

**THE STRUCTURE AND PROCESS QUALITY OF CARE AND ITS
DETERMINANT IN THE MANAGEMENT OF UNDER-NUTRITION
AMONG UNDERFIVE CHILDREN ATTENDING PUBLIC HEALTH
FACILITIES IN DAR ES SALAAM**

Ruth Kumidi Mkopi

Master of Public Health Dissertation
Muhimbili University of Health and Allied Sciences
September, 2013

**THE STRUCTURE AND PROCESS QUALITY OF CARE AND ITS
DETERMINANT IN THE MANAGEMENT OF UNDER-NUTRITION
AMONG UNDERFIVE CHILDREN ATTENDING PUBLIC HEALTH
FACILITIES IN DAR ES SALAAM, 2013**

By

Ruth Kumidi Mkopi

A Dissertation Submitted in (Partial) Fulfilment of the Requirements for the Degree
of Master of Public Health of
Muhimbili University of Health and Allied Sciences

Muhimbili University of Health and Allied Sciences
September, 2013

CERTIFICATION

The undersigned certifies that she has read and hereby recommends for acceptance by Muhimbili University of Health and Allied Sciences a dissertation entitled, **“The structure and process quality of care and its determinant in the management of under-nutrition among under five children attending public health facilities in Dar es salaam”**, in (partial) fulfilment of the requirements for the degree of Master of Public Health of the Muhimbili University of Health and Allied Sciences.

Dr. Urassa David (MD, Phd)

(Supervisor)

Date: _____

**DECLARATION
AND
COPYRIGHT**

I **Ruth Kumidi Mkopi**, declare that this **dissertation** is my own original work and that it has not been presented and will not be presented to any other university for a similar or any other degree award.

Candidate's signature..... Date.....

This dissertation is a copyright material protected under the Berne Convention, the Copyright Act of 1999 and other international and national enactments, in that behalf, on intellectual property. It may not be reproduced by any means, in full or in part, except for the short extracts in fair dealing; for research or private study, critical scholarly review or disclosure with an acknowledgement, without the written permission of Directorate of Postgraduate studies, on behalf of both the author and the Muhimbili University of Health and Allied Sciences.

ACKNOWLEDGEMENTS

I would like to thank Dr. D. Urassa for his invaluable assistance and insights leading to the writing of this dissertation. My sincere gratitude also goes to the members of the graduate committee for their patience and understanding during the period of my studies that finally led to the production of this work. I would also like to sincerely thank my research team with whom I worked with during data collection. Last but not least I would like to send my heartfelt thanks to Dr Bruno Sunguya and Dr Francis Fredrick for their technical assistance in accomplishing this work.

DEDICATION

I would like to dedicate this thesis to my late father, who taught me more during his life than I ever realized, who helped me with understanding myself and who essentially opened life's horizon to this level today. I am indebted to the brave woman in my life, my mother who tirelessly took care of me after the departure of my father.

LIST OF ABBREVIATIONS

AIDS	Acquired Immune Deficiency Syndrome
CTC	Care and Treatment Centre
HAZ	Height for Age Z-scores
HIV	Human Immunodeficiency Virus
IDD	Iodine Deficiency Disease
IDA	Iron Deficiency Anaemia
IPD	In-Patient Department
MUAC	Mid Upper Arm Circumference
MUHAS	Muhimbili University of Health and Allied Sciences
NACS	Nutrition Assessment Counselling and Support
OPD	Out Patient Department
PEM	Protein Energy Malnutrition
RCH	Reproductive and Child Health
SAM	Severe Acute Malnutrition
MAM	Moderate Acute Malnutrition
SD	Standard Deviation
SPSS	Statistical Package for Social Sciences

TDHS	Tanzania Demographic and Health Survey
TFNC	Tanzania Food and Nutrition Centre
UNICEF	United Nations Children's Fund
VAD	Vitamin A Deficiency
WHO	World Health Organization
WAZ	Weight- for- Age Z-scores
WHZ	Weight –for- Height Z-scores

OPERATIONAL DEFINITIONS

Quality of Care: Is defined as the degree to which health services for individual and population increases the likelihood of desired health outcomes and are consistent with current professional knowledge (Lohr KN, 1990)

Nutrition: Is the outcome of various processes from when the food is eaten and nutrients are absorbed in the body for better health outcomes. (MoH, NNS 2011/12-2015/16)

Malnutrition: Is a state of poor nutrition status, which is the result of inadequate or excess intake of nutrients by the body.

Stunting: Is defined as failure to reach linear growth potential measured by Low Height for Age

Underweight: Is defined acute loss of weight due to acute disease or hunger measured by Low Weight for Age.

Wasting: is an acute loss or weight due to acute disease or hunger measured by low weight for height or length and an indicator for risk of death and is used as the admission criteria to therapeutic feeding programs (WHO 1999).

Moderate Acute Malnutrition: Moderate acute malnutrition in children is defined as a weight-for-height between -3 and -2 z-scores of the median of the WHO child growth standards without oedema.

Severe Acute Malnutrition: Severe acute malnutrition is defined by a very low weight for height (below -3z scores of the median WHO growth standards), by visible severe wasting, or by the presence of nutritional oedema. It is a life threatening condition requiring urgent treatment.

Z Score: A Z-Score is a statistical measurement of a score's relationship to the mean in a group of scores. A Z-score of 0 means the score is the same as the mean. A Z-score can

also be positive or negative, indicating whether it is above or below the mean and by how many standard deviations.

Quality: Is the totality of features and characteristics of an entity that bears on its ability to satisfy a stated or implied need

TABLE OF CONTENT

CERTIFICATION	II
DECLARATION AND COPYRIGHT	III
ACKNOWLEDGEMENTS	IV
DEDICATION	V
LIST OF ABBREVIATIONS	VI
OPERATIONAL DEFINITIONS	VIII
TABLE OF CONTENT	X
LIST OF TABLES.....	XIV
LIST OF FIGURES.....	XIV
CHAPTER ONE	1
1.0 INTRODUCTION	1
1.1 Background Information	1
1.2 Problem statement	8
1.3 Rationale of the study.....	10
1.4 Research question	11
1.5 Research Objectives	11
1.5.1 Broad objective.....	11

1.5.2 Specific objectives	12
CHAPTER TWO	13
2.0 LITERATURE REVIEW	13
CHAPTER THREE.....	20
3.0 METHODOLOGY	20
3.1 Study area.....	20
3.2 Study design.	20
3.3 Study duration	20
3.4 Study population.....	21
3.5 Inclusion criteria.....	21
3.6 Exclusion criteria.....	21
3.7 Sample size	21
3.8 Sampling technique	23
3.9 MEASURES	23
3.9.1 Dependent variables	23
3.9.2 Independent variable.....	23
3.9.3 Data collection tool and technique	24
3.9.4 Data collection.....	25

3.9.5 Data management	27
3.9.6 Ethical consideration	28
3.9.7 Study Limitations	29
CHAPTER FOUR	30
4.0 RESULTS.....	30
4.1 Demographics characteristics.....	30
4.2 Quality of care.....	32
4.2.1 Structural quality	32
4.2.2 Provision of Nutrition services	34
CHAPTER FIVE	41
5.0 DISCUSSION.....	41
5.1 structure quality and its determinants	41
5.2 Accuracy of Anthropometric measurements taken by health care workers	42
5.3 Management of under nutrition in relation to the WHO guideline.....	43
CHAPTER SIX.....	46
6.0 CONCLUSION AND RECOMMENDATION.....	46
6.1 CONCLUSION.....	46
6.2 RECOMMENDATIONS	46

CHAPTER SEVEN	48
7.1 REFERENCES	48
7.0 APPENDICES.....	60
7.1 Appendix I:..... Informed Consent Form, English Version	60
7.2 Appendix II: Ridhaa ya kushiriki kwenye utafiti	64
7.3 Appendix III, QUESTIONNAIRE	68
7.4 Appendix iv, Dodoso.....	73
7.5 Appendix v. Structural quality assessment checklist	78
7.6 Appendix vi. Dodoso la upimaji wa ubora wa huduma za kituo	79

LIST OF TABLES

Table 1: Demographic characteristics of health care workers.....	30
Table 2: Demographic characteristics of children under five years	31
Table 3: Distribution of Age and Sex of children under five years.....	31
Table 4: Number of Health institutions with available structure facilities for anthropometric measurements, assessment and management of under-nutrition	33
Table 5: Type of nutrition services provided, anthropometric measurement taken and management provided to children with under-nutrition.....	36
Table 6: Adoption of length/height and MUAC measurements in routine anthropometric measurement by health care workers	38

LIST OF FIGURES

Figure 1: Conceptual Framework of Quality of Care and its determinants.....	3
Figure 2: Assessment of Nutrition status by health care workers	39
Figure 3: Assessment of Nutrition status by Researchers	40

ABSTRACT

Background

Globally under-nutrition has affected many children, it contributes to about one third of the eight million deaths among under-fives every year, Tanzania like many other developing countries suffers from the problem of malnutrition with about 42% of under-five children with chronic under-nutrition, also known as stunting. There have been several interventions conducted to reduce under-nutrition among children all over the World and Tanzania in particular, however within the past ten years the levels of nutrition status of children under five years in Tanzania has not shown much of a significant improvement rather the levels of stunting and wasting has increased significantly.

The structural and process quality of care in health facilities plays an important role in the management of under-nutrition in health facilities but also provides a preventive health education to mothers and care givers, it is therefore imperative to explore the quality of core elements in the management of under-nutrition that may have resulted in the persistent high rates of under-nutrition in Tanzania

Objective

To determine the structure and process quality of care and its determinants in the management of under-nutrition among under-five children attending Public Health facilities in Dar es Salaam

Design: Cross Sectional study

Setting: The study was conducted in one district hospital, two health centers, and 17 dispensaries, in Kinondoni District in Dar es Salaam region.

Methods: A total of 384 health care providers and 384 children aged 6 – 59 months were included in this study. Kinondoni District and District hospital were selected conveniently,

and health centres and dispensaries included in this study were randomly selected. Quantitative data was collected using a standardized questionnaire from health care workers. Anthropometric measurements were taken from children participants by the trained researchers and compared to measurements taken by the health care providers. Anthropometric data were converted to nutrition status values using Epi-Info ENA Ver. 3.5.1, 2008 (CDC, Atlanta, Georgia, USA) software, using WHO reference values. All data were analyzed using SPSS version 17 (SPSS Inc., Chicago, Illinois, USA).

The main outcome variable was the structure and process quality of care and its determinants in the management of under-nutrition. and the independent variables assessed included availability of equipment for taking anthropometric measurements, availability of human resource, availability of therapeutic foods, treatment guidelines and management of acute malnutrition.

Results: All facilities had weighing scales and only a few had length boards, consequently length measurements were not adequately taken. As a result, the main nutrition status assessed was weight for age using Road to health care which was found mostly in dispensary levels. Few facilities had treatment guidelines and staff trained on the management of malnutrition. The only medication used for treatment of under-nutrition was Ready To Use Therapeutic Food (RUTF) found in a few health facilities. There was a significant mean difference between the assessments of under-nutrition done by the researchers compared to that done by the health care worker.

Conclusion:

The overall result of this study indicates that there is inadequate structure quality to facilitate screening, assessment, and management of under-nutrition at all levels of health facilities. Such health facilities also had a low number of trained personnel for the management of under-nutrition. There is also inaccuracy and inconsistency in practices of

taking anthropometric measurements This resulted in misdiagnosis of malnutrition and consequently poor quality of care given to children under fives.

Recommendations

The study findings have revealed poor structure and process quality of care and its determinants in various aspects. It is therefore recommended that, the Ministry of Health and Social Welfare to consider adequate supply of medications, equipments for screening, and assessment of nutrition status of children. Furthermore, the Ministry should revisit its continuing professional education (CPD) to also provide in-service nutrition training for health care workers providing care to children under fives in the health facilities.

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background Information

The desire to implement a quality nutrition program relies to health care providers of which their adherence to clinical guidelines for the management of malnutrition among children is central. Evidence suggest that, implementation of the potentially better practices that follows clinical guidelines including timely initiation of nutrition support to identified and admitted children leading to earlier attainment of adequate energy intakes; reduces delay in reaching full enteric feeds, reduces the length of stay in the feeding program and improved growth at time of discharge.

The Donabedian Model is the conceptual framework that has been dominantly used in the assessment of health services and quality of care (Figure 1).. The model categorically describe the ways through which information can be obtained in order to draw inferences about the quality of care, that is *structure, process*, and *outcome*, and it has been used by many researchers (Donabedian. A, 2003).

Structure refers to the physical and organizational aspects of care setting, describes the context in which health care is delivered including the structure of the hospital, necessary equipments, human resource for health (staff), supplies and financing. For quality assessment structural measures that predict variations in process or outcome of care have great utility. Assessments of paediatric quality of care involving structural measures have focused primarily on hospital characteristics and provider characteristics.

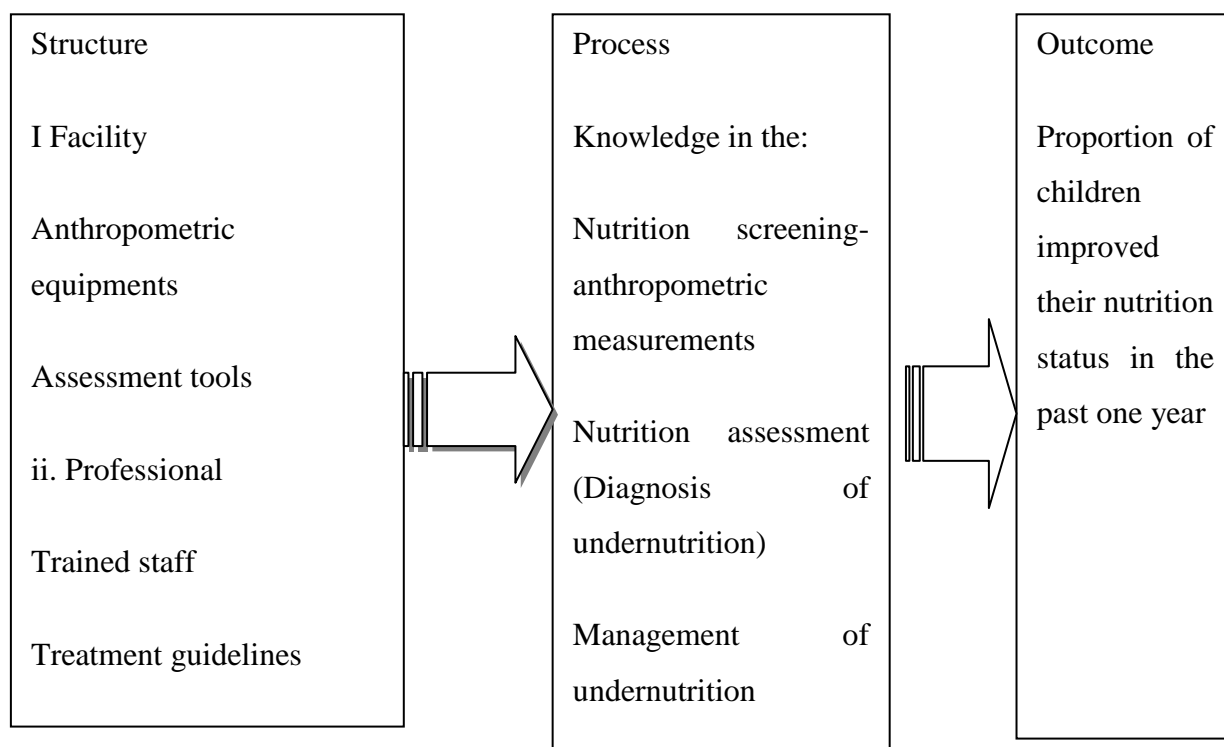
Process explains the delivery of health care, such as screening, medical examinations, diagnosis, treatment, preventive services, patient satisfaction including family's reactions. According to Donabedian process quality carries a lot of weight in health care services and

assessment of process is nearly equivalent to measurement of quality of care because process consists of all practices of health care delivery (Donabedian A, et al, 1980). He further pointed out that elements of the process of care do not signify quality until their relationship to desirable outcome has been established. He goes on to say that, "once it has been established that certain procedures used in specified situations are clearly associated with good results, the mere presence or absence of these procedures in these situations can be accepted as evidence of good or bad quality" (Donabedian 1980).

The use of process measures to assess quality of care in the management of under-nutrition is imperative that, effective measurements are necessary in identifying opportunities for improvement and to guide the process of improvement. Outcome reflects the effects of health care on the health status of patients and populations, such as change in health status, behavior or knowledge also patient satisfaction. This is taken generally as the indicator of quality as it is in line with the primary goal of health care is improving patients status. Donabedian also stated that outcome is the ultimate validation of the effectiveness and quality of medical care (Donabedian, 1966),

However in using the outcome measures in measuring the quality of care Donabedian noted some limitations these include the fact that some outcomes are difficult to measure, outcomes can be affected by many factors outside of the medical care system, and relevant outcomes may not be apparent for years. (Donabedian, 1966). Measuring outcome in the management of under-nutrition may alternatively be done through measuring the health/nutrition status of children, and this can be done in operational studies.

Figure 1: Conceptual Framework of Quality of Care and its determinants



This model is useful and it provides the linear configuration for the adapted model “Good structure increases the likelihood of good process, and good process increases the likelihood of a good outcome” (Meeks-Sjostrom, 2008). In this sense this study will apply the Donabedian model to assess the two determinants of quality of care that is structure and process, to examine the quality of care and its determinants in the management of under-nutrition among children under five years.

In Tanzania poor children are more likely to be exposed to health risks than their better-off peers, and they have less resistance to disease because of under-nutrition and other hazards typical in poor communities. These inequities raises issues related to poor access to services related to preventive and curative interventions and are linked to knowledge based

of health workers. Successful approaches to improve the situation this include those that improve geographic access to health interventions in poor communities.

Targeting of health interventions to poor people and ensuring universal coverage are promising approaches for improvement of equity, however, this calls for proper planning for child survival and effective delivery at health facilities. Regular monitoring of inequities and use of the resulting information for education, advocacy, and increased accountability among the general public and decision makers is urgently needed, but will not be sufficient if the knowledge of health workers in clinical management of malnutrition is not updated basing on current evidence (Victora C.G, 2003).

Under-nutrition results from insufficient food intake and repeated infectious diseases. Under-nutrition includes having low weight for one's age (underweight), shorter for one's age (stunted), dangerously thin (wasting) (UNICEF, 2006). This study focused in examining the quality of care and its determinants in the management of under-nutrition caused by nutrition deficiencies either due to inadequate feeding, hunger, or due to diseases such as diarrhoea.

Malnutrition is increasingly recognized as prevalent (wasted) and deficient in vitamins and minerals (micronutrients) and important health problem in many countries. This problem has serious long-term consequences for the child and adversely influences development of a nation

Malnutrition can be classified as under-nutrition and over nutrition. Under-nutrition is further classified according to severity into mild, moderate, and severe forms using anthropometry which is the measurement of the size, weight and proportions of the human body, biochemistry and clinical assessment (J Picot et al, April 2012). According to time of onset, is classified as acute and chronic forms.

The causes of malnutrition are multi-factorial, few of them include, dietary and environmental factors, which are common risks of malnutrition among children. Most common nutritional problems among children are Protein Energy Under-nutrition (PEU),

Iron Deficiency Anaemia (IDA), Iodine Deficiency Disorders (IDD), and Vitamin A Deficiency (VAD) (ACC/SCN, 2000).

Nutritional status can be defined as the interpretation of information obtained from the methods of nutritional assessment. The nutritional status is influenced profoundly by diet, infectious and parasitic diseases, and is a major determinant of child's health and survival (Nyaruhucha.C et al, 2006)., The areas that have received more attention in the last decade are the survival and healthy development of children especially those under five years of age and the social and economic roles of women in developing countries

Under-nutrition affects adversely the growth and health of children. Under-nutrition in its severe form still remains a significant cause and determinant of mortality, short-term morbidity, permanently lost productivity and intellectual capacity in societies of which its costs and losses are unaffordable (Latham, 1997). About 2% of children in developing countries have Severe Acute Malnutrition (SAM) (UNICEF 2005), SAM is the commonest reason for paediatric hospital admission, in many countries such as Malawi. (Manary MJ, et al 2004).

Malnutrition has been shown to cause impairment at a cellular, physical and psychological level (Holmes, S.2007, Kubrack C, .. 2007, Allison, S.P, 2000). This impairment is dependent on many factors, including the patient's age, gender, type and duration of illness, and current nutritional intake.

At a cellular level, under-nutrition impairs the body's ability to mount an effective immune response in the face of infection, often making infection harder to detect and treat (Scrimshaw, N.S.; DanGiovanni, J.P.1997). It also increases the risk of pressure ulcers, delays wound healing, increases infection risk, decreases nutrient intestinal absorption, alters thermoregulation and compromises renal function (Holmes, S.2007).

At a physical level, under-nutrition can cause a loss of muscle and fat mass, reduced respiratory muscle and cardiac function, and atrophy of visceral organs (Hoffer, L.J. 2001, Holmes, S.2007, Kubrack, C, 2007). It has been shown that an unintentional 15% loss of

body weight causes steep reductions in muscle strength and respiratory function, while a 23% loss of body weight is associated with a 70% decrease in physical fitness, 30% decrease in muscle strength and a 30% rise in depression (Allison, S.P. 2000). At a psychological level, malnutrition is associated with fatigue and apathy, which in turn delays recovery, exacerbates anorexia and increases convalescence time (Kubrack C, Jensen, L. 2007).

The spectrum of the more severe forms of protein energy under-nutrition in early childhood is considered to form clinical and biochemical change such as nutritional marasmus, marasmic kwashiorkor, and kwashiorkor. The World Health Organization cites malnutrition and especially under-nutrition as the greatest single threat to the world's public health. About 80% of the world's undernourished children live in just 20 countries. Intensified nutrition action in these countries can lead to achievement of the first Millennium Development Goal (MDG) and greatly increase the chances of achieving goals for child and maternal mortality (MDGs 4 and 5) (Black R.E. et al, 2008). Despite of important advances in prevention and treatment, under-nutrition continues to be a worldwide problem. Globally, 55 million children under the age of five are wasted. Of them 19 million (35%) are severely wasted (Giugliani C. et al, 2009).

Chronic under-nutrition has remained a persistent problem for young children in sub-Saharan Africa (FAO, 2008). In Tanzania, all population groups are affected by malnutrition especially under-nutrition. However, children under-five years of age and women, particularly those who are pregnant and lactating are the most affected groups (Kavishe, 1993).

A high percentage of these children fail to reach the normal international standard height for their age often associated with stunted growth. Moreover, the number of undernourished children in sub-Saharan Africa continues to increase and the region has shown little improvement over the past decades (FAO, 2008).

Tanzania ranks as the 3rd worst affected country in Africa with respect to under-nutrition after Ethiopia and the Democratic Republic of Congo (DRC). The Country ranks 10th in its contribution to the World's chronic undernourished children (UNICEF, 2009a). According to UNICEF, 44% of children under 5 years old suffer from stunted growth (low height-for-age) indicating chronic under nutrition, about 4% are wasted (low weight-for-height); a sign of acute and 22% are underweight (low weight-for-age) while an astounding 72% suffer from anaemia.

Under-nutrition clearly remains widespread, even after significant reductions in poverty achieved in recent years. A recent review done by Black and others reported that under-nutrition accounts for 11% of total global disability-adjusted life years (DALYs), a measure that takes into account the impact of both early mortality and disability. (Black et al 2008). Reducing under-nutrition is one of the Millennium Goals (Goal 1 that aims to eradicate extreme poverty and hunger), and is also a key factor underpinning several others. Achieving goals in primary education, reducing child mortality, improving maternal health, and combating HIV/AIDS, malaria and other diseases all depend crucially on nutrition (Olwedo M.A. et al.2008).

The three underlying determinants of child under-nutrition include household food security; quality of care; resources for health, including access to health services; and a healthy environment. These three inputs are key to the process of determining nutritional outcomes both for individuals and for populations as a whole. It is important to recognize that balance is required across these factors if under-nutrition is to be sustainably reduced.

A multitude of studies from the United States and other countries, have verified that undernourished patients are at increased risk for morbidity and mortality. Furthermore, it affects the quality of life in undernourished people particularly those suffering from benign gastrointestinal conditions (Pirlich M et al, 2006).

1.2 Problem statement

Several studies have highlighted issues concerning quality of health care provided to children under five years, both anecdotal and empirical evidence suggest that the quality of care offered in many facilities, both primary and referral, is generally poor . (English M, 2004, English M, 2009) The results from 53 developing countries with nationally representative data on child weight-for-age indicate that 56% of child deaths were attributable to under-nutrition potentiating effects, (Pelletier. D.L et al, 1995).

The rising death toll necessitated researchers to conduct various studies which have revealed the fact that many children's preventable deaths from severe malnutrition occurs due to inappropriate care and it has also been documented in other areas that Weaknesses in health systems, inappropriate training of doctors and nurses, inadequate supervision, and lack of support for staff all contribute to compromised quality of care. (A.A. Jackson et al, 2006)

A study conducted in Tanzania revealed that the overall performance of all hospitals in the management of acute malnutrition was very poor as with other common clinical conditions (MoH,2010). Thirteen hospitals (18.8%) in this study failed to improve the nutritional status of patients. In most of the hospitals length/height or weight were measured but the results could not be interpreted due to lack of clinical guidelines and interpretation charts (MoH, 2010).

This and several other studies have focused more and ended in the observation of nutrition status of children, little is known on the quality of care in the management provided to these children and its outcome. Diagnosis of under-nutrition requires screening and assessment of nutrition status of children in every clinic visit. It also emphasize on providing good nutritional care as a matter of quality, clearly delivering against all elements of fair, personalized, safe and effective care as well as ensuring equality, improved outcomes and best patient experience. Such requirements need a well-trained practitioner with appropriate equipments and guidelines in place.

Nationally the nutritional status of children under five years as measured by height-for-age (stunting) and on various background characteristics is 42 percent, with severe stunting at about 17%. The overall percentage of children aged under five years as measured by weight for height (wasting) is 5%, and the proportion of severely wasting being 1% and the rate of underweight as measured by weight for age for children under five years, overall is 16% with 4% being severe underweight.

Dar es Salaam region has significant levels of under-nutrition affecting children under five years, the overall stunting is 25% with severe stunting of 6.9%, wasting is 8% with proportion of severe wasting of 1.7% and underweight is 12% with severe underweight of about 0.5%.

Nutritional screening remains important to identify persons who require treatment. This is due to the fact that, malnutrition is an under-recognized and under-treated condition. However, knowledge about the correspondence between the findings from nutritional screening and the actual provision of treatment is sparse.

Proper knowledge and competence of health care workers has been highlighted to contribute greatly to the proper care of children and henceforth improving the quality of care in managing malnourished children. Inappropriate case management of severe malnutrition is believed to be one of the main reasons why high case fatality rates (20–30%) (S.Collins, 2007), persist worldwide and is a similar case as it is in Tanzania (TDHS, 2010). Inversely, it has been found that training health workers improves nutrition program coverage, program outcomes, program monitoring and supervisions, more important it improves the nutritional status of children hence reducing deaths among underfives children (WHO, 2008).

Under-nutrition is associated with several nutritional determinants of which inadequate care for young children is among them; this is at household level and at health facility level when children are admitted for rehabilitation. Questions arise here includes the skills of health workers in managing complicated cases of severe acute malnutrition. Evidence

suggests that newly adapted feeding program protocols are not adequately trained to health workers as result nutrition interventions to reduce malnutrition are inadequately implemented (Alderman, H, et al 2006).

Dar es Salaam region established preventive services including nutrition assessment and management both as outpatient and inpatient care. However services are provided in a substandard way and it can be reflected in the rising national prevalence of chronic under-nutrition, from 38% (TDHS 2004-05) to 42 % (TDHS 2010). Such upsurge calls for the necessity of conducting this study so as to assess and identify the gaps in quality of care provided in the management of malnutrition.

1.3 Rationale of the study

Millennium Development Goal number one aim at eradicating extreme poverty and reducing hunger, which targets also halving the proportion of people who suffers from hunger between 1990 and 2015, the goal is focusing in reducing the prevalence of underweight children under five years of age and proportion of population below minimum level of dietary energy consumption. With this regard, this study is aimed at making a contribution in achieving this target. The results of this study will be used to inform professionals, decision makers and other stakeholders on the ground knowledge and practices in the assessment and management of under-nutrition in health care facilities.

Secondly the results will be used to advice decision makers and practioners to focus on improving the structural quality of health facilities in the implementation of nutrition activities that can facilitate efficient and effective process quality aspects of care in the management of under-nutrition in the health facilities. This encompasses making available equipments for anthropometric measurements, nutrition status assessment tools, supplies of specialized food products for management of under-nutrition and essential treatment guidelines/protocols. In-service training of health care providers in the management of under-nutrition

The results determined by comparing the anthropometric measurement done by the health care worker compared by that done by researchers will be used to show the importance in taking accurate anthropometric measurements as an important element of monitoring the progress of children growth, the researcher here is taken as a gold standard. Accurate measurements enables accurate assessment of nutrition status of children, hence accurate decision in management plan, as well ensuring the quality care in the management of under-nutrition.

Finally the results will be used in advising policy makers to in-cooperate management of under-nutrition package in routine health facility activities.

1.4 Research question

What is the structural and process quality of care and its determinants in the management of under-nutrition in children underfive attending Public health facilities in Dar es salaam region?

1.5 Research Objectives

1.5.1 Broad objective

To determine the structure and process quality of care and its determinants in the management of under- nutrition among under-five children attending Public Health facilities in Dar es Salaam

1.5.2 Specific objectives

1. To assess the level of provision of nutrition services for the under fives in health facilities.
2. To determine the accuracy of anthropometric measurements taken by health workers compared with that of trained researcher.
3. To assess the quality of care provided by HCWs in the management of under-nutrition of under five in relation to WHO guideline for management of under-nutrition.
4. To determine the willingness of health care workers in adopting changes in the new Tanzania treatment protocol for under-nutrition.

CHAPTER TWO

2.0 Literature review

Under-nutrition is a major public-health problem throughout the developing world and is an underlying factor in over 50% of the 7.6 million children under 5 years of age who die each year of preventable causes (Liu, L. et al 2012). Under-nutrition has resulted in more than 146 million children being underweight in developing countries (Black et al, 2010)..

About 560 million preschool children living in developing countries today, 26% are underweight (defined as a weight-for-age z score ≤ -2.0). In the past few years, several analyses have documented that more than 50% of all childhood deaths are attributable to underweight, and most of these deaths occur in children with mild to moderate (as opposed to severe) underweight.

Risks of death due to the four major causes of child mortality (pneumonia, diarrhoea, measles, and malaria) are reported to be substantially and significantly higher for underweight children. Underweight is usually associated with poor cognition, fewer years of schooling, lower adult income, and for girls, a higher risk that their infants will also be malnourished, perpetuating the problem generation after generation. Black et al reported the synergism that coexisting between malnutrition and infections (Black R.E et al 2008). The earlier estimate modelled the relative risks on the basis of the synergism of malnutrition and infection. Under-nutrition kills children by increasing case fatality of common childhood infections, not by increasing their incidence (Black, R.E et al 2008)

Underweight malnutrition develops in a remarkably similar pattern in children in resource-constrained settings throughout all regions of the world. During the first 3 to 6 months of life, the average weight gain of these children is similar to that observed in healthy populations. Then, within the brief six months that comprise the second half of infancy, the average weight-for-age of Asian and African children plummets to approximately -1.5 to -1.75 Z-scores (about the fifth percentile of a well-nourished population), followed by little or no recovery

This coincides with the time infants begin eating non–breast milk food which, for those in developing countries, is nearly always a porridge that is seldom energy dense, even more rarely micronutrient dense, and frequently contaminated with bacteria. (Stephen Allen et 2007).

Protein energy malnutrition was associated with morbidity and mortality in children in sub-Saharan Africa by the African Health Sciences Journal. The prevalence of under-nutrition is high in Africa, with 38.6% of the children under five years stunted 28.4% underweight, and 7.2% wasted (Olwedo M. A. et al.2008).

Undernourished and better-nourished children are both killed by a few preventable diseases, such as measles, malaria, diarrhea and pneumonia. These are also the diseases that kill malnourished children. Therefore, preventing and managing these diseases is a first step for well-fed children and those at a fallback step for malnourished children. (Pelletier D.L. et al, 1995).

Under-nutrition has negative effects on income and on economic growth leading to increased mortality and morbidity. Consequently it, lead to loss of economic output and increased spending on health. Poor nutrition means that individuals are less productive (both due to physical and mental impairment), and that children benefit less from education (Horton S. et al, 2008).

During the past seven years, a growing number of countries and international relief agencies have adopted a community-based model for the management of acute malnutrition, called community-based therapeutic care (CTC) which was later called Food By Prescription (FPB) whereby this time the program was adopted in Tanzania and currently the program has been renamed as Nutrition Assessment Counselling and Support (NACS).

This model provides a framework for an integrated public-health response to acute malnutrition. Patients with SAM without medical complications are solely treated as outpatients and reserving inpatient care for the few with SAM and complications. Mid-

Upper-Arm Circumference (MUAC) and Weight For Height/Length Z-Score are used as the sole anthropometric indicator for screening and admission into the management of Acute Malnutrition program

The model also aims to integrate treatment with various other interventions designed to reduce the incidence of malnutrition and improve public health and food security. Program design attempts to take into account the socioeconomic factors, particularly poverty, high workloads for women, and the exclusion from health and education services that contribute to the late presentation of cases of acute malnutrition (Collins S. et al, 2006)

Guideline for management of malnutrition in Tanzania.

Tanzania Ministry of Health through Tanzania Food and Nutrition Centre have developed about three documents guiding the management of malnutrition which are, Guideline for community based Nutrition Rehabilitation, Nutrition Assessment Counselling and Support – Reference manual for facility – based service providers and National guide on Nutrition Care and Support for People Living with HIV/AIDS. In Tanzania there are three ways that have been used to prevent and address malnutrition, these are.

Through food:

This involves promotion of a balanced diet using a variety of locally available foods, promotion of optimal feeding of vulnerable groups, promotion of home fortification of foods, promotion of kitchen gardens and backyard gardens, improved household food production, economic strengthening and livelihood initiatives to improve food security.

Through health care services

This involves; integration of nutrition assessments, counselling and support (NACS) into routine health services, provision of guidelines, standards, protocols, job aids and essential equipments for NACS, supply of micronutrient supplements and Specialised food products to treat malnutrition according to the national protocol.

Through behaviour change

This involves, growth monitoring and promotion and nutrition counselling and education, including food demonstration.

In a view of this study, hence it aims at assessing the quality of care in the management of under-nutrition in the health facility, the guiding document onto how care is provided is the Nutrition Assessment Counselling and Support. The guideline has stipulated the steps in the management of under-nutrition which starts with the critical nutrition actions, these are messages a health care worker is supposed to give a client, the second step is Assessing Nutritional status, this involves clinical examination, dietary history and anthropometric measurements of weight, height/length and MUAC measurements,

Nutrition assessment leads to the identification of a nutrition status and facilitate appropriate nutritional management, nutritional management is divided into Nutrition care plans A, B and C. The plans directs health care workers on the proper management with regard to the type of under-nutrition a person has, on both outpatient and inpatient management.

Under-nutrition has been a long-standing Public health problem in Tanzania and the levels of continue to be unacceptably high despite intervention efforts undertaken. Protein-energy malnutrition (PEM), nutritional anaemia, iodine deficiency disorders (IDD), Iron Deficiency Anaemia (IDA) and Vitamin A Deficiency (VAD) are the main nutritional disorders of public health significance. Population groups most affected are children below 5 years of age, pregnant and lactating women.

Under-nutrition is responsible for one third of deaths in children under 5 years in Tanzania, making it a significant cause of under five deaths in the country. Despite some progress made over the past decade, malnutrition remains a public health problem. The prevalence of malnutrition varies widely across regions and socio-economic groups.

Not only is there early onset of malnutrition in Tanzania but also their rates are high. Nationally level of stunting of the children under five years is 42%, and the proportion of severely stunted is 17%, whereas 5% of under five children are wasted (TDHS 2010). A cross-sectional study which was undertaken in urban Dar-es-Salaam, Tanzania revealed the prevalence rates of stunting, underweight, wasting, and morbidity were 43%, 22%, 3%, and 80%, respectively (Kulwa. K et al 2006).

Under-nutrition among Tanzanians is manifested at an early age, therefore, great emphasis is placed on monitoring child nutrition to avoid or minimize the adverse consequences of malnutrition.

Malnutrition does not only seem to be a poverty issue. Lack of knowledge and low dietary quality of food given to children are also two likely contributing factors (Black R.E. et al, 2008, Horton S. et al 2008). There is some evidence that nutrition-education interventions can result in the favourable growth and development (Black R.E et al, 2008).

Nutrition is an important part of nursing care, therefore good healthcare cannot be provided without having satisfactory knowledge about nutrition. (TFNC2005/06 –, 2006, 2009/10).

Delivery of good quality health care has considerable potential to reduce childhood deaths in income countries where mortality is high. Lohr, K.N describes the quality of care as the degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge (Lohr, 1990)

Quality care for children under five years is important, and it should consist of several components, where by the child should have an opportunity to receive the needed care, the

care should be appropriate and skilfully provided and the best possible outcomes are achieved (Rita. M, 1998).

The most nutritionally vulnerable period of the life of a child is the first 18 months of life. A child who is undernourished in the first stage of life is likely to remain stunted in his/her adulthood. Moreover, under-nutrition in early life is negatively associated with cognitive development; malnourished children will most likely perform worse at school than their healthy siblings. Thus, the health consequences of poor nutrition may influence the amount and timing of school enrolment. A child who has fewer completed years of schooling or has learned less in his or her time in school or both will exhibit a lower productivity when in the labour market. (Alderman H. et al. 2008).

Promotion of good nutrition during pregnancy to two years of childhood is therefore very important, this period is called “the window of opportunity”. Children under five years are going through a period of active growth and development which requires necessary nutrient to enhance it, inadequate intake of food nutrients directly and indirectly affect under five children and may lead to growth retardation and suppression of immunity which further predispose children to various diseases which in turn interferes with nutrient uptake and may also cause nutrient loss.

In order to prevent or reverse the associated negative clinical outcomes for malnourished children, it is imperative that these children are promptly identified. Routine nutrition screening using validated nutrition screening tools can provide a basis for dietetic referrals for prescription of appropriate nutrition support. In realization of this, various interventions should focus on the importance of good nutritional care and proper management once the child is undernourished.

The increase of stunting levels in Tanzania raises a question as to how is management of under-nutrition undertaken, the competence of care providers in the screening, assessment and management of acute under-nutrition, the availability of equipments, medical, and

nutritional supplies used in the management of acute malnutrition. All these together question the quality of care provided to under five years children in the management of under-nutrition which begins with screening, assessment, counselling and therapeutic feeding.

Quality of care has different meanings, ranging from technical competence to the interpersonal dimensions of care, and the perceived importance of these dimensions often varies by context and stakeholder (Bruce, 1990). Program beneficiaries' awareness of, and satisfaction with, a program are important components of quality of care, influencing participation, compliance and program effectiveness (Gilson et al. 1994; Guerrero et al. 2010). Therefore, it is crucial to understand the quality of care both from the perspective of care providers and recipients.

The care practices are linked with the quality of the human resources that facilitate care for children's good nutritional status in the health facilities or feeding centres; it is recognized that quality care of service providers is one of an essential block of early childhood care for survival, growth and development of children (Engle, P.L, 2000 et al).

CHAPTER THREE

3.0 METHODOLOGY

3.1 Study area

This study was conducted in Kinondoni district one of the three districts of Dar es Salaam region. The district is situated in the Northern part of Dar es Salaam region. To the east it borders with the Indian Ocean, to the north and west borders with Pwani Region. The 2002 Tanzanian National Census showed that the population of Kinondoni was 1,083,913 with annual increase rate of 4.3% per annum, with a volume proportion of 21% children under five years.

About 75 % of residents of Kinondoni Municipality have access to health facility within 5km radius;the area of Kinondoni is 531 km². Administratively, Kinondoni Municipality is broken into four divisions, 27 different wards, and 113 sub-wards. (CCHP Review for Dar es Salaam Region, 2008)

3.2 Study design.

The study design was cross sectional.

The study used a hospital based cross sectional design to determine the structure and process quality of care and its determinant in the management of children suffering from under-nutrition aged below 5 years in health facilities in the selected district.

3.3 Study duration

The study was conducted for a period of six months, from August 2012 to February 2013.

3.4 Study population

This study aimed at determining the structure and process quality of care and its determinants in management of malnutrition in children aged six (6) months to five years (59months). Study participants included all children 6-59months attending health facilities in Kinondoni district and health care providers in those health facilities. Health facilities were also evaluated to assess the structures that support appropriate management of malnutrition.

3.5 Inclusion criteria

All children 6 months to five years and all health care providers eligible for the study and available at the facility on the day of interview.

3.6 Exclusion criteria.

All children less than 6 months and above 59 months and health care providers not on duty on the day of interview

3.7 Sample size

The sample size for the two study populations was calculated based on the single proportion formula presented below

Sample size for children:

$$n = Z^2 P(1-p)$$

E2

Where;

z is the standard deviation (normal) that correspond to 5% level of stat percentage point of normal distribution corresponding to the statistical significant level of 1.96

P is the proportion of children receiving appropriate care in the facility and since this is not known it is estimated at 50% chance of occurrence.

E corresponds to maximum likely error, which was 0.05

Therefore based on the above parameters the sample size n was 384 for the children aged below 5 years in this study.

Sample size for Health Care Workers:

$$n = \frac{Z^2 P(1-p)}{E^2}$$

$$E^2$$

Where;

z is the standard deviation (normal) that correspond to 5% level of stat percentage point of normal distribution corresponding to the statistical significant level of 1.96

P is the number of health workers providing appropriate quality of care, it is not known hence the number is estimated at 50% chance of occurrence.

E corresponds to maximum likely error, which was 0.05

Therefore based on the above parameters the sample size n of Health Care Workers.

was 384.

3.8 Sampling technique

Kinondoni district was randomly selected from the three districts of Dar es Salaam. A sampling frame of public health facilities was obtained from the District Medical Office (DMO).

One District hospital was selected conveniently from the three district hospitals in Dar es salaam region, two health centres in Kinondoni district were selected conveniently out of three health centres in Kinondoni district and 17 dispensaries were randomly selected from the available 33 public dispensaries in Kinondoni district. :

Children under five years of age who attended the health facility were selected conveniently according to their availability and consent form were given to their parents, those who consented to be interviewed were included in the study. Health care workers were selected conveniently where by those who were working in children clinics (RCH), pediatric ward and some in outpatient department who mainly attended children and were present on the day of interview and consented to participate were selected.

3.9 MEASURES

3.9.1 Dependent variables

Structure quality of care

Process quality of care

Accuracy of anthropometric measurements

Willingness to adopt WHO guidelines for management of under-nutrition

3.9.2 Independent variable

Age

Sex

Availability of equipment for taking anthropometrics

Availability of human resource

Availability of therapeutic foods

Treatment guideline

Use of standard WHO guidelines Management of acute malnutrition

3.9.3 Data collection tool and technique

Plan for data collection

One research assistant was recruited and trained to assist the researcher in data collection. The research assistant possessed a Bachelor of Science on Human Nutrition, with previous research experience on nutrition assessment and management of undernutrition. The research assistant was trained on the objectives of the study, data collection process, respondents' selection criteria, obtaining consent from recruited study subjects, good rapport, taking anthropometric measurements, understanding and elaborating questions, assuring respondents' confidentiality and recording responses.

Pretesting of data collection tools: Prior commencement of the data collection tools were pretested where 40 health workers participated and 40 children aged 6 – 59 months had their anthropometric measurements taken which was ten percent of the total participants recruited in the actual study. This process took place in the health facilities, which were not selected for the actual study. Adjustments and sequence of the questions together with the discussion guides were modified after the pretesting. The questionnaire was back translated into Swahili language (Swahili is the national language understood by majority of Tanzanians).

3.9.4 Data collection

Data collection was done by the principal investigator together with one research assistant, Questionnaires which were translated from English to Swahili were used to collect information from health care workers. All participants were given consent form to read first, and then the researcher or research assistant read loudly the contents of the informed consent form (ICF). Health workers were then asked if they understood the contents of the consent form then were asked if they were willing to participate in the study or not..

Having finished the brief general introduction, the actual interview based on the structured questions that are in the questionnaire was done.

About 416 (106%) of children whose mothers were approached to be included in the study agreed to participate, their anthropometric measurements were taken. Children aged 6-59 months information were taken, age and sex was recorded, then the child was measured weight , height/length and oedema was assessed by the health care worker and these measurements were also repeated by the principal investigator or the research assistant. Both measurements were recorded in a sheet of paper

Measurements done by the researcher/ research assistant and those taken by the health care workers were later analysed and compared. The measurements of the researcher and that of the research assistant were considered as Gold standard. Data check was done and record of children which were incomplete such as those whose age or date of birth could not be identified were removed in the data analysis.

Weight

Weight was taken using a standard beam balance (SECA) with the child putting on light clothing and no shoes. Older children's weight was measured while standing on a weighing scale (SECA). Weight was measured to the nearest 0.1 grams and calibration of weighing scale to zero was performed each day of recruitment.

Length/height

Length of participants were measured with length board, parents/guardians assisted in removing shoes and gently laying the child in supine position on the board, with their heads placed at 90⁰ to the fixed head piece. Investigator straightened the legs of the child at the knees and ensured that feet were at right angle to the sliding foot piece which was brought into contact to the child's heels. Length was measured to all children below 2 years or below 85 centimetres.

Height of participants was measured with the child standing at right angle in front of height board and sliding head piece was brought into contact with the head and height measured. Height/length was recorded to the nearest 0.1centimeter. All children aged above 2 years and above 85 centimetres had their height assessed while standing.

Mid Upper Arm Circumference (MUAC)

MUAC is used as an alternative measure of thinness to "weight for height". The mother were asked to remove clothes that covered child's left arm, the midpoint of the child's arm was calculated by first locating the tip of the child's shoulder with the investigator's finger tip. The child's elbow was bent to make a right angle, the tape was placed at zero, which is indicated by two arrows, on the tip of the shoulder, and the tape was pulled straight down past the tip of the elbow, number at the tip of the elbow was read to the nearest centimetre, and divided into two to estimate the midpoint which was marked on the arm by a pen.

The child's arm was straightened and the tape wrapped around the arm at the midpoint, numbers on the tape were right side up and the tape flat around the skin. The tape was not too tight or too loose, with the tape in the right position and tension, measurements on the tape were read aloud to the nearest 0.1 cm and the research assistant recorded the measurement.

3.9.5 Data management

Data handling and quality control

The researcher monitored the filling of questionnaires to ensure quality data collection, also the researcher was required to clarify any queries that aroused during data collection to the research assistant to ensure reliability in the data collection exercise.

All these were expected to minimize any chances of collecting poor data that will not correctly answer the research questions.

Structural quality assessment checklist was also used to assess the structural quality of the studied health facilities, the researcher and research assistant used the checklist to assess the availability of different structural variables which were necessary for the facility to provide quality health care in the management of under-nutrition in children under five years old. All twenty facilities sampled were assessed by using this checklist and results were analysed.

Data entry and analysis

Duly completed questionnaires were coded before entering into the computer record file where micro-soft excel was used to clean data through consistence checks. Anthropometric data were converted to nutrition status values using Epi-Info ENA Ver. 3.5.1, 2008 (CDC, Atlanta, Georgia, USA) software, using WHO reference values. All data were analyzed using SPSS version 17(SPSS Inc., Chicago, Illinois, USA). Frequency distribution and two-way tables were used to summarize the data. Chi-square and Fisher's exact tests were

used to determine the association between independent and dependent variables with categorical variables. Paired samples t-test was used to compare measurements with mean values. In all the analyses, P value < 0.05 was considered significant.

Nutritional status

Weight for height was used to interpret nutritional status; Z-score corresponding to the weight and height of each participant was computed by ENA for SMART software using the WHO growth standard, 2006 anthropometric assessment charts and then scores were interpreted as:-

- Z-scores between Mean and -1SD: Normal nutritional status
- Z-scores between -1SD and -2SD: mild acute wasting
- Z-scores between -2SD and -3SD: moderate acute wasting
- Z-scores below -3SD: severe acute wasting

3.9.6 Ethical consideration

Ethical clearance was obtained from MUHAS ethical committee. Permission to conduct the study in health facilities was sought from the District Medical Officer's office in the respective district hospital, health centres and dispensaries. Written informed consent was sought from all parents/care takers and health care workers before their inclusion into the study, all respondents were clearly informed of the study objectives and that their participation is voluntary, respondents were told that all the information provided will be confidential, participants names will not be used, instead numbers will be used.

In the course of taking anthropometric measurements, children who could be identified clinically as malnourished, their parents/care takers were given nutrition counselling on proper feeding of their children, how to prepare nutritious diet and prevention of communicable and food born diseases

3.9.7 Study Limitations

Children who could not be identified by clinical assessment missed the opportunity for their parents or care takers to receive nutrition counselling or any other kind of management because nutrition status of children whose anthropometric measurements were taken was obtained during data analysis by using Epi-Info ENA Ver. 3.5.1, 2008 (CDC, Atlanta, Georgia, USA) software, using WHO reference values.

This study is liable to recall bias by caregivers because they could not state clearly the age of some children 6-59 months . Stunting and underweight status depend on age of the child. Therefore, due to this limitation stunting and underweight results should be interpreted cautiously because such statuses require accurate ages to within two weeks (CDC/WFP: A manual: Measuring and Interpreting Mortality and Malnutrition, 2005). To minimize the effect of this limitation, the researchers used event calendars to ascertain age. Moreover, age of children under five children was ascertained using the history from the mother or guardian

Department	RCH	7	1.8	24	6.3	123	32.0	154	40.1
	OPD	7	1.8	14	3.6	80	20.8	101	26.3
	IPD	7	1.8	0	0	0	0	7	1.8
	CTC	10	2.6	21	5.5	91	23.7	122	31.8

Table 2: Demographic characteristics of children under five years

Variable	Children under five years	Hospital N=31		Health Centre N=59		Dispensary N=294		Total N=384	
		No	%	No	%	No	%	No	%
Sex:	Female	18	58	33	56.8	153	52	204	53.1
	Male	13	7.2	26	14.4	141	78.3	180	46.8

Table 3: Distribution of Age and Sex of children under five years

Age range	Boys		Girls		Total		Ratio Boy:girl
	no.	%	no.	%	no.	%	
6-17 months	79	50.6	77	49.4	156	40.6	1.0
18-29 months	43	47.8	47	52.2	90	23.4	0.9
30-41 months	29	40.3	43	59.7	72	18.8	0.7
42-53 months	23	44.2	29	55.8	52	13.5	0.8
54-59 months	6	42.9	8	57.1	14	3.6	0.8
Total	180	46.9	204	53.1	384	100.0	0.9

4.2 Quality of care

In this study the variables that constitutes to quality of care studied were availability of anthropometric equipments, assessment tools, trained staff, medical supplies, guidelines, accurate measurements, diagnosis, accurate treatment and adherence to treatment guideline. These variables have been categorized into structure and process quality as described below.

4.2.1 Structural quality

A total number of twenty (20) health facilities were recruited in the study, the hospital and health centres were well equipped with the necessary equipments for taking anthropometric equipments, baby weighing scales and Salter hanging scales were available in all facilities, MUAC tapes and length boards were only available in 30% of the facilities studied.

Tools for assessing nutrition status available were WHO WHZ growth charts, and Road To Health (RCH1) growth cards, 65% of the facilities used Road to Health Charts for assessing nutrition status of under fives and only 30% (6) of the studied facilities used both WHO WHZ score charts and RCH1 cards for assessing nutrition status of under fives.

Among the staff recruited 98.2% were coming from Outpatient department attending patients who came to the facility and return home, and only 1.8% were coming from inpatient department who were attending patients who were admitted specifically in the pediatric ward. Majority of these staff were nurses 62% followed by clinicians 24.2% and only 1.3 % were nutritionist. From the total number of staff, only 28.9% were trained in the management of malnutrition and in relation to this there were about 58.3% of staff who had formal in-service training of infant feeding counselling.

Management of under-nutrition was done in form of outpatient management Program (OTP) except for one facility (District hospital) which had paediatric ward which offered

inpatient management of under-nutrition, with the available therapeutic food being RUTF which was found only in 20% (4) of health facility observed.

Guidelines/treatment protocols for management of malnutrition were available in the hospital and health centres at 100%. However, only 47% of dispensaries involved in the study had guidelines of treatment protocols for management of malnutrition guidelines for management of SAM inpatient were practically unavailable in all facilities.(Table 3)

Table 4: Number of Health institutions with available structure facilities for anthropometric measurements, assessment and management of under-nutrition

Variable		Hospital N= 1		Health center N= 2		Dispensary N=17		Total N=20	
		No.	%	No.	%	No.	%	No	%
		Setting	Outpatient department	24	77.4	59	100	294	75.8
Inpatient department	7		100	0	0	0	0	7	1.8
Cadre	Nurses	20	64.5	34	57.6	184	62.6	238	62
	Nurse assistant	1	3.2	9	15.2	38	19.7	48	12.5
	Clinicians	8	25.8	15	25.4	70	23.8	93	24.2
	Nutritionist	2	6.4	1	1.7	2	0.7	5	1.3
Available anthropometric equipment	Baby scale	1	100	2	100	17	100	20	100
	Salter hanging scale	1	100	2	100	17	100	20	100
	MUAC tapes	1	10	2	100	3	17.6	6	30

			0						
	Length/height board	1	10 0	2	100	3	17.6	6	30
Available Assessment tools	WHO WHZ Score	0	0	0	0	1	5.9	1	5
	RCH 1	0	0	0	0	13	76.5	13	65
	Both	1	10 0	2	100	3	17.6	6	30
Available Therapeutic Food	RUTF	1	10 0	0	0	3	17.6	4	20
Staff trained in the management of malnutrition		23	6	20	5.2	68	17.7	111	28.9
Staff trained in infant feeding counseling		17	4.9	28	7.3	179	46.6	224	52.3
Availability of guideline/treatment protocols	NACS treatment protocol	1	10 0	2	100	1	5.9	4	20
	SAM guideline	0	0	0	0	0	0	0	0
	Infant feeding counseling guideline	1	10 0	2	100	8	47	11	55

4.2.2 Provision of Nutrition services

The process of providing nutrition services by the healthcare workers was examined and about 75.3% of health care workers provided nutrition services. Out of these 36.2% provided Nutrition Assessment Counselling and Support, whereas 39.1% provided growth monitoring and infant feeding counselling services Anthropometric measurements were

taken in all facilities, weight was taken on every visit by 72% of health care workers interviewed but length/height and MUAC was only measured by 33.5% and 45.1% respectively on every visit.

Treatment of children with under-nutrition was observed and about 33.8% of health care workers treated children with SAM without medical complications with RUTF, 15.1% gave RUTF to children with SAM with medical complications and about 30.4% and 51.5% did not provide any medication for children with Severe Acute Malnutrition without medical complications and SAM with medical complications respectively. (Table 5)

Health worker opinion on addition anthropometric parameters in the treatment guideline

A higher proportion of health care workers 52.3% (201) disagreed the addition of length measurements and 39.6% (152) disagreed the addition of MUAC measurements components in the assessment of nutrition status in all facility types, leaving a small proportion of health care workers agreeing the addition of both MUAC and height measurements in the new guideline 21% and 24.5 respectively, which showed no significant difference between health facilities.(Table 5)

Nutrition status of children under five years

Nutrition status of children whose anthropometric measurements taken by the researchers and health care workers were obtained and compared, the prevalence of wasting by the researchers was 9.1% (35) and 5.8% (18) assessed by the HCW $P= 0.038$. The prevalence of underweight did not show any significant difference between that assessed by the researchers and HCW 9.9% (38) , and 9.6% (37) respectively with mean difference of 0.064 and P value 0.066. Prevalence for stunting was 15.6% (59), assessed by the researchers and 14% (42), assessed by the HCW, this showed statistical difference with mean difference os 0.327 and P value 0.001.

Over all findings shows a significant difference in the number of children assessed at hospital level, health centres and dispensary levels, more children who were malnourished were form the lower health facility levels that is, dispensaries.(Table 6)

Table 5: Type of nutrition services provided, anthropometric measurement taken and management provided to children with under-nutrition

Variable	Category	Hospital		Health Centers		Dispensaries		Total	
		N=31		N=59		N=294		N=384	
		N	%	N	%	N	%	N	%
Type of nutrition services	Nutrition Assessment Counseling and Support	10	32.2	24	40.6	105	35.7	139	36.2
	Growth Monitoring and Infant feeding	7	22.5	23	39	120	40.8	150	39.1

	Inpatient management of SAM	7	22.5	0	0	0	0	7	1.8
	No intervention	7	22.5	12	20.3	69	23.4	88	22.9
Anthropometric measurements taken on every visit	Weight taken on every visit	17	4.4	45	11.7	216	56.3	278	72.4
	Length/height taken on every visit	16	4.2	38	9.9	75	19.5	129	33.6
	MUAC taken on every visit	15	3.9	36	9.4	122	31.8	173	45
Medication of SAM outpatient	RUTF	22	70.9	42	71.1	66	22.4	130	33.8
	Others	0	0	13	22	132	44.8	145	37.7
	No medication	9	29	4	6.7	96	32.6	109	28.4
Medication for SAM inpatient	F75/F100	0	0	0	0	0	0	0	0
	RUTF	16	51.6	17	28.8	25	8.5	58	15.1
	Others	1	3.2	8	13.5	31	10.5	40	10.4
	No medication	14	45.2	31	52.5	153	52	198	51.5
Medication for MAM	Dietary counseling	28	90.3	36	61	173	58.8	237	61.8
	RUTF	1	3.2	0	0	0	0	1	0.2
	Others	0	0	10	16.9	50	17	60	15.6
	No medication	2	6.4	13	22	71	24.1	86	22.4

Table 6: Adoption of length/height and MUAC measurements in routine anthropometric measurement by health care workers

Variable	Facility Type	Health Care Workers			
		Agree		Disagree	
		No.	%	No.	%
Length/height	Hospital N= 31	8	25.8	14	45.2
	Health Centre N=59	12	20.3	37	62.7
	Dispensary N=294	61	20.7	150	51
Mid Upper Arm Circumference	Hospital N=31	7	22.5	15	48.3
	Health centre N= 59	25	42.4	9	15.2
	Dispensaries N= 294	62	21.1	128	43.5

Figure 2: Assessment of Nutrition status by health care workers

Main survey results for WHZ:

Prevalence of wasting

(<-2 z-score and/or oedema)

All (308): (18) 5.8% (1.8- 9.9 C.I.)

Boys (149): (15) 10.1% (5.1-15.0 C.I.)

Girls (159): (3) 1.9% (-2.1- 5.9 C.I.)

Main survey results for WAZ:

Prevalence of underweight(<-2 z-score)

All (384): (37) 9.6% (7.7-11.6 C.I.)

Boys (180): (22) 12.2% (7.4-17.1 C.I.)

Girls (204): (15) 7.4% (4.2-10.6 C.I.)

Main survey results for HAZ:

Prevalence of stunting (<-2 z-score)

All (299): (42) 14.0% (11.1-17.0 C.I.)

Boys (144): (22) 15.3% (6.0-24.6 C.I.)

Girls (155): (20) 12.9% (5.7-20.1 C.I.)

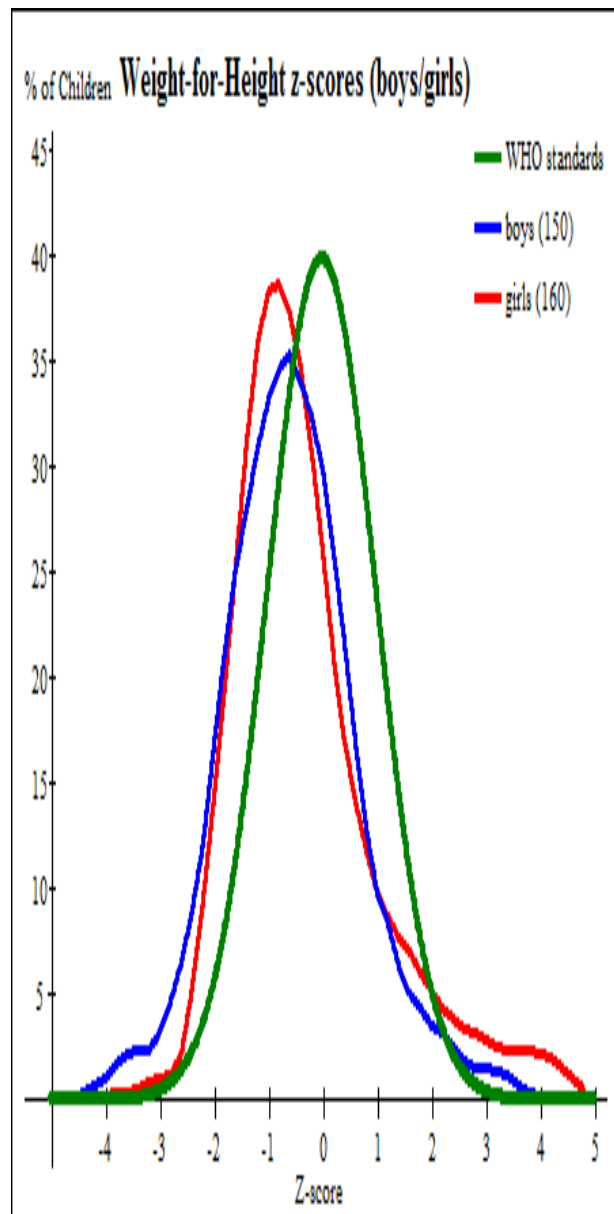


Figure 3: Assessment of Nutrition status by Researchers

Main survey results for WHZ:

Prevalence of wasting

(<-2 z-score and/or oedema)

All (384): (35) 9.1% (5.9-12.3 C.I.)

Boys (180): (19) 10.6% (2.5-18.7 C.I.)

Girls (204): (16) 7.8% (6.1-9.6 C.I.)

Prevalence of underweight

(<-2 z-score)

All (383): (38) 9.9% (7.5-12.4 C.I.)

Boys (179): (22) 12.3% (9.0-15.6 C.I.)

Girls (204): (16) 7.8% (5.2-10.5 C.I.)

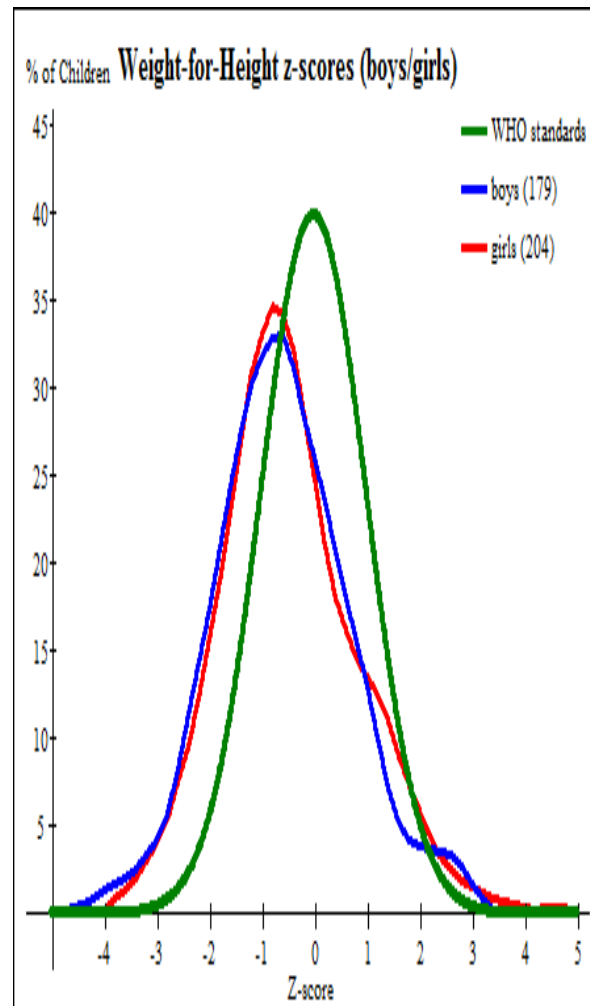
Prevalence of stunting

(<-2 z-score)

All (377): (59) 15.6% (11.9-19.4 C.I.)

Boys (178): (32) 18.0% (13.2-22.8 C.I.)

Girls (199): (27) 13.6% (10.7-16.4 C.I.)



CHAPTER FIVE

5.0 DISCUSSION

The aim of this study was to assess the structure and process quality of care and its determinants in the management of under-nutrition among children under five

5.1 structure quality and its determinants

The structure of the health facility, which includes the availability of equipments, staff and other supplies enables the identification of under-nutrition and risks to under-nutrition. The identification of nutrition status requires the availability of nutrition status screening equipments and assessment tools in the health facilities.

The findings from this study showed a significant shortage of equipments at dispensary level, specifically length/height boards and MUAC tapes which constitutes the structural component of the facility in the identification of under nutrition. This has an implication in the routine measurement of length or height of children and hence limit the assessment of wasting to children under five years.

A study conducted by George. N, revealed similar situation in Cameroon where the equipment for taking body weights (scales) are more frequently used in health centres than measuring boards for heights. Even when the length/height measuring boards exist there are some difficulties inherent in their qualities; thus the height measurement is not always available or accurate (George N. 2013). Interpretation of anthropometric measurements into a nutrition status of a child depends mainly on the availability and adequacy of nutrition assessment tools. Findings from this study revealed that the main assessment tool was Road to health card which records weight measurements plotted against child's age, WHO WHZ growth charts were not adequate hindering the assessment of wasting.

Similar findings were reported in the baseline survey on quality of Paediatric care in Tanzania done by the Ministry of Health and Social Welfare 2010 which reported that 18.8% (13) hospitals could not improve the nutrition status of children and interpretation of weight and length/height measurements could not be done due to lack of clinical guidelines and interpretation charts.

RUTF is the therapeutic food of choice in the management of SAM without medical complication (WHO, 2007), in this study findings showed that a low proportion of health facilities had RUTF in stock. This poses a challenge in the management of under-nutrition as per management guideline. Out of 20 health facilities observed only four (20%) had RUTF as therapeutic food for management of under-nutrition, this implies that some children who were found to have SAM were not given therapeutic feeding as per treatment protocol.

However at district level, the district hospital was lacking therapeutic feeding for inpatient management of under-nutrition which is usually an immediate treatment of Severe Acute Malnutrition with medical complication in the stabilization and rehabilitation phase which are very crucial phases of saving the life of a child with severe under-nutrition.

5.2 Accuracy of Anthropometric measurements taken by health care workers

Anthropometry variables such as weight and height measurements are indicators of nutrition status, but these measurements are said to be prone to largest standard of error, such as reliability and validity issues which can influence both the measurements and interpretation of nutrition status. (Ulijaszek SJ, Kerr DA, 1999). Findings from this study have demonstrated unreliability of weight and length/height measurements taken by health care workers compared to those taken by the researchers who were taken as gold standard. The differences in measurements resulted in discrepancy in the prevalence of wasting and stunting of children studied.

Measurement reliability is a good indicator of data quality, and can reduce errors in measurements, the primary goals for screening of nutrition status are to monitor weight

(change), to evaluate nutritional treatment the patient is undergoing and to enable early recognition of changes in the nutrition status and advice accordingly.

The study done by WHO multicentre growth reference study group also observed the differences in the measurements done by two different observers where the bias estimates showed that they tended to underestimate Arm Circumference, Length and Height. (WHO, 2006) The discrepancies observed in the prevalence of under-nutrition between the observer and health care worker has revealed that in some instances children under fives are not correctly measured, and the wrong measurements results into wrong diagnosis and mismanagement which may end up with adverse outcome such as chronicity and increased morbidity and mortalities.

The Similar kind of observation was made in the study done in Ghana whereby the researcher found a prevalence of wasting to be 27% and that found by the health care providers was 5.9% only (S. Antwi, 2008). This compromised the quality of care in the management of under-nutrition and raises a need for proper training on the screening of under-nutrition at all facility levels, calibration of anthropometric equipments on daily basis and adherence to management guideline on correct steps in performing anthropometric measurements.

5.3 Management of under nutrition in relation to the WHO guideline

The widespread availability of nutrition services was proportionately distributed in all facility types, specifically growth monitoring and infant feeding. All primary health care settings in Tanzania have well established Reproductive and Child Health services with main activities being growth monitoring and infant feeding counselling. However the Ministry of Health of Tanzania indicate one of the role of Reproductive and Child Health Clinics among others to be nutritional care for pregnant woman and children under five years/ (MoH, 2008).

Tanzania have significant levels of under-nutrition indicators for under five children specifically stunting, yet the findings of this study in the process of growth monitoring was mainly on the weight measurements, this could have been attributed by the availability of weighing machines of both types that is baby scales and Salter hanging scales at all facility levels. Chronic under-nutrition (stunting) can only be identified where both height/length measurement and weight of the child is known, and thus appropriate management can be executed to correct the nutrition status of the child.

From the intervention point, these findings do not contribute largely to the efficient process quality in the management of under-nutrition. Assessment of a single index of malnutrition delays the diagnosis of other important nutrition deficiencies such as wasting and stunting leading to severe or chronic forms. It is however known that, weight is the best index in measuring growth in young children whereas height is the best index in measuring growth in older children, therefore the use of all measurements in the diagnosis of under-nutrition is of paramount importance.

.Severe Acute Malnutrition have been associated in causing preventable deaths each year (Collins et al. 2006a), which are due to various factors including poor quality of care in the management of acute cases of malnutrition. Findings from the study shows that children were not treated according to the treatment guideline. Children who were found to have SAM, both with medical complications and without medical complications, only 33.8% of children who had SAM without medical complications were given RUTF and 15.1% of children who were found to have SAM with medical complications were also given RUTF, this is different from other findings in Southern Bangladesh where 58.8% of community health workers treated SAM without medical complications according to the algorithm(Chloe Puett et al, 2012).

According to these findings management of under-nutrition remains to be a challenge, hence inadequate process quality in the management of under-nutrition is observed. The

treatment guideline clearly state the care plans for children with severe malnutrition with/without medical complications, wrong treatment of children with severe under-nutrition both with medical complications and without medical complications endangers the lives of these children and may eventually lead to death or severity of the disease, However this management pattern did not go in line with the management protocol (TFNC, 2011).

Nzioko, et al (2009) found similar situation in Kenyatta National Hospital where about 44.6% of admitted children with severe under-nutrition were being fed on porridge, Cow's milk and routine ward diet.. Ashworth et al (2004) also found similar case in two South African hospitals where children with severe malnutrition were given small portions of general adult ward die.

Poor management of children with severe malnutrition was also reported by Jackson (Jackson et al, 2006), in the study conducted in two South African hospitals where about 50% of deaths were attributed by doctors error and about 28% deaths were attributed by nurse's error in the management of severe under-nutrition. Under-nutrition like any other disorder in children should be treated in accordance to the available guidelines or treatment protocol, like all health disorders the treatment given should aim at restoring a normal health physically, mentally and socially. A retrospective review done in two South African hospitals Mary Theresa and Sipetu Hospitals also confirm these findings whereby it was found that 98 admissions were diagnosed with severe malnutrition with case fatality rate of 50%, however none of the recommended ten steps of treatment of severe malnutrition were practiced by health care workers at the hospital. (Thondi P, et al, 2004)

The findings further showed a negative attitude of health care workers towards accepting the addition of MUAC and length/height component in the assessment of nutrition status, this is reflected in the facilities where length/height boards and MUAC tapes were available but measurements were not adequately taken

CHAPTER SIX

6.0 CONCLUSION AND RECOMMENDATION

6.1 CONCLUSION

The study found that there was a remarkable inadequacy of equipments for taking anthropometric measurements, tools for assessment of nutrition status, lack of trained staff in the management of under-nutrition and lack of essential supplies such as therapeutic food for management of under-nutrition and treatment guidelines, this compromised the structure quality of the facility which affects the provision of quality care in the management of under-nutrition among children under five.

Inaccuracy in taking anthropometric measurements, assessment and management of under-nutrition was observed in the facilities, this is a huge setback in the whole process of screening, assessment and management of under nutrition. All these together conclusively led to an observation of a poor quality of care given to children under five years with under-nutrition in the facility studied.

6.2 RECOMMENDATIONS

General findings obtained from the study raises a need for the authorities to improve the structure of the health facilities. Such improvements should focus on supply of equipments for taking anthropometric measurements, tools for assessing all nutrition indices, train staff in the management of under-nutrition as recommended by the WHO, improve the availability of guidelines and essential medications for management of under-nutrition in all facility levels.

Many of malnourished children are assessed at first level facilities, that is, dispensary level, however at this level there was a remarkable inadequacy of equipments, trained staff and medications. This brings to our attention that the lower level of health facilities are equally important and should be well equipped.

It is also recommended to strengthen capacity building to staff working in existing Reproductive and Child Health clinics to enable them to do nutrition screening and assessment of children under five years at the same time monitor their growth pattern.

Ministry of Health and Social Welfare should consider the integration of Nutrition assessment, counselling and support in all health facilities and inpatient management of under-nutrition in all facilities with paediatric ward so as to improve the quality of care in the management of under-nutrition at all levels.

CHAPTER SEVEN

7.1 REFERENCES

- A A Jackson, A Ashworth, S Khanum. (2006) Improving child survival; Malnutrition task force and Pediatrician's responsibility. Arch Dis Child ;91:706–710. doi: 10.1136/adc.2006.095596
- Alderman, H, Hans H. Mariacristina R. 2006;. Reducing child malnutrition in Tanzania: Combined effects of income growth and program interventions; Journal Economics & Human Biology, Volume 4, Issue 1, Pages 1–23
- Allison, S.P. Malnutrition, disease and outcome. Nutrition 2000, 16, 590-593
- Ann Ashworth, Alan Jackson, Ricardo Uauy, (2007) Focusing on Malnutrition Management to Improve Child Survival in India, Indian Pediatrics .; 44: 413-416
- Ann Ashwoth (2001). Treatment of Severe Malnutrition, Journal of Pediatric Gastroenterology & Nutrition: - Volume 32 - Issue 5 - pp 516-518
- Ashworth A, Ferguson E. (2009) Dietary counseling in the management of moderate malnourishment in children. Food Nutr Bull; 30:S406–33.
- Barker LA, Gout BS, Crowe TC. (2011) Hospital malnutrition: prevalence, identification and impact on patients and the healthcare system. Int J Environ Res Public Health. : 10.3390 (PubMed).
- Black RE, Morris SS, Bryce J. (2011) Where and why are 10 million children dying every year? Lancet Volume; 361: Pp 2226–34.

- Bruce J. (1990) Fundamental elements of the quality of care: a simple framework. *Studies in Family Planning* 21, 61–91, *Bull World Health Organ* vol.83 n.3 Geneva Mar. 2005
- Camila Giugliani, Bruce B Duncan, Erno Harzheim, Serge Breysse, uc Jarrige, (2009) The impact of a short-term intervention using the WHO guidelines for the management of severe malnutrition at a rural facility in Angola, *Arch Dis Child* 2010 95: 198-202
- Charles Nzioki, Grace Irimu, Rachel Musoke and Mike English,(2009) Audit of care for children aged 6 to 59 months Admitted with severe malnutrition at Kenyatta National hospital, Kenya: *Int Health*. 2009 September; 1(1): 91–96. doi:10.1016/j
- C.N. M. Nyaruhucha, P.S. Mamiro, A.J. Kengere & N.B. Shayo,(2006) Nutritional status of unde five children in a pastoral community in Simanjiro District, Tanzania. *Tanzan Health Res Bull*. 2006 Jan;8(1): Pp32-6. (PubMed)
- Donabedian A. Ann Arbor, MI.(1980) *The Definition of Quality and Approaches to Its Assessment*.Vol 1. Explorations in Quality Assessment and Monitoring. : Health Administration Press; 1980
- Donabedian, A. (1966). "Evaluating the Quality of Medical Care." *Milbank Memorial Fund Quarterl* 44 (2): 166-206. Donabedian, A. (2003). *An introduction to quality assurance in health care*. (1st ed., Vol. 1). New York, NY: Oxford University Press
- Engle P.L.Bentley, M. And Pelto. G.(2000); The role of care in nutrition programs: current research and a research agenda; *Journal of NutritionSociety* (2000), 59, 25–35

- English M, Esamai F, Wasunna A, (2004) Assessment of inpatient paediatric care in first referral level hospitals in 13 districts in Kenya. *Lancet* Volume 363:1948–53.
- English M, Ntoburi S, Wagai J, Mbindyo P, Opiyo N, Ayieko P, Opondo C, Migiro S, Wamae A, Irimu G (2009) An intervention to improve aediatric and newborn care in Kenyan district hospitals: Understanding the context. *Implement Sci* Volume 4:42.
- FAO (2008). Soaring Food Prices: Facts, Perspectives, Impacts and Actions Required," background paper prepared for the High-Level Conference on World Food Security: The Challenges of Climate Change and Bioenergy, Rome, June 3-5. Available at www.fao.org/foodclimate/conference/en/. Accessed on Sept.10, 2010
- Food and Agriculture Organization (FAO),(2007) Human nutrition in the developing world: <http://www.fao.org/DOCREP/W0073e/w0073e03.htm> :
- Geert Tom Heikens (2007) , How Can We Improve the Care of Severely Malnourished Children in Africa?: *PLoS Medicine* www.plosmedicine.org 0222 Perspectives February 2007 Volume 4 |Issue 2 | e45
- Georges Nguéfack-Tsague1,&, Agatha Tanya Nguti Kien1, Charles Ntungwen Fokunang (2013) Using weight-for-age for predicting wasted children in Cameroon. *Pan African Medical Journal*. 2013; 14: 96. doi:10.11604/pamj.2013.14.96.1914
- Gilson L., Alilio M. & Heggenhougen K. (1994) Community satisfaction with primary health care: An evaluation undertaken in Morogoro Region of Tanzania. *Soc Sci Med*. 1994 Sep;39(6):767-80. (PubMed)

- Guerrero S., Myatt M. & Collins S. (2010) Determinants of coverage in community-based therapeutic care programs: towards a joint quantitative and qualitative analysis. *Disasters* 34, 571–585
- Harold Alderman, Hans Hoogeveen, Mariacristina Rossi, (2009) Preschool Nutrition and Subsequent Schooling Attainment: Longitudinal Evidence from Tanzania. *Economic Development and Cultural Change*, 2009, vol. 57, issue 2, pages 239-260
- Healy, M.J.R., Yang, M., Tanner, J.M., Zumrawi, F.Y., (1988). The use of short-term increments in length to monitor growth in infancy. In: Waterlow, J. (ed.), *Linear Growth Retardation in Less developed Countries*. Nestlé Nutrition Workshop Series, Vol. 14, Vevey/Raven Press, New York. Hoffer, L.J. Clinical Nutrition: Protein-energy malnutrition in the inpatient. *Can. Med. Assoc. J.* 2001, 165, 1345-1349.
- Holmes, S. (2007) The effects of under-nutrition in hospitalised patients. *Nurs. Stand.* Volume, 22, 35-38.
- Horton, S., H. Alderman and J Rivera D. (2008) Copenhagen Consensus Challenge Paper: Hunger and Malnutrition. In B. Lomborg (ed.), *Global Crises, Global Solutions*. Cambridge: Cambridge University Press, 2009. Pp. 305-333.
- .
- James Berkley, Isaiah Mwangi, Karen Griffiths, Ismail Ahmed, Sadik Mithwani, Mike English, Charles Newton, Kathryn Maitland, (2005) Assessment of Severe Malnutrition Among Hospitalized Children in Rural Kenya, Comparison of Weight for Height and Mid Upper Arm Circumference- *JAMA*, August 3, 2005—Vol 294, No. 5 591J
- Picot, D Hartwell, P Harris, D Mendes, AJ Clegg and A Takeda (2012)

The effectiveness of interventions to treat severe acute malnutrition in young children: a systematic review. Health Technol Assess. 2012;16(19):1-316.. (PubMed)

Jean-Piere Hanicht. (2008) Malnutrition kills directly, not indirectly.

The Lancet, [Volume 371, Issue 9626](#), Pages 1749 - 1750, 24 May 2008

Kavishe, F. P. (1993) *Nutrition Relevant Actions in Tanzania*. Tanzania Food and Nutrition Centre, 20th Anniversary 1973-1993. Monograph Series No. 1. UN-ACC/SCN Country Case Study. A case study for the XV Congress of the International Union of the Nutrition Sciences, September 26 to October 1, 1993, Adelaide. Pp. 180-230.

Kulwa KB, Kinabo JL, Modest B. (2006) Constraints on good child-care practices and nutritional status in urban Dar-es-Salaam, Tanzania. *Food Nutr Bull.* 2006 Sep;27(3):236-44. (PubMed) Kubrack, C.; Jensen, L. (2007). Malnutrition in acute care patients. *Int. J. Nurs. Stud.* Volume, 44, 1036-1054.

Lagrone L, Cole S, Schondelmeyer A, Maleta K, Manary MJ. (2010) . Locally produced ready-to-use supplementary food is an effective treatment of moderate acute malnutrition in an operational setting. *Ann Trop Paediatr.* Volume;30(2):103-8

Laws R.A, Tapsell L.C, Kelly J. (2000); Nutritional status and its relationship to quality life in a sample of chronic hemodialysis patients. *Journal of Renal Nutrition*,(2000), 10 page 139 0 147

Liu L, Johnson HL, Cousens S, Perjin J, Scott S, Lawn JE, Rudan, Campbel H,

Cibulskis R, Li M, Mathers C, Black RE; (2012) Global, regional, and national causes of child mortality: an updated systematic analysis for 2010 with time trends since 2000. Lancet. 2012 Jun 9;379(9832):2151-61. doi: 10.1016/S0140-6736(12)60560-1. Epub 2012 May 11. (PubMed)

Lohr KN, Schroeder SA. (1990) . A strategy for quality assurance in Medicare. *N*

Engl J Med. 1990 Mar 8;322(10):707–712. [PubMed]Magdalena Johansson, John L.Z. Nyirenda, AnnaKarin Johansson, and Birgitta

Lorefält, (2011) Perceptions of Malawian Nurses about Nursing Interventions for

Malnourished Children and Their Parents. *J Health Popul Nutr*. 2011 December; 29(6): 612–618.

Manary MJ, Ndkeha MJ, Ashorn P, Maleta K, Briend (2004) A. Home based therapy for severe malnutrition with ready-to-use food. *Arch Dis Child* Volume. 89: 557–61.

Mainz J, (2004). Quality indicators: essential for quality improvement: editorial.

International Journal for Quality in Health Care 2004; Volume 16, Supplement1: pp. i1–i2

Mary Abwola Olwedo¹, Edison Mworozzi¹, Hanifa Bachou, Christopher Garimoi

Orach: (2008)Factors associated with malnutrition among children in internallydisplaced person’s camps, northern Uganda: *African Health Sciences* Vol 8 No 4

Margaret S. Westaway , Paul Rheeder², Danie G. Van Zyl³ and John R. Seager

(2003) Interpersonal and organizational dimensions of patient satisfaction: the moderating effects of health status. *Int J Qual Health Care* (2003) 15(4): 337-344.

Martin marshall¹, Niek klazinga², Sheila Leatherman³, Charlie Hardy⁴, Eckhard

Bergmann⁵, Luis Pisco⁶, Soeren Mattke⁷ and Jan mainz (2006) OECD Health Care Quality Indicator Project. The expert panel on primary care prevention and health promotion. *International Journal for Quality in Health Care*;: pp. 21–25

Michael Lathan, (1997), Human Nutrition and Developing World, Food and

Agriculture Organization (FAO), (Food and Nutrition Series, V. 29, No. 2). Pp 508

Molla S. (1999). Measuring the Quality of Health Care: A Statement by The National Roundtable on Health Care Quality, Institute of Medicine. Washington, D.C: NATIONAL ACADEMY PRESS.

Naber, T.H. Schermer, T. deBree, A. Nusteling, K.Eggink, L Kruiemel, J.W.; Bakkeren,

J. van Heereveld, H. Katan, M.B. Prevalence of malnutrition in nonsurgical hospitalized patients and its association with disease complications. *Am. J.Clin. Nutr.* 1997, 66, 1232-1239

Nancy M. Dale,; Rebecca F. Graiss,; Andrea Minetti, ; Juhani Miettola, Noel C.

Barengo, (2009) Comparison of the New World Health Organization Growth Standards and the National Center for Health Statistics Growth Reference Regarding Mortality of Malnourished Children Treated in a 2006 Nutrition Program in Niger. - Arch Pediatr Adolesc Med. 2009;163(2):126-130

National Bureau of Statistics, Tanzania, ICF Macro Calverton, Maryland, USA, Tanzania Demographic and Health Survey 2004/05

National Bureau of Statistics, Tanzania, ICF Macro Calverton, Maryland, USA, Tanzania Demographic and Health Survey 2010, April 2011.

Olwedo MA, Mworozzi E, Bachou H, Orach CG (2008). Factors associated with malnutrition among children in internally displaced person's camps, northern Uganda. Afr. Health Sci. 8(4):244-252

Pelletier DL, Frongillo EA Jr, Schroeder DG, Habicht JP.(1995) The effects of malnutrition on child mortality in developing countries. Bull WHO 1995;73:443-8

Pelletier DL, Low JW, Johnson FC, Msukwa LA. Child anthropometry and mortality in Malawi: testing for effect modification by age and length of follow-up and confounding by socioeconomic factors. J Nutr. 1994;124:S2082-105.

Pirlich M, Schütz T, Norman K, Gastell S, Lübke HJ, Bischoff SC, Bolder U, Frieling T, Güldenzoph H, Hahn K, Jauch KW, Schindler K, Stein J, Volkert D, Weimann A, Werner H, Wolf C, Zürcher G, Bauer P, Lochs H. (2006) The German hospital malnutrition study. Clin Nutr. Volume; 25(4):563-72. Epub 2006 May 15.

Regional Administrative Officer (RMO), 2010. Dar es salaam Regional

Commissioner's office, strategic plan for 2010/11- 2012/13, RMO health report 2010

Rita Mangione-Smith and Elizabeth A. McGlynn, 1998, Assessing the Quality of Healthcare Provided to Children. *Health Services Research* 33:4 (October 1998, Part II) Pp 1059-1089

Robert E Black, Lindsay H Allen, Zulfiqar A Bhutta, Laura E Caulfield, Mercedes de Onis, Majid Ezzati, Colin Mathers: Maternal and child under nutrition: global and regional exposures and health consequences: *The Lancet* January 17, 2008

Robert E Black, Simon Cousens, Hope L Johnson, Joy E Lawn, Igor Rudan, Diego G Bassani, Prabhat Jha, Harry Campbell, Christa Fischer Walker, Richard Cibulskis, Thomas Eisele, Li Liu, Colin Mathers, (2008.) Global, Regional, and National causes of child mortality in 2008: a systematic analysis, *Lancet* May 12, 2010

Rowe A, de Savigny D, Lanata C, Victora C: (2005) How can we achieve and maintain high-quality performance of health workers in low-resource settings? *Lancet* 2005, 366:1026-1035

S Antwi, (2008). Malnutrition: Missed Opportunities for Diagnosis: *Ghana Med J.* Volume; 42(3): 101–104.

Scrimshaw, N.S.; DanGiovanni, J.P. (1997) Synergism of Nutrition, Infection and Immunity, an overview. *J. Nutr.* Pp 133, S316-S321

Stephen Allen, IkeOluwa Lagunju:(2007) The management of severe malnutrition: taking a broader view, *Arch Dis Child.* 2007 March; 92(3): 191–192.

Steve Collins, Nicky Dent, Paul Binns, Paluku Bahwere, Kate Sadler, Alistair

Hallam,(2006) Management of severe acute malnutrition in children:
Lancet 2006; 368: 1992–2000

Tanzania Food and Nutrition Centre (TFNC) : (2011) Nutrition Assessment,

Counselling and Support (NACS): Reference Manual for Facility-Based
Service Providers,. Dar es salaam Tanzania (TFNC). 2011: pp 34-37

Tanzania Food and Nutrition Centre: (2006) Strategic plan 2005/2006 – 2009/2010,
TFNC Report No. 2006, June 2006

Thandi Puoane David Sanders¹, Ann Ashworth Mickey Chopra Susan Strasser and
David Mccoy (2004):Improving the hospital management of malnourished
children by participatoryresearch *International Journal for Quality in
Health Care* 2004; Volume 16, Number 1: pp. 31–40

The United Republic of Tanzania, Ministry of Health and Social Welfare, (2011)
National Nutrition Strategy, July 2011/12- June 2015/16 Pp 01.

Ulijaszek SJ, Kerr DA.(1999) Anthropometrics measurement error and the
assessment of nutritional status. *Br J Nutr* 1999;82:165-77.

UNICEF (2005) Global database on child malnutrition. <http://>

www.childinfo.org/areas/malnutrition/wasting.php (accessed Dec 20,
2005).UNICEF, (2006) Nutrition survival and development, a report card
on nutrition, number 4, May2006.

http://www.unicef.org/progressforchildren/2006n4/index_survivalanddevelopment.html

UNICEF (2007) Global database on child malnutrition.

<http://www.childinfo.org/areas/malnutrition/wasting.php> (accessed 15 Jan 2007).

United Republic of Tanzania, Ministry of Health and Social Welfare (MoHSW) (2010)

Baseline survey on quality of paediatric care in Tanzania November 2010, Pp 32

Victora C.G, (2003) Applying an equity lens to child health and mortality: more of the same is not enough; the Lancet, vol. 362, issue 9379, pages 233-241

World Health Organization (WHO, 1999), Management of Severe Malnutrition. A Manual for Physician and Other Senior Health Workers. Geneva 1999, Pp 03

World Health Organization (WHO 2012). Community-based management of severe acute malnutrition., A Joint Statement by the World Health Organization, the WorldFood Programme, the United Nations System Standing Committee on Nutrition and the United Nations Children's Fund-2007.

http://www.who.int/nutrition/topics/statement_commbased_malnutrition/en/

WHO, UNICEF, and SCN, (2006) Informal consultation on community-based management of severe malnutrition in children. Food and Nutrition Bulletin (sup). 27;3. September 2006. Available at: http://www.unu.edu/unupress/food/FNB_v27n3_suppl.pdf

WHO, (2008) Impact of an integrated nutrition and health program on neonatal mortality in rural northern India; Bull World Health Organ vol.86 n.10 Geneva Oct. 2008; ISSN 0042-9686

WHO (2006) Multicentre Growth Reference Study Group, Reliability of anthropometric measurements in the WHO Multicentre Growth Reference Study; Acta Pædiatrica, 2006; Suppl 450: 38_ 46

Youth Action Volunteer (YAV), (2008). Council Comprehensive Health Plans Review for Kinondoni, Ilala and Temeke Municipal Councils and Kibaha District Council Final Report, 18th June 2009 Pp 38-47

7.0 APPENDICES

7.1 Appendix I: Informed Consent Form, English Version

MUHIMBILI UNIVERSITY OF HEALTH AND ALLIED SCIENCES

DIRECTORATE OF RESEARCH AND PUBLICATIONS, MUHAS

INFORMED CONSENT FORM

ID-NO

--	--	--	--	--	--	--	--	--	--

Introduction

Greetings! My name is **Ruth Mkopi**, I am a Master of Public Health (MPH) student at Muhimbili University of Health and allied Sciences. I am conducting a research on; Quality of Care in the Underfive children management of malnutrition in Dar es salaam Region Purpose of the study

This study aim at determining the quality of care in the management of children under five years in health facilities in Dar es salaam region. The information collected will be on knowledge, attitude and practices in the children underfives management of malnutrition in health facilities by health care workers and reliability exercise on the anthropometric

measurements of children attending the health facility to determine if children are measured according to the standards and their nutrition status determined accordingly. You are being asked to participate in this study because you have particular knowledge and experiences that may be important to the study.

What Participation Involves

If you agree to participate in this study the following will occur:

1. You will sit with a trained interviewer and answer questions about knowledge, attitude and practices in the management of children malnutrition, the interviewer will be recording your responses in the questionnaire.
2. No identifying information will be collected from you during this interview, except your age, level of education, marital status, religion and your current occupation.
3. You will be interviewed only once for approximately 30 minutes in a private setting.

Confidentiality

I assure you that all the information collected from you will be kept confidential. Only people working in this research study will have access to the information. We will be compiling a report, which will contain responses from various health care providers without any reference to individuals. We will not put your name or other identifying information on the records of the information you provide.

Risks

You will be asked questions about knowledge, attitude and practices in the quality of care in the under five children management of malnutrition. Some questions could potentially make you feel uncomfortable. You may refuse to answer any particular question and may stop the interview at anytime.

Rights to Withdraw and Alternatives

Taking part in this study is completely voluntary. If you choose not to participate in the study or if you decide to stop participating in the study you will not get any harm. You can stop participating in this study at any time, even if you have already given your consent. Refusal to participate or withdrawal from the study will not affect the quality of service at the health facility.

Benefits

There will be no significant direct benefit to you personally, however the information you provide will help to increase our understanding on knowledge, attitude and practices in the quality of care in the underfives children management of malnutrition in health facilities and give room to effective planning and implementation of interventions of managing malnutrition to children under five years of age in our health facilities to ensure better outcome.

In Case of Injury

We do not anticipate that any harm will occur to you or your family as a result of participation in this study.

Who to contact

If you have questions about this study, you should contact the Principal Investigator, RUTH MKOPI, Muhimbili University of Health and Allied Sciences (MUHAS), P.O. Box 65001, Dar es Salaam (Tel. no. +255 716 179 910 or +255 789 223 392). If you have questions about your rights as a participant, you may call Prof. Mohammed Aboud, Chairman (Research and Publications Committee, MUHAS. P.O.Box 65001 Dar es Salaam. Tel: 2150302-6 and Dr. DP URASSA who is the supervisor of this study (Tel. +715 279 553)

Certification of consent.

I have been invited to take part in the study on Quality of care in the underfive children management of malnutrition in Dar es salaam region.

I have read the foregoing information or it has been read to me and have understood. My questions have been answered to my satisfaction. I agree to participate in this study.

Signature

Do you agree?

Participant Agrees

Participant disagree

Signature (or thumbprint) of participant

Signature of witness (if participant cannot read)

Signature of research assistant

Date consent signed

7.2 Appendix II: Ridhaa ya kushiriki kwenye utafiti

Afya ya Jamii na Sayansi ya Jamii

Chuo Kikuu cha Afya na Sayansi Shirikishi Muhimbili

Namba ya utambulisho:

--	--	--

Ridhaa ya kushiriki kwenye utafiti.

Salaam! Mimi naitwa Ruth Mkopi Natoka Chuo Kikuu cha Afya na Sayansi Shirikishi cha

Muhimbili na ninafanya utafiti kuchunguza ubora wa huduma wanazopatiwa watoto chini ya

umri wa miaka mitano kwenye matibabu ya utapiamlo.-

Lengo la utafiti.

Utafiti huu una lengo la kukusanya taarifa juu ya uelewa, matazamo katika na hatua zinazotolewa katika kutoa huduma ya matibabu ya utapiamlo wa watoto chini ya miaka mitano Mkoani Dar es Salaam. Unaombwa kushiriki katika utafiti huu kwa vile unauielewa na uzoefu ambao unaweza kuwa muhimu kwenye utafiti.

Nini kinahitajika ili kushiriki

Kama unakubali kushiriki katika utafiti huu yafuatayo yatafanyika:

1. Utakaa na afisa anayekuhaji na kujibu maswali kuhusu uelewa, mtazamo na hatua zinazotolewa katika kutoa huduma ya matibabu ya utapiamlo wa watoto chini ya miaka

mitano mkoani Dar es salaam. Afisa anayekuhoji atakuwa anaweka taarifa ya kile unachosema kwenye dodoso.

2. Hapatachukuliwa taarifa ya kukutambulisha wakati wa mahojiano haya isipokuwa umri wako, kiwango chako cha elimu, na kazi yako ya sasa.

3. Utahojiwa mara moja tu kwa takribani dakika thelathini (30).

Ninakuhakikishia kwamba taarifa zote zitakazopatikana kutoka kwako zitakuwa siri. Ni watafiti pekee wanaofanya katika utafiti huu ndio watakaoweza kuzifahamu taarifa hizo. Tutafanya majumuisho ya ripoti yetu kutokana na majibu yenu pasipo kuweka taarifa za mtu mmoja mmoja. Hatutaweka jina lako wala taarifa yoyote inayokutambulisha wewe katika rekodi ya taarifa ulizotoa.

Hatari

Utaulizwa maswali kuhusu uelewa, mtazamo na hatua zinazotolewa katika kutoa huduma ya matibabu ya utapiamlo wa watoto chini ya miaka mitano katika kituo hiki cha afya. Inawezekana baadhi ya maswali hutapendezwa nayo. Unaweza kukataa kujibu swali lolote na kukatisha ushiriki wako katika mahojiano haya muda wowote.

Haki ya kujitua au vinginevyo

Ni uamuzi wako kushiriki katika utafiti huu. Kama umechagua kutoshiriki katika utafiti huu hapatakuwa na hatua yeyote itakayochukuliwa dhidi yako. Unaweza kusitisha ushiriki wako katika utafiti huu muda wowote hata kama ulishatoa ridhaa ya kushiriki. Kukataa kushiriki au kujitua katika utafiti hakutaathiri ubora wa huduma inayotolewa kwa mifugo yako.

Faida

Hapatakuwa na faida ya moja kwa moja kwako, hata hivyo taarifa utakazotupa zitasaidia kuongeza uelewa wetu juu utoaji wa huduma ya matibabu ya watoto chini ya miaka mitano ya utapiamlo na kusaidia kuboresha mipango na utekelezaji wa huduma za matibabu ya utapiamlo katika vituo vya afya.

Endapo utapata madhara au la.

Hatutarajii kama patatokea madhara yoyote kwako au kwa familia yako ambayo yatasababishwa na matokeo ya ushiriki wako katika utafiti huu.

Nani wa kuwasiliana naye

Kama utakuwa na maswali juu ya utafiti huu, utaombwa kuwasiliana na mratibu wa utafiti au mtafiti mkuu, RUTH MKOPI, Chuo Kikuu Cha Afya ya Jamii na Sayansi Shirikishi (MUHAS), S.L.P 65001, Dar es Salaam (Simu. na. 0716 17 99 10 au 0789 22 33 92). Kama una maswali kuhusu haki yako kama mshiriki, unaweza kumpigia simu Dr.Joyce Masalu, Mwenyekiti wa Kamati ya Chuo ya Utafiti na Uchapishaji, S.L.P 65001, Dar es Salaam. Simu: 2150302-6 na Dkt. DP URASSA ambaye ni msimamizi wa utafiti huu (Simu. 0715 279 553)

Kuthibitisha ridhaa.

Nimekaribishwa kushiriki katika utafiti kuchunguza ubora wa huduma wanazopatiwa watoto

chini ya umri wa miaka mitano kwenye matibabu ya utapiamlo. Nimesoma taarifa au

imesomwa kwangu na kuelewa. Maswali yangu yamejibiwa na nimeridhika hivyo

ninakubali kushiriki katika utafiti huu.

Saini

Unakubali?

Mshiriki anakubali

Mshiriki anakataa

Saini (au alama ya kidole gumba) ya mshiriki

Saini ya shahidi (kama mshiriki hawezi kusoma)

Saini ya mtafiti

Tarehe ambayo fomu ilisainiwa

7.3 Apendix III, QUESTIONNAIRE

A. Background Information

1. Respondent's number _____

2. Sex 1. Female 2. Male

3. Highest Education level attained 1. Certificate level 2. College level 2. University level

4. Marital status 1. married 2. single 3. Divorced 4. Widowed 5. co-habiting

5. Facility name. _____ District _____

6. Department 1. RCH 2. OPD 3. IPD 4. CTC

7. Cadre 1. Reg. Nurse 2. Nurse Attendant 3. Clinician 4. Nutritionist

B.Nutrition activities

8. Are there any nutrition services provided in this facility 1. Yes 2. No

9. What type of nutrition services are provided in this facility

1. Nutrition Assessment Counselling and Support 2. Growth monitoring and Infant feeding counselling 3. Inpatient management of SAM 4. All 5.No intervention

10. Are there health care workers trained on nutrition 1. Yes 2. No- if the answer is No go to question 12

11. Have you received training in the management of malnutrition 1. Yes 2. No

12. Have you received training in Infant feeding counseling 1. Yes 2. No

13. Are there guidelines for management of malnutrition in this facility

1. Yes 2. No. If answer is No go to question 14

14. If yes, what guideline 1. NACS Treatment Protocol 2. Infant feeding guideline 3. Management of SAM guideline 4. No guideline

15. Do you have anthropometric equipments in your facility 1. yes 2. No

16. if yes which ones 1. Baby scale 2. Salter hanging scale 3. MUAC tapes 4. Tape measure 5. Length/height board

17. Are there assessment tools in your facility 1. Yes 2. No

18. if yes which one

1. WHO WHZ score charts 2. WHO WAZ score charts 3. WHO HAZ score charts
4. Road to Health growth chart (RCH 1)

19. How often is a child measured weight

1. On every visit 2. When the child is sick 3. On interval visits 4. Not measured

20. How often is a child measured length/height

1. On every visit 2. When the child is sick 3. On interval visits 4. Not measured

21. In your opinion do you agree the addition of the length/ht measurements in the new guideline	1.Strongly Agree	2.Agree	3,Neither agree nor disagree	4.agree	5.Strongly Agree

22. How often do you take Mid Upper Arm Circumference (MUAC) of a child

1. On every visit 2. When the child is sick 3. On interval visits 4. Not measured

23. In your opinion do you agree the addition of the MUAC in the new guideline	1.Strongly Disagree	2.Disagree	3.Neither Agree nor Disagree	4.Agree	5.Strongly Agree

C. MANAGEMENT OF MALNUTRITION

24. How do you manage children with Acute malnutrition? 1. As outpatient 2, As inpatient 3. Both

25. Is there a treatment guideline for outpatient management of malnutrition?

1. Yes 2. No

26. Is there a treatment guideline for inpatient management of malnutrition 1. Yes 2. No

27. What type of medication do you give to a child with Severe Acute Malnutrition without medical complications? Mention _____

28. What type of medication do you give to a child with Severe Acute Malnutrition with medical complications? Mention _____

29. What type of medication do you give to a child with Moderate Acute Malnutrition?

Mention _____

D. 30. UNDER FIVES SCREENED AND ASSESSED ACCORDING TO THE GUIDELINE

Wt taken by HCW	Wt taken by the researcher	Length taken by HCW	Length taken by researcher	WHZ- HCW	WHZ- researcher

E. Change in the Nutrition status of a child as observed from RCH1 (**tick where appropriate**)

JAN		FEB		MAR		APR		MAY		JUN		JUL		AUG		SEP		OCT		NOV		DEC	
<-	>-	<-	>-	<-	>-	<-	>-	<-	>-	<-	>-	<-	>-	<-	>-	<-	>-	<-	>-	<-	>-	<-	>-
2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1

THANK YOU

7.4 Appendix iv, Dodoso

1. Taarifa za mhojiwa

2. Namba ya mhojiwa _____

3. Jinsia 1. me 2. Ke

4. Elimu ya juu uliyopata 1. Ngazi ya Cheti 2. Ngazi ya stahada 3. Ngazi ya shahada

5. Hali ya ndoa 1. Umeolewa/umeoa 2. hujaolewa/hujaoa 3. mtalaka 4. Mjane/mgane 5. unaishi kinyumba na mwanaume/mwanamke

6. Jina la kituo cha afya. _____ wilaya _____

7. Idara 1. huduma ya mama na mtoto 2. wagonjwa wa nje 3. wagonjwa waliolazwa

4. kituo kinachohudumia wanaoishi na maambukizi ya VVU.

8.Kazi yako . 1. Muuguzi 2. Muuguzi msaidizi 3. Daktari 4.
Afisa lishe

B.Huduma za matibabu ya lishe

9. Je kuna huduma zozote za lishe zinatolewa na kituo? 1. Ndio 2. Hapana

10.Ni huduma zipi za matibabu ya lishe zinatolewa na kituo hiki cha afya?

1Matibabu ya utapiamlo kwa wagonjwa wa nje 2. Matibabu ya utapiamlo kwa wagonjwa waliolazwa 3. Ufuatiliaji wa ukuaji na maendeleo ya mtoto na ulishaji wa watoto wachanga

11.Je kuna wahudumu wa afya waliopata mafunzo ya lishe

1. Ndio 2 .Hapana – kama jibu ni hapana nenda swali namba 13

12.Je kuna wahudumu wa afya waliopata mafunzo ya matibabu ya lishe

1. Ndio 2Hapana

13. je kuna wahudumu wa afya waliopata mafunzo ya ulishaji wa watoto wachanga

1. Ndio 2. Hapana

14.Je kuna muongozo wa utoaji wa huduma ya matibabu ya lishe katika kituo

1. Ndio 2. Hapana – kama jibu ni hapana nenda swali namba 15

15.Kama kuna miongozo ni ipi?

1. Muongozo wa matibabu wa NACS 2. Muongozo wa kitaifa wa ulishaji wa watoto wachanga 3. Muongozo wa matibabu ya utapiamlo

16. Je kuna vifaa vya kupimia hali ya lishe katika kituo hiki 1, Ndio
 2. Hapana

17. kama vifaa vipi ni vipi 1. Mzani wa kuwapimia watoto wachanga wa mezani
2. Mzani wa kuwapimia watoto wa kuning'inia 3. Kipimo cha kupimia mzingo wa mkono 4. Futi kamba

5. Ubao wa kupimia urefu/mlalo wa mtoto

18. je kuna visaidizi vya kugundua hali ya lishe katika kituo chako 1. Ndio 2. Hapana

19. kama vipi ni vipi 1. Chati za uwiano wa uzito kwa urefu(WHO)2. Chati za uwiano wa uzito kwa umri (WHO) 3. Chati za uwiano wa urefu kwa umri (WHO)
4. Kadi ya maendeleo na ukuaji wa watoto(RCH 1)

20. Ni mara ngapi mtoto anapimwa uzito 1. Kila anapohudhulia kliniki 2.Mtoto anapokuja akiwa anaumwa 3. Kila baada ya mahudhurio kadhaa ya kliniki 4. Hapimwi kabisa

21, Ni mara ngapi mtoto anapimwa urefu 1. Kila anapohudhulia kliniki2. Motto anapokuja akiwa anaumwa 3. Kila baada ya mahudhulio kadhaa ya kniniki 4. Hapimwi kabisa

22. kwa maoni yako unakubaliana na kuongezwa kwa kipimo cha urefu kwenye muongozo mpya wa matibabu	1.Nakubali kabisa	2.Nakubali	3. sikatai wala sikubali	4.Sikubali	5.Sikubali kabisa
--	-------------------	------------	--------------------------	------------	-------------------

ya utapiamlo					

23. Ni mara ngapi mnapima mzingo wa mkono wa mtoto

1. Kila hudhurio la kliniki 2. Mtoto anapohudhuria akiwa anaumwa 3. Kila baada ya mahudhurio kadhaa 4 Hatupimi kabisa

24. kwa maoni yako unakubali kuongezwa kwa kipimo cha mzingo wa mkono kwenye muongozo mpya wa matibabu ya utapiamlo	1.Nakubali kabisa	2.Nakubali	3. Sikatai wala sikubali	4.Sikubali	5. Sikubali kabisa

C. MATIBABU YA UTAPIAMLO

25. Watoto wenye utapiamlo wanatibiwaje?

1. Kama wagonjwa 76an je 2. Wanalazwa hospitali 3. Aina zote za matibabu

26. je kuna muongozo wowote wa matibabu ya nje ya utapiamlo 1. Ndio 2. Hapana

27. je kuna muongozo wowote wa matibabu ya watoto wenye utapiamlo mkali wenye matatizo ya kiafya waliolazwa 1 Ndio 2. Hapana

7.5 Appendix v. Structural quality assessment checklist

Facility name..... Date of visit.....

Type of facility, 1. Health Centre 2. District Hospital 3. Regional hospital

Instructions: Review the following items and tick the Yes (Y) or No (N) column based on what is currently available in the health facility.		Y		N		Remarks
1	The facility has at least one functional:					
	1. Child/baby scale					
	2. Height/length board					
2	The facility has mid-upper arm circumference (MUAC) tapes for children 6-59 months					
3	The facility uses protocol/algorithms/guideline for managing malnutrition.					
4	The facility has data collection tools and collects patient data					
5	The facility has WHO weight for height/length Z-score charts for children					
6	The facility has WHO weight for Age Z-score charts for children					
7	The facility has WHO Height for Age Z-score charts for children					
8	Check if at least two HCWs are trained in NACS at the facility:					
	i. CTC					
	i. RCH					

	i. Paediatric ward			
9	The facility has enough Therapeutic foods for clients to last for 3 months			
10	Good knowledge on: <ul style="list-style-type: none"> i. The use of equipment i. MUAC tapes i. Weighing scale v. Height/length boards v. Translation of the results into child's nutritional status 			

7.6 Appendix vi. Dodoso la upimaji wa ubora wa huduma za kituo

Jina la kituo Tarehe ya mahojiano

Aina ya kituo , 1. kituo cha afya 2. Hospitali ya wilaya 3. Hospitali

Maelekezo : Chunguza vifuatavyo na andika kwenye chumba cha Ndiyo (N) au Hapana (H), kulingana na kile kilichopo kwa muda huu katika kituo cha afya.		Maoni	
		N	H
1	Kituo kina angalau kifaa kimoja kinachofanya kazi:		
	1. Mzani wa kupimia uzito watoto wadogo		
	2. Ubao wa kupimia urefu		
2	Kituo kina utepe wa kupimia mzingo wa mkono cha Miezi 6-59		
3	Kituo kinafuata muongozo katika matibabu ya utapiamlo kwa watoto		
4	Kituo kina fomu za kukusanya takwimu za wagonjwa wa utapiamlo		

6	Kituo kina kitendea kazi cha kutathmini hali ya lishe ya mtoto (WHO WFH Z-score):			
7	Kituo kina kitendea kazi cha kutathmini hali ya lishe ya mtoto (WHO WAZ-score):			
8	Kituo kina kitendea kazi cha kutathmini hali ya lishe ya mtoto (WHO HAZ-score):			
9	Chunguza na uliza kama kuna wafanyakazi wa afya waliopata mafunzo ya matibabu ya utapiamlo kwa watoto :			
	i. Kituo cha kuwahudumia wanaoishi na maambukizi ya VVU (CTC)			
	i. Kituo cha afya ya mama na mtoto (RCH)			
	i. Wodi ya watoto			
10	Kituo kina chakula dawa cha kutosha kwa matibabu ya utapiamlo kwa miezi 3			
11	Je kuna uelewa wa matumizi ya i. Utepe wa kupimia mzingo wa mkono (MUAC tapes) i. Mzani wa kupimia uzito i. Ubao wa kupimia urefu wa kusimama na kulala v. Vitendea kazi vya Kutathmini hali ya lishe ya mtoto			