource-poor settings (Bernal, Velásquez, Alcaraz, & Botero, 2008; Nzioki, Irimu, Musoke, & English, 2009). In addition to mortality, malnutrition impairs immune function of malnourished children making them prone to repeated infections which are more severe and longer lasting than in well-nourished children that may lead to further deterioration of their nutritional status (WHO 2008). Furthermore, stunting is also associated with suboptimal brain development, which is likely to have long-lasting harmful consequences for cognitive ability, school performance and future earnings (UNICEF, 2013).

The trend of malnutrition in the country which is one of leading causes of high morbidity and mortality in under five children has not changed much from the time when the Malawi Demographic Health Survey (MDHS) was done in 2010. According to NSO & ICF international (2016), stunting is now at 37% from 47%, underweight 12% from 13% and wasting at 3% from 5%. Under five mortality rate is at 64 deaths /1000 and malnutrition accounts for 22% to this high mortality (NSO & ICF international, 2016; WHO, 2010). The death rate is higher than most of the global and the regional figures.

Malnutrition is categorized into two: Acute Malnutrition and Chronic Malnutrition. Acute malnutrition is further divided into Moderate Acute Malnutrition (MAM) and Severe Acute Malnutrition (SAM) depending on the patient's degree of wasting (Ministry of Health, 2012). Severe acute malnutrition contributes to more than 60 % of deaths in children in developing countries (Nyeko, Calbi, Ssegujja, & Ayot, 2016). In 2013, an estimated 2.9 million under-five children were admitted globally for treatment of SAM (UNICEF, 2015).

Appropriate care of hospitalised children with severe acute malnutrition is a priority across the globe to ensure reduced morbidity and mortality (Tafese & Shele, 2015). Evidence from a review of treatment practices worldwide showed that many health services used discredited practices and that staff were unfamiliar with modern, effective guidelines for the management of severe malnutrition (Nyeko et al., 2016). SAM children are nine times more likely to die than those children who are well-nourished hence need for health care workers to be knowledgeable and competent in case management of SAM (UNICEF, 2013). A study in South Africa found that where health care workers had knowledge in management of severe acute malnutrition, their confidence in managing children with severe acute malnutrition increased despite working under difficult circumstances (Puoane, Cumming, Sanders & Ashworth, 2008).

Generally, evidence from literature review show that health care workers do not have adequate knowledge in case management of SAM (Bachou, 2008; Mowe et al., 2008; Nzioki et al., 2009; Warfa et al., 2014). This is due to lack of in-service trainings to improve and update their knowledge and practices (Younas, Khan, Khan, Shah & Munir, 2012). According to Gaur and Bansal (2016), 50 paediatricians and medical officers showed lack of knowledge in basics,

assessment and management of SAM which led to poor quality care. Furthermore, Puoane, Sanders, Ashworth & Ngumbela (2006) reported that lack of knowledge by nurses on case management malnutrition resulted to negative attitudes towards severely malnourished children and their caregivers which affected quality of care.

Currently in Malawi, the researcher did not come across studies that have been done on knowledge, attitudes and practices of health care workers on management of severe acute malnutrition. Therefore, there is need to conduct the study to establish the knowledge, attitudes and practices of health care workers at Kamuzu Central Hospital as the results will contribute to the body of knowledge in management of SAM hence improve care.

1.2 Background

Severe acute malnutrition (SAM) is a major global public health problem (Collins, 2007). According to UNICEF, WHO & World Bank (2015), about 16 million under five children had severe acute malnutrition globally and about 1 million of them die each year. In an effort to address this high mortality of children with severe acute malnutrition, the World Health Organisation developed guidelines in 1999 with ten- step protocol to be followed in the inpatient care of severe malnutrition (Warfa et al., 2014). In health facilities where the WHO guidelines were introduced and implemented, studies showed a reduction in mortality from high rates of 50% to as low as 6% (Warfa et al., 2014). Despite the evidence, some regions especially developing countries continue to have high mortality and morbidity rates.

Asia and Africa are the two continents that still have vast majority of children suffering from severe acute malnutrition. According to UNICEF, WHO and World Bank

(2015), 68 % and 28% of children in Asia and Africa were malnourished respectively. For example, a study done by Ahmed et al. (2014) reported that Pakistan and Indonesia recorded 1.4 million and 1.2 million of severely acute malnourished children respectively. India alone is home to more than 8 million children with SAM and the case fatality rate is between 20-40% (Ahmed et al., 2014). In spite of the huge numbers of children suffering from the condition, the coverage of interventions in Asia is either absent on a national scale or poor (Ahmed et al., 2014). In addition, there are also challenges like shortage and turnover trained staff, lack of space, shortage of supplies and lack of guidelines which affect the quality of care provided to children with severe acute malnutrition (Ahmed et al., 2014).

Sub Saharan Africa has 13 million children with severe acute malnutrition (Munthali, Jacobs, Sitali, Dambe, & Michelo, 2015). In Zambia and Kenya, studies done by Munthali et al. (2015) and Nyarko (2015) reported that there were 5% and 6% of children with severe acute malnutrition respectively. Likewise, severe acute malnutrition is the primary diagnosis in 20% of pediatric hospital admissions in Ethiopia (Saaka et al., 2015).

In response to the increased morbidity and mortality, many African countries incorporated the World Health Organisation 10 steps protocol (**APPENDIX E**) in their guidelines and standards of care so that they could improve case management of SAM and reduce mortality rates. Despite the action, children continue to have poor outcomes with most of the hospitals in sub Saharan Africa recording case fatality rates of between 20 and 50% (Bachou, 2008). A case fatality of 38% was recorded at Kenyatta national hospital in Kenya due to poor management of children with severe acute malnutrition

(Nzioki et al., 2009). Similarly, a study done in Ethiopia, a case fatality rate of 21.3% was reported and this was attributed to untrained staff who were managing children with severe acute malnutrition (Moges & Haidar, 2009). However, in South Africa, staff with knowledge and appropriate management practices in case management reduced case fatality of SAM from 45% to less than 10% (Puoane et al., 2008).

Severe acute malnutrition in Malawi is managed both in the community and in health facilities using CMAM guidelines. The Ministry of Health in 2012 developed the CMAM guidelines which incorporated the WHO ten steps protocol to improve case management and reduce mortality. SAM children with complications are admitted in nutritional rehabilitation centres in health facilities while those with no complications are treated in the community. Children admitted in NRU's in Malawi mainly present with two types of malnutrition, kwashiorkor and marasmus (Ministry of Health, 2012). Oedema is the main symptom of kwashiorkor due to lack of proteins in the body while marasmus is due to lack of all the food groups and presents with severe wasting. Others sometimes can present with marasmic kwashiorkor. The management for all three conditions is the same.

Malnutrition is preventable. In Malawi, malnutrition is common due to many factors. Food insecurity is one of the main factors due to poverty, increased pressure on land, decreased soil fertility and ever changing climatic conditions (Stalcrantz, 2006). In addition, inappropriate feeding practices, HIV infection, tuberculosis, unsuitable weaning practices, poor hygiene, lack of safe water, inadequate child care and poor maternal education are some of the contributors of malnutrition (Maleta, 2006; NSO, 2011).

At hospital level, training of health care workers in CMAM treatment guidelines is done for health workers to manage complicated SAM in the in-patient setting effectively (Ministry of Health, 2012). At community level, community health workers are trained to identify children with SAM and to recognise those children who need urgent treatment or have complications and need referral (Ministry of Health, 2012). Government of Malawi also introduced interventions to combat malnutrition like growth monitoring and screening of children under 5, Vitamin A supplementation and deworming.

Proper management of children with severe acute malnutrition in health care facilities is important to ensure that needs of sick children are met to decrease child mortality (Tafese & Shele, 2015). However, studies show that quality of health care for children in developing countries has often been found to be poor (Tafese & Shele, 2015). Much of this has been attributed to provision of inappropriate and poor quality clinical care (Younas et al., 2012). In a study done at Queen Elizabeth Central hospital in Malawi by White (2016), mortality of infants with SAM was 17.9%. This was attributed to the gap in knowledge of health care workers in identification and management of SAM in infants.

1.3 Problem Statement

Health care workers who have knowledge in management of SAM are competent and have improved management practices which lead to positive outcomes (Puoane, et al, 2008; Sunguya et al., 2013). Evidence has shown that most health care workers lack this knowledge in management of SAM (Gaur & Bansal, 2016; Tafese & Shele, 2015; Warfa

et al., 2014). This leads to children with SAM having complications and unnecessary deaths due to poor management.

According to NSO and ICF international (2016) and WHO (2010)), under five mortality rate in Malawi is at 64 deaths /1000 which is very high and malnutrition accounts for 22% of this high mortality. Malnutrition indicators for Malawi are still high with stunting at 37%, underweight 12% and wasting at 3% despite so many interventions that have been introduced to combat the disease (NSO & ICF international, 2016). At Kamuzu Central Hospital, the HMIS data for 2014-2015 indicated that 1093 children were admitted at the hospital with severe acute malnutrition and the mortality rate was 11%. This shows that the risk of children dying with severe acute malnutrition is very high.

According to researcher's experience, challenges like shortage of staff, lack of in-service trainings, space and lack of support and supervision also contribute in high mortality of children affected by SAM due to poor management. Therefore, the researcher would like to assess the knowledge level, attitudes and practices of health care workers in management of severe acute malnutrition at Kamuzu Central Hospital.

1.4 Significance of the study

The study findings will help training institutions to start providing updated pre-service trainings in severe acute malnutrition so that when students complete their training, they are knowledgeable and competent to manage children with SAM. Furthermore, the study findings will help policy makers to make adjustments by updating standards and guidelines in the management of severe acute malnutrition. Findings on lack of adequate knowledge of health care workers, negative attitudes and poor management practices will

influence hospital managers to conduct in-service trainings to update knowledge of their staff to improve care. The study results will also help to identify gaps in management of severe acute malnutrition which other people can do further research.

1.5 Study Objectives

1.5.1 Broad objective

To explore the knowledge, attitudes and practices of health care workers on management of severe acute malnourished children at Kamuzu Central Hospital.

1.5.2 Specific objectives

The specific objectives will be as follows:

- a) To assess the knowledge of health care workers regarding management of severe acute malnutrition.
- b) To assess the attitudes of health care workers in the management of SAM.
- c) To explore the practices of health care workers in the management of SAM.
- d) To determine the availability of resources in the management of severe acute malnutrition.
- e) To identify challenges faced by health care workers in providing care to children with SAM.
- f) To assess relationships among variables.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter presents a review of the existing literature on knowledge, attitudes and practices of health care workers in management of severe acute malnutrition. The literature search included hard copies of government reports, textbooks, theses, journal articles and information from the electronic data bases. Most findings of the research study were conducted in Asia and Africa. Google scholar, Google search, Chrome, Mozilla fire fox and HINARI were search engines used to conduct literature search in the following databases: CINAHL, Cochrane Library, PubMed/Medline, African Journal online, African wide information, EBSCOHost, psycINFO.

The following search terms were used: Knowledge, attitudes, practices, health care workers, challenges and management. The search terms were combined to form search queries like: Knowledge AND health care workers AND management of SAM. Knowledge of health workers was any form of undergraduate training, in-service training or any continuing professional development (CPD). World Health Organization (WHO) definitions of health care worker was used to select health cadres as the population of interest. Management of SAM were activities health workers perform in managing children with SAM.

The literature review was guided by objectives of the study and it included both primary and secondary sources that were published in English language between 2006 and 2017. Literature review was restricted from 2006 to 2007 because the study wanted

articles that provided latest evidence based practices relevant to current management of SAM.

The search yielded 152 articles that were conducted in Africa and Asia. Only 56 were included in the study and the others were excluded because there were not relevant to the study, had unclear or different intervention or unclear or different population. Nonetheless the researcher did not come across any research on knowledge, attitude and practices of health care workers on management of severe acute malnutrition that was conducted in a Malawian setting. Therefore, the researcher used studies from other parts of Africa and Asia to give the context of this study.

2.2 Knowledge of health care workers on management of SAM

Severe acute malnutrition contributes to more than 60% of deaths in children in developing countries (Nyeko et al., 2016). Unfortunately, evidence has shown that many health care workers do not have adequate knowledge in management of children with SAM (Bachou, 2008; Mowe et al., 2008; Nzioki et al., 2009; Warfa et al., 2014). For instance, Gaur and Bansal (2016) found that none of the paediatricians and medical officers in India were able to answer correctly all 5 questions in management of SAM category. This is also collaborated by Tafese and Shele (2015) who found that only 55% of health care workers had adequate knowledge in management of severe acute malnutrition in Ethiopia. Likewise, studies in South Africa, Kenya and Uganda also found that health care workers who were treating children with severe acute malnutrition had poor knowledge and they did not manage them according to the WHO guidelines (Bachou, 2008; Karaolis et al., 2007; Nzioki et al., 2009). The reviewed literature shows that there is knowledge and skills gap among health care workers in management of SAM

which affect quality of care. This just shows that it is a requirement for health care workers to have knowledge in management of severe acute malnutrition in order to provide appropriate care in the clinical settings.

Lack of in service trainings of health care workers on severe acute malnutrition was identified by a number of studies as the reason for lack of adequate knowledge by health care workers in management of severe acute malnutrition (Moges & Haidar, 2009; Nzioki et al., 2009). Benyera (2013) found that trainings on use of guidelines were not frequent and this resulted in knowledge gap in the care of SAM children. UNICEF (2015) recommended that the most effective way to build and maintain the quality of SAM management is to offer trainings by experienced trainers, followed by on the job mentoring and learning visits that allow health workers to support each other. In addition, in their studies, Karaolis et al. (2007), Puoane et al. (2006) and Hossain et al. (2009) reported that management of severe acute malnutrition in the medical and nursing curricula needed to be adequate and not haphazard so that students should be competent to manage children with SAM at the clinical area.

Nevertheless, Sunguya et al. (2013) argue that medical and nursing education lack adequate practical nutritional training to satisfy the demands of the clinical practice hence in-service trainings in nutrition is the best option. Most studies have found that high mortalities of severe malnourished children are linked to lack of frequent trainings of health care workers which result in many health care workers not adhering to guidelines in managing children with SAM.

Conversely, literature review shows that in Bangladesh and South Africa where health care professionals were trained in SAM, their knowledge increased and it made

them feel confident to manage severely malnourished children despite working under difficult circumstances (Hossain et al., 2009; Puoane et al., 2008). There was also evidence that Senior Nursing Staff of the Paediatric wards were trained in SAM because they were required to identify incorrect or incomplete activities and take prompt action where needed (Hossain et al., 2009; Puoane et al., 2008). Consequently, due to the knowledge which they gained in management of SAM, senior nurses also took a leading role in induction of new staff, felt confident and free to guide doctors as well as take action according to standing orders (Puoane et al., 2008). Knowledge in management of severe acute malnutrition increase HCWs' confidence and competence in implementing SAM guidelines which may result in quality care.

As such, training and orientation of new staff in management of children with SAM is vital. The drawback in Malawi is that there is high turnover of adequately trained staff between hospitals and departments. It is documented that one of the constraints in the management of children with severe acute malnutrition is high staff turnover due to transfers and attrition (Ahmed et al., 2014). The problem of staff turnover, resulted in unnecessary deaths of children because untrained staff were managing children with severe acute malnutrition in Botswana, Kenya and South Africa (Benyera, 2013; Karaolis et al., 2007; Nzioki et al., 2009) respectively. UNICEF (2015) recommends that in settings where there is high turnover, all staff should be trained in management of children with severe acute malnutrition so that they can in turn orient new staff.

Health care workers also need to have knowledge and skills for implementing psychosocial stimulation of children with severe acute malnutrition. According to

Ministry of Health and Child Welfare (2008), severe malnutrition affects mental and behavioural development which can be reversed by appropriate treatment including sensory stimulation and emotional support. Emotional and physical stimulation through play can significantly reduce the risk of permanent mental retardation and emotional impairment (Ministry of Health and Child Welfare, 2012). However, review of literature showed that children were often not provided with toys and there was either brief or no interactions between health care workers and children, and care givers were not encouraged to interact with their children (Karaolis et al., 2007; Mbugua, 2015; Nzioki et al., 2009).

2.3 Attitudes of health care workers on management of severe acute malnutrition

Literature review indicated that some of the health care workers had positive attitudes towards management of children with severe acute malnutrition while others developed the positive attitudes after acquiring knowledge in management of severe acute malnutrition. In their studies Tafese and Shele (2015), Puoane et al. (2008) and Kobe (2006) found that health care workers showed positive attitude towards assessment and management of severe acute malnutrition. Furthermore, Sunguya et al. (2013) and Puoane et al. (2006) stated that in-service trainings improve health care workers knowledge in nutrition as well as attitudes towards nutritional care. Puoane et al. (2006) found that there were few health care workers who had negative attitudes due to lack of knowledge on management of severe acute malnutrition but their attitudes changed after receiving some training. Knowledge helped them to understand physiological changes that occur in children with severe acute malnutrition and that it was not the caregivers' fault that the children are suffering from severe acute malnutrition (Puoane et al., 2006).

This shows that knowledge in management of severe acute malnutrition can make one confident and competent hence improve one's attitude.

On the contrary, some nurses had negative attitudes; were more judgemental and interacted less with caregivers despite receiving training in management of malnutrition and this affected quality of care (Puoane et al., 2008). Nurse's lack of interest was attributed to their negative attitudes towards nutrition screening and perceptions that nutrition was not important and less relevant to other tasks (Mowe et al., 2008). The findings of these studies were similar despite differences in sample sizes, target population and setting. From these studies it can be concluded that due to negative attitudes of health care workers, poor quality care was provided despite being trained in nutrition.

Literature review also established that positive attitudes do not always translate to better management practices in malnutrition (Holst et al., 2009). In Ethiopia, some of the health care workers who had positive attitude towards SAM, had poor knowledge and practices towards assessment and management of childhood malnutrition (Tafese & Shele, 2015). This result was consistent with a study done in Scandinavia where 90% of respondents had a positive attitude towards nutritionally screening patients on admission, though only one-third of the nurses actually carried out nutritional screening on admission (Holst et al., 2009). In addition, Holst et al. (2009) found that documentation of nutritional care plans in the patient's records were given a high priority among nurses (93%), but this was rarely followed through in practice. This shows that even if health care workers have positive attitudes but if they don't have the passion, drive and motivation to manage children with malnutrition, they can still provide poor care.

2.4 Practices on management of severe acute malnutrition

2.4.1 Availability and use of guidelines

Ministries of health in different countries developed local guidelines or adopted the WHO guidelines in management of severe acute malnutrition in order to reduce morbidity and mortality. In availability and lack of utilization of guidelines affect quality of care. According to (Ministry of Health and Family Welfare, 2008) guidelines are important as they promote the best available therapy so as to reduce the risk of death, shorten the length of time spent in hospital and facilitate rehabilitation and full recovery.

Availability of guidelines in management in health facilities is essential because they act as a reference to keep health care workers up to date with information in management of different conditions. A study done in five health centres of Wakiso district in Uganda found that all five health centres had no guidelines on integrated management of acute malnutrition (Akugizibwe, Kasolo, Makubuya, & Damani, 2013). Similarly, a study done in ten hospitals in Tanzania on emergency and critical care services reported that there was completely lack of guidelines on critical conditions in all the health facilities (Baker et al., 2013). This is very risky as it meant that health care workers were not following standardized and evidence based care as guidelines have the potential to improve care (Baker et al., 2013).

Utilisation of guidelines has shown to decrease case fatality rates and improve care of children with severe acute malnutrition. However, despite availability of guidelines in most studies, findings show that there was inadequate utilization of guidelines in management of SAM by most health care workers in health facilities (Anthony, 2013; Benyera, 2013; Kamunya, 2013; Ramírez Prada, Delgado, Hidalgo Patiño, Pérez-Navero, & Gil Campos, 2011). A study conducted by Nzioki et al. (2009)

at Kenyatta teaching hospital in Kenya reported a case fatality rate of 38% due to poor adherence to local guidelines in management of SAM even though most of the clinicians were trained and guidelines were available. Similarly, a study done at Mbabane Government Hospital in Swaziland found that the case fatality rates for child malnutrition were unacceptably high (Benyera, 2013). This was due to poor adherence to guidelines during case management. Findings for both studies indicate that if guidelines are not adhered to, poor quality care is provided hence increase in mortality rate.

Nevertheless, Warfa et al. (2014) mentioned that careful assessment and appropriate treatment using WHO standardized guidelines reduces morbidity and mortality of SAM from rates as high as 40-50% to some as low as 6%. In agreement, a study by Falbo et al. (2009) in Brazil reported a reduction in mortality rate from 38% to 6% after implementation of WHO guidelines. The above studies show that if guidelines are used accordingly, they can significantly reduce mortality as shown in the above studies. However, the researcher did not come across a study conducted in Malawi to determine the availability and utilization of guidelines in management of SAM in Malawi.

2.4.2 Management practices in children with severe acute malnutrition

Global studies have shown that poor hospital care of severely malnourished children contributes to high case fatality rates (Nzioki et al., 2009). Therefore, it is important to follow appropriate management principles in order to avoid unnecessary deaths.

The first three steps of stabilization in management of severe acute malnutrition are very critical. These steps which are essential for the survival of children with malnutrition were poorly implemented. A study in Kenya found that hypoglycaemia was

not being actively diagnosed or managed as blood sugar were not measured routinely during admission (Benyera, 2013). Similarly a study by Younas et al. (2012) found that only 25.9% (n=38) were investigated for hypoglycaemia on admission. Hypoglycaemia is very common complication in malnourished children and if not treated effectively it can lead to brain damage. Feeding is also important in the first 30 minutes of admission. On average studies by Kamunya (2013) and Warfa et al. (2014) found that children were fed 2.6 and 12.3 hours after admission respectively. This is very dangerous as children can easily go into hypoglycaemia.

Children with severe acute malnutrition lose subcutaneous fat significantly and as a result, this reduces the body's capacity to regulate temperature. Consequently, they need to be kept warm all the time as they become hypothermic easily. According to Benyera (2013) children were not managed in heated rooms as there were no heaters and the kangaroo method was not practiced for younger children hence they were at risk of hypoglycaemia. In agreement, Warfa et al. (2014) adds that children were nursed in general paediatric rooms and only 5% (n=5) had correct management of hypothermia. If SAM children are not managed properly, hypothermia can lead to abnormal heart rhythms and reduced level of consciousness.

Severely malnourished children who are in shock need to be treated with intravenous fluids according to guidelines. A study conducted in Pakistan by Younas et al. (2012) found that only 7 out of 11 children were treated correctly of hypovolemic shock and unnecessary use of fluids was done. In addition, Younas et al. (2012) and Nzioki et al. (2009) found that monitoring for signs of over hydration and deterioration

were rarely done. In children with severe acute malnutrition and shock, fluids need to be treated with caution as there is risk of overload and this can lead to heart failure.

Low morale of health care workers in any health setting affect quality of care provided to patients. According to (Benyera, 2013; Karaolis et al., 2007), low morale of staff was cited as a reason for suboptimal care. This was due to late salary payments, lack of trainings, poor conditions of service, inadequate pay rises and non-recognition of additional training (Benyera, 2013; Karaolis et al., 2007). This shows that for quality of care to be provided to children with SAM, staff need to be motivated.

Lack of proper laboratory services also affects care of malnourished children as several tests need to be done. Benyera (2013) reported that lack of proper and adequate laboratory support affected case management as tests ordered were often not available or inaccurate results were provided. This shows that there is need for functional laboratory services where there is facility based management of children with severe acute malnutrition.

2.5 Availability of resources

Availability of resources is very crucial for health care workers in the clinical setting. If resources are not available, substandard care is delivered to patients. Evidence from literature review show that almost all essential supplies and equipment were available in most of the studies on management of malnutrition (Kamunya, 2013; Mbugua, 2015; Nzioki et al., 2009; Puoane et al., 2008). A study by Nyarko (2014) found that only 5 out of 33 nurses reported that the equipment at their clinics were inadequate to manage undernourished children. Supporting this study, Kamunya (2013) in a study done

at Kenyatta tertiary hospital in Kenya, staff reported that equipment and supplies like glucometers, resomal, F75, F100, Vitamin A and multivitamins were largely available.

In areas where there were lack of resources and equipment, mostly it was due to distribution problems by central medical stores, lack of knowledge on how to use equipment, lack of ordering by ward staff, lack of guidelines and heavy workload (Benyera, 2013; Karaolis et al., 2007). Shortage of staff should also not be an excuse for not ordering essential resources and all health care workers need to be oriented on all equipment used in management of SAM.

2.6 Challenges in management of Severe Acute Malnutrition

Health care workers encounter a number of challenges in management of severe acute malnutrition. These challenges affect the quality of care provided to severely malnourished children and the challenges include shortage of staff, lack of support and supervision and lack of adequate space.

2.6.1 Shortage of staff

Shortage of staff affects the quality of care provided to children with SAM. Due to heavy workload, staff may not be able to monitor patients hence children can easily have complications. Studies conducted by Collins (2007), Ahmed et al. (2014), Bachou, (2008) and Nzioki et al. (2009) found that quality of care is affected by shortage of staff. Taneja et al. (2012) acknowledged that patients were not managed according to standards because of shortage of staff hence they were unable to cope with work overload. As the prevalence of SAM is highest in resource-poor environments, there is usually a significant difference among the large numbers of patients requiring treatment and the small numbers of skilled staff and limited resources available to treat them (Collins, 2007). For instance, a study conducted in Swaziland revealed that there were situations at

times where one nurse had to take care of more than 30 severe acutely malnourished children (Benyera, 2013). This uneven ratio may lead to exhaustion by health care workers hence they may not be able to provide quality care. Similarly, a study by Nzioki et al. (2009) found that due to shortage of staff, caregivers were responsible for feeding and oral rehydration of their children, monitoring and charting of feeds.

Supporting the above studies, Kamunya (2013) reported that nurses acknowledged that children with SAM were not managed according to standards due to high patient nurse ratio hence monitoring of patients was only done once a day. Likewise, a study done in Malawi by Agyeman-Duah et al. (2014) at Kamuzu Central hospital in the medical department reported that the patient needs and how to meet those needs did not match the few available staff. Another study conducted in Lilongwe, Malawi, reported that shortage of staff causes delay in starting emergency interventions, delays referral to a senior staff as well as low morale which in turn results to substandard care (Bradely et al., 2014).

Despite the studies being done in different care settings, observations indicate that shortage of staff affect the provision of standard care. Availability of adequate health care workers is important for a conducive working environment which boost their morale to provide quality care.

2.6.2 Lack of adequate space

Severe acute malnutrition is managed both in the community and health facilities. Lack of adequate space is one of the challenges in facility based management of severe acute malnutrition (Ahmed et al., 2014; Taneja et al., 2012). Studies done in Afghanistan, India, Indonesia and Bangladesh showed that there were problems in management of

children with severe acute malnutrition as they were unable to accommodate all children with complications (Ahmed et al., 2014). SAM children with complications are very ill with a high risk of death hence they should be managed in health facilities and not in the community. In India, in Sheopur district at three rehabilitational centres, 116 children died of malnutrition due to overcrowding in five months (ANI, 2016). Chances of infection are high in overcrowded areas due to poor hygiene which may have led to complications as manifested by the high death rate.

2.6.3 Lack of support and supervision

Supervision and support in management of SAM is essential to maintain quality care. Managers at different levels need to supervise health care workers and give them support where they need guidance. According to Puoane et al. (2008), in hospitals where they were successful in managing children with severe acute malnutrition, senior nurses closely supervised junior staff and the sister-in-charges provided strong leadership that encouraged good teamwork and motivation. In addition, Puoane et al. (2008) and Karaolis et al. (2007) stated that leadership, teamwork, supervision and support were important to reduce case fatality rates of severe malnourished children. This is important because strong leadership helps to motivate staff and close supervision helps to monitor whether staff are doing the right things and assist them accordingly. Reduced mortality was evidenced in a study done in South Africa where matrons and medical superintendents were influential with regard to induction of new staff, in-service trainings and mentoring (Puoane et al., 2008).

On the contrary, a study done in Uganda by Bachou (2008) found that reporting and monitoring systems were not in place, there were no clear lines of accountability and supervisors did not physically monitor staff under them. This led to inappropriate

management of severe malnourished children by staff manifested by high case fatality in the study.

In conclusion, literature review showed that health workers did not have knowledge in management of severe acute malnutrition due to lack of in-service trainings. Most health care workers had positive attitude though they did not follow appropriate practices in management of children with SAM due challenges like shortage of staff, inadequate resources, work overload, lack of support and supervision as well as lack of motivation. Most of the studies showed that resources were available in health facilities though quality of care was not up to standard.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

This chapter describes the research methodology that was used in exploring health care workers knowledge, attitudes and practices in management of severe acute malnutrition at

Kamuzu Central Hospital. The research methods will include the research design, study setting, study population, sample and sampling, data collection, data collection instrument and data analysis. Ethical issues that were considered in the study will also be discussed.

3.2 Study design

Study design is the glue that holds all the elements in a research project together (Kombo & Tromp, 2006). The study was quantitative in nature and used descriptive cross sectional design. This method helped the researcher to collect accurate data from participants on their knowledge, attitudes and practices on management of severe acute malnutrition at Kamuzu Central Hospital. The cross section method allows one time interaction with respondents.

3.3 Study site

The study was conducted at Kamuzu Central Hospital which is a referral hospital for all districts in the central region as well as health centres within Lilongwe. It is located in Lilongwe urban and is 3.2km from the city centre. It has a population of 1,905, 282 (NSO, 2011). The hospital has several departments and one of them is the paediatric department which has a bed capacity of 288 beds. The paediatric department also comprises of several sections and one of them is the nutritional rehabilitation unit (NRU)

which admits SAM children with complications. The NRU has a bed capacity of 20 but it can have a statistic of 50 to 60 patients per day and this means two or three patients sleeping on one bed. However, during data collection, it was noted that there were changes in the department and the NRU had been moved to an enclosed bay with 10 beds in one of the wards of the department. SAM children who had complications and were at risk of death were admitted at the emergency ward or high dependency unit.

According to KCH HIMS data, during 2014-2015 financial year, the nutritional rehabilitation unit admitted 1093 children with an average of 91 admissions per month. The numbers are higher between the months of December and April as this is the rainy and growing season and most people don't have food. Almost half of the cases at the NRU are caused by diseases such as HIV, Tuberculosis, cerebral palsy and cancer and the rest is due to food insecurity (KCH HMIS, 2014- 2015). Health care workers who take care of SAM patients include medical doctors, clinicians and nurses. Support staff help with preparation and provision of feeds.

Kamuzu Central Hospital was chosen because it had high mortality of children with severe acute malnutrition compared to the other central hospitals in Malawi. Kamuzu Central hospital is also a teaching hospital and it will help to examine what type of foundation is provided to students on management of SAM.

3.4 Study Population

Study population comprised of all health care workers (doctors, clinical officer and nurses) who had worked at the paediatric department at Kamuzu Central Hospital for a minimum of 6 months. This is enough time for one to have knowledge on how the

department manages children with SAM and will be able to provide the required information to the researcher.

3.5 Sampling Method

A proportionate simple random sampling method which is a probability or random sampling method was used to select participants in this study. This method was chosen because all participants or elements had an equal chance of being included in the sample preventing subjectivity, bias and allowed results to be generalized to target population (Brink, van der Walt & van Rensburg, 2012). The researcher used a fishbowl technique where all names of health care workers eligible to participate in the study were written on small pieces of paper, folded and then put in a container. A piece of paper was drawn from the container at a time and the name of the participant was noted. The paper was then placed back, shaken the container and selected a second participant and repeated the same procedure until the desired sample size was reached.

3.6 Sample Size

The sample size for the study was calculated using formula by Kish Leslie (Geoffrey, 2009).

$$N = \frac{Z^2 P (1 - P)}{\delta^2}$$

Where N= Sample size of health care workers in the paediatric department.

P= Is the estimated number of health care workers with knowledge in management of SAM. The researcher therefore will use 0.5 as P to calculate the sample size

Z_{α} = The value of normally distributed variables at 95% confidence interval which is 1.96

δ = Is the allowable error of the 95% confidence interval which is 5% (0.05 expressed as decimal)

The calculated sample size $N = Z_{\alpha/2}^2 P(1-P)/\delta^2$

$$1.96^2 \times 0.5 \times (1-0.5) / (0.05)^2$$

$$3.84 \times 0.5 \times 0.5 / 0.0025$$

384 health care workers.

Using the modified Kish Leslie formula for available sample size $n = N / [1 + (N-1)/K]$

K for available number of health care workers at Kamuzu Central hospital.

$$384 / [1 + (384 - 1) / 59]$$

$$384 / 1 + 6.5$$

$$384 / 7.5$$

51 Health Care Workers.

3.7 Inclusion Criteria

Respondents included in this study were all health care workers who had worked at the nutritional rehabilitation unit and paediatric department at Kamuzu Central Hospital for a minimum of 6 months and those HCWs who were willing to participate in the study.

3.8 Exclusion Criteria

Health care workers not willing to provide consent. Health care workers at the nutritional rehabilitation unit and paediatric department who have worked for less than 6 months, intern doctors, students and support staff were excluded from the study.

3.9 Data Collection tool

Data collection was done by structured questionnaire and observations. Close and open ended questions were used to obtain information from the participants. The structured questionnaire assisted the researcher to be systematic and ensure that similar questions are asked to all participants (Polit & Beck, 2010). A questionnaire was developed by the researcher herself based on literature review, CMAM guidelines and the WHO ten step protocol in management of severe acute malnutrition. The questionnaire included questions relating to demographic characteristics of the health care workers, knowledge of HCWs on management of severe acute malnutrition, practices of health care workers on management of SAM, attitudes of HCWs on management of SAM, availability of resources for management of SAM, and challenges encountered during management of severe acute malnutrition (**APPENDIX C**)

Observation method of collecting data was also used as it allowed the researcher to observe behavior as it occurred (Brink et al., 2012). This allowed to collect data on actual provision of care. The researcher utilized the WHO ten steps protocol and CMAM guidelines in management of severe acute malnutrition to develop the observation tool. Specific actions to be carried out were added under each step. The researcher observed participants providing actual care and if the activities were done a positive tick was given to a behaviour on the checklist. Additional information on what cadre did the behaviour

was also noted and comments were written on the behaviour done. Direct observation was used as it allows the researcher to put behaviour in context and therefore understand it better (Kombo & Tromp, 2006). A participant observation was used as it allowed an investigator to become an active member of the culture under study. The method helps reduce reactivity and participants become more comfortable with the researcher (Kombo & Tromp, 2006). A total of 9 observations instead of the planned 10 were done due to time constraints (**APPENDIX D**).

3.9.1 Validity of data collecting tool.

To ensure content validity, literature review was done extensively so that all the components about the phenomenon under study were included in the questionnaire. Most items of the questionnaire were formulated based on CMAM guidelines by Ministry of Health (2012) and WHO guidelines. The data collecting tool was also presented to paediatric clinical officer responsible for nutrition and experienced senior lecturer to enhance its validity. Their responsibility was to evaluate what the instrument was measuring, what has been missed and if it was an appropriate tool for the study. The experts comments were about flow of some questions, clarity and adding some open ended questions for practices in order for health care workers to provide responses of what they actually do when managing children with SAM.

External validity refers to the degree to which results of a study can be generalized to other people and settings (Brink et al., 2012). To ensure external validity, the study recruited a sample size that is a representative of the population being studied in order to generalise the results to the general population. Participants included all cadres

of health care workers working at the paediatric department hence the results will be generalized to all HCWs working at the paediatric department.

3.9.2 Reliability of Data collecting tool

Reliability is a measure of how consistent the results of a test are (Kombo & Tromp, 2006). To ensure reliability of the tool, it was pretested on 3 health care workers who were eligible for the study from Kamuzu Central Hospital department but were not in the sample size. Participants were also asked to make any comments on the tool. One observation was also carried out assess the reliability of the tool. The feedback from the pretesting helped to add and rephrase questions in order to improve their clarity in the questionnaire. A list of behaviours for observation were also added under each step of the WHO ten steps for easy assessment. Results of pre-testing were not included in the main study findings.

3.10 Data Collection Procedure

Data collection was done at Kamuzu Central Hospital after getting permission from the hospital director, the head of paediatric department and COMREC (Appendix F, G and H). The researcher planned to administer all the questionnaires but some were self-administered as health care workers felt that they did not have enough time due to workload and they had to fill them at home. For the questionnaires that were administered by the researcher, permission was sought from the unit matron to see if it is possible to collect data at that particular time at the site. The unit matron provided a private room for conducting interviews to ensure privacy. Health care providers who were sampled were approached and purpose and objective of the study was explained. Once they had shown willingness to participate in the study, health care workers were

provided with a consent form to sign and interviews were conducted immediately or at their convenient time. For those that were self-administered, the process of seeking consent was the same only that when health care workers were asked for the interviews to be conducted, they requested to fill the questionnaire at home explaining that they are very busy and they could not find time to sit down with the researcher to answer the questionnaire even when they were told that it could be done at their convenient time. For those interviewed, it took approximately 30 minutes to 50 minutes as some requested to be given enough time to think for responses.

Observations were done in two wards, the emergency ward and the nutrition rehabilitation ward. In practice, children who are severely malnourished and are at high risk of death are firstly admitted in the emergency ward or in the high dependency unit. After they have improved, they are sent to the nutritional rehabilitation ward or other wards according to other comorbidities which they have and age, i.e. Oncology and Young infant wards. Those with complications but not very sick are admitted straight to the NRU. During the period of data collection, there was no patient in the high dependency unit. The researcher observed participants providing actual care and if the children were being managed according to guidelines, a positive tick was given to a behaviour on the checklist. Additional information on what cadre did the behaviour was also noted and comments were written on the behaviour done. The 9 observations were done for 10 days and were done for 8 and ½ hours per day.

3.11 Data Management

Each questionnaire was rechecked for completion soon after data collection for accuracy to ensure quality data. The investigator also checked for completeness of

questionnaires for those health care workers who filled them at home. The completed questionnaires were kept in a drawer under lock and key by the researcher for privacy and confidentiality. During data collection the questionnaires were assigned numbers based on the number of participants (L001 to L051) in order to detect any missing questionnaires and in readiness for data entry. Data collected was coded, entered, cleaned, stored and analysed using SPSS 20.

3.12 Data Analysis and presentation

Data was analysed using statistical package for social sciences (SPSS) version 20.0. Frequencies, charts and percentages were used to present demographic data. Descriptive statistics (means, standard deviations, percentages and frequencies) were used to describe and summarise data. Tables, frequencies, charts, percentages and graphs were used to describe participant's knowledge, practices and attitudes regarding SAM. Cross tabulations were computed to determine demographics impact on knowledge, practices and attitudes on management of children with SAM. Open ended questions were analysed through coding. Responses were read for each question to get sense of what the respondents were answering. Categorisation was done for responses expressing same ideas or using similar words. Each answer was then assigned a number. For example, D1a, D1b. Each answer was then coded as a separate variable and was coded as 1 for YES and 2 for NO. Correlation tests were also conducted on the relationship between participants SAM knowledge and their practices as well as SAM attitudes. A p value of <0.05 was considered statistically significant in the analysis.

Data from the observation checklists were incorporated in the results and discussion to either support or disagree that a behaviour was done as per guidelines with what the participants responded in the questionnaire.

3.13 Ethical Considerations

The researcher sought and obtained ethical approval from the College of Medicine Review Ethics Committee (COMREC) (Appendix H). Permission was also provided by Kamuzu Central Hospital Management Team through the Hospital Director (Appendix G). Detailed information about the study, duration of the interviews, data collection methods and benefits was explained to the participants. The participants were free to ask any questions before consenting to take part in the study.

No medical procedures were done to the study participants therefore, they were no risks to their health. No money was given to those who participated in the study. No one was forced to participate in the study, only those who gave their consent were included. Participants were free to opt out if they felt they didn't want to continue with the interview.

Participants were also assured that confidentiality were to be maintained at all times. The participants' names were not written on the questionnaire to maintain anonymity and the written consent form were kept separate from the questionnaire and was not used to identify the respondents. The completed questionnaires and all documents with participant information were stored in sealed envelopes and placed under lock and key. Information was only available to the researcher and her supervisors.

CHAPTER FOUR

PRESENTATION OF FINDINGS

4.1 Introduction

This chapter discusses the data analysis and findings from 51 questionnaires completed by health care workers at Kamuzu Central Hospital. 9 observations were also done to assess the care provided to SAM children by health care workers. Findings on availability of drugs, supplies and equipment, infrastructure and human resource were also done through observations. The sample size of the study was calculated using a formula by Kish Leslie.

The specific objectives of the study were to assess the knowledge and attitudes of health care workers in the management of severe acute malnutrition, explore their practices, determine availability of resources and identify challenges which they encounter in management of severe acute malnutrition.

Questionnaires were administered by the researcher though some were self-administered as health care workers felt they did not have enough time to complete the questionnaire while at work due to workload so they asked for permission to do it at home. The investigator checked the questionnaires for completeness after those health care workers who filled at home returned them. Observations were done by assessing the behaviour of participants while providing actual care.

Data collected was coded, entered, cleaned, stored and analysed using SPSS 20. The findings of the study have been discussed according to the sections of the questionnaire. The sections are demographic data, knowledge, attitudes and practices of health care workers in management of severe acute malnutrition, availability of resources

and challenges encountered by health care workers in management of severe acute malnutrition.

4.2 Demographic characteristics of respondents

This section required respondents to provide information of their age, gender, education qualification, professional qualification, cadre, how long they have been working at the department and when last did they attend any in service training.

4.2.1 Respondents' gender

Of the total 51 respondents, 82% (n=42) were females and 18% (n=9) were males.

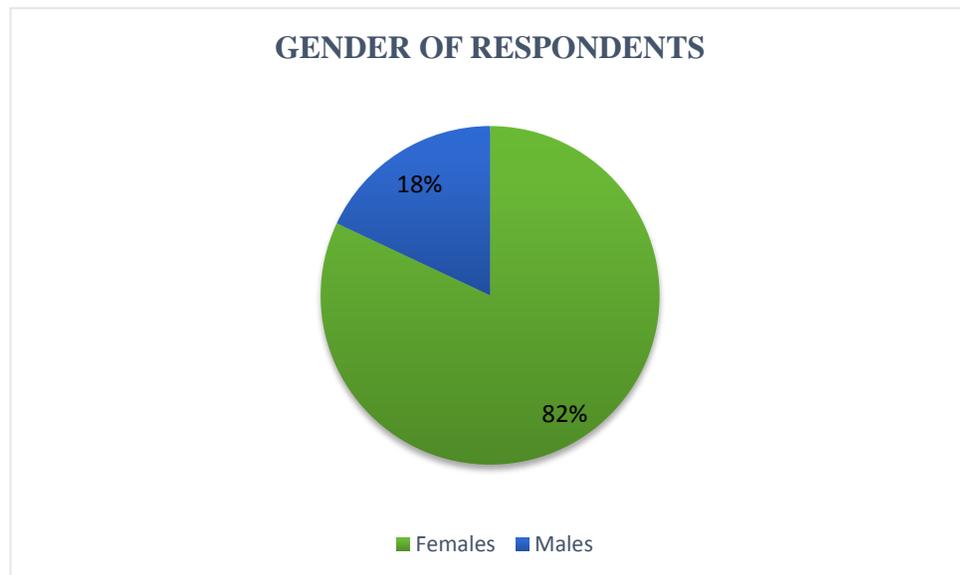


Figure 1: Gender of respondents

4.2.2 Age of respondents

On age, the majority of the respondents, 51% (n=26) were between the ages of 25-34 and only 8% (n=4) were more than 55 years. There was only 2% (n=1) who were between 15-24. The mean for knowledge for all age groups was 7.784 with a standard deviation of 1.375. This meant that the knowledge level of all the health care workers were closely clustered around the mean. The chi-square between age and knowledge was $\chi^2 = 42.561$, $p=.011$. This showed that there was statistical significant relationship between age and knowledge in management of severe acute malnutrition, $p>0.05$. This meant that the age of the health care workers determined their knowledge in management of severe acute malnutrition.

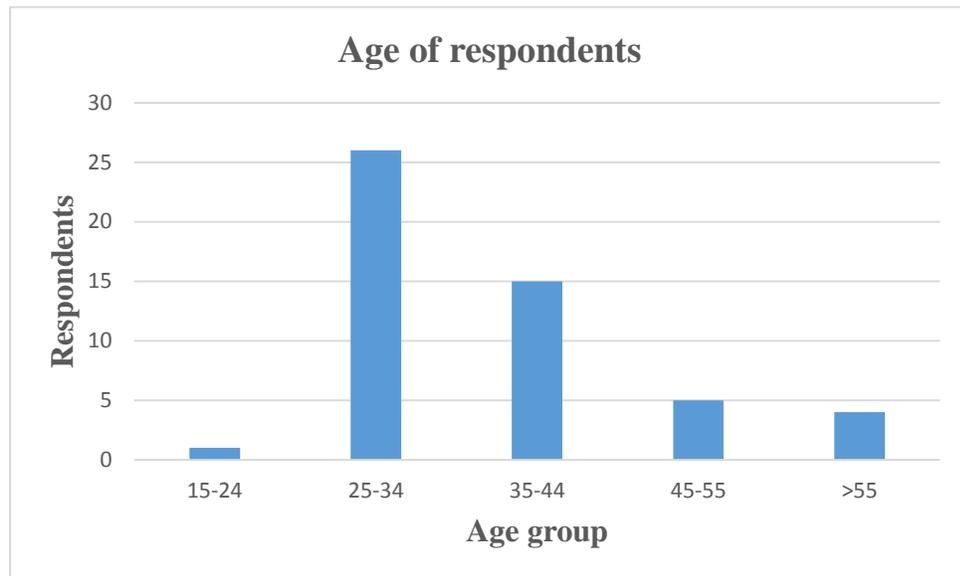


Figure 2: Age of respondents

4.2.3 Respondents' educational and professional qualification

All the respondents in the study had MSCE except 2% (n=1) who had Junior Certificate of education. On professional qualification, a total of 57 % (n=29) of the

health care workers had diploma and this included nurse midwife technicians, clinical officers and registered nurses. 22% (n=11) had university degrees and 2% (n=1) had Masters Degree. The mean score for practices for the participant with masters was 18.00 followed by the ones with degree at 16.27(SD 3.495). Cross tabulation between professional qualification and practices was statistically significant with a p value of $p=0.025$ ($p>0.05$). This means that one's practices improves as professional qualification go up.

4.2.4 Respondent's cadre

Most of the respondents were nurses EN/M, NMT and RNM 77% (n=39). This is because the nurses were also many in the sample population. The least cadre of respondents were doctors which were 4% (n=2) as the sample population was very small.

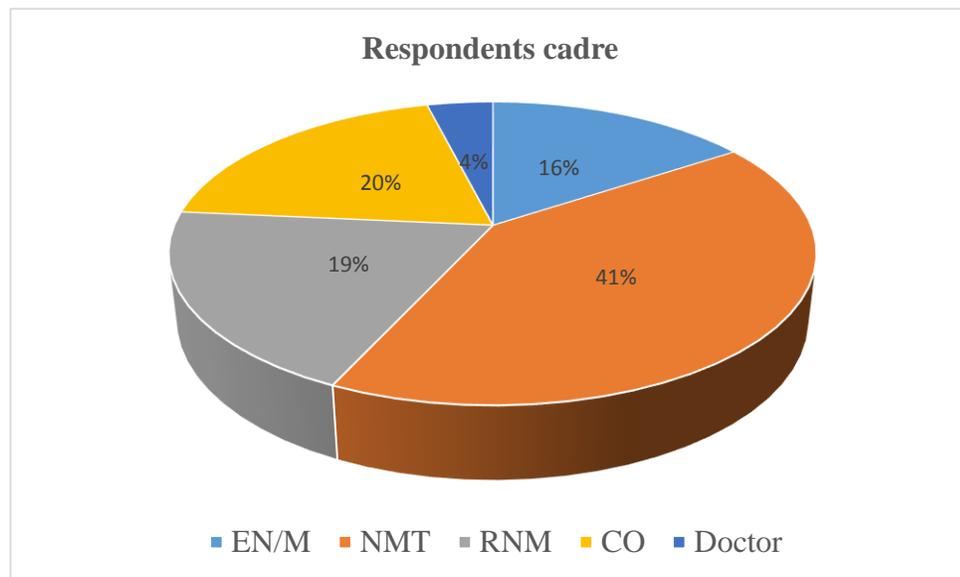


Figure 3: Respondents cadre

4.2.5 Work experience

Most of the health care workers had worked at the department for more than 4 years 47% (n=24). However only 6% (n=3) had worked for 6 to 12 months. The mean for experience and practices was higher in those who had worked for 6 to 12 months followed by those that had worked for more than 48 months, 40.333 (SD 1.527) and 38.7917 (SD3.476) respectively. Cross tabulation was also done to find out if there was any association between experience working in the paediatric department and attitudes. χ^2 was 45.386, p=.730. This shows that the correlation was non-significant as the p value is greater than 0.05.

4.2.6 In-service trainings

A total of 27% (n=14) respondents mentioned that they had attended an in-service training the past 6 to 12 months year and 33% (n=17) respondents the past 13 to 24 months. This showed that health workers from the department attend in-service trainings and there was need for management to organize a training for most health care workers who had not been trained in severe acute malnutrition.

4.3 Respondents' knowledge on severe acute malnutrition

The respondent's knowledge in management of severe acute malnutrition was assessed using 11 questions as indicated in APPENDIX C (QB1, B5-B14). The knowledge scores were determined by taking the correct answer by each respondent out of the 11 knowledge questions and expressed as a percentage.

On whether respondents were trained in management of SAM, most of the respondents 73% (n=37) reported that they were not trained while 27 % (n=14) had been trained. Of those that were not trained, 73% (n=27) reported that they got the information

from colleagues, 21% (n=8) was pre-service information, 3% (n=1) from ward in charge, and 3% (n=1) from doctors. The results on guidelines used in management of SAM, the majority of the respondents mentioned 39% (n=20) WHO guidelines, 33% (n=17) mentioned CMAM guidelines and 28 % (n=14) expressed that they did not know what guidelines are used in the department (Figure 3). This may have been attributed to lack of availability of guidelines in the wards of the department. CMAM guidelines which are currently being used in management of SAM were only available at the NRU ward in the whole paediatric department.

All the respondents were asked the criteria used to identify children with severe acute malnutrition, 71% (n=36) reported that they use oedema, MUAC and weight for height while the rest reported that they use oedema, MUAC and weight for age which was not correct.

Respondents were also asked to choose the correct answer on the two main phases of management of SAM. The majority 57% (n=29) mentioned stabilization and transition which is incorrect while 43% (n=22) chose the correct answer stabilization and rehabilitation.

The rest of the questions were for the respondents to choose whether the statement was correct or not (Table 2). On whether antibiotics should be given to SAM children with no signs of infection, 61 % (n=31) responded incorrectly. 90 % (n=46) responded correctly that children with vomiting and diarrhoea should be given Resomal while 9.8% (n=3) mentioned ORS.

Table 1: Showing correct and incorrect responses of knowledge on management of SAM

	STATEMENT	Correct	%	Incorrect	%
B7	SAM children with no signs of infection do not require broad spectrum antibiotics.	20	39	31	61
B8	Children with SAM need to be kept dry and warm during the day and night to prevent hypothermia	50	98	1	2
B9	Intravenous fluids should only be given to SAM children in shock	39	76	12	24
B10	F75 is given in rehabilitation phase of SAM	32	63	19	37
B11	SAM children with diarrhea and vomiting should be given ORS	46	90	5	10
B12	Feeding of SAM children should be done every 3 hours during the day and night to prevent hypoglycaemia	50	98	1	2
B13	Nasogastric tube should be used in SAM children who feed less than 75% of prescribed diet.	39	76	12	24
B14	Poor skin turgor is not a reliable method in diagnosing dehydration in SAM children.	27	53	24	47

A calculation of correct answers out of 11 questions on SAM knowledge in percentages was done to find out those who had adequate knowledge and those with

inadequate knowledge. According to the rating system, those who scored above 75% were taken to have adequate knowledge while those who scored less than 75% had inadequate knowledge. 35% (n=18) of the participants had scores more than 75% which showed that they had adequate knowledge while 65% (n=33) had scores below 75% which showed that they had inadequate knowledge in management of SAM. This may be a reflection of the number of respondents who were trained in severe acute malnutrition.

4.4 Respondents' attitude towards management of SAM

Respondents' attitude towards management of severe acute malnutrition was assessed using 10 statements (Table 2). All statements were read to each respondent in order to rate whether they agreed or disagreed with the statement. The following were the options: Strongly disagree, disagree, neutral, agree and strongly agree. The responses were then grouped into three categories, strongly agree and agree for positive attitude, neutral for some positive attitude and strongly disagree and disagree for negative attitude for statements 1, 2, 3, 6, 7, 8 and 10. Statements 4, 5 and 9 strongly agree and agree was negative attitude while neutral was some positive attitude while strongly disagree, disagree were positive attitude (Table 3).

Most of the respondents, 82 % (n=42) strongly agreed and 18% (n=9) agreed respectively that every health care worker in the paediatric department should be trained in management of severe acute malnutrition. 96 % (49) agreed that good interpersonal communication between health care workers and guardians promote a trusting relationship. An average of 75% of the respondents showed positive attitude towards management of severe acute malnutrition.

Table 2: Respondents' attitudes on management of severe acute malnutrition

Statement	Positive attitude (strongly agree and agree)	Undecided (Neutral)	Negative attitude (strongly disagree and disagree)
Every health care worker at the paediatric department should have knowledge in SAM	51(100%)	0	0
As a health care worker, I feel having knowledge in SAM facilitates positive attitude in management of children with SAM	49 (96%)	0	2 (4%)
Good interpersonal communication between providers and caregivers promote a trusting relationship in SAM management	50 (98%)	1(2%)	0
Support from managers, supervision, teamwork and in-service trainings are key elements to successful management of SAM children.	49 (96%)	1(2%)	1(2%)
It is my responsibility to provide standard care to SAM children even when there is work overload due to shortage of staff.	44 (86%)	5 (10%)	2 (4%)
Inadequate resources should not be an excuse for lack of commitment and poor quality care in management of SAM children.	32 (62%)	10 (20%)	9 (18%)
It is my responsibility as a health care worker to supervise feeding and record the feed chart.	48 (94%)	1(2%)	2 (4%)
Mean respondents attitude	90%	5%	5%

Statement	Positive attitude (Strongly disagree and disagree)	Undecided (Neutral)	Negative attitude (Strongly agree and agree)
Guardians of health care workers should be warned that SAM is as a result of lack of parental care	24 (47%)	12(24%)	15 (29%)
I perceive SAM as inferior to other conditions hence children with SAM receive substandard care.	33 (64%)	8(16%)	10(20%)
As a health care worker, I feel there is no time to provide physical and emotional stimulation to SAM children during rehabilitation phase.	35(69%)	7(14%)	9 (17%)
Mean respondents attitude	60	18%	22%
Total mean of respondents attitude	75%	12%	13%

4.5 Respondents' practices in management of SAM

Practices in management of severe acute malnutrition was assessed through open ended questions and observations. Respondents were able to give more than one answer as shown in Table 4. Most of the answers in the questionnaire were also compared with the WHO ten steps observed during actual provision of care.

4.5.1 Demographics of children who were observed during actual provision of care.

The age range for the 9 children was from 9 months to 38 months. All the children had weight for height of <3SD and were discharged home.

Table 3: Summary of demographics of SAM children who were observed being cared for

Type of malnutrition	Male	Female	Z score	
			-3SD	-2SD
Kwashiorkor	2	3	5	0
Marasmus	2	1	3	0
Marasmic/ kwashiorkor	1	0	1	0

Table 4: Respondents' practices in management of severe acute malnutrition

No	Response	Yes		No		
		Frequency	%	Frequency	%	
1	Prevent hypoglycaemia in SAM children	-Feeding children as prescribed.	51	100	0	0
		-Administering prescribed antibiotics	8	16	42	82
		-Providing warmth	11	22	40	78
		-Monitoring blood sugar	8	16	43	84
2	Treat hypothermia in SAM children	-Raising room temperature by using heaters	40	78	11	22
		-Kangaroo method	5	10	46	90
		-shutting doors and windows	19	38	32	62
		-Providing extra linen to cover the child	48	95	3	6
		-Monitoring temperature	5	10	46	90
3	Treat dehydration in SAM children but not in shock	-Resomal	48	95	3	6
		-ORS	3	6	48	95
4	Signs of over hydration during rehydration	-Increased heart rate	21	41	30	59
		-Oedema of the face and extremities	44	86	7	14
		-Increased respirations	30	59	21	41
		-Enlarged liver	1	2	50	98

5	Correcting micronutrient deficiencies in SAM children	-Vitamin A	48	94	3	6
		-Feeds	23	45	28	55
		-Folic Acid	28	55	23	45
		-Multivit	7	14	44	86
6	Antibiotic given to SAM children with complications	-Benzylpenicillin and gentamycin	41	80	10	20
		-Ceftriazone	22	43	29	57
		-Amoxil	3	6	48	94
7	How to ensure that malnourished children are taking their feeds	-Supervising and monitoring during feeds	46	90	5	10
		-Recording in the file the amount child has taken	21	41	30	59
8	Criteria used to determine child's progress to stabilisation phase to transition phase	-Child finishes all feeds	13	26	38	74
		-Subsiding oedema	26	51	25	49
		-Improvement of complications	7	14	44	86
		-Don't know	17	33	34	67
9	Emotional and physical stimulation provided to SAM children	-Toys	26	51	25	49
		-Structured play	5	10	46	90
		-Advising mother to play with child	4	8	47	92
		-Nothing	21	41	30	59

Results of practices will be presented using the WHO ten steps in management of SAM in NRU and OTP which are incorporated in the CMAM guidelines

4.5.2 Step 1, 4 and 7: Treat/prevent hypoglycaemia, correct electrolyte imbalance and start cautious feeding.

Table 4 shows that all respondents 100% (n=51) mentioned giving feeds as prescribed or every three hours to prevent hypoglycaemia. However, only 22% (n=11) and 16% (n=8) mentioned provision of warmth and monitoring of blood sugar respectively as some of the interventions in preventing hypoglycaemia.

All the children started feeds hours after admission and not 30 minutes as per guidelines. The children had to wait for the routine time of the ward to be given feeds. Supervision and monitoring of feeds was not done during actual provision of care though 90% (n=46) respondents mentioned monitoring and supervising of guardians during feeds. Table 4 also shows that 41% (n=21) reported that feeds should be recorded in the chart. However, recording of feeds in the files was done by nutritionists by recall the next day in the morning.

4.5.3 Step 2: Treat and prevent hypothermia

To prevent hypothermia, children in the NRU were being nursed in an enclosed bay with glass while at the emergency ward, it was an open ordinary ward. No heaters were seen near the allocated beds of children with SAM in the emergency ward while in the NRU, heaters were in the storeroom though 78% (n=40) mentioned raising room temperature by using heaters to prevent hypothermia. Table 4 shows that provision of extra linen to treat hypothermia was mentioned by 95% (n=48) though observations were not made on this behaviour as no child was diagnosed with hypothermia. The NRU has

cot beds which prevent mothers to sleep with the children for warmth. In the emergency ward, there are big beds but mothers could not sleep together with their children as there were two or more children sharing one bed with diagnoses of SAM or different conditions. Monitoring of temperature was not consistently done in the NRU as it was only done during admissions and when doctors were doing ward rounds. Nurses rarely entered NRU as they were mostly busy with other patients in other bays. At the ward where there is NRU, there were mostly two nurses on duty against 90 to 100 patients. At the emergency ward, monitoring of temperatures was mostly done by vital signs assistants though it was erratic.

4.5.4 Step 3: Treat/ Prevent Dehydration

On how they treat SAM children who are vomiting and have diarrhoea, Table 5 shows 90% (n=46) responded that they provide Resomal though 10% (n=5) responded that they give ORS. This is very dangerous as ORS is high in sodium and low in potassium content. High sodium can trigger heart failure hence it is not suitable for malnourished children. During the observations, Resomal was being prescribed by clinicians, provided by home craft workers and they did not give it as prescribed as they would just pour it in a cup without measuring the amount the child was supposed to get. No monitoring was done for signs of over hydration though 86% (n=44) and 59% (n=30) responded that they monitor for oedema of the face or extremities and increased respirations respectively (Table 4).

4.5.5 Step 5: Treat/Prevent infection

Antibiotics in children with severe acute malnutrition with complications were given in time during the day and most participants mentioned correct names of

medications as per CMAM guidelines. Table 4 shows that 80% (n=41) responded that they give benzyl penicillin and gentamycin while 43% mentioned ceftriaxone and on ceftriaxone others added that it is given to patients who are at high risk of death or if benzyl penicillin has failed to change the condition for the better. However, 6% (n=3) mentioned Amoxil which is not given according to the CMAM guidelines in children with complications.

4.5.6 Step 6: Correct micronutrient deficiencies

Table 4 shows that 95% (n=48) of respondents stated that Vitamin A should be given to SAM children to correct micronutrient deficiencies. Folic acid was mentioned by 55% (n=28) of the respondents while 45 % (n=23) pointed out that feeds also correct micronutrient deficiencies. 14% (n=7) mentioned multivitamin which is not included in the CMAM guidelines.

4.5.7 Step 8: Achieve catch up growth

On average, stabilization phase lasted for 3 days. It was observed that it was nutritionists and nutritional clinical officer who were responsible for progressing children from stabilization to transition phase. As noted in Table 4, 51% (n=26) of health care workers mentioned subsiding oedema as the criteria for progressing children from stabilization to transition. Some of the respondents, 33% (n=17) reported that they did not know the criteria used to progress children to transition phase.

4.5.8 Step 9: Provide sensory stimulation and emotional support

A total of 51 % (n=26) responded that they provide toys for physical and emotional stimulation and 41% (n=21) stated that they don't do anything and they do not know how to provide physical and emotional stimulation. This was manifested during

observations as children were not provided with toys though they were available. Only 8% (n=4) respondents mentioned that mothers are advised on importance of play with their children however no health care worker was observed giving any education to mothers on importance of play.

4.5.9 Step 10: Prepare for follow up and discharge to OTP and SFP

On observation, group health education to guardians on topics like nutrition, danger signs and family planning were not done. Nutritionists were the ones responsible for discharging patients and their main focus was on nutrition education only. Necessary documents for OTP were given and they stressed the importance of follow up.

4.6 The relationship between knowledge and attitudes, knowledge and practices as well as attitudes and practices in management of severe acute malnutrition.

Spearman's rank correlation coefficient (ρ) was done to determine the relationship among variables. Spearman correlation coefficient was used because the variables did not fit normal distribution and there were outliers in data hence it was also proper to use the non-parametric statistical analysis. Results showed that there was a very strong positive association between variables knowledge and attitude ($\rho=0.89$). However, the correlation coefficient was found to be not statistically significant $p= .540$.

Spearman's rank correlation also showed that there is no significant association between health care workers knowledge and practices $\rho= -0.65$, $p=.653$. Attitude and practices $\rho=0.124$ show that there is a very weak positive relationship between the two variables. A p value of .392 also concluded that there is no significant relationship between attitudes and practices.

4.7 Structured observations on availability of supplies and equipment, human resource and infrastructure.

From observation, there was erratic supply of resources. Guidelines for management of SAM were only found in the NRU ward (Table 5).

Table 5: Assessment on supplies, drugs and equipment

	Supplies/drugs/ equipment	Available	Adequate	Inadequate	Comment
1	Glucometer and glucostixs	✓		✓	Due to erratic supply of glucostixs, blood sugar was done to only those at risk of hypoglycaemia.
2	Functional heaters	✓		✓	The ones available kept in storeroom.
3	Adult beds with mattresses	✓	✓		The NRU does not have enough space for big beds.
4	Functional scales, height boards and MUAC tapes	✓	✓		All the wards except NRU have scales but no height boards and MUAC tapes
5	Thermometers	✓		✓	Every health care need to have one
6	Therapeutic feeds and Resomal	✓	✓		Though F100 was out of stock for 6 months and erratic supply of RUTF
7	Antibiotics	✓	✓		
9	Antimalarials	✓	✓		
10	Vitamin A	✓	✓		
11	Guidelines	✓		✓	Available in the NRU only.

On infrastructure, the problem was lack of space in the existing buildings hence the NRU was very small, no NRU HDU and the play room was very small as well (Table 6).

Table 6: Assessment on Infrastructure

	Infrastructure	Available	Not available	Comment
1	NRU ward		✓	There was a ward but due to lack of space only a 10 bedded bay was used as an NRU
2	Hospital Laboratory	✓		Functional though sometimes it runs out of some reagents
3	Hospital Pharmacy	✓		Most drugs and supplies for SAM management available
4	NRU High Dependency unit		✓	Due to lack of space
5	Play room	✓		Playroom available though it is very small
6	Kitchen for milk preparation	✓		Spacious and most equipment available
7	Cooking demonstration room/area		✓	No space and no supplies for demonstrations to be done

Information on human resource shows that there was acute shortage of staff. For example, there was only one consultant for the whole paediatric department and nurses were not adequate. As a result, there was poor monitoring of patients.

Table 7: Assessment on Human Resource

		Number	Comment
1	Consultants	1	Not adequate for the whole department
2	Medical officers	2	Not enough
3	Clinical officers	10	Not adequate
4	Registered nurses	14	Not enough because it includes 4 unit matrons
5	Nurse midwife technicians Enrolled nurse/ midwives	39	Not enough for a department with seven wards
6	Support staff		
	• Assistant Nutritionist	3	Not adequate
	• Home craft workers	5	Not adequate

4.8 Challenges encountered by health care workers in management of SAM

Practices in management of severe acute malnutrition was assessed through open ended questions (Figure 4).

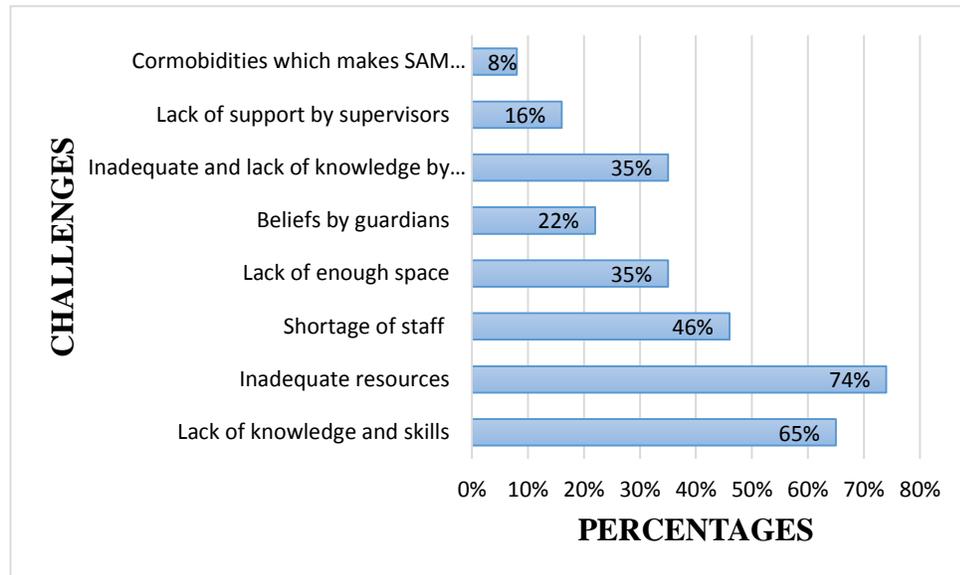


Figure 4: Challenges encountered by health care workers in managing children with SAM

Lack of adequate resources was mentioned by most respondents 74% (n=38). For example, respondents indicated that they had just been supplied with F100 which had been out of stock for six months and they always had erratic supply of glucostixs and RUTF. Lack of knowledge and skills was mentioned by 65% (n=33). Shortage of staff was mentioned by 46 % (n=23) and 35% (n=17) stated lack of enough space. Only 8% (n=4) mentioned comorbidities as one of the challenges encountered in management of severe acute malnutrition.

4.9 Summary

In conclusion, it can be drawn that most respondents in the study were not knowledgeable though they had positive attitude in management of severe acute malnutrition. In practice, some of the key interventions in management of SAM mentioned by respondents were completely missed during actual provision of care. This may have been attributed to the lack of knowledge, shortage of staff and lack of supervision.

CHAPTER FIVE

DISCUSSION

5.1 Introduction

This chapter will discuss findings of this study on health care workers' knowledge, attitudes and practices in management of severe acute malnutrition at Kamuzu Central Hospital in Lilongwe district. The limitations and recommendations of the study have also been presented. The other objectives were to identify the challenges which the health care workers encountered and the availability of resources in managing children with SAM. The sample size of the study was 51 and comprised of doctors, clinical officers and nurses. 9 patient observations were also done to assess health care workers providing actual care to patients. The discussion has been presented in five sections as guided by the study objectives.

5.2 Health care workers knowledge in management of Severe Acute Malnutrition

The results of this study conducted at Kamuzu Central Hospital in Lilongwe district of Malawi showed that the majority of health care workers 65 % (n=33) had inadequate knowledge in management of severe acute malnutrition. This may have been attributed to only a few health care workers who were trained 27% (n=14) in severe acute malnutrition. Lack of knowledge in management of severe acute malnutrition may result in poor practices and may lead to high mortality as health care workers unknowingly use practices that are suitable for normal children but highly dangerous for SAM children. The results are consistent with other studies conducted in South Africa, Kenya, Swaziland, Ethiopia, Uganda, India and Denmark (Bachou, 2008; Benyera, 2013; Gaur & Bansal, 2016; Karaolis et al., 2007; Mowe et al., 2008); Tafese & Shele, 2015; Warfa et

al., 2014) respectively where it was found that majority of the health care workers had inadequate knowledge due to lack of in-service trainings. A hospital based prospective audit study done at Mbagathi tertiary hospital in Kenya by Kamunya (2013) found that due to lack of regular trainings, health care workers including nutritionists had limited understanding of the needs of severely malnourished children and importance of WHO guidelines. This finding showed that due to lack of regular in-service trainings, health care workers were not able to respond promptly to the needs of children with SAM. In addition, there is need to put more emphasis on undergraduate training in SAM as evidence has shown that nursing and medical curricula do not provide adequate time for theory and clinical practice hence when students graduate, they are unable to competently manage children with SAM.

On the other hand, studies have shown that training in management of SAM promote positive practices which result in quality care. In Bangladesh and South Africa (Hossain et al., 2009; Puoane et al., 2008) where health care workers were trained in SAM management, their knowledge and confidence in management of SAM increased despite working under difficult circumstances. This shows there is need for frequent trainings and refresher courses of health care workers so that they should update their knowledge and skills hence provide quality care. Supporting this, a descriptive cross section study conducted by Nurdan et al. (2013) in Turkey observed that the higher the level of knowledge in nutrition the nurse has, the more they examined patients and noticed malnutrition. Likewise, a systemic review conducted on sixteen studies concluded that child under nutrition management practices and competence of health workers improved the quality of care after in-service trainings (Sunguya et al., 2013). In

this study, 73% (n=37) were not trained hence there is need for hospital management to organise a training for these health care workers to improve care being provided to SAM children.

5.3 Health care workers attitude towards management of SAM

The study findings revealed that 75% of the respondents had positive attitude towards management of severe acute malnutrition though they had inadequate knowledge. This showed that with adequate knowledge and the positive attitude which the health care workers already had, quality of care may have been provided to children with severe acute malnutrition. The findings were similar to those done in South Korea by Kim & Choue (2009) using a questionnaire survey where nurses had positive attitudes towards patients' nutritional status and had a high desire to receive nutritional information yet they had limited knowledge of nutrition. Supporting this, a cross sectional study conducted by Tafese and Shele (2015) found that 65% had favourable attitude towards assessment and management of children with malnutrition though only 55% had adequate knowledge.

Conversely, other studies showed that health care workers' lack of knowledge made them to have negative attitudes. A qualitative study done by Puoane et al. (2006) in South Africa found that health care workers had negative attitudes due to lack of knowledge as nurses thought that guardians did not care for their children and that's why they were malnourished. They concluded that mothers did not feed their children the recommended foods though it only revealed that they did not have an understanding that SAM is caused by many different factors. Similarly, a questionnaire survey conducted by Mowe et al (2008) in Denmark, Norway and Sweden also found that health care workers

had negative attitudes because they perceived nutrition as inferior to other tasks. In this study, though only 27% were trained in management of SAM, 75 % of the participants had positive attitudes.

This study also revealed that there is no association between attitudes and practices. Most health care workers in this study had positive attitude towards management of severe acute malnutrition though the actual care that provided was suboptimal. This shows that even if health care workers have positive attitude towards management of SAM, they can still provide substandard care. This is consistent with a questionnaire based study done in Scandinavia by Holst et al. (2009) where 90% had positive attitude towards screening on admission but only one third of the nurses actually carried out nutritional screening during admission. In this study, 94% (n=48) of the respondents mentioned supervision and recording of feeds as their responsibilities though during actual care it was completely not done and recording of feeds was done by nutritionists by recall the next day.

5.4 Health care workers practices in management of Severe Acute Malnutrition

Health care workers practices in management of severe acute malnutrition were inadequate. Most of the respondents did not mention key interventions in management of severe acute malnutrition according to WHO 10 steps and CMAM guidelines while some stated correct practices which were not done during actual provision of care. This may have been attributed to lack of knowledge of guidelines used in management of SAM as well as the importance of using them.

5.4.1 Availability and utilization of guidelines in management of severe acute malnutrition

Findings revealed that guidelines were only available at the NRU ward and 28% (n=14) of the respondents mentioned that they did not know and had never seen CMAM guidelines which were being used in management of severe acute malnutrition in the wards. Availability of guidelines in management of severe acute malnutrition in the clinical setting is very important because they act as a reference for health care workers during case management. Inavailability of the guidelines may have been due to lack of training to managers at different levels at the department hence they did not recognise the need for each ward to have them. This finding is consistent with structural data collection and descriptive cross sectional studies done in Uganda and Tanzania (Akugizibwe et al., 2013; Baker et al., 2013) where it was reported that all facilities had no guidelines in management of acute malnutrition and critical conditions respectively.

Evidence also showed that utilization of guidelines decreased mortality. A study in Brazil revealed that use of guidelines reduced mortality rate from 38% to 6% (Falbo et al., 2009). However, in this study CMAM guidelines which incorporates the WHO ten steps in management of children with severe acute malnutrition were not fully utilized. Not all the required steps in management of children with severe acute malnutrition were followed. Guidelines in management of severe acute malnutrition are very crucial because the systems of the body of children with SAM undergoes reductive adaptation in order to allow the body to survive on limited calories. If management of a normal child is used on SAM children, they can easily die. Most of the studies attributed lack of use of guidelines as due to lack of knowledge and shortage of staff.

Treating and preventing hypoglycaemia in children with SAM in the stabilization phase is very crucial. Low supply of blood sugar to the brain can lead to brain damage. The study findings revealed that all 51 respondents (n=100%) had knowledge on importance of giving feeds as prescribed to prevent hypoglycaemia and all the children in the study received F75 in the stabilisation phase. Findings were similar to those of a descriptive cross sectional study done by Mbugua (2015) where almost all the children (86%) were given F75 in the stabilisation phase. However, in a hospital-based prospective audit study done by Nzioki et al. (2009), only 55% of the patients received F75 and the rest were fed on whole cow's milk, special milk and routine ward diet.

One of the shortfalls noted was insufficient monitoring of blood sugar which is one of the key interventions in prevention of hypoglycaemia. Due to erratic supply of glucostrixs, only children assessed to be at risk of hypoglycaemia were checked blood sugar. Even though glucometers and glucostrics were available, random blood sugar was only done to 2 out of 5 children who were at risk of hypoglycaemia. The results were consistent to those of hospital-based prospective audit study conducted by Younas et al. (2012) in Pakistan where hypoglycaemia was only investigated in 38 out of 147 children though glucometers and glucostrix were available.

Malnourished children are highly susceptible to hypothermia because they have a lower metabolic rate and a larger body surface area. Findings revealed that appropriate measures were not totally in place to prevent and treat hypothermia. There were no heaters near the beds where malnourished children were nursed in the emergency ward and in the NRU, they were kept in the store room. Kangaroo mother care (KMC) as one of the method of treating hypothermia was only mentioned by 10% (n=5) of respondents

and was not being practised in the wards. This may have been due to lack of practice after trainings in KMC hence the skill was lost and health care workers were uncomfortable to teach guardians.

Similarly, monitoring of temperature to prevent hypothermia was not consistently done. This did put malnourished children at risk as hypothermia cannot be identified very quickly and can easily lead to death. Monitoring of temperature may have been erratically done due to shortage of staff. The results were consistent with the ones found by Nzioki et al. (2009) where temperatures were rarely done during admission and hospitalization.

On the other hand on both interviews and observation SAM children who were dehydrated but not in shock were given Resomal. This is good as Resomal contains less sodium, more sugar and more potassium compared to ORS which contains high sodium and low potassium. This result is consistent with that found by Mbugua (2015) where 83% of children with dehydration but not in shock were treated with Resomal. However, guardians of SAM children were being given Resomal by home craft workers who did not give the right amounts and did not explain on how long the amount given was supposed to be taken. According to CMAM guidelines, malnourished children need to be rehydrated slowly than usual in order not to overwhelm the body systems as they have slowed down to allow the body to survive on limited calories. This may have been attributed to lack of knowledge by home craft workers which was mentioned by most health care workers as one of the challenges in SAM management as only one is a trained qualified home craft worker.

Findings revealed that all children with complications were either prescribed benzyl penicillin with gentamycin or ceftriaxone as per CMAM guidelines. Children who

were severely malnourished were usually covered on antibiotics even if there were no signs and symptoms of infections the body does not use its limited energy to respond in usual ways like inflammation or fever. All the medications for SAM management were available during the time of study and the patients received their antibiotics as prescribed. Likewise, Nzioki et al. (2009) reported that 99% received broad spectrum antibiotics and 90% got appropriate broad spectrum antibiotics including gram negative cover. Contrary to the results above, an observational study by Karaolis et al. (2007) reported that only half of the children received the right combinations of antibiotics as they were out of stock or they were not prescribed as required.

Findings of the study showed that supervision and recording of feeds were not being done. Feed charts were filled by 24 hours recall method by nutritionists. These activities were mostly not done due to shortage of staff. Home craft workers needed to be trained in order to help with these ward activities so that they could take some of the workload off health care workers due to shortage of staff. The findings were similar to those by Younas et al. (2012) who found that carers were responsible for giving feeds to their children but were poorly supervised and as a result 51% of children were receiving less than 60% of the calculated feeds.

5.5 Availability of resources in management of SAM

Findings of the study showed that there was shortage and erratic supply of resources and 74% of the respondents reported that one of the challenges which they encountered was lack of adequate resources. A qualitative study done in Iran found that lack of essential supplies in management of severe acute malnutrition compromise quality of care because it decreases health care workers' productivity (Mosadeghrad,

2014). Similar findings were reported by Akugizibwe et al. (2013) who found that lack of availability of MUAC tapes, height boards and RUTF were some of the major challenges for diagnosing and providing quality care to children with protein energy malnutrition. Likewise, a retrospective observational study done by Benyera (2013) also found that drug stock outs and poor laboratory functionality contributed negatively on management of children with SAM which resulted in high case fatality rates. This finding indicate that availability of resources in management of SAM are required all the time to enable health care workers provide quality care.

5.6 Challenges in management of SAM

A number of challenges encountered by respondents in management of severe acute malnutrition were reported. The major challenges were lack of knowledge, shortage of staff, lack of adequate space and lack of support and supervision.

5.6.1 Shortage of staff

Findings of the study revealed that there was shortage of staff in the paediatric department. This was manifested during observations where a few health care workers were available to cover 7 wards and only two nurses per shift to look after 90 patients in a ward where there was NRU. Respondents from the study also stated that they were unable to monitor children with severe acute malnutrition due to shortage of staff. Activities like vital signs, fluids and feeds were not being monitored but these were very important in order to evaluate progress. Evidence has shown that shortage of staff affect quality of care. Increasing number of health care workers is very crucial as heavy workloads can lead to stress, lower job satisfaction, low morale and burn out hence suboptimal care.

5.6.2 Lack of enough space

Findings from the study revealed that there was inadequate space for children with SAM. In the emergency ward, it was always overcrowded, three or four children sleeping on the same bed. This was because the ward is small and it cannot accommodate so many beds but very sick malnourished children had to be admitted in this ward in order to closely monitor their conditions. Though SAM children were allocated a few beds, it is difficult to abide by it due to large number of patients requiring emergency care, as a result, those with SAM slept with other children with different conditions or those with SAM slept in beds that were allocated for other conditions. The NRU which was only a bay in a ward was also overcrowded as two children slept in a cot and when the beds were full extra mattresses were added on the floor. This was a health hazard as the children were at high risk of cross infection. In India 116 malnourished children died in three rehabilitation clinics in 5 months due to lack of proper care in crowded NRUs, appropriate facilities and shortage of doctors. (ANI, 2016). There is need to build a new infrastructure which will have a ward, HDU, play area, kitchen, demonstration area so that children with severe acute malnutrition are admitted in one place and not spread all over the department. The result was consistent with those by Baker et al. (2013) where infrastructure necessary for emergency and critical care were lacking in hospitals in Tanzania and in other hospitals critically ill patients were admitted in the general ward.

5.6.3 Lack of support and supervision

The findings of this study revealed that support and supervision in management of severe acute malnutrition was not done. Respondents mentioned that there was need for managers at hospital and Ministry level to regularly supervise and support them.

Effective supervision is very crucial because it helps managers to evaluate whether health care workers are doing things right or they need support. If supervision is done regularly and properly, it can help managers to get the best out of staff. It can bring job satisfaction and commitment to their job hence quality care provided to children with SAM. Bachou (2008) in Uganda had similar findings in a pre-post study design where reporting and monitoring systems were not in place and there were no clear lines of accountability and supervisors did not physically monitor staff under them. This led to inappropriate management of severe malnourished children by staff manifested by high case fatality.

5.7 Limitations of the study

Since the study was conducted in one hospital and in one district, the findings may not be generalizable to the whole country but only to Kamuzu Central Hospital.

The study was a requirement for the fulfilment of Masters in Child Health Nursing hence time was a limiting factor as the thesis was required to be finished at a specified period of time. This affected the number of observations that were supposed to be done as they were time consuming and self-administration of questionnaires for a few health care workers opposed to planned interviews.

Since the researcher used participant observation method, the presence of the researcher might have made the health care workers aware that they were being studied and this made them behave differently hence it might have affected the results of the observations.

Inadequate financial resources were also one of the limiting factors hence the study was done in only one hospital.

5.8 Recommendations of the study

Based on the findings of this study, the following recommendations were made in the following categories:

Nursing and Medical Education

Nursing and Medical pre-service training curriculum should be strengthened to give adequate time in theory and practice of management of children with SAM

Nursing and Medical Practice

Ministry of Health, hospitals and non-governmental organizations should encourage in service education to qualified nurses and medical personnel on management of SAM since most of the respondents in the study reported that they had not been trained in management of severe acute malnutrition.

Shortage of staff also affected quality of care, hence there is need for more nurses to be deployed at Kamuzu Central hospital by Ministry of Health.

SAM to be included in the continuous professional development sessions in colleges and at the paediatric department.

Guidelines on management of severe acute malnutrition to be available in all the wards at the paediatric department.

Supervision should be done by relevant personnel in order for quality care to be provided to children with SAM.

Nursing research

The same research should be repeated in other hospitals in the country.

5.9 Conclusion

The findings of the study showed that health care workers at Kamuzu Central Hospital have inadequate knowledge in management of severe acute malnutrition. They have positive attitude though what they claimed is done in practice did not match with what was observed during actual provision of care. This may have been due to challenges which they mentioned like lack of knowledge and skills, shortage of staff, inadequate resources and lack of adequate space. Improving the above challenges may enhance the quality of care provided to children with severe acute malnutrition.

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7.1 Appendices

Appendix A: Participants Information

Study Title: Knowledge, Attitudes and Practices of Health Care Workers on Management of Severe Acute Malnutrition at Kamuzu Central Hospital.

Dear participants

I am Lucy Ngoma, a Masters in Child Health Nursing student at Kamuzu College of Nursing. In partial fulfillment of my Masters programme, I am conducting a research study on “Knowledge, Attitudes and Practices of Health Care Workers on management of Severe Acute Malnutrition at Kamuzu Central Hospital”. I would like to request you to participate in the research study on the above mentioned subject.

Purpose of the study

The study is important as it will help to identify gaps and come up with strategies in the management of severe acute malnourished children hence improve outcomes. Your participation in the study will be helpful because it will provide an insight on health care’s knowledge, altitude and practices on management of SAM and what can be done to improve care.

Willingness to participate in the study.

Your participation in the study is voluntary. You are free to withdraw from being a participant at any time and there is no penalty. Withdraw will not affect your work in any way.

Risks in participating in the study

No invasive procedures will be performed for the purposes of the study therefore you are not at any risk. The study and its procedures have been approved by the appropriate research committees at College of Medicine, Kamuzu College of Nursing and Kamuzu Central Hospital.

Procedure

As a participant, for the questionnaire, you will meet the investigator at a quiet place in the paediatric department to avoid disturbances. The interview will take approximately 25-30 minutes. You are free not to answer any question you do not want. Collected information will be kept by the researcher and will only be accessed by people directly involved in the research. The collected information will be destroyed by burning after data analysis. For observations, they will be done as you are providing actual care to children with severe acute malnutrition.

Benefits

The study will enable the hospital identify any weaknesses in the management of severe acute malnutrition. This will help in improving care given to children with this illness hence promote positive outcomes.

Confidentiality

Privacy will be maintained as numbers will be used in identifying responses. Only those that are involved directly in the study will have a look at the data. Presentation of results will not reveal individual participants.

Financial information

You will not spend any money in this study and no money will be given after participating in the study.

Contact Persons.

If you have any questions concerning this study or being participant you may contact:

Lucy Ngoma on phone numbers **0888545525** and **0991697143** or my supervisor **Dr Pindani** at Kamuzu College of Nursing on **0888896970**. You can also contact: **The Chairperson, College of Medicine Research and Ethics Committee, Private Bag 360, Chichiri, Blantyre.**

Appendix B: Consent form

Study Title: Knowledge, Attitudes and Practices of Health Care Workers on Management of Severe Acute Malnutrition at Kamuzu Central Hospital.

PLEASE READ AND SIGN THE FORM IF YOU ARE INTERESTED IN TAKING PART IN THE STUDY.

I have read the information sheet about the study and have understood the purpose of the study. I have been given an opportunity to ask questions about the study and its process and my questions on the study have been answered. I understand that my identity and information will not be disclosed at any point and that I am free to withdraw from the study without giving reasons. I understand that I will not benefit financially. I also understand that the study will not in any way affect me negatively. I agree to voluntarily take part in the study.

Participants

Name.....

Participants

signature.....

Date.....

Name of the researcher.....

Signature of the researcher

Date.....

Thank you for your participation.

For further inquiries, you may contact: The Chairperson, COMREC Secretariat, P/Bag,
360, Chichiri, Blantyre 3.

Appendix C: Questionnaire for health care workers.

Study Title: Knowledge, Attitudes and Practices of Health Care Workers in the Management of Severe Acute Malnutrition at Kamuzu Central Hospital

Date of interview:Time interview started:Time interview ended:..... Interview Code number:..... Name of interviewer.....

PART A: Demographic characteristics

A1. Gender of respondent

Male.....1

Female.....2

A2. How old are you?

15-241

25-34.....2

35-44.....3

45-55.....4

>55.....5

A3. What is your educational qualification?

PSLC.....1

JCE.....2

MSCE.....3

A4. What is your highest professional qualification?

Certificate.....1

Diploma.....2

Degree.....3

Masters.....4

A5. What is your cadre?

- EN/M.....1
- NMT.....2
- RNM.....3
- CO.....4
- Doctor.....5

A6. How long have you been working in the NRU or peadiatric department?

- 6months-12 months.....1
- 13 months-24 months.....2
- 25 months-36 months.....3
- 37 months -48 months....4
- >48 months.....5

A7. When last did you attend any inservice training/education?

- <12 months.....1
- 13 months-24 months.....2
- 25 months-36 months.....3
- 37 months -48 months....4
- >48 months.....5

PART B: Knowledge of health care workers on management of SAM

B1. What guidelines do you follow in managing children with severe acute malnutrition?

B2. Have you been trained in management of severe acute malnutrition?

- Yes.....1

No.....2

B3. If yes, when last did you attend the training?

<12 months.....1

13 months-24 months.....2

25 months-36 months.....3

37 months -48 months.....4

B4. If no, what is your source of knowledge about severe acute malnutrition.

Pre-service.....1

Self-study.....2

Colleagues.....3

Ward in charge.....4

Others (specify).....5

B5. What is the criterion used for identifying children with severe acute malnutrition?

By assessing oedema, MUAC and weight for height1

By assessing oedema, MUAC and weight for age.....2

B6. What are the two main phases of management of severe acute malnutrition.

1. Stabilisation and transition

2. Stabilisation and rehabilitation

Please tick the following statements whether they are correct or not which are important in management of severe acute malnutrition. 1= correct answer and 2= incorrect answer.

	STATEMENT	1	2
B7	SAM children with no signs of infection do not require broad spectrum antibiotics.		
B8	Children with SAM need to be kept dry and warm during the day and night to prevent hypothermia		
B9	Intravenous fluids should only be given to SAM children in shock		
B10	F75 is given in rehabilitation phase of SAM		
B11	SAM children with diarrhea and vomiting should be given ORS		
B12	Feeding of SAM children should be done every 3 hours during the day and night to prevent hypoglycaemia		
B13	Nasogastric tube should be used in SAM children who feed less than 75% of prescribed diet.		
B14	Poor skin turgor is not a reliable method in diagnosing dehydration in SAM children.		

PART C: Attitudes

How do you feel about the following statements in management of children with severe acute malnutrition. Tick a number that apply to each statement. 1=strongly disagree, 2=disagree, 3=neutral, 4=agree, 5=strongly agree.

	STATEMENT	1	2	3	4	5
C1	Every health care worker at the paediatric department should have knowledge in SAM even if they do not care for malnourished children on daily basis					
C2	As a health care worker, I feel having knowledge in SAM facilitates positive attitude in management of children with SAM.					
C3	Good interpersonal communication between providers and caregivers help promote a trusting relationship in SAM management					
C4	Guardians of SAM children should be warned that SAM is a result of lack of parental care					
C5	I perceive SAM as inferior to other conditions hence children with SAM receive substandard care.					
C6	Support from managers, supervision, teamwork and in-service trainings are key elements to successful management of SAM children.					

C7	It is my responsibility to provide standard care to SAM children even when there is work overload due to shortage of staff.					
C8	Inadequate resources should not be an excuse for lack of commitment and poor quality care in management of SAM children.					
C9	As a health care worker, I feel there is no time to provide physical and emotional stimulation to SAM children during rehabilitation phase.					
C10	It is my responsibility as a health care worker to supervise feeding and record the feed chart.					

PART D: Practices.

D1 How do you prevent severely malnourished children from developing hypoglycaemia?

.....

.

.....

.....

D2 In management of severe acute malnutrition, how do you treat hypothermia (axillary temperature less than 35 degrees)?

.....

.....

D3 How do you treat severe malnourished children who have dehydration but not in shock?

.....
.....
.....
D4 What signs of over hydration do you look out for in a severe malnourished child during rehydration.

.....
.....
.....
D5 How do you correct micronutrient deficiencies in children with severe acute malnutrition?

.....
.....
.....
D6 What antibiotics do you give to severe acute malnourished children with complications?

.....
.....
.....
D7 As a health care worker, how do you ensure that malnourished children are taking prescribed feeds?

D8 What criteria do you use to determine that a severe malnourished child should progress from stabilisation phase to transition phase?

.....
.....

D9 What emotional and physical stimulation activities do you provide to severely malnourished children in order to reduce the risk of permanent mental and behavioural retardation.

.....

D10. What challenges do you encounter when managing children with SAM.

.....

THANK YOU FOR PARTICIPATING IN THE STUDY

Appendix D: Observation checklist for practices

Age in Month: Sex: Height: Weight: MUAC:

Oedema: W/H: Type of malnutrition: No:

	Step	Yes	No	Cadre	Comment
1	<p>Treat/prevent Hypoglycemia</p> <ul style="list-style-type: none"> • Random blood sugar done U/5 or on admission • If hypoglycemia present (<3 mmol/l) correct treatment given. • First feed given within 30 minutes of admission • Feeds given every three hours 				
2	<p>Treat/prevent hypothermia</p> <ul style="list-style-type: none"> • Warmth provided i.e. blankets, heaters • Monitoring of temperature done and recorded. • Feeds given every 2 hours if hypothermic 				
3	<p>Treat/prevent Dehydration</p> <ul style="list-style-type: none"> • Dehydration present • Resomal given • Correct amount of resomal given and recorded 				

	<ul style="list-style-type: none"> • Monitoring of rehydration done by nurses • IV fluids administered for those in shock • Correct amount of fluids given in shock • Monitoring of IV fluids done by nurses • Child transfused if not responding to IV fluids 				
4	<p>Correct electrolyte imbalance</p> <ul style="list-style-type: none"> • F75 provided which contains potassium and magnesium 				
5	<p>Treat/Prevent infection</p> <ul style="list-style-type: none"> • Antibiotics prescribed • Type of antibiotics • Correct dosage of antibiotics • Antibiotics given on time and according to prescription • Infection prevention practices followed 				
6	<p>Correct micronutrient deficiencies</p> <ul style="list-style-type: none"> • Vitamin A given • Correct dose given • F75 given as prescribe • Folic acid given. 				
7	<p>Start cautious feeding</p> <ul style="list-style-type: none"> • F75 prescribed and given • Correct amount prescribed 				

	<ul style="list-style-type: none"> • Feeds given every three hours. • Feeds supervised and recorded • Correct preparation of feeds 				
8	<p>Achieve catch up growth</p> <ul style="list-style-type: none"> • Correct transition of patients from F75 to RUTF • Correct amount prescribed. 				
9	<p>Provide sensory stimulation and emotional support.</p> <ul style="list-style-type: none"> • Toys available and provided to child. • Health care workers observed providing structured play. • Caregivers educated on importance of play and stimulation. 				
10	<p>Prepare for follow-up and discharge to OTP or SFP</p> <ul style="list-style-type: none"> • Caregivers given education on issues like nutrition, danger signs, family planning. • Caregivers advised on the importance of follow up. 				

PART B: SUPPLIES, DRUGS AND EQUIPMENT CHECKLIST

	Supplies/drugs/ equipment	Available	Adequate	Inadequate	Comment
1	Glucometer and glucostixs				
2	Functional heaters				
3	Adult beds with mattresses				
4	Functional scales, height boards and MUAC tapes				
5	Thermometers				
6	Therapeutic feeds and Resomal				
7	Antibiotics				
8	Antimalarials				
9	Vitamin A				
10	Multivitamin				
11	Guidelines				

PART C: INFRASTRUCTURE CHECKLIST

	Infrastructure	Available	Adequate	Inadequate	Comment
1	NRU ward				
2	Laboratory				
3	Pharmacy				
4	NRU HDU				
5	Play room/area				
6	Kitchen				
7	Cooking demonstration room/area				

PART D: HUMAN RESOURCE CHECKLIST

		Adequate	Inadequate	Comment
1	Consultants			
2	Medical officers			
3	Clinical officers			
4	Specialized child health nurses			
5	Registered nurses			
6	Nurse midwife technicians			
7	Enrolled nurse midwives			

Appendix E: Who 10 Steps Protocol In Management of Severe Acute Malnutrition

STEP	AIM	SPECIFIC ACTIONS
1	Treat/prevent hypoglycemia	Do random blood sugar Give 10% dextrose if RBS< 3mmol/l or child not alert Initiate feeds within first hour Feed every 2-3 hours day and night to prevent hypoglycemia/hypothermia
2	Treat/prevent hypothermia	Keep warm
3	Treat/prevent dehydration	Rehydrate with low sodium fluids, monitor for fluid overload, avoid intravenous fluids except in shock
4	Correct electrolyte imbalance	Give potassium and magnesium, restrict sodium
5	Treat/prevent infection	Give broad spectrum antibiotics; infection may be silent
6	Correct micronutrient deficiencies	Give micronutrient supplements, do not give iron in first week
7	Start cautious feeding	Give 100kcal/kg/day and 1g protein/kg/day
8	Achieve catch up growth-rebuild wasted tissues with high energy, high protein diets with micronutrients	Give 150-220kcal/kg/day and 4-6g protein/kg/day, supplement iron, continue giving other micronutrients
9	Provide sensory stimulation and emotional support to enhance mental development	Involve mother in caring for child, provide tender loving care, provide age appropriate play/toys
10	Prepare for continuing care & follow up after recovery	Educate the mother on appropriate feeding, motivate her, ensure she has adequate resources and is available to feed her child

Note. “From clinical outcomes of children aged 6 to 59 months with SAM admitted at Mbagathi district hospital” by J.K. Fondo, 2013. Retrieved from

<http://erepository.uonbci.ac.ke/xmlui/bitstream/handle/112.....>

Appendix F: Permission letter to pretest and collect data at Kamuzu Central Hospital

Kamuzu College of Nursing
Private Bag 1,
Lilongwe.
14th July 2016

The Hospital Director,
Kamuzu Central Hospital,
P.O.Box 149,
Lilongwe.

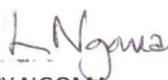
Dear Sir,

PERMISSION TO TEST RESEARCH TOOLS AND COLLECT DATA AT KAMUZU CENTRAL HOSPITAL

I am a student at Kamuzu College of Nursing, pursuing a Masters Degree in Child Health Nursing. In partial fulfillment of the programme, I am conducting a study on **Knowledge ,Attitudes and Practices of Health Care Workers on management of Severe Acute Malnutrition.**

I would like to request for approval to test the research tools and collect data at the hospital.

Thanking you in advance for your favourable consideration.


LUCY NGOMA

Head of
Department

I would
like to

Thank

LUCY

Appendix G: Letter of approval to conduct the study at Kamuzu Central Hospital



TELEPHONE No.: (265) 753 555

TELE FAX No.: (265) 756 380

PLEASE ADDRESS ALL
COMMUNICATIONS TO: THE HOSPITAL
DIRECTOR
E-MAIL: Kch@sdp.org.mw

MINISTRY OF HEALTH
KAMUZU CENTRAL HOSPITAL
P. O. Box 149
LILONGWE
MALAWI
25TH JULY 2016

Ref : nhsrc 2016

The Chairman,
College of Medicine Research Committee,
Ministry of Health,
Private Bag 360,
Chichiri,
Blantyre 3.

Dear Sir,

RE: LETTER OF SUPPORT FOR A RESEARCH STUDY TITLED – KNOWLEDGE ,ATTITUDES AND PRACTICES OF HEALTH CARE WORKERS ON MANAGEMENT OF SEVERE ACUTE MALNUTRITION AT KAMUZU CENTRAL HOSPITAL – PAEDIATRIC

I am writing to express my support in the willingness by the researcher to conduct the above named research at Kamuzu Central hospital.

The research will help in facilitating future improvements in recognition and management of patients with severe acute malnutrition at Kamuzu Central Hospital.

Thanks in advance for the support you are going to give the researcher.

Yours Sincerely,


Dr. Jonathan Ngoma
Hospital Director
P.O. BOX 149
LILONGWE

Appendix H: Certificate of Approval from College of Medicine Research and Ethics Committee.



