UNIVERSITY FOR DEVELOPMENT STUDIES

THE COMMUNITY-BASED MANAGEMENT OF ACUTE MALNUTRITION (CMAM) PROGRAMME: IMPLEMENTATION REALITIES IN THE SAVELUGU NANTON MUNICIPALITY OF NORTHERN GHANA.

BY

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DECEMBER, 2015

DECLARATION

Candidate's Declaration

I certify that this thesis does not incorporate without acknowledgement any material previously submitted for any degree in any university; and that to the best of my knowledge it does not contain any material which is formerly published or written by any other persons except where due reference is written in this thesis.

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Supervisor's Declaration

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ABSTRACT

Child survival remains one of the most important public health challenges in Ghana. The implementation of Community-based Management of Acute Malnutrition (CMAM) is one of the key strategies to improve child survival. The aim of this study was to assess the implementation realities of Community-based Management of Acute Malnutrition programme on child survival in Savelugu/Nanton Municipal of the Northern Region of Ghana. The specific objectives are:

1. Assessing the CMAM service provision in the district.
2. To determine the quality and level of access of CMAM services in the district.
3. To assess factors associated with the poor performance of CMAM services in the District.
4. To solicit for ways of improving CMAM services in the District.

A community based descriptive cross-sectional survey was carried out and a systematic random sampling technique was employed to select the study participants for the study. A total of 249malnourished children aged six (6) months to fifty-nine (59) months in the programme and their mothers constituted the study sample. Both qualitative and quantitative methods were used to collect data and techniques including face-to-face interview, focus group discussion (FGD) and key informants interview (KII) were used.

The study findings showed that, overall maternal nutrition knowledge among the study participants was relatively low (15.8%).Time spent before arrival to Out-Patient Care(OPC) site and also time spent at the Out-Patient site were found to be associated with unsuccessful treatment outcomes (P=0.02,P=0.002) respectively. Women who were far from health facility (> 4 km) were 85 % less likely to make 5 continuous visit without absenting (AOR= 0.15, 95 % CI 0.07, 0.29]).

Shortage of "Plumpy nut" and sharing of the "plumpy nut" were found to be strongly positively associated with default treatment outcome ($p<0.001$).Compared to those who did not experience plumpy nuts shortages, those who experienced shortages were about 3.6 times likely not to recover successfully (95% CI, AOR=3.6, $p<0.001$).There was general improvement in the nutritional status of children benefiting from the programme which in part is indicative of effectiveness of the programme.The study however recommends that, Out-Patient sites be decentralized to all public health facilities in the district to reduce the travel time and supply of "plumpy nuts" to OPC should be regular.

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DEDICATION

This work is dedicated to my father (Mr Ofori Asante), my mother (Georgina Oduro) and my wife (Alberta Adu Amankwah).

LIST OF ABBREVIATIONS

BMI	**Body Mass Index**
CHP	**Community Health Promoter**
CFSVA	**Comprehensive Food Security & Vulnerability Analysis**
CHPS	**Community-Based Health Planning and Services Initiative**
CHV	**Community health Volunteer**
CMAM	**Community-Based Management of Acute** Malnutrition
DHMT	**District Health Management Team**
DHS	**Demographic Health Survey**
ENA	**Essential Nutrition Actions**
FANTA	**Food and Nutrition Technical Assistance** Project
FAO	**Food and Agriculture Organisation of the** United Nations
GAM	**Global Acute Malnutrition**
GDHS	**Ghana Demographic and Health Survey**
GHS	**Ghana Health Service**
GSS	**Ghana Statistical Service**
GMP	**Growth Monitoring and promotion**
HEW	**Health Extension Worker**
HFA	**Height-For-Age**
HMIS	**Health Management Information System**
HKI	**Helen Keller International**
HoD	**Head of Department**
IEC	**Information, Education and Communication**
IMCI	**Integrated Management of Childhood Illness**

IYCF	Infant and Young Children Feeding
MUAC	Mid-Upper Arm Circumference
M&E	Monitoring and Evaluation
MAM	Moderate Acute Malnutrition
MCH	Maternal and Child Health
MCHN	Maternal and Child Health and Nutrition
MDG	Millennium Development Goal
MICS	Multiple Indicator Clause Survey
MOH	Ministry of Health
NCHS	National Centre for Health Statistics
NGO	Non-Governmental Organization
NRC	Nutrition Rehabilitation Centre
NHIS	National Health Insurance Scheme
OPC	Out-Patient Care
OTP	Outpatient Therapeutic Programme
PHC	Primary Health Care
ReSoMal	Rehydration Solution for Malnutrition
RUTF	Ready-to-Use Therapeutic Food
SAM	Severe Acute Malnutrition
SFP	Supplementary Feeding Programme
TFC	Therapeutic Feeding Centre
UNICEF	United Nation Children Fund
USAID	United States Agency for International Development
UN	United Nations

UNICEF	**United Nations Children's Fund**
UN/SCN	**United Nations System Standing** Committee on Nutrition
VAD	**Vitamin A Deficiency Disorder**
W/A	Weight-For-Age
W/H	**Weight-For- Height**
WFP	World Food Programme
WIFA	Women in their Fertile Age
WFA	Weight-For-Age
WFH	**Weight-For-Height**
WFP	**World Food Programme**
WHO	**World Health** Organization

CHAPTER ONE

1.0 Introduction

This chapter is the introductory chapter of the study. It composed of the background to the study, the problem statement, the research questions, the conceptual framework, the goal, the aims, the objectives and the significance of the study.

1.1 Background to the Study

Community-based Management of Acute Malnutrition (CMAM) is a public health intervention based on the principles of coverage, access and cost-effectiveness. The model attempts to maximize population-level impact by focusing on providing effective therapeutic care to the majority of acutely malnourished people as outpatients, using techniques of community mobilization to engage the affected population and maximize coverage and compliance. Wherever possible, programmers build on local capacity and existing structures and systems, helping to equip communities to deal with future periods of vulnerability.

The treatment of severe malnutrition occupies a unique position in-between clinical medicine and public health. The causes of primary acute malnutrition are essentially poverty, social exclusion and loss of entitlement and the vast majority of cases can be treated by economic development and public health measures designed to increase dietary quantity and quality alone, with no need for clinical inputs. The serious physiological consequences of acute malnutrition, such as reductive adaptation, marked immunosuppression and concurrent infection, generally appear late in the evolution of the condition and become increasingly severe as the condition progresses (Steve, 2005)

Acute malnutrition that has progressed to the stage where there are concurrent life threatening complications must be treated on an inpatient basis. However, inpatient treatment is associated with major opportunity and economic costs for the affected families and health service providers alike. These costs are often unaffordable and the results have been that inpatient therapeutic programmes often have low coverage, low recovery, high mortality rates and high default rates.

It is well known that untreated Severe Acute Malnutrition (SAM) carries a very high risk of mortality and morbidity for children. 28% of children in Ghana are stunted, with 10 being severely stunted, 9% are wasted, with 2% been severely wasted and 14% are underweight with 30% been severely underweight (GDHS, 2008).

Community-based Management of Acute Malnutrition (CMAM) model treats people suffering from severe acute malnutrition using a combination of three treatment modalities, inpatient care, outpatient care and supplementary feeding according to the clinical and anthropometric characteristics at presentation. Ideally, those with moderate acute malnutrition and no medical complications are supported through a Supplementary Feeding Programme (SFP) that provides dry take-home rations. Supplementary Feeding Programme (SFP) are common in humanitarian operations but rarely exist in developmental settings. Those with severe acute malnutrition with no medical complications are treated in an Outpatient Care (OPC) (FANTA.2 2011).

The patient attends an Out-Patient Care site weekly to receive Ready to Use Therapeutic Food (RUTF), a course of oral broad-spectrum antibiotics, anti-helminth treatment, folic acid, and if appropriate vitamin A, measles vaccination and anti-malaria's. People who are acutely malnourished and have additional serious medical complications are treated in an inpatient care (1PC) until they are well enough to be transferred into the OPC (FANTA.2, CMAM Job Aid, 2010).

The inpatient protocols used in Community-based Management of Acute Malnutrition are essentially the same as those recommended by the World Health Organization (WHO) with the exception of the admission criteria and discharge criteria and the dietary protocols in the transition phase (FANTA.2, CMAM Job Aid, 2010).

The Community-based Management of Acute Malnutrition (CMAM) Programme was introduced in Ghana in June 2007. Prior to 2007, the Ghana Health Service had addressed the needs of children with SAM in pediatric wards or Nutrition Rehabilitation Centers (NRCs) which provided nutrition counseling and foods cooked with locally available ingredients. However, these NRCs did not follow the WHO 1999 treatment protocols for the management of SAM or provide any specialized therapeutic foods for these children (GHS, 2013).

Based on these experiences, three key innovations allowed the evolution from in-patient to community-based care possible and they are:

1. The development of Ready-to-Use Therapeutic Foods (RUTF) such as Plumpy nut, which are lipid-based and thus resistant to contamination and which do not require medical oversight
2. A new classification distinguishing between severe cases with and without medical complications.
3. The use of simple, color-coded middle-upper arm circumference (MUAC) measuring tapes for diagnosis that allow community members to be trained to identify severe acute malnutrition and refer to treatment sites.

Community-based Management of Acute Malnutrition (CMAM) learning sites were established in the country between April 2008 and March 2009 in two sites; Ashiedu Keteke Sub-Municipal in Greater Accra region and Agona West Municipal in the Central region.

Community-based Management of Acute Malnutrition integration and scale up in Ghana was planned in a two-phased approach. Phase 1 targeted five regions and is currently being implemented in all namely Upper East, Upper West, Northern, Central and Greater Accra Regions. The second phase which is ongoing covers the five remaining regions namely Western, Eastern, Volta, Ashanti, and Brong Ahafo.

The programme was introduced in four districts in the Northern Region in May 2010 namely Gusheigu, Nanumba North, East Gonja and Saboba districts and later rolled on Savelugu Nanton mun icipal,Yendi,Mion,TamaleMetro,Sagnarigu,Karaga,Tolon,Kumbungu,EastMamprusi Zabzugu and Tatale. Currently CMAM is implemented in fifteen (15) districts out of the twenty six (26) districts in the Northern Region (GHS, 2012).

Savelugu Nanton Municipal was rolled onto the programme in 2011 and currently operating five OPC sites (Tampion, Nanton, Diare, Pong Tamale and Savelugu RCH) and 1 IPC site (Savelugu Hospital). This programme is operating on four components and these are:

1. Community outreach
2. Outpatient cares (OPC) for SAM cases without medical complications
3. Inpatient care for SAM cases with medical complications
4. Supplementary feeding programme.

The community-based management of severe acute malnutrition according to the WHO, is an attempt to achieve sustainable impacts at a population level by taking the socioeconomic realities into account, balancing the potentially conflicting demands and ethics of clinical and public health.

This project seeks to evaluate one of the community-based model for addressing acute malnutrition called Community-based Management of Acute Malnutrition (CMAM) which also promote empowerment of individuals and communities, social justice, equity, community

participation and inter-sectoral approaches to health improvement-principles endorsed in 1978 Alma Ata Declaration of Health for All.

1.2 Primary Health Care Strategy by the Savelugu Municipal.

The Municipality has adopted the three-tier system for the delivery of primary health care initiated in 1980.The community and villages represent the first level,the sub-districts for the second level and the third level comprise of the District Hospital and District Health Management Team. The hospital manages the curative diseases and the Municipal Health Directorate deals with the preventive care.

1.2.1 Education

The Pong-Tamale veterinary college is the only post-secondary institution in the municipality. The basic educational system has 76 public Primary schools, 3 private primary schools, 19 junior secondary schools, 2 senior high schools and 1 specialized school for the deaf and dumb.

There are 44 public and 13 private nurseries which cater for children of pre-school age. Non-formal education is undertaken in various communities by non-governmental organizations and the Ghana Education Service. The level of illiteracy is high. Gross enrolment is 46% but is 56 for boys and 35% for girls. Dropout rate is 7.7% for boys and 12.1% for girls (GES, 2012).

1.2.2 Population Distribution

The table 1.0 shows the population projection by sub-districts of the municipality. 24.4% of the population form the children under five years and are part of the most important population for this study.

Table 1.0: Age Distribution of Population by Sub-District

Age Group (months)	Dist. (%)	Savelugu	Nanton	Tam_pion	Diare	Pong-Tamale	Total
0 -6	5.4	3,164	1,394	1,221	1,209	975	7,964
6 -11	4	2,344	1,033	905	896	722	5,899
12 - 23	3.2	1,875	826	724	717	578	4,719
24 - 59	11.8	6,914	3,047	2,669	2,642	2,130	17,403
5-14 yrs	27	15,820	6,972	6,107	6,046	4,874	39,819
Expected pregnancy	4	2,344	1,033	905	896	722	5,899
WIFA (12 -44yrs)	24	14,063	6,198	5,429	5,374	4,332	35,395
Men 15 – 49yrs	13	7,617	3,357	2,941	2,911	2,347	19,172
Men&Women 50-60yrs	8	4,688	2,066	1,810	1,791	1,444	11,798
60 yrs	5	2,930	1,291	1,131	1,120	903	7,374
Total	100	58,594	25,823	22,620	22,391	18,051	147,479

Source: DHMT- Savelugu, 2013

1.3 Problem Statement

Malnutrition has been recognized as a major public health concern across the globe. Major intervention programmes tailored at mitigating its full scale effects has seen some successes.

The Community-based Management of Acute Malnutrition programme is recognized as a public health intervention based on the principles of coverage, access and cost-effectiveness. An external evaluation of the Community-based Management of Acute Malnutrition (CMAM) programme in Ethiopia, Malawi and Niger reported its effectiveness in those countries (FANTA, 2007) but the case of Ghana is unknown. The implementation of the programme started in the Northern Region of Ghana since 2010 with 15 out the 26 Districts currently implementing it.

Since its inception in the Region, only one out (fatality or death rate) of the three the WHO Sphere Standards (cure rate more than 75%, fatality or death rate less than 10% and defaulter rate less than 15%) has been achieved for the five years of implementation.

Savelugu/Nanton Municipal is one of the Districts in Northern Ghana implementing the Community-based Management of Acute Malnutrition (CMAM) programme and data from District's 2012 annual report indicates a similar pattern as the Northern Region. The district has not fared well in respect of the sphere standard for the three discharge categories; having recorded a 68.1% cure rate, 0.6% death rate and 24.4% defaulter rate. Quite clearly, these indicators fall short of an effective management of SAM cases (GHS, 2012). Only one (fatality or death rate) out of the three indicators of the WHO Sphere Standards was achieved.

Consequently, the seeming lack of or insufficient research efforts targeted at evaluating the implementation realities and the factors influencing the effectiveness of the Community-based Management of Acute Malnutrition programme on child survival in Savelugu/Nanton Municipal of Northern Ghana is unknown.

It is therefore imperative to assess factors that could be responsible for the poor performance of Community-based Management of Acute Malnutrition (CMAM) programme in the Municipal and thereby suggest ways of enhancing the successful treatment on CMAM programs across the country.

1. 4 Research Questions

1. How are the Community-based Management of Acute Malnutrition (CMAM) services offered?
2. What is the quality and level of access to the Community-based Management of Acute Malnutrition (CMAM) services?

3. What factors are associated with the poor performance of Community-based Management of Acute Malnutrition (CMAM) services in the District?

4. What are the ways of improving Community-based Management of Acute Malnutrition (CMAM) services in the District?

1.5 Goal

The primary goal of the study is to assess the assess the Community-based Management of Acute Malnutrition intervention in the Savelugu/Nanton Municipal

1.6 Main Objective

The main aim of the study is to assess the state of implementation of Community-based Management of Acute Malnutrition (CMAM) in Savelugu Nanton Municipal in the Northern Region of Ghana.

1.6.1 Specific Research Objectives

1. Assessing the Community-based Management of Acute Malnutrition service provision in the district.
2. To determine the quality and level of access of Community-based Management of Acute Malnutrition services in the district.
3. To assess factors associated with the poor performance of Community-based Management of Acute Malnutrition services in the District.
4. To solicit for ways of improving Community-based Management of Acute Malnutrition services in the District.

1.7 Significance of Study

Malnutrition remains a major public health problem throughout the developing world and is an underlying factor in over 50% of the 10-11 million children under 5 years who die each year of preventable causes. However, whilst the importance of under-nutrition (low weight for age) is commonly acknowledged, the importance of acute malnutrition is seldom, if ever mentioned. This is a serious omission as acute malnutrition is an extremely common condition, associated with high rates of mortality and morbidity and requiring specialized treatment and prevention interventions.

Household food insecurity is a problem in Northern Ghana since a significant proportion of the population (10%) was indicated by the 'WFP in CFSVA report in 2009 to have limited access to nutritious food. Also analysis of mortality measures is useful in identifying promising directions for health programmes and improving child survival efforts in Ghana (GDHS, 2008)

Knowledge gained in this study will allow for effective implementation of malnutrition prevention measures for children under five and improve nutrition outcomes. Also the results gotten from this study could add to any information of other researches to determine the extension of the programme to other parts of the country, to identify challenges in the programme, try solving them and achieving the Millennium Development Goal 4.

Finally, this study will provide the Municipal Health Managers with information necessary for planning and implementation of child survival interventions. Additionally it will provide information to partners and the Ministry of Health (MOH) to guide policy formation.

1.8 Conceptual Model of CMAM

According to UNICEF (1998), an understanding of the complex and subtle causes of malnutrition is important to appreciate the scale and depth of the problem, the progress achieved

to date and the possibilities for further progress that exist. Malnutrition, clearly, is not a simple problem with a single, simple solution. Multiple and interrelated determinants are involved in why malnutrition develops, and it similarly intricate a series of approaches, multifaceted and multi-sectorial, needed to deal with it

Community-based Management of Acute Malnutrition (CMAM) is based upon the fundamental principle that all people whose lives are at risk from malnutrition should receive appropriate care and assistance. The provision of care should be impartial, targeted solely on the basis of need. It should be delivered without discriminating between or within affected populations and should not favor any particular side in conflicts or disputes. In practice, this principle translates into a commitment and obligation to provide the largest possible proportion of the acutely malnourished population with access to appropriate care in a timely fashion for as long as necessary. The core operating principles are:

Maximum coverage and access: The Programme should be designed to achieve the greatest possible coverage and make services accessible for the highest possible proportion of a population in need. It aims to reach the entire severely malnourished population.

Timeliness: Programmes should catch the majority of cases of acute malnutrition before additional medical complications occur on top of the simple malnutrition.Good community outreach is essential.Screening and referral is done by community volunteers

Appropriate medical and nutritional care: Programmes should provide simple, effective outpatient care for those who can be treated at home and inpatient care for those who require inpatient treatment in order to survive

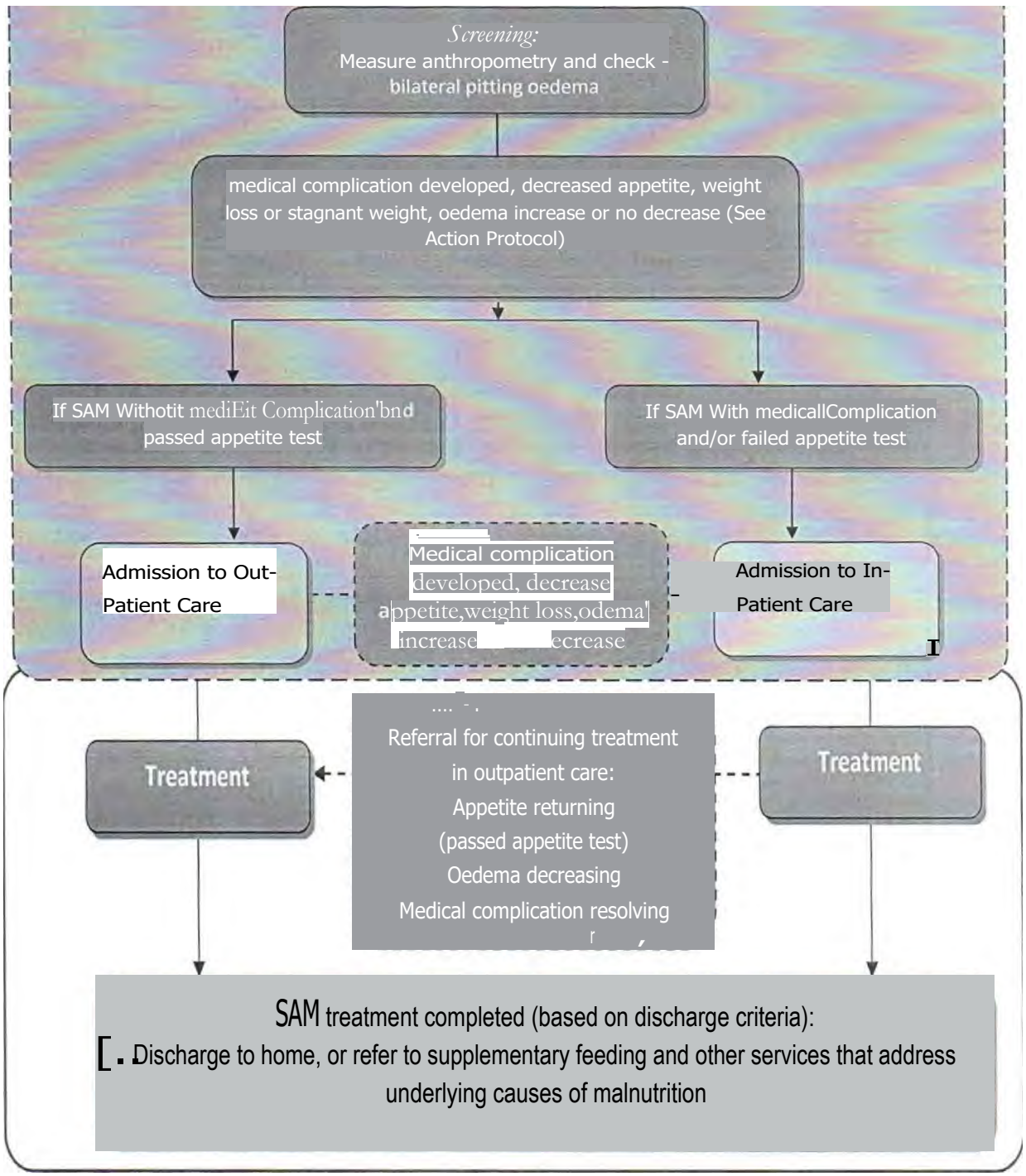
Care for as long as it is needed: Programmes design to address Severe Acute Malnutrition (SAM) should be integrated into routine health services of health facilities.Treatment for SAM

- should be available as long as there is a need if supplies are present. Additional support to health facilities can be added during certain seasonal peaks or during a crisis.

Implementing these principles in practice requires programme priorities, design and resources to be tailored to the particular circumstances of the programme.

The purpose of this study is to identify the barriers which are an underlying cause of malnutrition and its effect to the implementation of the Community-based Management of Acute Malnutrition (CMAM) program

Figurel.1 Community-based Management of Acute Malnutrition Conceptual Model



Source: UNICEF 2012

1.9 Chapter Outline

Chapter one addressed the background to the study which talked about trends in maternal mortality and the causes of these deaths is in the world, Africa and Ghana. In this same chapter, problem statement, research questions, study objectives, conceptual framework, and scope of the study were also addressed accordingly.

In chapter two, the researcher reviewed relevant literature in relation to research work and more so, in support of the purpose of the study. The literature review was organized and presented according to the specific objectives.

Chapter three discussed the study methods and design, data collection techniques and tools, study population, study variables, sampling techniques and size, data handling and analysis, and ethical consideration.

The results and interpretations of the study had been presented in the chapter four, also according to the specific objectives.

Chapter five and six dealt with the discussion of the findings and conclusions and recommendations respectively. The references and appendices followed these chapters.

CHAPTER 2

LITERATURE REVIEW

2.0 Introduction

This chapter discusses the major **literature** in the area of the research topic. It considers the issues globally but the emphasis is on the Ghanaian environment. The purpose of the chapter is to provide the necessary background against which the findings of this study could be understood. Some of the areas that were looked at include literature on malnutrition, literature on the Community-based Management of Acute Malnutrition (CMAM), literature on accessibility and availability of health service offering CMAM, literature on the quality of service offered, literature on community participation and mobilization and literature on monitoring and evaluation of the CMAM programme.

2.1 Malnutrition

Malnutrition contributes to more than half of all under-five childhood deaths throughout the developing world(UNICEF, 1998).The associated effects of poverty, inadequate household access to food, infectious disease, care and inadequate breastfeeding and complementary feeding practices often lead to illness, growth faltering, nutrient deficiencies, delayed development, and death, particularly during the first two years of life. Malnutrition is the insufficient, excessive or imbalance consumption of nutrients. Malnutrition occurs when the body does not get the right amount of nutrients, whether macronutrients such as calories and protein, or micro nutrients such as vitamins and minerals; often it is both. Good nutrition is key to maintaining or improving health, and people's ability to secure an adequate diet is fundamental to achieving social and economic advances. Nutrition disorders in turn impede the

economic development of a country through decreasing educational attainment and economic productivity, and increasing health care costs (World Bank, 1999).

Taken together, stunting, severe wasting, low birthweights due to intrauterine growth restriction, sub-optimal breastfeeding (non-exclusive for six months and discontinued before one to two years) and deficiencies of vitamin A, zinc and iron lead to the deaths of 3.6 million children under five years of age each year (Black et al., 2008). Moreover, these forms of malnutrition together account for 35 percent of all preschooler deaths and 11 percent of the global burden of disease, i.e., the total gap between current global health status and an ideal situation where everyone lives into old age in full health (Black et al., 2008). Thus, malnutrition is a calamity that deprives humanity of countless scientists, creative artists, community and national leaders and productive workers who die prematurely or grow up without reaching their full potential.

2.2 Global Trend of Malnutrition in the World

In 2000, WHO estimated that malnutrition affects one out of three worldwide and base on FAO estimation, over one billion people suffer more serious forms of under nutrition. With its crippling effect on the population as a whole, children are the most affected. It is estimates that more than a third of child deaths are caused by under nutrition and the deaths of over 6 million (55%) children under five are either directly or indirectly attributable to malnutrition with most children suffering multiple types of malnutrition (UNICEF/FAO 1998; WHO 2008.).

In 1992, the United Nations Food and Agricultural Organization (FAO) estimated that about 841 million people or about one fifth of the world's population was food energy deficient. This reason cannot be exempted from been the cause of children under five years of age recording over 20 percent of stunting in seven countries in the Middle East and North Africa and in nine other countries, wasting is prevalent in over five percent, indicating a medium to high levels of childhood malnutrition (World Bank, 1999).

According to UNICEF, 1.5 to 1.8 million more children in India are currently at risk of malnourishment, as households cut back on meals or switch to less nutritious foods due to rising food prices (average rice prices rose by 21 percent and wheat prices by 15 percent in 5 2007/08). With more focus on malnutrition gaining some worldwide attention, the trend of malnutrition is still very unpredictable, declining and rising spontaneously. Base on the World Bank global estimates, there has been marginal progress in reducing the share of underweight children (from 20 percent in 1992 to 17 percent in 2007). The FAO also estimated that in 2007, 923 million people were undernourished compared with 848 million in 2004. The World Bank in 2008 estimate that by the end of 2008, up to 967 million people (or an additional 44 million people) will be under-nourished largely due to the rise in global food prices and these higher levels of malnutrition will impinge on future growth and productivity in developing countries.

Globally, an estimated 165 million children under-five years of age, or 26%, were stunted (i.e height-for-age below —2 SD) in 2011 — a 35% decrease from an estimated 253 million in 1990. High prevalence levels of stunting among children under-five years of age in Africa (36% in 2011) and Asia (27% in 2011) remain a public health problem, one which often goes unrecognized. More than 90% of the world's stunted children live in Africa and Asia.

Globally, an estimated 101 million children under-five years of age, or 16%, were underweight (i.e., weight-for-age below —2SD) in 2011 — a 36% decrease from an estimated 159 million in 1990. Although the prevalence of stunting and underweight among children under-five years of age worldwide have decreased since 1990, overall progress is insufficient and millions of children remain at risk.

Also an estimated 52 million children under-five years of age, or 8%, were wasted (i.e. weight-for-height below —25D) in 2011 — a 11% decrease from an estimated 58 million in

1990. Seventy percent of the world's wasted children live in Asia, most in South-Central Asia (WHO, 2012; FAO 2011).

And this implies, children are at substantial increased risk of severe acute malnutrition and death.

Globally, an estimated 43 million children under-five years of age, or 7%, were overweight (i.e., weight-for-height above +2SD) in 2011 — a 54% increase from an estimated 28 million in 1990. Increasing trends in child overweight have been noted in most world regions, not only developed countries, where prevalence is highest (15% in 2011). In Africa, the estimated prevalence under-five overweight increased from 4% in 1990 to 7% in 2011. The prevalence of overweight was lower in Asia (5% in 2011) than in Africa, but the number of affected children was higher in Asia (17 million) than in Africa (12 million)(WH0,2012)..

2.3 Trend of Malnutrition in Africa

Malnutrition among young children is a wide spread problem in most African countries. The direct causes may be the result of economic, social, cultural, agricultural or climatic factors. The problem of malnutrition differs from country to country, so do the situations which cause the problems (WHO, 2005)

Central Africa currently ranks highest with 51% of its population undernourished, followed by East Africa and Southern Africa, both at 43%, from 1997 to 1999. The next ranking sub-regions are the Caribbean (28%), Oceania (26%) and South Asia (24%), with the remaining sub-regions falling below 20% prevalence. Interestingly, the Near East and North Africa region had its greatest decline between 1969 to1971 and 1979 to 1981, decreasing from 25 to 9 percent, but then experienced a slight increase from 1990 to 1992 to 1996 to 1998 1'y 2 percentage points (FAO 2011).

At the country level, there are eight countries that have prevalence rates of under nutrition of over 50%, three of which are in East Africa, two in Southern Africa, one in Central Africa, one in the Near East, and one in the Caribbean. They include: Somalia (75%), Burundi (66%), the Democratic Republic of the Congo (64%), Afghanistan (58%), Eritrea (57%), Haiti (56%), Mozambique (54%) and Angola (51%) (WHO, 2005).

2.4 Trend of Malnutrition in Ghana

In Ghana, although the nutritional status of preschool children has improved, malnutrition persists. Many factors still have a negative impact on the nutritional status of young children. among which inadequate infant feeding practices, high morbidity and poor access to health care services. Although declining, poverty still affects a large proportion of the population and food insecurity persists. These factors are among the main causes of malnutrition among young Ghanaian children. Although trends in the nutritional status of preschool children are encouraging more efforts in addressing malnutrition are needed (FAO, 2009).

Child under-nutrition continues to be a major public health problem in developing countries like Ghana. According to the 2008 Ghana Demographic and Health Survey, almost 14% of Ghanaian children under the age of five are underweight, more than one quarter of children (28%) are stunted or too short for their age and almost 9% are wasted or too thin for their height. Furthermore, more than two thirds (77.9%) of children under the age of five years have at least one form of anaemia.

The prevalence of wasting has decreased steadily, from 10% in 1998, 7% in 2003 to 5% **in 2006** and that of severe wasting 1**%** (GSS et al., 2007).

Overall, 9 percent of children under five are wasted, with 2 percent severely wasted. Wasting is highest among children age 6-8 months (29 percent) and is lowest among children age 48-59 months (3 percent) (UNICEF-M1CS 2006). The level of wasting does not vary much with sex,

birth interval, or urban-rural residence. The extent of wasting decreases as the size at birth increases and mother's nutritional status improves. Wasting is more common in the Upper West (14%), Northern (13%) and Central (12%) regions than elsewhere. Wasting generally decreases as mother's level of education and wealth quintile increase (GDHS, 2008).

According to WFP (2009) report on CFSVA, 7.1% of children in Ghana were wasted (2% severely wasted) and 22.1% were stunted. The report also revealed that, male children are shorter and generally more underweight on average than female children. On the other hand, female children appear slightly thinner than male children and appear to have a higher rate of severe wasting.

There were no significant differences in the prevalence of wasting by gender. Prevalence increased during the first two years of life, from 4% among infants aged 0-6 months to 11% among children aged 12-23 months. After this age, the prevalence of N\ asting decreased and among children aged 36-59 months, it was 2%, a statistically insignificant percentage (GSS et al., 2007). In contrast with the prevalence of stunting which was much higher in rural areas than in urban areas, the prevalence of wasting did not vary by sector. There were large regional differences in the prevalence of wasting, ranging from 3% in Greater Accra and Brong Ahafo regions to 12% in the Upper East region. The prevalence of wasting appears to be associated with mothers' level of education (GSS et al., 2007).

A similar trend can be observed with the prevalence of underweight which has decreased from 25% in 1998 to 22% in 2003 and 18% in 2006 with severe underweight being 3% (GSS and Macro Int., 1999; GSS et al., 2004; GSS et al., 2007).

Overall, prevalence of stunting, wasting and underweight were higher in the Upper East and Northern regions. However overweight is not a problem among young children in Ghana (GSS et al., 2007).

Trends in child nutritional status can be observed by comparing data collected in the 2006 MICS with data from the 2003 and 1998 GDHS.

The comparison shows that prevalence of stunting initially increased from 26% in 1998 to 30% in 2003 but then decreased to 22% in 2006. Between 2003 and 2006, the prevalence of stunting decreased similarly in both urban and rural areas. These differences in prevalence of stunting are difficult to interpret. It is not certain whether these fluctuations correspond to real changes in prevalence (FAO, 2009).

The availability component according to Osei et al. (2010) is often measured through proxies at the population level, such as national agricultural output, while access and utilization are more often measured at the household and individual levels. The access component comprised of three core domains: anxiety and uncertainty about household food supply, insufficient quality of food, and insufficient food intake by household members. The utilization component is influenced most immediately and not only by nutrition, knowledge and beliefs, but also by access to healthcare, water, and sanitation services and practices relating to the management of childhood illness and hygiene. However, approaches to measuring access and utilization have ranged from the use of children's nutritional status, to more direct methods such as food frequency questionnaires (Carlsen et al, 2010).

2.5 **Trend of Malnutrition in Northern Region**

Child malnutrition continues to be unacceptably high in Northern Ghana. A recent study conducted by UNICEF in the Northern Region showed that, the prevalence of chronic malnutrition has increased from 32 % in 2008 to 37 % in 2011 (UNICEF & GHS, 2011). Although there are reported cases of food insecurity at the household levels in Ghana especially in Northern Ghana, its contribution to malnutrition is unclear.

There is substantial regional variation of malnutrition in the country, with some of the poorest indicators found in the northern part of the country. The estimated prevalence of chronic malnutrition for example, in the Northern Region is 32.4% compared with the national average of 28 % (GDHS, 2008).

UNICEF Multiple Indicator Cluster Survey (MICS) conducted in 2011 showed that, the prevalence of chronic under-nutrition in the Northern Region of Ghana has increased to 37 % (UNICEF/GHS). According to the WHO (2000) classification of malnutrition, the malnutrition situation in the Northern Region can be described as being in a serious state.

The relative importance of each of the known risk factors of malnutrition is likely to vary between settings. To reach any conclusions about whether food insecurity is an important cause of child malnutrition.

The persistent prevalence of chronic malnutrition in Northern Ghana is of particular concern that requires urgent attention and immediate action. To be able to address the problem adequately, it is important that the context specific risk factors for malnutrition are identified for appropriate interventions. The risk factors of malnutrition are multifaceted and complex but it is often argued that variations in child feeding practices and household hygiene are much more important causes of malnutrition than is inadequacy of household food availability. There are reported cases of food insecurity at the household levels in Ghana especially in Northern Ghana; however its contribution to malnutrition is unclear.

Examining malnutrition rates by region according to WFP (2009) report on CFSVA, children in the northern part of the country (Northern, Upper East and Upper West) appear to be thinner (with higher GAM and SAM prevalence) as well as shorter (with higher stunting prevalence) than children in the southern, coastal areas.

2.6 Measurements of Children Nutritional Status

The nutritional status of an individual is defined as the measurement of the degree to which an individual's needs for nutrients are being met (Krauss and Mahan, 1994). Changes in body dimensions reflect the overall health and welfare of individuals and populations. Anthropometry is used to assess and predict performance, the health and survival of individuals and reflect the economic and social wellbeing of populations. Anthropometry is widely used, easily practiced by non-professionals, inexpensive, easily interpretable, scientifically acceptable, and a non-invasive measure of the general nutritional status of an individual or a population group (Cogill, 2003). The four building blocks or measures used to undertake anthropometric assessment are: age, sex, length/height, and weight. Each of these variables provides one piece of information about a person. When they are used together they can provide important information about a person's nutritional status and are called an index. In assessing the nutritional status of children, the following aspects must be considered:

A. Anthropometry

1. Weight (kg)
2. Height (m)
3. MUAC (cm)

Different types of anthropometric indices commonly used to measure children nutritional status are weight-for-age (underweight), height-for-age (stunting), and weight-for-height (wasting). The advantage of weight-for-age index is that it depicts both past (chronic) and/or present (acute) under nutrition although it is unable to distinguish between the two. The height-for-age measurement is good for measuring the nutritional status in the past and is also considered the best indicator of chronic under nutrition reflecting cumulative effects of socioeconomic, environmental, health and nutritional conditions (van der Hoek et al. 2002). The advantages of

weight-for-height measurement are that it does not require data on age and can be used to differentiate between children who are overweight, normal or wasted. Mid-Upper Arm-Circumference (MUAC) has recently emerged in the literature as potential screening tool for poor nutritional status (Manary and Sandige, 2008).

In relation to MUAC, the nutritional status of children could be classified as below

Table 2.1: Classification of MUAC of Children

CLASSIFICATION OF MUAC MEASURES (CM)	**NUTRITIONAL STATUS**
<11.5	Severe acute malnutrition
<12.5 and >11	Moderate acute malnutrition
>13.5	Normal nutrition

The WHO recommends the use of deviations from the median or Z-score to observe growth. The equation to estimate a Z-score is;

$$\text{Z-score} = \frac{\text{Value of Subject} - \text{The Median of Reference}}{\text{Standard Deviation of Reference}}$$

and the classifications of nutritional status are shown in table 2.2

Table 2.2 Nutritional Status Classifications

INDICATOR	< - 3 SD	< - 2SD	> -2 SD until< 2SD	> 2 SD
vv c1giu-ivi-a6 (WAZ)	JGVG1G malnourished	LJIIUGI NV GI6111.	VV GII IIIJIAL 131IGLI	V VG1 NA GII,'111,
Height-for-age (HAZ)	Severe stunting	Stunting	Well nourished	
Weight-for-height (WHZ)	Severe wasting	Wasting	Well nourished	Overweight

Source: Supariasa et al., 2002

2.6.1 Acute malnutrition (Wasting)

It expresses the weight of the child in relation to the height. In children under 5 years of age, the relationship of weight to height is almost constant regardless of their sex or race and follows a constant evolution as they grow. Internationally accepted reference values of weight-for-height for under five-year-old children are available. The body weight is sensitive to rapid changes in food supply or disease, while height changes very slowly. Low weight for height is characterized by wasting and loss of muscle fat. It is an indicator of thinness and identifies acute malnutrition. This is the most useful index for screening and targeting vulnerable groups in emergencies. It is a useful indicator for admissions and discharge in and out of feeding programs. Alongside oedema, it is the most appropriate index used to detect existing malnutrition or recent onset of malnutrition in the population.

The weight-for-height index gives information about children's recent experience with food intake. Children whose weight is less than -2SD score of the median weight of children of the same height in the reference population. In all 6 percent of the children under five are moderately or severely wasted or too thin for their height, while 1 percent is severely wasted. Children 0-

11 months are more likely to be wasted in comparison to children who are older. This pattern is expected for underweight and stunting as it is related to the ages at which many children cease to be breastfed and are exposed to contamination in water, food, and the environment (UNICEF-MICS, 2011).Children from the poorest households are at least twice more likely to be underweight, stunted or wasted in comparison with children from the wealthiest households. The problem of wasting in the Northern region as at the time the MICS was conducted was 8.1% of which 1.7% are severely wasted (UN ICEF-MICS, 2011).Birth weight and educational status of mothers are major factors that contribute to wasting (GDHS, 2008).

2.6.2 Chronic malnutrition (stunting)

It is a measure of chronic malnutrition. That is, long-term and persistent malnutrition normally associated with long-term factors such as poverty and frequent illness. A child's height is compared to the median height (length) of the reference population of the same age and sex to give Height-for-Age index. Children falling below the cutoff point of —2 SD from the median of the reference population are classified as too short for their age or stunted.

Chronic malnutrition is of crisis proportion among children in Ghana. More than one quarter (28.0%) of Ghana's children under age five suffer from growth retardation or stunting (GDHS, 2008). Twenty-three percent of the children are moderately or severely stunted or too short for their age, and 7 percent are severely stunted (UNICEF-MICS 2011).Children whose height-for-age is less than -2SD score of the median height of children of the same age in the reference population are said to be stunted. A high prevalence of stunting in the population has serious implications for the economic development of the country. This is because stunting in childhood reduces adults' economic productivity and earning capacity. By impairing the cognitive development of children, chronic malnutrition reduces their future productivity as adults. Stunting in childhood increase **the** susceptibility in adulthood to heart disease, stroke, diabetes

and other chronic disease and possibly also to obesity. The problem of stunting in the Northern region as at the time the Ghana demographic and health survey was conducted was 32.4 of which 15.4% are severely stunted. The 2011 MICS indicates that 37.4% are stunted with 13.3 being severely stunted Short birth interval, low birth weight and low educational status of mothers are risk factors that contribute to stunting (GDHS, 2008).

2.6.3 Underweight

It conveys the weight of a child in relation to the child's age. Weight-for-Height index is a useful index for monitoring growth and development of children. When used in growth monitoring at health facilities, a child's W/A is commonly plotted on the Road to Health growth chart. This allows for better understanding of the child's positive or negative growth. At population level, the measurement indicates the total proportion of underweight children.

Children whose weight-for-age is below -2SD score from the median weight of children of the same age in the reference population are said to be underweight. This measures both acute and chronic malnutrition. Overall 14% of Ghana's children are underweight with 3% severely underweight. Generally 21.8% of children are underweight in the Northern region with 3.4% severely underweight (less than -3SD). Short birth interval, low birth weight and low educational status of mothers are risk factors that contribute to underweight (GDHS, 2008)

2.6.4Oedema

It is the abnormal accumulation of large amounts of body fluid in the intercellular tissues. It is a key clinical feature of severe malnutrition and is associated with high mortality rates in children. Oedema increases the child's weight. It therefore tends to hide the true picture of the nutritional status of the child. All cases of oedema should be separated from the rest of the

respondents during analysis and treated as severe acute malnutrition. Oedema should always be used as a major criterion for admission into therapeutic feeding programs.

2.6.5 Overweight

Another problem among children in Ghana is that 5% are overweight that is children whose z-scores is greater than +2SD (GDHS, 2008)

2.7 Community-based Management of Severe Acute Malnutrition (CMAM)

Introduction:

The Community Therapeutic Care (CTC) approach to treating acute malnutrition (defined as the presence of bi-pedal edema or weight for height <80% or <-2 SD with respect to reference norms) among children <5 years was pioneered by Valid International in the early 2000s. Prior to that, the standard response was provided through therapeutic feeding centers (TFCs) or nutrition rehabilitation units (RHUs); in-patient facilities which treated all cases with therapeutic milk-based formulas (F75 and F100) administered by medical staff. These facilities were often overcrowded, allowed cross-infections, and required lengthy stays that led to high default rates and the mother's absence from her other children for extended periods.

Prior to 2007, the Ghana Health Service (GHS) addressed the management of children with severe acute malnutrition in hospitals and nutrition rehabilitation centers in Ghana. These services did not yet follow the WHO 1999 treatment protocol for the management of Severe Acute Malnutrition (SAM) or the Community-based Management of Acute Malnutrition (CMAM) approach. The CMAM approach was introduced to senior health managers and senior clinicians in a June 2007 national workshop given by the GHS with support from UNICEF and the United States Agency for International Development (USAID).Community-based Management of Acute Malnutrition (CMAM) a community- based approach for management

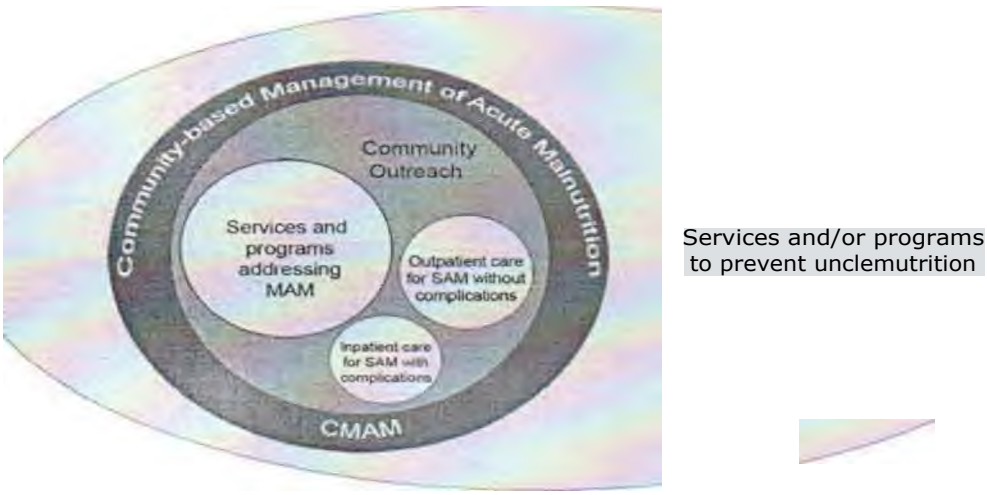
of acute malnutrition comprises; Community Outreach which leads to timely identification and referrals of SAM cases with the use of MUAC tapes to measure the MUACs of children, Supplementary Feeding Programmes (SFPs) for children with moderate acute malnutrition, Outpatient Therapeutic Programmes (OTPs) for SAM cases without medical complications and Stabilization Centers (SCs) or Inpatient programmes for SAM cases with medical conditions(Michael and Wilhelmina,2012)

2.7.1 The core components **of CMAM**

The four core components of CMAM (community outreach, outpatient care for children under 5 with SAM without complications, inpatient care for SAM with complications, and supplementary feeding for the management of MAM), which should be offered in the context of broader preventive services. To date community outreach strategies have entailed using trained volunteers to promote the use of services within the community by making it understandable and acceptable within current cultural norms; overcome local barriers to uptake; promote community case-finding and referral; and conduct follow-up home visits to support household understanding of and compliance with treatment.(FANTA-2 project, 2008)

However, attention to a system for recognizing and sustaining the commitment of volunteers is necessary. The integration of Community-based Management of Acute Malnutrition with preventive services is also crucial.

Figure 2.1: Core Components of CMAM



Source: FANTA-2 Project, 2008

CMAM provides a holistic approach by utilizing and building the capacity of community structures already in place, training community members, and minimizing the time mothers and children must be away from the home.

The therapeutic care is to save lives of individuals with Severe Acute Malnutrition (SAM). Severe acute malnutrition is a complex medical condition. It can be defined using anthropometry and clinical measurements .Management of severe acute malnutrition involves a combination of routine medications, specific therapeutic foods and individualized. Therapeutic care programmes can obtain very high recovery rate (above 80 or 90%) and reach most malnourished individuals in the community.

Therapeutic care has evolved in recent years from an approach based solely on inpatient care to an integrated strategy in which those with severe acute malnutrition and medical complications are treated in hospitals and those with no medical complications are treated at community level.

2.7.2 Community-based Management of Acute Malnutrition Treatment Process

2.7.2.1 Admission and Discharge Criteria for CMAM Programme

The admission criteria are as follows for children 6-59months;

1. Diagnostic anthropometry and clinical sign: WFH <- 3 SD or MUAC < 115 min and
2. Bilateral pitting oedema
3. Appetite
4. **Medical complication**

For transition from inpatient care to outpatient care:

1. Reduced oedema,
2. Resolving medical complication,
3. Good appetite.

The discharged criteria are as follows for children 6-59months:

1. **Cured; attained** 15% weight gain after admission.
2. **Defaulted;** was absent for two days (in-patient) or three weeks (out- patient)
3. Died; died during admission.
4. **Non-** recovered; did not attain 15% weight gain after admission (4 months)

2.7.2.2 Inpatient Care

Hospitals in Ghana provide services for treatment of acute malnutrition with standardized treatment protocols in place. Nutrition rehabilitation is based on an improved milk diet. About

10 of the 42 NRCS provide residential (i.e. inpatient care) based on administering and improved diet or enriched porridge and local foods. No NGO programmes provide inpatient treatment of severe acute malnutrition.

2.7.2.3 Outpatient Care

The majority of severely acutely undernourished children are treated in the outpatient therapeutic feeding component of the program. The Out-Patient Care provides home based treatment and rehabilitation for children who are severely acutely undernourished but who have appetite and are free of medical complications. Around 85% to (0% of severely acutely undernourished children are normally treated at the Out-Patient Care. Children can be admitted directly into the Out-Patient Care, treated with routine drugs and given Ready-to-Use-Therapeutic Food to eat at home. They attend the Out-Patient Care every week for medical checkups, to receive additional medical treatment if required and to be given their one week supply **of RUTF.** (CTC field manual, 2006)

2.7.3 Indicators of CMAM Performance

2.7.3.1 Cured /Recovery Rate

This is one of the indicators that is used for reference and evaluation purposes. A cured rate is one of the programmes means of exit, i.e. when children under the programme are treated and discharged and cured this should be below the 75% sphere minimum standard, and just below the 70% benchmark normally achieved by Community-based Management of Acute Malnutrition programmes. When compared to other integrated programmes, the cure rate of this programme positive and proves that this intervention can effectively treat the large majority of malnutrition cases admitted.

2.7.3.2 Death Rate

Deaths are patients that die during their stay in the Community-based Management of Acute Malnutrition (CMAM) program after they have been assigned to it .this includes patients who die in transit from one facility to another. Where a patient with Severe Acute Malnutrition (SAM) dies in transit, from an Out-Patient Care (OPC) to In-Patient Care (IPC), the death should be recorded as death within the program and assigned to the Out-Patient report.

If the child was previously reported as "defaulter unconfirmed" and is subsequently found to have died, this should be notified in a subsequent monthly report in the "change of category section"; a note is made in the registration book and the IPC/OPC chart. (Grellety, 2011).

Deaths usually account for some of all exits, which should be significantly below the sphere minimum standard of 10%, and 4 — 5% of deaths are generally achieved by Community-based Management of Acute Malnutrition (CMAM) programmes. Given the absence of any existing treatment prior to the implementation of the programme, and the late presentation of cases, it is likely that a number of deaths may be going unreported, in particular amongst the defaulter and transfers to inpatient care. Information collected during most evaluations of CMAM programmes indicated that some deaths occur amongst defaulters. This is not likely to represent a large proportion of all defaulters, but further investigation is advisable. There are also reports that the admission of children with no/poor appetite into the Out-Patient Care is also directly responsible for the subsequent defaulting. (CMAM full report 2010).

2.7.3.3 Defaulter Rate

On average, children default after only one visit to the programme. Discussion held during evaluation of Community-based Management of Acute Malnutrition (CMAM) in Bardiya suggested that miscommunication between health workers and caretakers, distance and the

perceived recovery of the child are the primary reason for defaulting. These are common reasons affecting Community-based Management of Acute Malnutrition (CMAM) programme attendance in other contexts. Experience has also shown that addressing these issues can rapidly improve programme performance. (UNICEF, 2010).

2.7.3.4 Non Recoveries/ Non — Responder Rate

Usually account for all discharged cases that had not recovered within 3 months (16 weeks) of treatment. This is a positive result attesting to the efficacy of the Community-based Management of Acute Malnutrition (CMAM) approach in the treatment of SAM. (GHS, 2012).

2.7.4 **Ready-to-use Therapeutic Feeding**

An interview with mothers about their experiences with Community-based Management of Acute Malnutrition and their use of a Ready-to-use Therapeutic Foods (RUTF), known as Plumpy Nut, was more reassuring. Although the findings are preliminary, all mothers and caretakers expressed great relief in the effectiveness of the product, and appreciated the accessibility of care. Mothers also had great facility in understanding basic nutritional concepts, such as the importance of including specific foods in their diets and their child's supplementary diets (Singh, 2011).

2.8 Quality of Community-based Management of Acute Malnutrition (CMAM) Services

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).

Programme beneficiaries; 'awareness of, and satisfaction with a programme are important components of quality of care, influencing participation, complains and programme

effectiveness (Gilson et al. 1994; Guerrerro et al.2010). Therefore, it is crucial to understand the quality of care both from the perspective of care providers and recipients.

Quality of Community-based Management of Acute Malnutrition (CMAM) services can be assured through adherence to national CMAM guidelines, continuous support to and supervisions of CMAM services and harmonized monitoring and evaluation tools that are linked to the national health information system.

One study in Malawi compared outcomes for cases of acute malnutrition treated by medical professionals to cases handled by community health aids with medical aids with no medical training. No differences in recovery rate were found between the two groups, with an average 89% recovery rate: an acceptable outcome by international standards (Linneman et al. 2007). Another study demonstrated good recovery rate (93.7%) in children with SAM during a famine in MALAWI using a CMAM approach delivered by trained community health aids alone (Amthor et al. 2009). This study, the first trial of its kind in Asia, assesses the quality of care provided by CHWs in the provision of Community-based Management of Acute Malnutrition (CMAM) protocols. It takes a mixed methods approach to provide perspectives on different aspects of quality of care. The first objective of the study was to measure Community Health Worker (CHWs') technical competence in managing cases of Severe Acute Malnutrition according to a treatment algorithm. The second objective was to examine the subjective aspects of quality of care, by assessing elements of CHW service delivery that were valued by caretakers.

Although, there are national guidelines for Community-based Management of Acute Malnutrition (CMAM), significant variations occurs across facilities in terms of admission and discharge criteria, treatment protocol, patient registration, individual record — keeping and

programme monitoring. There is neither a national system of data collection nor surveillance. The ad hoc approach has significant implications for the quality of the individual treatment and for the quality and consistency of the services. For instance, admission and treatment might be based on Weight-for-Height (WFH), Weight-for-Age (WFA), visible wasting or bilateral pitting oedema, weight loss and severe clinical anemia. Target weight or target Weight-for-Height (WFH) (z- score or percentages of the median) generally is not documented in patient registers or records. As a result, progress is often subjectively interpreted as any consistent weight gain, which means discharge criteria are not standardized. While staff might perform competently (follow the limited guidelines they have) they are significantly hampered by the general guidelines. The approach requires many trained staff and substantial inpatient bed capacity. Where these are available and sufficient attention is paid to the quality of care, there is good evidence that these protocols can substantially decrease case fatality rates in both stable environments and during emergency humanitarian interventions. (SPHERE project team 2003; Ahmed et al. 2006).

However, whereas there is good evidence that adequate training of health staff in the management of SAM is essential if the implementation of the World Health Organization (WHO) guidelines is to be effective, the evidence based supporting the view that the wider implementation of the WHO guidelines is key to the reduction of case fatality rates is weak (Collins et al, 2006) particularly skilled and motivated health staff is a vital determinant of success and effectiveness. Quality of CMAM services can be assured through adherence to national CMAM guidelines, continuous support to and supervision of Community-based Management of Acute Malnutrition (CMAM) services, and harmonized monitoring and evaluation tools that are linked to the national health information system.

2.9 Impact of Community-based Management of Acute Malnutrition (CMAM) Services.

From 2008 to 2013, World Vision Canada implemented Community-based Management of Acute Malnutrition (CMAM) in **20** Area Development.

Programs (ADPs) in eight countries. Two hundred and thirty-four outpatient therapeutic program centres were established as well as supplementary feeding programs and support of stabilization centres. The average recovery rate of 93% far exceeds the SPHERE international standard of at least 75%. The Community-based Management of Acute Malnutrition (CMAM) programs have also contributed to saving hundreds of thousands of lives during the Horn of Africa drought response in 2012 in Somalia, Ethiopia, Kenya and Tanzania, as well as the cyclical food crisis in the West African countries of Niger, Mauritania, Mali and Chad.

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To treat children with severe and moderate malnutrition, Community-based Management of Acute Malnutrition (CMAM) needs to be an integral part of the national primary health care system. World Vision has been instrumental in influencing the governments of Ethiopia, Kenya, **Zambia,** Burundi and North and South.

Sudan to include CMAM in their national health care policies (CMAM programs work with **communities** to identify, manage and prevent wasting). This encourages community ownership and sustainabi ity.

2.10 Factors Influencing Community-based Management of Acute Malnutrition (CMAM) Program.

A number of factors have contributed to the success in implementing Community-based Management of Acute Malnutrition programs.

World Vision/Canada in 2013 worked closely with community-based health systems and the Ministry of Health, Ghana to train community health workers and volunteers to actively conduct case identification, referral and follow-up in other to improve on access and coverage.

Despite CMAM's proven effectiveness in reducing child malnutrition, challenges remain with program implementation. Co-ordination between partners and a reliable supply chain for medicine and food is essential to the program's success. Community health workers need sufficient trainimz and supervision of Community-based Management of Acute Malnutrition implementation by district health personnel to ensure children receive adequate follow-up during the referral process. Data management was a major challenge as case information was often of poor quality and not accessible to decision makers within a reasonable timeframe. This at times undermined our ability to respond effectively and made it difficult to monitor program quality (World Vision Canada, 2013).

Community volunteers are trained to regularly screen and monitor all young children so cases of malnutrition can he identified early and treated immediately. This leads to more children being treated, faster rehabilitation and fewer deaths. Malnourished children are assessed and placed into one of three types of treatment, Supplementary Feeding Program (SFP), Outpatient Care (OPC) or Inpatient Care (IPC).

Standard, internationally-adopted Community-based Management of Acute Malnutrition (CMAM) protocols were adapted to fit existing health systems and services. Efforts were made

to harmonize CMAM with other national protocols such as Integrated Management of Childhood Illness (I MCI) protocols. Proposed amendments were only made for the districts where Community-based Management of Acute Malnutrition was to be implemented (e.g. adding Mid Upper Arm Circumference (MUAC) to the identification of Severe Acute Malnourished and Moderate Acute Malnourished). The aim was to ensure maximum integration and harmonization between these programmes, with minimum disruption to standardized health practices in the country. More significant changes were made, however, to reflect current research findings and international practice. This included three primary changes to standard Community-based Management of Acute Malnutrition (CMAM) protocols:

- A MUAC cut-off point of 11.5cm was incorporated as the primary referral and admission criteria
- 15% Weight Gain was adopted as the OPC discharge criteria for Nepal
- Cases of Moderate Acute Malnutrition (MAM) with complications were to be referred and admitted to 1PC.

2.11 Accessibility and Availability to Health Service Centers for Community-based Management of Acute Malnutrition (CMAM)

Jones, et al, 2003, concluded that two-third of child deaths could be prevented by interventions that are available today and are feasible for implementation in low-income countries at high levels population coverage. Rutherford et al (2009) cited several studies that simple traditional measures, such as distance from household to a health facility, availability of transportation and health care cost are used to determine accessibility. This they found to be inclusive. Recently, qualitative studies have suggested the need to additional barriers, such as lack of social support from primary caretli \' er, limited autonomy in decision-making and financial matters, and social exclusion at health

Financial autono; y likely to increase the primary caregiver's ability to access health care and pay for it. Qualitative research in Ghana has drawn attention to the importance of female financial autonomy for household expenditure in terms of the ability to obtain health care (Carlough & LeMas:2r J, 1998). Studies that look at the relationship between these factors and child death could be useful. World health organization also recommended a combination of improving quality of care and accessibility at first level public health facility and increasing access to care throu .1!1 the work of a community health worker (Shrestha et al. 2011)

Women and chi! 're • Face a number of health challenges especially in accessing the care they need most (castello et al, 2004 cited by Bigirwa, 2009). International agencies have always expressed the need to ensure that children and women access timely and appropriate health services in other to increase survival. The WHO (2005) emphasizes access to services by mothers and childre to access timely services as it is unethical to deal with health issues of women, whiles ignoring their children and vice-versa, because these groups are naturally interlinked, and mutually benefit from each other.

Community base nagement of acute malnutrition (CMAM) has been widely adopted as the most appropriate hi le for children with SAM: the United Nations support its integration with other community L. d health and nutrition activities in areas with a high burden of SAM (Collins et al.20e6: et al. 2007)

Community-has : • ::inagement of Acute Malnutrition (CMAM) has been delivered by trained health workers faun; rimary care facilities. While this has improved coverage in many settings, there are still issue. around community access and sensitization to CMAM programmes, including distam:' ; catment site and awareness of the programme (Guererroet al, 2010).

Community health workers (CHWS), defined as non-professional workers having limited education and coitii:ILt from communities they serve (WHO, 1987), have direct access to some of the most iincl..,;c:.:ed communities. Health services focused on preventive care commonly rely on CHWs and their ubiquity at the community level makes a viable candidates for performing simple, lifesaving tasks. With the development of community based strategies such as Community Case Management (CCM) and Community Based Integrated Management of Childhood Illness MCI), the role of the CHW has further expanded to include the provision of curative care (MARSH et al, 2008, 2009), and the World Health Organization (WHO) has started to explore the possibility of incorporating treatment of SAM into its IMCI protocols (A. Breind "unpuhi • observations"). There are challenges one can anticipate when further decentralizin ment of SAM in to standard community based protocols such as ensuring both that sufficient capacity exist, and the community awareness and coverage are adequate to ensure programme (;uality. However, developing an alternative service delivery strategy will also enable (Toitmit—.ity-based Management of Acute Malnutrition (CMAM) programmes to address some of current issues around community access and sensitization (Guererro et al. 2010). Studies contributing research on models for best service delivery practices in this area are therefore timciy.

In Ghana, the ' ! IS health care providers manage SAM cases in outpatient and inpatient care and collal?:' with health volunteers to conduct community outreach activities. Community-based .1.,inagement of Acute Malnutrition (CMAM) services are provided within existing MCI " -crvice delivery structures. Health facilities providing outpatient care including hosp dyclinics, health centers, community clinic, CHPS zones and community outreach point. I.: : •.2nt care services are provided solely in hospitals. Services are delivered by trained and s':;: ised community volunteers at the community with referral linkages with

the nearest health facilities and the most relevant in community with limited geography, social or economic access to health centers. (Michael A. NeeQuaye and Wilhelmina Okwabi, 2012.)

2.12 Integration ofCommunity-based Management of Acute Malnutrition (CMAM) into Already Existing Health System

A review of CMAM by the Food and Nutrition Technical Assistance (FANTA) project in Ethiopia, Malawi and Niger (FANTA, 2008) came out with the strength and weaknesses in integrating CMAM into the already existing health systems in these countries. Ethiopia has benefited from strong external support in service provision and capacity building. However, there is the need for stronger engagement of Ministry of Health department to take on Community-based Management of Acute Malnutrition (CMAM) responsibility. Integration of Community-based Management of Acute Malnutrition activities into health system is facilitated by NGO-supported CMAM support unit which provides regional and district-level support for MOH CMAM scale-up, and there is momentum to replicate integrated CMAM relying on minimal external support while maintaining staff capacity and service quality. The potential for building or strengthening links beyond CMAM to other program contexts, such as Integrated Management of Childhood Illness (IMCI), the Enhanced Outreach Strategy for Child Survival and the Health Extension Programme, provides additional opportunities for CMAM integration into the health system. However, the motivation, interest, and capacity created within the MOH by the presence of NGOs and UNICEF is at risk of stagnation or decline, given the recent closure of numerous NGO programs as some emergency funding came to an end. The sudden departure of NGOs endangers Community-based Management of Acute Malnutrition (CMAM) services and risks the collapse of CMAM in certain areas of Ethiopia where the MOH is not sufficiently engaged. As long as the MOH does not take a leadership role and CMAM is not integrated into

MOH policies and plans, job descriptions of health care providers and pre-service training for professional qualifications, there will be limited ownership and sustainability.

In Malawi, two cases of drought in 2002 and 2006 served as catalysts to scale up Community-based Management of Acute Malnutrition (CMAM) services throughout the country, with NGO and MOH programs transitioning from traditional, center- to community-based services for SAM (FANTA, 2008). MOH engagement and leadership, as well as district-level motivation, have contributed to significant success in Malawi. The MOH has been engaged in Community-based Management of Acute Malnutrition (CMAM) from the start, informed by the evidence of the pilot programs. Moreover, the MOH had access to CMAM technical assistance through significant NGO support, which later was institutionalized by creating the CSU. During the 2005 drought emergency, the Ministry of Health (MOH) took the lead role in guiding the gradual expansion of CMAM programs and further encouraged involvement of district-level MOH managers and staff. The early recognition of the need for a Community-based Management of Acute Malnutrition technical support unit seconded to the MOH has been beneficial for Community-based Management of Acute Malnutrition scale up and will be important for sustainability. Malawi CMAM programs serve as important national as well as international learning sites for Community-based Management of Acute Malnutrition good practices and integration of services. There are a variety of experiences and strategies employed by the NGOs in integrating CMAM into the health system. One Non-Governmental Organizations (NGO) with specific skills in strengthening health systems has been very successful in integrating Community-based Management of Acute Malnutrition during the emergency phase. Other examples of successful MOH-managed Community-based Management of Acute Malnutrition services with minimal external support were observed. Niger is subject to recurrent droughts and frequent food insecurity. Prior to the 2005 nutrition emergency, treatment of SAM was

mainly restricted to NGO programs outside of MOH facilities. During the 2005 crisis, national CMAM guidelines were developed and community based services were rapidly expanded by numerous NGOs. A few NGOs did actively involve the MOH in program set-up, in-service training, support and supervision, and program monitoring.

In these instances, MOH staff has provided the Community-based Management of Acute Malnutrition (CMAM) services as part of routine health services at MOH health facilities, with limited NGO logistical and supervisory support. NGOs face numerous difficulties in adapting their programs so that the CMAM services can be integrated into the health system. The discussion around the integration of CMAM services in Niger underscores two public health dilemmas. One is the question of managing health services in emergency versus development contexts and of treating high caseloads through high levels of external resources and the set-up of parallel systems versus achieving integrated, sustainable services. The second is the tension between achieving-high-quality care and expanded coverage. The Bardiya experience (Guerrero, 2010), shows that CMAM is an effective model for the community-level identification and treatment of SAM. Key indicators, including cure (68.2%) and death rates (0.34%), transfer to IPC (2.62%) and non-responders (0.34%), were comparable to those of other (more resource-intense) CMAM programmes. The pilot programme succeeded in integrating existing community networks for the purpose of sensitization and case -finding.

The integration and strengthening of the Female Community Health Volunteers system is a positive outcome - not only for the purposes of the pilot, but also for ensuring the successful continuation of the Community-based Management of Acute Malnutrition (CMAM) programme in the district. Experience has shown that starting small and gradually expanding the geographical coverage of CMAM, allows for improved monitoring, higher programme

performance and the lesson learning platform required for future expansion of CMAM (Guerrero, 2010). The sudden departure of NGOs endangers CMAM service and risk the collapse of Community-based Management of Acute Malnutrition in certain areas of Ethiopia where the Ministry Of Health is not sufficiently engaged. Levels of SAM in Niger remains high and access to services for the management SAM is low. Only one Community-based Management of Acute Malnutrition programme visited by the FANTA team had quality community outreach, attaining high coverage and thus documenting the true extent of the emergency. Ministry Of Health engagement and leadership as well as district-level motivation, have contributed to significant access in Malawi (FANTA, 2008),In a presentation on Community-based Management of Acute Malnutrition (CMAM), the speaker explained that the treatment of acute malnutrition would be integrated within existing health systems so that at each entry point, e.g. EPI, growth monitoring, IMCI, PMTCT, a child would have a MUAC measurement taken and would be treated with RUTF if with SAM. This public health approach would allow rapid scale up and mass diagnosis. There would be limited follow up of children, thereby reducing costs and resources, and increasing number of points of contact would allow early presentation and increase coverage and clinical effectiveness. Monitoring would not need to be too detailed or cumbersome with results based on under-five mortality rates (FANTA, 2008).

2.13Health Seeking Behavior of Caregivers of Malnourished Children

Health behavior is any activity undertaken by an individual who believes to be healthy, for the purpose of prevention or detecting illness in an asymptomatic state. The health seeking behavior of mothers and availability of child health services have been influenced by the health promotion activities of the Community Health Officers (CHOs) and the Community Based Agents (CBAs). (GSS et al, 2003) Various studies from developing countries have reported that delay in seeking

appropriate care and not seeking any care contributes to the large number of child deaths (D'Souza, 2003)).

As cited by Glanz, et al, (2002) and OgednJ (2007), the health Belief Model is a health behavior change and psychological model developed by Irwin M. Rosenstock in 1966 for studying and promoting the uptake of health services. The model is built on the premise that, health behavior is a function of specific health belief; all must be operating for a (risk reductionlhealth promoting) behavior to occur. Subsequent amendment to the model was made as to accommodate evolving evidence generated within the health community about the role that knowledge and perceptions pay in personal responsibility. A person motivation to undertake a health behavior can be divided into three categories; individual perceptions, modifying factors, and likelihood of action. The model explains how the following factors influence health seeking behavior:

- Perceived barriers (an individual's assessment of the influences that facilitate of discourage adoption of the promoted behavior)
- A variant of the model include the perceived costs of adhering to prescribed intervention as one of the core beliefs.
- Perceived severity (an individual's assessment of the seriousness of the condition, and its potential consequences)
- Perceived susceptibility (an individual's assessment of their risk of getting the condition)
- Perceived benefits (an individual's assessment of the positive consequences of adopting the behavior)

The following mediating factors also connect the various types of perceptions with the predicted health behavior:

- Perceived efficacy (an individual's self-assessment of ability to successfully adopt the desired behavior)
- Social-psychological variables (such as social economic status, personality, coping strategies)
- Demographic variables (such as age, gender, ethnicity, occupation)
- Perceived control (a measure of level of self-efficacy)
- Perceived threat (whether the danger imposed by not undertaking a certain health action recommended is great).
- Cues to action (external influences promoting the desired behavior, may include information provided or sought, reminders by powerful others, persuasive communications, and personal experiences)
- Health motivation (whether an individual is driven to stick to a given health goal

The prediction of the model is the likelihood of the individual concerned to undertake recommended health action such as preventive and curative health actions.

2.14 Community Participation and Mobilization in Community-based Management of Acute Malnutrition (CMAM)

The quality of engagement with target communities is a vital determinant of the success of a community-based programme. Community mobilization is crucial for effective early case-finding and early case finding and the quality of Out-Patient Care (OPC) service provision are the two most important determinants of case fatality rates, programme coverage and the impact of the programme.

We use the term 'community mobilization' to refer to a range of activities that help implementers understand the affected communities, build relationships with them and foster -

their participation in programme activities. The objective is to enhance the immediate programme impact whilst creating a platform for comprehensive community mobilization over the longer term. Fostering community participation at the beginning of the programme also facilitates integration with other longer-term programmes in other sectors such as health, food security etc. It is particularly important to have information on community structures (both formal and informal), key stakeholders (traditional authorities, traditional and western health practitioners, civil society etc), literacy levels, terms used to define malnutrition, who is responsible for children, who makes key decision on household resource allocation, attitudes to health and malnutrition, health seeking behavior, and formal and informal means of communication used.

Community sensitization aims to raise awareness of the programme, promote understanding of its methods and lay the foundations for community ownership in the future. Sensitisation messages should provide essential information about the programme's aims, methods and actors. In particular people must know what the programme will mean to them in practice: what will it do, where it will operate, who will implement it, how can people access it and what will accessing the programme mean to individuals?

Messages must be formulated and disseminated with the active involvement of key stakeholders in a language that local people understand

Experiences indicate strongly that it is inadvisable to use financial rewards to motivate community sensitization. People who are paid for delivering messages may not necessarily be convinced of the message or convincing whilst communicating it. If material benefits are offered, communities often put forward the more powerful and privileged to do the work and more motivated, interested and credible people may be excluded (Collins et a1,2005).

In order to be able to provide the largest possible proportion of the acutely malnourished population with access to care, a programme needs to be very effective at identifying people who need care and admitting them to the programme. To reduce the barriers to access, screening must take place in the community using a simple, low cost method that is easy for community-based volunteers to use and is accepted as fair and transparent by the population.

In 1978, member states of the WHO voted to adopt the policy of Primary Health Care (PHC). They recognized that health improvement were not merely the result of health service delivery and medicines. Reflecting recognition of social determinants of health which include social, economic and political concerns, PHC according to WHO as based on principles of equity and community participation and supported by recognition of activities for appropriate technology, multi sector collaboration and sustainability. The idea that community lay people had a crucial role to play in health improvement was in the PHC policy for several reasons.

1. Community resource including money, materials and time can contribute to improved health.
2. People's health is not merely an outcome of health services but equally important to what people do to and for themselves.
3. Health improvements and sustainability of community health programs depends on people defining their needs and taking action to meet these needs.
4. "Social learning" where professionals and community people learn from each other enables both groups to define joint purpose and build partnerships.

In the years following the acceptance of PHC, efforts were made to integrate the principle of community participation into the health planning and health care. Jewkes and Murcot (as cited

by Lewycka et al 2010), however, noted that his was not an easy task because there was no agreement on standards definition of the terms "community" and "participation".

"Community" is usually often defined in geographical terms, but this does not always capture the deeper reality around which group form: identities, ideologies, religious, income, etc and member do not necessarily want the same thing at the same time.

Defining "participation" is equally complicated. As noted by Oakley (and quoted by Lewycka et al. 2010), participation can be active or passive; can be contributive, collaborative or transformative. In addition, authors directly addressed the question of power in community participation and how participation reflected who had power and for what it was used. A study conducted in Malawi also noted that community based health interventions do not always involve between officials and communities, communities may feel their needs are not being met and powerful groups may capture resource (Lewycka et al. 2010).

To understand experience of integrating community participation into health care programs. Rifkin (2001) developed a typology that enabled planners to view how they approached community participation in their own programs.

1) The medical approach: Health is defined as the absence of disease and participation as having people to what the professional advises. This approach may be seen as mobilizing communities.
2) The health services approach. Health is defined by the WHO as "the Physical, mental and social well-being of the individual" and participation as a contribution of the community's time, materials and/ or money. This approach might to view as collaboration, but with professionals defining what is needed.

3) The community development approach. Health is defined as a human condition and participation as the planning and managing of health activities by the community using professionals as resource and facilitators. This approach might be seen as empowerment, which is creating opportunities for those without power to gain knowledge, skills and confidence to take decisions that affect their own lives (Rifkin and Pridmore, 2001). These difference approaches to community participation in health improvement has affected and poverty eradication and traced the historical development of some critical points relationship between better health and community participation (Rifkin et al 2000).

Case studies suggest that move sustainable improvement is possible community empowerment through participatory approach is pursed. However, programs pursuing empowerment face challenges that include the need to address issues of power and control.

A more extensive investigation published by Taylor – Ide and Taylor (2002) discusses in detail the results of improvements in health and overall development of community participation.

Hossain et al (2004) confirmed the fact that little evidence exists on how interventions can be replicated or on the relationship between community participation and health outcomes. To quote: "In these years, of research and project implementation, one can observe a myriad of factors that may have played a role in improving health, but the challenge remains to find the definite answer regarding the share between interventions and the process of implementation (influence of community empowerment or development) in improving the health of communities and at what level and scale."

These conclusions help to define the challenges for assessing the role of community participation on health outcomes in nutrition programs for child survival and anemia.

The study by USAID and AFRICARE observed that when community mobilization increased community demand for more interventions. PHC assumed that community participation was - critical for health improvements directly have been scarce. Much evidence indicates that without community participation health and development programs have difficulty (Pritchett, 2004). The search for the converse has proved elusive. For example, in trying to address the direct impact of participation on health improvements Manandhar and colleague proved how participation in women's groups in a controlled study in Nepal improved ante-natal outcome (Manandhar et al 2004). The tightly controlled epidemiological study illustrated a causal relationship. However, the study and subsequent publication have so far failed to describe how these women's groups functioned and whether each group had exactly the same intervention. This example shows how difficult it is to identify and describe the process by which communities are involved in health programs.

Engaging women in improving community health is an important component of equity in primary health care. Community participation approaches endeavor to empower women with confidence and skill to adopt new and senior roles. This not only promotes equity, but may also benefit child health outcome as women are more likely to use any improved knowledge or income for their children.

Equitable and sustainable health programs require communities with planning and management skills. This means communities can plan around their needs in a locally appropriate way which may also foster local program ownership since it stems from local people's ideas and time investments. Strong planning and management skills means that the community will be more likely to adapt the program to changing circumstances, thus maintaining program effectiveness. Activities to promote such skills include active participation in needs assessments and

monitoring and evaluation. Effective and sustainable control of childhood illness including malaria acute respiratory infection (ARI) and diarrhea in several endemic countries have been achieved through multi- strategic approaches of community engagement and participation (MOH/GHS, 2010).

Full community participation in designing a health program is likely to lead to a locally appropriate design that addresses community priorities. This may increase program effectiveness and enhance community ownership of the program, contributing to its sustainability and encouraging local people to invest their resource in it.

2.15 Monitoring and Evaluation

Technical review meeting Report (GHS/UNICEF, 2011) on CCM and Community-based Management of Acute Malnutrition (CMAM) revealed that in all the presentations (from Kassena/Nankana and Bawku West districts and Bolgatanga Municipality), it was realized there was high defaulter rate. However, Bawku West district gave reasons such as: migration of people leading to high defaulter rates and other non-implementing districts coming to access the service but withdrawing late due to long distance. Community-based Management of Acute Malnutrition (CMAM) learning report, Strengthening Facility based CMAM Supervision was conducted at Machinga, Malawi. The report revealed the key findings of strong and weak points from the Machinga District Hospital visit. The strong points include; Supervision was reported to have been done monthly using the supervisory check list. However, according to the available documentation, supervision is done quarterly. There are 10 officers that conduct CMAM supervision and these include the community nurse, focal person, Integrated Disease Surveillance Response Coordinator (IDSRC) and the zone officers. And tools for CMAM supervision were available. The weak points also includes, Documentation in the OPC is not

done accurately. Community-based Management of Acute Malnutrition (CMAM) data was filed; however, the data was not properly separated according to CMAM programme. Clinical examination is not being done for OPC admissions.

Until recently, coverage was estimated using an adaptation of the WHO Expanded Programme on Immunization (EPI) coverage survey method .This method uses a two-stage cluster sampling approach and a sampling procedure, called probability proportional to size (PPS). Sample size - restrictions imposed by the fact that severe malnutrition is a relatively rare condition means that such survey estimates tend to lack useful precision. In addition, PPS sampling locates the bulk of data collection in the most populous communities. This may leave areas of low population density, often those communities that are likely to be distant from health facilities, feeding centers, and distribution points, un-sampled. It is these areas where coverage is likely to be lowest with a result that PPS surveys may evaluate coverage as being adequate even when coverage is poor or non-existent in many areas outside of urban centers (Haider, 2000). As part of the CTC programme we have developed a new direct method of assessing coverage (Myatt et al., 2004). This method is simple and rapid to implement, provides a useful level of precision and allows examination of the geographical distribution of coverage. It also provides an estimation of prevalence. This survey method involves dividing the survey area into non-overlapping squares of equal area (quadrants) and sampling the community or communities located closest to the center of each quadrat. During sampling, the method uses an active case-finding approach to find cases of acute malnutrition. This involves the surveyor asking community health workers, traditional birth attendants, traditional healers and other key informants to take them to see 'children who are sick, thin, have swollen legs or feet, or attending a feeding programme' and then asking the mothers of confirmed cases to help identify other cases. It is important to use the local terms for thin, wasted, oedema, kwashiorkor, baggy-pants,

sickness, feeding programme, wrist-band etc. These local terms should have been ascertained during the social enquiry that preceded the start of the programme. It is important that the case-finding method used finds all, or nearly all, cases in the sampled communities and in previous surveys and we have performed "capture ; re-capture" methods using different case finding approaches to verify that this was the case (Myatt et al 2004;Feleke, 2005).

2.16 Knowledge and Acceptance Level of CMAM.

In evaluation of community management of acute malnutrition by UNICEF in 2010, it was revealed that, lack of awareness of the programme, was the second most common reason for non-attendance to Community-based Management of Acute Malnutrition (CMAM) centres in the regionand the persistence of lack of awareness as a barrier suggested that, effective engagement with beneficiary communities was often lacking.

Also Under the Sphere Project, titled 'Humanitarian Charter and Minimum Standards in Disaster Response' in 2004, Suggested that strengthening community sensitisation activities remains a key activity to increase coverage even in more successful programmes and in cases of lack of awareness and knowledge of a program.

However sensitization Engagement/activities are particularly challenging in resource-limited settings where health systems are weak and less integrated to the population

According to Camille and Sheila **(2011),** the outreach element of the CMAM model-UNICEF model, is not prioritised leading to the dominant model of delivery being facility based and relying on passive case-finding between the programme and the community which can be led by outreach worker networks.

It is therefore necessary for appropriate messages based on socio-cultural assessments and using local channels of communication to increase community awareness remain critical in CMAM process.

To ensure high Community-based Management of Acute Malnutrition (CMAM) programme uptake depends on the degree of awareness of malnutrition as a condition that can be treated successfully, and the availability of treatment at low cost to the beneficiary household. Increasing both awareness and programme coverage requires that CTC Implementers devote appropriate time and resources to the planning and implementation of sensitisation activities. The acknowledgement of a problem will permit the development of community awareness, in order to provide a probable intervention implementation plan to address the identified problems - The result from program's outcomes should be visible at this point, and have favoured community's acceptance of the intervention (Oosthuizen & Louw, 2013).

Handler and colleagues (2001) and Hawe and colleagues (1997) also suggested adequate staff training and institutional capacity building as necessary constructs for program goal achievements. Sustainability Framework can provide a systematic process to promote program planning towards sustainable health outcomes. The Sustainability Framework combines the internal factors (e.g. staff competence, supervisory skills) and the external factors (e.g., political commitment, funding and 23 health impact). The internal factors focus on the providers' capacity to maintain intervention activities; whereas external factors are common to any program implementation to achieve sustainability.

One needs to recognize the contextual characteristic of the intervention's implementation. The program developer should utilize the communication channels to optimize the transfer of the intervention's activities to the implementing agency with fidelity. In addition to the previous, organizations should also encourage sustainable capacities for the implementation of the evidence-based interventions?

2.17 Considerations in Community-based Management of Acute Malnutrition Process.

The addition into international protocols of the outpatient treatment for severe acute malnutrition without an inpatient initial phase for stabilization requires a change to the existing **WHO** classification of wasting and oedema. The existing WHO classification has only two categories for acute malnutrition: severe malnutrition and moderate malnutrition, defined according to anthropometry and the presence of bilateral pitting oedema. This classification was operationally useful when there were only two modes of treatment available; inpatient therapeutic care for people with severe acute malnutrition and outpatient supplementary feeding for those with moderate acute malnutrition. However, the addition of a new mode of outpatient treatment for the severely malnourished requires the division of the severe acute malnutrition category into either "severe acute malnutrition without complications" for severely malnourished patients who can be treated successfully using outpatient treatment alone, or "severe acute malnutrition with complications" for those who require inpatient treatment. The moderate classification remains the same.

In community-based programmes, this division of severe acute malnutrition is important to provide a basis for patient flows through the system and guiding staff in their decision on whether people needs inpatient or outpatient treatment. The additional "severe acute malnutrition without complications" category, combined with direct admission into outpatient therapeutic programmes, avoids many possible negative consequences for patients and the programme. If patients with "severe acute malnutrition without complications" are admitted into inpatient centers, they are exposed unnecessarily to additional risk of infections. The career, usually the mother, has to spend a substantial period away from her family including other children. This may result in increased malnutrition in the other children and undermine the economic activity and food security of the household. It is also usually unpopular with people

and discourages early presentation and encourages default. The inappropriate use of inpatient care also has important resource implications with space and resources in resource-intensive inpatient centers allocated to patients who do not need inpatient care, thereby reducing the programme's impact and increasing its costs. On the other hand, if cases of severe acute malnutrition with complications are not admitted into inpatient care, morbidity and mortality will increase.

This classification will help harmonies the criteria for severe acute malnutrition used in humanitarian therapeutic feeding programmes with those included in the IMCI guidelines for more stable situations. At present, there are marked discrepancies between humanitarian practice as recommended by the WHO and the IMCI guidelines. Humanitarian guidelines use WHM (or z scores) and presence of oedema as criteria for admission into therapeutic feeding. By contrast, WHM has never been recommended by the WHO for community screening. Instead, the IMCI assess weight for age but bases admission into hospitals upon the presence of "visible severe wasting", severe palmar pallor or oedema of both feet.

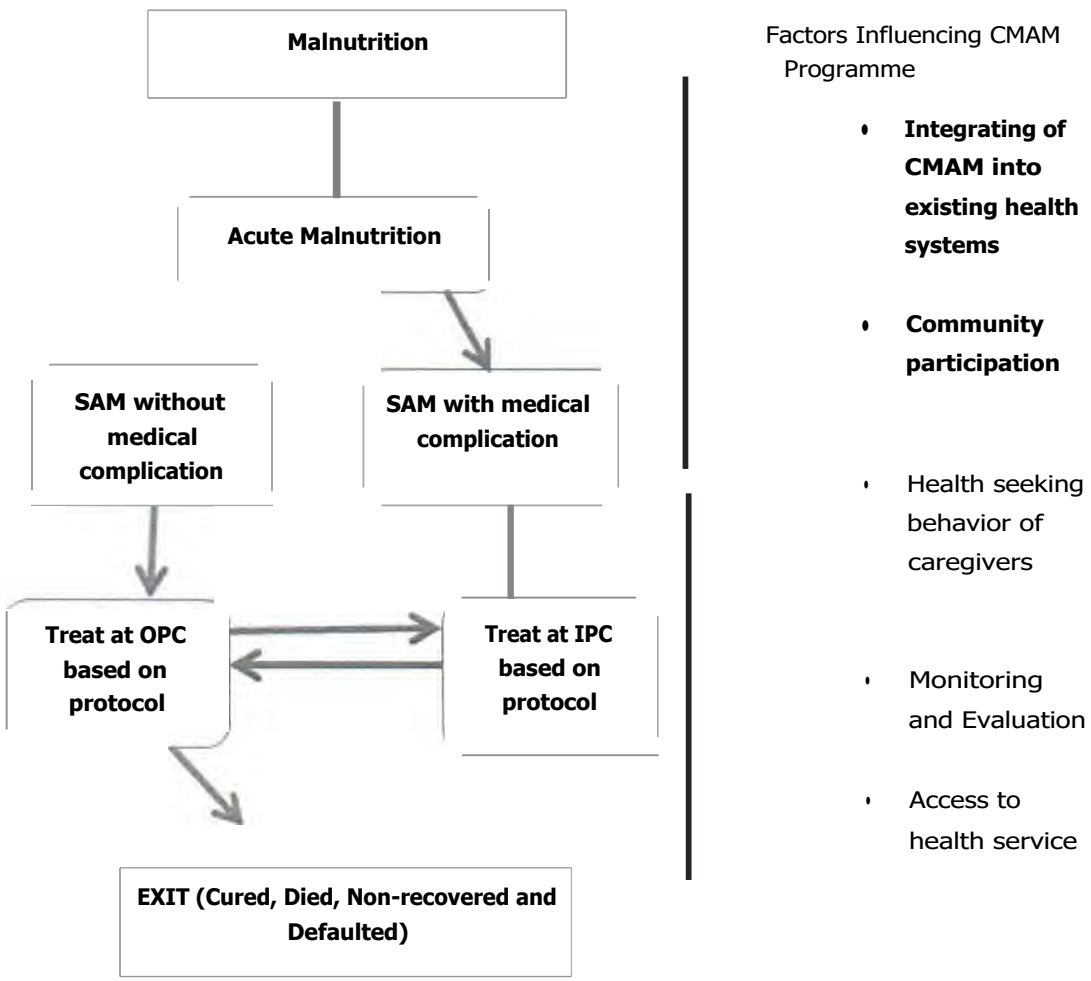
Replacing "visible severe wasting" with a more quantifiable MUAC <11.5cm criteria, will also improve discriminatory power and decrease subjectivity in the referral of severely malnourished into treatment programmes. Oedema occurs in both this classification and the IMCI criteria. The only change is to include moderate oedema (grades one and two) as criteria for outpatient programmes and only severe oedema (grade three) as a criterion for inpatient admission of community-based interventions.

2.18 Conceptual Framework of Community-based Management of Acute Malnutrition

It is acknowledge that children presented with malnutrition with medical complications are admitted into the inpatient care where the Childs situation is managed/treated. And after a

positive response to treatment (gaining 15 % of body weight and absence of complications) is then enrolled into the outpatient care to conclude with the management and treatment process. This concept is adapted from UNICEF CMAM model, 2012. However the factors that influence the successful impact of CMAM program is highlighted as essential and worthy of consideration in diagrammatically representing CMAM so as to have a holistic view and approach in the management and treatment process.

Figure 2.2: Conceptual Model of Community-based Management of Acute Malnutrition



Source: Adopted from UNICEF model, 2012 but modified by investigator.

CHAPTER THREE

METHODOLOGY

3.0 Introduction

This chapter describes how the research was conducted. According to Kitchen and Tate (2000), methodology is a coherent set of rules and procedures which can be used to investigate a phenomenon or situation.

The chapter describes the research design, the population and sampling, the tools for data collection, the plan for data analysis, presentation of results, quality control, ethical considerations, the study limitations, work plan and budget, as well as the plan for dissemination of results. **The** study was conducted in five Sub-Districts in Savelugu/Nanton Municipality. The main method for the collection of data was the use of questionnaire and semi-structured interview guide. The questionnaire was logically and systematically organized to bring out the main and sub-objectives of the study in the most appropriate way to elicit the desire responses to answer the research question.

In the study, a diverse form of methods was employed to generate the required data. The sampling procedures, data collection techniques and tools and the analysis of the data were critically considered to ensure minimal biases and make the data more reliable and valid.

3.1 Study Design/Type

According to Mowton, 2001, a research design is a way in which a study is developed.

This study on the basis of maximizing the reliability of results employed a combination of both qualitative and quantitative research methods.

Researchers have been conducting mixed **methods research for several** decades, and referring to it by an array of names. Early articles on the application of such designs have referred to them

as multi-method, integrated, hybrid, combined, and mixed methodology research (Creswell and Plano Clark 2007: 6).

I agree with Tashakkori and Teddlie (2003) calling the combination as mixed methods research, referring to all procedures collecting and analyzing both quantitative and qualitative data in the context of a single study.

The basis for employing these designs are likewise varied, but they can be generally described as methods to expand the scope or breadth of research to offset the weaknesses of either approach alone (Greene, Caracelli, and Graham 1989, Rossman and Wilson 1991, Pasanen, 2013).

For instance it almost impossible to avoid subjectivity of the researcher from influencing the research process in a qualitative studies, therefore quantitatively this could be mitigated

Also in the case of quantitative approach, the researcher seeks to obtain objective opinions about the subject of study whereas in qualitative approach, there is nothing like the objective truth, the researcher is interested in meanings as they appear to, or as they are archived by persons on live social situations (Sherman and Webb,2000).

3.2 Study Area

The Savelugu/Nanton municipal is one of the districts carved out of the West Dagomba in 1988. The municipality is about 1,760 square kilometers and shares boundaries with the Tamale metropolis to the South, Karaga district to the east, West Mamprusi to the north, and the Kumbungu district to the west.

The population for the area is 147,457 which is mostly rural and covers 218 communities with a population density of 58.7/square kilometer. This population is predominantly young, and people under 15 years of age constitute as high as 49% of residents (GDHS, 2008; UNICEF 2000). The area is predominantly inhabited by the Dagomba ethnic group with a few other tribes

from other parts of the country who are mostly working in government and non-government departments.

Socio-cultural and•religious norms in the communities of the municipality vests most authority in the hands of chiefs, religious leaders and clan heads that are mostly male. The system of inheritance is patrilineal thus making women more dependent on men for resources.

Women are therefore disadvantaged in terms of access to education, health, and other social amenities in relation to men though they face the same levels of poverty. The females comprise 51% of the population and 49% are male. However, only 3.1% of household heads are women. The average house hold size is 8.7 with the lowest being one and the highest 47(DHMT Annual Report 2013).

The District Health Administration (DHA) has five sub districts which serve as the main Out-Patient Care sites for the Community-based Management of Acute Malnutrition (CMAM) programme, a government hospital and two private clinics. The Savelugu municipal hospital serves as a referral center for the rest of the health facilities. There are eight operational CHPS zones, thus Dipale, Kundanali, Guntingli, Nanton, kurugu, Fazihini, Nambagla, Pigu, and Nyolugu.

3.3 Study Population and Units

A population is the total collection of elements about which we wish to make some inference (Cooper and Schindler, 2001). Kumekpor (2002) also defines population in the context of research as the total number of all units/elements of the phenomenon to be investigated that exist in the area of investigation. However Anaman (2003) describe population in the context of research as elements, objects or events of a group that confirm to specific criteria that the researcher intends to investigate to make generalization. The main study population and units in this study was mothers with SAM children, Programme managers, volunteers and some

stakeholders in the community. The Out-Patient Care admission cards were also reviewed to ascertain the case load and possible barriers to the implementation of the programme. This helped put the subject matter in perspective and also understood the situation and where it prevailed more for effective planning and decision making.

3.5 Sampling Size

Since this is a cross sectional study, the (Cochran and Snedecor, 1989) sample size determination formula was used to determine the sample size.

$N=z^2pq/d^2$ where

N is the sample size desired

z is the statistical certainty chosen= 1.96 at a confidence level of 95%

p is the estimated prevalence of Acute Malnutrition in Northern Region =0.08

q is the proportion of well-nourished children — 1-p = 1-0.08=0.92

d is the precision desired = 0.05 (5%)

$$n = \frac{(1.96)^2 \times (0.08)(0.92)}{(0.05)^2}$$

$$n = \frac{3.8416 \times 0.0736}{0.0025}$$

n = 113.1 = 113

Since it is a clustersampling technique a correction factor of 2% was used the estimated sample size to get 226. Using 10% as non-respondent rate, a value of 23 was added. Therefore the total estimated sampling sized to detect the smallest change is 249.

3.6 Sampling Method and Technique

Sampling is the process of selecting a portion of the population to represent the entire population or the process of selecting a number of study units from a defined study population (Varkevisser, et al, 2003). Sampling is used because of limited time and resource available. The main purpose of sampling is to get a representation of the population to draw conclusions which are valid for the whole study population. A multistage and random sampling technique was employed after identifying the **five** OPC sites across the municipality Multistage sampling is a technique where by the elements are selected from natural occurring group or areas and then randomly selecting individual elements from chosen groups and areas and these was done as below:

The municipality has five (5) sub districts which serve as the Out-Patient Care (OPC) sites and each has several communities under them. Mothers of children with SAM were recruited at the five (5) out-patient sites in the municipality namely Tampion, Nanton, Diare, Pang Tamale and Savelugu RCH randomly for the research.

I. The caseload of each OPC site was identified through a review of clients' card and register.
II. Proportions of the sample size were assigned to the OPC site depending on the case load.
III. Samples were randomly selected based on the sample size of the OPC site.

To avoid bias with respect to the sampling either by convenience or random the following sampling procedure was carried out:

a) The selection of the clients was done by bring all the 'green cards' together and arranged them according to their unique OPC numbers.
b) Numbers **(1 to** 100) were written on a piece of paper, folded and put into a bowl. The Community Health Nurse (CHN) was allowed to pick randomly from the numbers till the last sample was gotten.

c) Cards of the numbers chosen were then sampled out and by the help of the community health workers and volunteers, selected children and their mothers were contacted. The district and sub district focal persons were also interviewed.

For the community based assessment, two communities under the implementing sub district (OPC site) were sampled out conveniently based on high coverage and low coverage principle. By this, the community with the highest admission and that with the lowest admission qualified for the survey. In all 10 communities, 10 volunteers, 6 focal persons for the programme and 260 beneficiaries were selected in the survey.

3.7 Study Variables

Both quantitative and qualitative methods were employed in measuring the variables of the - study. The key variables studied were:

3.7.1 Dependent Variable

Effect of Community-based Management of Acute Malnutrition (CMAM) Programme intervention aimed at reducing child morbidity and mortality.

3.7.2 Independent Variable

1. How the CMAM Programme is implemented at the community level.
2. Number of children benefiting from the CMAM Programme.
3. Number and quality of staff at the community level implementing the Programme.
4. Types of health activities implemented at the communities.
5. Level of awareness of caregivers on the intervention.

3.8 Data Collection; Study Tools and Instruments

Qualitative and quantitative data were gathered using a structured questionnaire with both closed and open-ended questions, Focus Group Discussion (FGD) and Key Informant Interview (KID

In all, forty FGDs_ were conducted in 10 communities (4 in each community with at most 7 participants), three with community people (including (i) grandmothers, (ii) women of child-bearing age and (iii) men who were opinion leaders) and one with beneficiaries in each community. In addition, thirty KIIs were held, three in each community with one each of the following: (i) religious leaders (an Imam, Pastor and church leader), (ii) CHV, and (iii) health staff (Nurses who conduct CMAM clinic).

These was to enable not just the collection of Data at administrative level, community level and individual/beneficiary level but to ensure detailed and accurate local perspectives and appreciation of the issues of Community-based Management of Acute Malnutrition (CMAM).

3.8.1 Administrative Level

Data was collected on the coverage, challenges and practices of the health staff, community volunteers and beneficiaries. The main tools used at this level were structured questionnaire. Secondary data on staff strength, source of funding, programme standards and treatment protocols, challenges among others was also taken at this level.

3.8.2 Community Level Assessment

At the community level, data was collected on the awareness, knowledge and practices as well as the perceptions of the community members on malnutrition.

The Focus Group Discussion (FGD) was guided with structured questionnaire was conducted for the mother-to-mother-support groups, father groups, lactation mothers and pregnant women. The Key informant guide was also used to interview the 'gate keepers' such as the chief, chief Imam, Pastor, Mallam, Fetish Priest, and Assembly man/woman to gather in-depth knowledge on the barriers of the Community-based Management of Acute Malnutrition (CMAM)

programme in the study communities and how they think it has affected the nutritional status or development of children (6-59 months) an thereby suggest ways of enhancing them.

3.8.3 Individual/ Beneficiary Level Assessment

At the individual level, anthropometry data was collected on the participants of the program to assess the improvement in their nutritional status that is attributable to the program. Data on the age of the children was collected. The anthropometric measure taken was MUAC and weight. The presence of bilateral pitting odema was also assessed. This figure was compared to the one measured on their admission at the outpatient center.

Data was also collected on the background characteristics of the mothers of the children using a structured questionnaire. These were collected to see if they affect the patronage of the program and the progress of their children throughout the program. Their knowledge on the program was also taken to assess how they understood the instructions or counseling given to them by the officials at the outpatient center. They were also asked whether the officials at the center makes follow — up to them when they miss a session or default.

A separate focused group discussion was organized for caregivers of children who defaultered, cured, died and those still in the programme

3.9 Data Analysis and Presentation of Results

Data collected were edited, cleaned and structured (grouped either as categorical or non-categorical) and fed into Statistical Package for the Social Sciences (SPSS) version 18, processed and presented in the form of tables, charts and percentages for easy understanding. Efforts were then made to explain the graphical presentations in written form.

Advanced statistical tests such as chi-square (x^2), cross-tabulations, one way Analysis of variance (ANOVA) and regression analysis were employed to measure the degree of relationship and difference of the data collected.

Chi-square analysis in statistics is to test the goodness of fit to verify the distribution of observed date with assumed theoretical distribution. It is a statistical measure used in the context of sampling analysis for comparing observed variance to theoretical variance. It was employed to test for the association of health seeking behavior among caregivers with malnourished children.

Analysis of variance (ANOVA) is an extremely useful technique concerning research. This is used when multi sample are involved. It is used to test the difference among different groups of data for homogeneity. If we take only one factor and investigate the differences among its various categories having numerous possible values one-way ANOVA can be used. Therefore One-way ANOVA was used in the study to test for homogeneity among accessibility factors such as time taking or distance to the nearest OPC site and health seeking behaviors of the different samples.

The Regression analysis deals with the nature of association between two or more variable. In - regression analysis we are concerned with the estimation of one variable for a given value of another variable on the basis of an average mathematical relationship between the two variables. Hence the analysis .was used to find out whether improvement in community based service such as outreach and household services predict high patronage of the programme.

Emergency Nutrition Assessment (ENA for SMART 2011) was also used to enter and analyze anthropometric data of the children. WHO standard reference (WHO flags) was used and data that were outside the range were excluded.

3.10 Quality Control

In order to obtain information on the acceptability and quality of the programmes, caregivers of children in the CMAM programme, the community volunteers and health officials both at the facility and district level were interviewed to get accurate and complete answers to maintain quality of the study.

The survey team was made up of interviewers who are health staff from the district who have experience in field surveys and speak the various dialects present in the district. Data was collected from the respondents in their native language. Therefore, questions were asked to the best of their understanding and no ambiguities, so as that quality will not be compromised. Before and during data processing, the information was checked for completeness and internal consistency.

3.11 Ethical Consideration

Written ethical clearance and authorization was sought from the Regional Director of Health Service (RDHS) for Northern Region through the District Director of Health Service (DDHS) for Savelugu/Nanton Municipal. For interviewees, verbal consent was sought from each individual before the interview was conducted. Confidentiality was assured and ensured.

3.12 Reliability and Validity

Reliability refers to the extent to which data collection techniques or analysis procedures will yield consistent findings. Easterby-Smith et al., (2002) explains that reliability can be assessed by checking whether the measure will yield the same result on other occasion, whether similar observations be reached by other observers, and the transparency in how sense was made from the raw data. Robson (2002) assets that subject or participant error, subject or participant bias,

observer errors and observer bias may be threats to reliability. Hence, data collection was carefully planned to eliminate possible sources of bias during data collection. This was done by using mostly closed-ended questions and where open-ended questions were used guidelines on how to ask the question were provided. The questionnaire was standardized and was not vaguely phrased. Pre-testing was done to identify any possible problems and to ensure that the tool for data collection was easily understood and completed.

Validity is concerned with whether the findings are really about what they appear to be about. The questionnaire structuring took into consideration the main and the sub-objective of the study, so that the outcome provided answers to the research questions and met the research objectives. The questionnaire was placed in a logical order and also free from ambiguity. The interviewers were trained so that deviation from the sampling procedures set out in the proposal was avoided. All these measures were put in place to reduce variability, thereby ensuring reliability and validity.

3.13 Plan Dissemination of Result

The researcher intends to disseminate information between and among stakeholders in health through presentation workshops and publications. **The** direct stakeholders targeted for the utilization of the results are the Savelugu/Nanton Municipal heath management team, OPC site staff, the communities where these findings were made, UNICEF and the School of Medicine and Health Science, Graduate School, University for the Development Studies.

CHAPTERFOUR

RESULTS

4.0 Introduction

This chapter provides detail analyses to describe the level of understanding of malnutrition in the district, how the Analysis of variance (CMAM) service is provided and its quality in the district, the level of access of CMAM services in the district and the knowledge of the people about the CMAM programme.

The sample size for the study consisted of two hundred and forty nine (249) participants; ninety nine (99) defaulter/treatment failures classified as unsuccessful treated and (150) cured classified as successfully treated.Also10 volunteers and 6 health staff trained in Analysis of variance (CMAM) programme were sampled for the interview and were all included in the analysis.

A list of all the respondents with their contact details such as address and telephone numbers and each participant traced to their individual communities. No respondent reached declined to participate in the study.

Also in the context of the study the people interviewed in the study are described as participants or respondents in the results presentation and subsequently in the discussion.

4.1 Socio-demographic Characteristics of Beneficiary Mothers

As deduced from table **4.1,** respondents between the ages of 20-34years constituted the highest with 82.7%, followed by 12.0% of respondents who are 35years and above and respondents <20years constituted the least with 13 respondents representing 5.2%

Informal jobs registered a combined high of 64.2% of respondents' occupation with Traders/Vendors and Farmers taking 32.5% and 32.1% respectively. Formal workers including Civil Servants, Health Care Workers and Educational Workers constituted 13.7%, 2.4% and 9.2% respectively of respondents as depicted in table **4.1.** Those involved in the service sector also polled 8.0% with other jobs including casual labour etc. taking 2.0% of the pie.

From the study 43 respondents representing 17.3% has not had any formal education. Respondents who attained Tertiary education status and Adult Education background registered 14.1% and 10.4% respectively. Respondents who also had a full course of Primary, Junior High and Senior High/Vocational schools level education posted 7.2%, 28.1% and 22.9%.

Over three quarters of the 249 respondents were Muslims i.e. 195 (78.3%) and 48 (19.3%) were Christians whiles 6 (2.4%) were adherents of the Africa Traditional Religion (ATR) (Table 1).

From the study, 196(78.7%) of the respondents were married whiles 26 (10.4%) were divorced and 26(10.4%) were still single.

A greater proportion of the respondents, 196 representing 78.7% were Dagombas, followed by other tribes including Frafra, Ewe, Hausa, Mossi etc. contributing a combined total of 22 (8.8%). Ashanti and Dagaaba tribes also recorded 5.2% and 3.2% respectively with Konkombas and Gonjas recording 5 respondents each, taking 2.0% apiece.

The research showed that 96.8% of the 249 households are headed by Males with only 8 households representing 3.2% being headed by Females.

Only 12 households constituting 4.8% of respondents live in a household with a size of between 4-5 people and 237(95.2%) of respondents live in a household with a minimum of 6 people.

Table 4.1: Socio-Demographic Characteristics of Beneficiary Mothers

Variable	Frequency	Percentage (%)
Age Groups (years)		
< 20	13	5.2
20-34	206	82.7
35+	30	12.0
Total	249	**100**
Occupation		
Trader/vendor	81	32.5
Farmer	80	32.1
Civil servant	34	13.7
Health care worker	6	2.4
Educational Worker	23	9.2
Service worker(e.g. hair-dresser, seamstress)	20	8.0
Others(specify)	5	2.0
Total	249	**100**
Educational Level		
Primary	18	7.2
JHS	70	28.1
SHS/Voc	57	22.9
Adult Education	26	10.4
No education	43	17.3
Tertiary	35	14.1
Total	**249**	**100**
Religion		
Islam	195	78.3
Christianity	48	19.3
ATR	6	2.4
Total	**249**	**100**
Marital Status		
Married	196	78.7

Single	27	10.8
Divorced	26	10.4
Total	249	100
Ethnicity		
Dagomba	196	78.7
Ashanti	13	5.2
Dagare	8	3.2
Gonja	5	2.0
Konkomba	5	2.0
Others	22	8.8
Total	**249**	100
Sex of Household Head		
Male	241	96.8
Female	8	3.2
Total	**249**	100
Size of Household		
4-5	12	4.8
6 above	237	95.2
Total	**249**	**100**

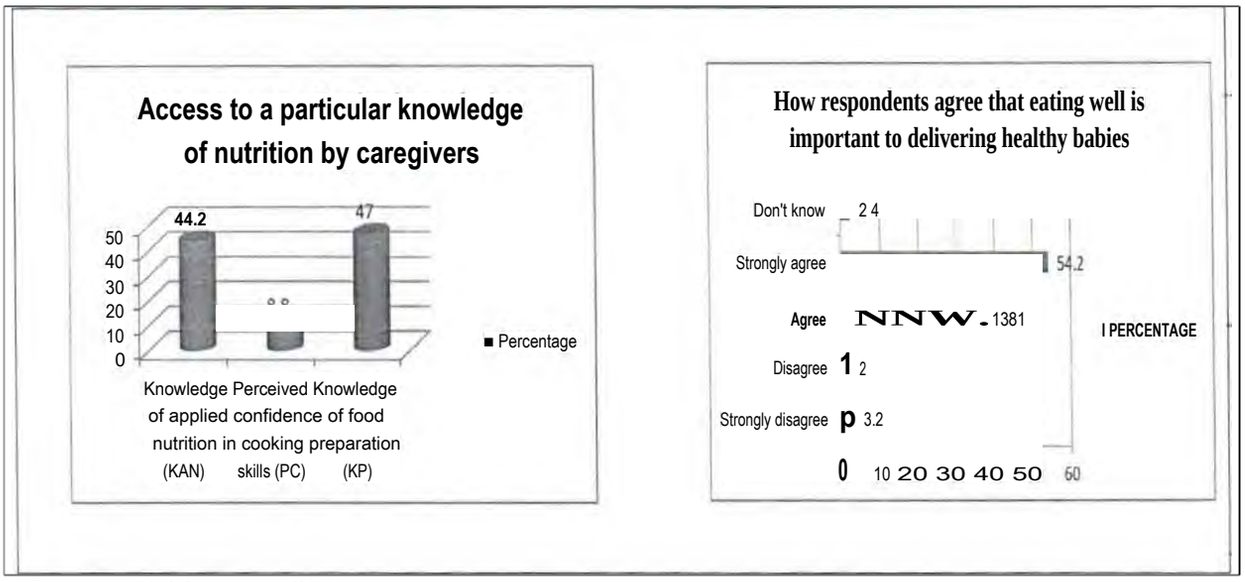
Source: Field survey 2014

4.2 Understanding of the Concept and Causes of Malnutrition

4.2.1 Maternal Nutritional Knowledge Evaluation

From figure 4.2 below, of the 249 respondents interviewed, 47.0% had Knowledge of Food Preparation (KP), 44.2% also had Knowledge of Applied Nutrition (KAN) and 8.8% had Perceived Confidence in cooking skill (PC). Asked if eating well is important to delivering healthy children, 54.2% strongly agreed and 38.2% only agreed .Those that disagree and strongly disagreed with statement constituted 3.2% and 2.0% respectively (figure 4.1).

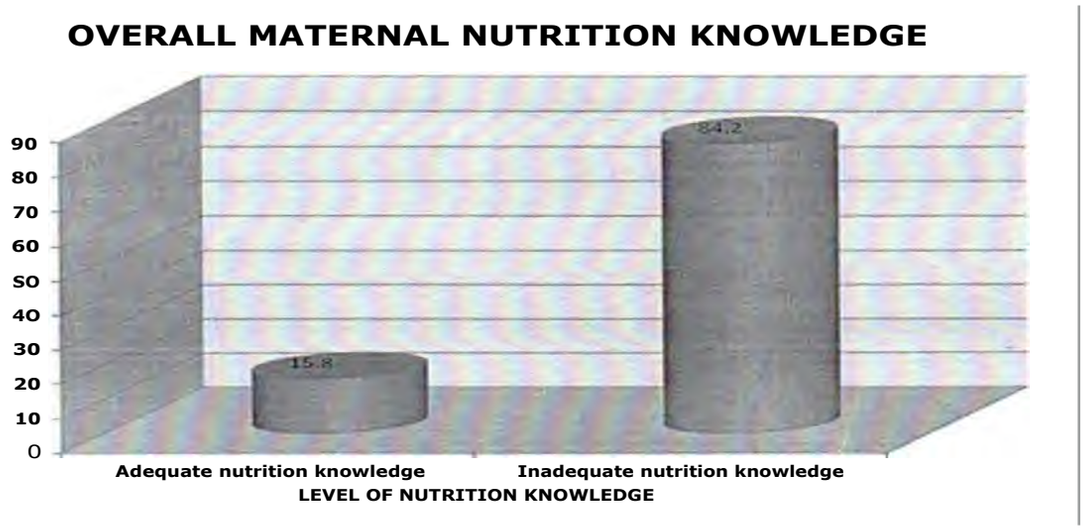
Figure 4.1: Maternal Nutritional Knowledge Evaluation



Source: Field survey 2014

The study revealed that, the overall maternal nutrition knowledge among the women studied was relatively low (15.8%) and that had inadequate nutrition knowledge (Figure 4.2).

Figure 4.2: Overall Maternal Nutrition Knowledge



Source: Field survey 2014

4.3 Health Seeking Behavior and Causes of Malnutrition

After common child morbidity pattern was assessed, it emerged that Malaria/Fever was 37.3% responsible for child illnesses households among the 249 respondents. Diarrhea followed with 21.3% and Malnutrition was identified by 32 (12.9%) of respondents as the illness children suffer in the household. The burden caused by Skin infection, Anaemia and Spiritual affliction are 10.4%, **10.0% and 8.0%** respectively.

Malnutrition was understood in the local language as `Kpantei' by 197 (79.1%) of respondents and as `Nagbangba' by 2 (0.8%) of respondents. However, 20.1% of the respondents did not know any local name given to the illness.

Beneficiaries were asked what their mode of treatment was before they enrolled for the CMAM programme. In all 161 (64.7%) said it was treated at the hospital, 37 (14.9%) said they used herbs and later send to the hospital when it turned critical and 51 (20.5%) said they treated with only herbs.

100 (40.2%) of the respondents admitted that, the Community Volunteer was the one who detected their children's cases of malnutrition. Community Health Nurses were also responsible for 37.8% detection of respondents' cases and HospitaUNurse and detection made by friends also took 11.6% and 10.4% respectively.

Using the UNICEF conceptual framework on maternal and child under-nutrition as basis of analysis, 104 (41.8%) of respondents believed their children's state of malnutrition was caused by the underlying factors such as household food insecurity; inadequate care and unhealthy household environment and lack of health services. Immediate factors i.e. inadequate food intake and disease accounted for 36.5% of respondents and Basic causes (income poverty; social; economic and political constraints) was also the reason alluded to by 21(8.4%) of respondents

As many as 114(45.8%) of respondents first sought health care assistance from the traditional healer, 32.5% called on the Public Health Facility and only 4(1.6) sought no assistance.

The research showed that 182(73.1%) of respondents see children 0-59months as those vulnerably affected by malnutrition, 63(25.3%) think people of all ages are affected and only 4(1.6%) see pregnant women as those malnutrition afflict (Table 4.2).

Table 4.2 Health seeking behavior and Causes of malnutrition

Variable	Frequency	Percent
Common Illnesses suffered by Children **the Household**		
Malaria/fever	93	37.3
Diarrhoea	53	21.3
Spiritual	20	8.0
Malnutrition	32	12.9
Anaemia	25	10.0
Skin infection	26	10.4
Total	**249**	**100.0**
Local name of malnutrition		
Kpantei	197	79.1
Nagbangba	2	.8
Don't know	50	20.1
Total	**249**	**100.0**
How was it treated		
Hospital	161	64.7
Herbs before hospital	37	14.9
Herbs	51	20.5
Total	**249**	**100.0**

Detection of malnutrition		
Friend	26	10.4
Volunteer	100	40.2
CHN	**94**	**37.8**
Hospital/Nurse	29	**11.6**
Total	**249**	**100.0**
Grouping of causes of malnutrition		
Immediate causes	**91**	36.5
Underlying causes	104	41.8
Basic causes	21	8.4
Spiritual	33	13.3
Total	**249**	**100.0**
Patients perception on Causes of malnutrition		
Poor care/feeding	**57**	22.9
Diseases	85	34.1
Poverty	21	8.4
Food insecurity	23	9.2
Poor sanitation	24	9.6
Inadequate food intake	6	2.4
Spiritual	33	13.3
Total	**249**	**100.0**
where did you first seek treatment when child was sick/malnourished		
sought no assistance	4	1.6
own medication	**9**	**3.6**
traditional healer	114	45.8
private clinic	10	4.0
public health facility	81	**32.5**
drug peddler	24	9.6
pharmacy/chemical store	7	2.8
Total	**249**	**100.0**

Group affected by malnutrition		
People of all ages	63	25.3
Pregnant women	4	1.6
Children 0-59mths	182	73.1
Total	249	100.0

Source : field survey 2014

4.4 Standard of Community-based Management of Acute Malnutrition (CMAM) Service

Most of the clients, 190(76.3%) said they were told the reason for enrolling them in the programme whiles 23.7% admitted they were not told.

From the findings, 98% said they were taught how to give the plumpy nut to their children. Asked how they give it to their children,94.4% said they give it alone,4% said they mix it with porridge,1.2% said they mix with water whiles 4%give it through different means

The therapeutic food i.e. Plumpy nuts for the malnourished children was admitted to have been shared with other children in the household by 63(25.3%) of 249 respondents.

Only 28(11.2%) of the respondents admitted that their children reacted negatively to the plumpy nuts when it was served them (table 4.3).

Table 4.3 Utilization of Ready to Use Therapeutic Food (RUTF)

Variable	Frequency	Percent
Did CHN educate you on child condition		
Yes	190	76.3
No	59	23.7
Total	**249**	**100.0**
Teach plumpy nut		
Yes	244	98.0
No	5	2.0
Total	**249**	**100.0**
How is plumpy nut given?		
Give it alone	235	94.4
Mix with porridge	**10**	4.0
Mix with water	3	1.2
Other	1	.4
Total	**249**	**100.0**
Other children eat plumpy nut?		
Yes	63	25.3
No	186	74.7
Total	**249**	**100.0**
Does your child react negatively to the p'nut		
Yes	28	11.2
No	221	88.8
Total	**249**	**100.0**

Source: field survey **2014**

4.5 Level of Access and Quality of Service

From **table 4.4** it is observed that 38(15.3%) of respondents admitted that they were occasions they did not meet the CHN at the CMAM site during an OPC day. From **table 4.4,** 153(61.4%) of respondents state that Community Health Nurse (CHNs) have a Good relationship with them. Whiles 15.7% admitted that CHNs relationship with them is satisfactory, 13(15.7%) say the relationship with them is poor.

Footing or trekking to the Out-Patient Care (OPC) site is the means of access for 153(61.4%) of the respondents. Only 4.4% are able to board Cars to the OPC site during an OPC day. From **table 4.4,** the travel time to the OPC site averaged 30minutes for 36(14.5%) respondents and 1-2hrs and >2hrs for 205(82.3%) and 8(3.2%) of respondents respectively.

An average of 30minutes was spent at the OPC site by 139(55.8%) of respondents whiles 30(12.0%) spent over 2hours before they are attended a CMAM clinic.

From the research, 89(35.7%) of the clients were sent back on certain occasions because of shortage of plumpy nut as depicted in the table below.

Table 4.4 Factors that Affects Patients Compliance to Treatment

Variable	Frequency	Percent
Absence of CHN on OPC days		
Yes	38	**15.3**
No	211	84.7
Total	**249**	**100.0**
CHN relationship with Clients		
Good	153	61.4
Very good	38	15.3
Poor	13	5.2
Satisfactory	39	15.7

Very poor	**6**	**2.4**
Total	**249**	**100.0**
How do you get to the OPC site		
on foot	**153**	**61.4**
Bicycle	**26**	**10.4**
Car	11	**4.4**
motorbike/tricycle	**59**	**23.7**
Total	**249**	100.0
Time spent at OPC center		
30 minutes	**139**	**55.8**
1-2 hours	80	**32.1**
>2 hours	30	12.0
Total	**249**	**100.0**
How long does it take to get to the site		
30min	36	14.5
1-2hrs	205	82.3
>2hrs	8	**3.2**
Total	**249**	**100.0**
Sent back because of shortage of plumpy nut?		
Yes	89	35.7
No	160	64.3
Total	**249**	100.0

Source: field survey 2014

4.6 Knowledge about the Community-based Management of Acute Malnutrition (CMAM) Programme

The researcher studied the knowledge of caregivers and made a comparison to ascertain from the study whether there was significant difference in knowledge and practice of the clients in the programme.

Through community outreach and home visits by the Community Health Nurse, 72.3% of the beneficiaries got to know about the CMAM programme, 14.5% from the hospital, 11.6% from a volunteer and 1.6% got to know about it from a friend as shown in **table 4.5** below

Asked if clients had cause to lose interest in the CMAM programme at some point, 31(12.4%) responded to the affirmative and 218(87.6%) said no.

The data above show that 49.4% of the clients spend less than eight (8) weeks in the programme, 44.6% spend between 8 to 16 weeks whiles 6% spend more than 16 weeks in the programme and table 4.5 shows the findings.

Table 4.5 Knowledge on the Community-based Management of Acute Malnutrition (CMAM) Programme

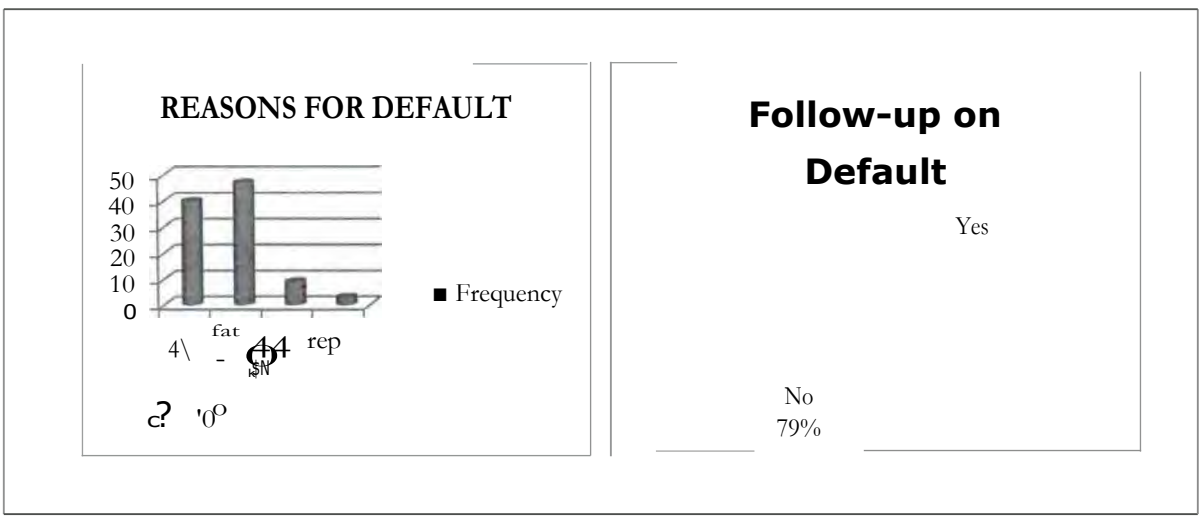
Variable	Frequency	Percent
How learnt about CMAM		
Friend	4	1.6
Volunteer	29	**11.6**
CHN	180	72.3
Hospital/Nurse	36	14.5
Total	**249**	**100.0**
Loss of interest		
Yes	31	12.4
No	218	87.6
Total	**249**	**100.0**
Duration on programme		
< 8 weeks	123	49.4
8-16 weeks	111	44.6
> 16 weeks	15	6.0
Total	**249**	**100.0**

Source: field survey 2014

4.8 Defaulter Rate and follow up's

Of the 99 clients who defaulted in treatment at some point in the programme, 47(47.5%) say OPC site being far was the reason why they defaulted. 40(40.4%) of the defaulted clients said they were busy on those OPC days. Asked whether a follow up was done on their default 21(21.2%) said a CHN came to their house to find out why they didn't come but as many as 78(78.8%) responded to the negative as shown in figure **4.3.**

Figure 4.3: Defaulter Rate and Follow up's



Source: Field Survey 2014

4.9 Factors **that Influence the Successful** Treatment on the Community-based **Management of Acute Malnutrition (CMAM) Programme**

Out of 28 variables that significant testing was done, only 12 variables were statistically associated ($p<0.05$) with treatment status i.e. successfully and not successfully treatment.

The relation of the Community Health Nurse with clients showed some significant relation with the treatment outcome of clients. 153 out of the 249 respondents who described their relation with

the CHN as Good, 62.7% were successfully treated. Of the 13 who said relation was Poor, 9(69.2%) were not successfully treated.

Out of the sampled clients 24(66.7%) of the 36 clients who spent an average of 30minutes to the OPC centre were successfully treated and 80(39.0%) of the 205 clients who uses between 1-2hours to travel to the OPC site were not successfully treated.

Treatment status was also influenced significantly ($p<0.05$) by the time spent at the OPC site. Of the 139 clients who spent an average 30minutes, 96(69.1%) were successfully treated and 30.9% were not successfully treated. Also, 19(63.3%) of the 30 clients who spent >2hours at the OPC site, were not successfully treated.

There was an absolute significant influence of shortage of plumpy nut to the treatment status of clients. Of the 89 clients who experienced a shortage of plumpy nuts, 56(62.9%) were not successfully treated. A significant number, 117(73.1%) who do not experience any shortage of plumpy nut had a successful treatment outcome.

Of the 235 clients who serve plumpy nut alone, 147(62.6%) were successfully treated and 88(37.4%) were not treated successfully. 8(80.0%) of the 10 clients who had mixed the plumpy nut with porridge before serving were not successfully treated.

The research revealed that 63 of the 249 clients admitted sharing plumpy nuts with other children in the household with 33(52.4%) of the malnourished children not successfully treated.

Negative reaction of child to plumpy nut has also shown a strong influence to the treatment status of clients, with 19(67.9%) of the 28 clients who reacted negatively not treated successfully. And as high as 141(63.8%) of the 221 clients who reacted positively been successfully treated.

There was a significant treatment success for durations of <8wks and 8-6wks with 63.4% and 62.2% treatment success respectively. However, 12(80.0%) of the 15 clients who lasted in the programme for excess of 16wks were not successfully treated.

Overall loss of interest in the programme by clients was absolutely significant in the treatment status of clients. 93.5% of the 31 clients, who had cause to lose interest in the programme, were not successfully treated but 67.9% of the 218 respondents who had faith in the programme were treated successfully.

Table 4.6 a: Factors that Influence the Successful Treatment on CMAM Programme

Variable	N	Treatment Status		Test Statistics	
		Not-Successful Treated	Successfully Treated		
		n (%)	n (%)	Chi-Square (X^2)	P-value
Sex					
Male	151	57 (37.7)	94 (62.3)		
Female	98	42 (42.9)	56 (57.1)	0.65	0.42
Total	**249**	**99 (39.8)**	**150 (60.2)**		
Level of Education of Mothers					
Low education	79	27 (34.2)	52 (65.8)		
High Education	170	72 (42.4)	98 (57.6)	1.51	0.22
Total	**249**	**99 (39.8)**	**150 (60.2)**		
Estimated Monthly Income					
Below minimum wage	166	64 (38.6)	102 (61.4)		
Above minimum wage	83	35 (42.2)	48 (57.8)	0.30	0.58
Total	**249**	**99 (39.8)**	**150 (60.2)**		
Household size					
4-5 people	12	4 (33.3)	8 (66.7)		
6 and above	237	95 (40.1)	142 (59.9)	0.22	0.64
Total	**249**	**99 (39.8)**	**150 (60.2**		

Where did client first seek treatment when child was sick					
Sought no assistance	4	1 (25.0)	3 (75.0)		
Own Medication	9	8 (88.9)	1 (11.1)		
Traditional Healer	114	47 (41.2)	67 (58.8)		
Private clinic	10	6 (60.0)	4 (40.0)	18.34	0.005
Public health facility	81	26 (32.1)	55 (67.9)		
drug peddler	24	6 (25.0)	**18** (75.0)		
Pharmacy/Chemical store	7	5 (71.4)	2 (28.6)		
Total	**249**	**99(39.8)**	**150 (60.2)**		
Perception on the causes of malnutrition (grouped under UNICEF conceptual frame work)					
Immediate causes	91	37 (40.7)	54 (59.3)		
Underlying cause	104	45 (43.3)	59 (56.7)		
Basic causes	21	10 (47.6)	11 (52.4)	5.85	0.12
Spiritual	33	7 (21.2)	26 (78.8)		
Total	**249**	**99 (39.8)**	**150 (60.2)**		
Groups Affected by Malnutrition					
People of all ages	63	37 (58.7)	26 (41.3)		
Pregnant women	4	3 (75.0)	1 (25.0)	15.64	0.000
Children 0-59 months	182	59 (32.4)	123 (67.6)		
Total	**249**	**99 (39.8)**	**150 (60.2)**		
CHN **relation with clients**					
Good	153	57 (37.3)	96 (62.7)		
Very Good	38	9 (23.7)	29 (76.3)		
Poor	13	9 (69.2)	4 (30.8)	13.19	0.01
Satisfactory	39	20 (51.3)	19 (48.7)		
Very Poor	6	4 (66.7)	2 (33.3)		
Total	**249**	**99 (39.8)**	**150 (60.2)**		
Time spent on road to get to the OPC center					
30 minutes	36	12 (33.3)	24 (66.7)		
1-2 hours	205	80 (39.0)	125 (61.0)	8.28	0.02
> 2 hours	8	7 (87.5)	1 (12.5)		

Total	249	99 (39.8)	150 (60.2)		
Time Spent at OPC center/site					
30 minutes	139	43 (30.9)	96 (69.1)		
1-2 hours	80	37 (46.3)	43 (53.8)	12.89	0.002
> 2 hours	30	19 (63.3)	11 (36.7)		
Total	**249**	**99 (39.8)**	**150 (60.2)**		
Have client being denied service due to shortage of plumpy nut					
Yes	89	56 (62.9)	33 (37.1)		
No	160	43 (26.9)	117 (73.1)	31.03	0.000
Total	**249**	**99 (39.8)**	**150 (60.2)**		
Was client taught how to give the Plumpy nut					
Yes	244	95 (38.9)	149 (61.1)		
No	5	4 (80.0)	1 (20.0)	3.45	0.06
Total	**249**	99 (39.8)	150 (60.2)		
How is the Plumpy nut given					
Give it alone	235	88 (37.4)	147 (62.6)		
Mix with porridge	10	8 (80.0)	2 (20.0)		
Mix with water	3	2 (66.7)	1 (33.3)	9.71	0.02
Other	1	1 (0.0)	0 (.0)		
Total	**249**	**99 (39**	**150 (60.2)**		
Is there sharing of Plumpy nut					
Yes	63	33 (52.4)	30 (47.6)		
No	186	66 (35.5)	120 (64.5)	5.61	0.02
Total	**249**	**99 (39.8)**	**150 (60.2)**		
Does child react negatively to Plumpy nut					
Yes	28	19 (67.9)	9 (32.1)		
No	221	80 (36.2)	141 (63.8)	10.39	0.001
Total	249	99 (39.8)	**150 (60.2)**		
Duration on programme					
< 8 weeks	123	45 (36.6)	78 (63.4)	10.83	0.004
8- 16 weeks	111	42 (37.8)	69 (62.2)		

> 16 weeks	15	12 (80.0)	3 (20.0)		
Total	249	99 (39.8)	150 (60.2)		
Lost interest in the programme					
Yes	31	29 (93.5)	2 (6.5)		
No	218	70 (32.1)	148 (67.9)	42.77	0.000
Total	**249**	**99 (39.8)**	**150 (60.2)**		

Source: field survey 2014

In a binary logistic regression, only perceived groups affected by malnutrition, loss of interest, duration on programme and denier of plumpy nut due to shortage were identified as the main factors influencing success of treatment on the Community-based Management of Acute Malnutrition (CMAM) OPC programme. Compared to other age group of people, children 0 to 59 months were perceived to be about 1.5 times (AOR=1.52, 95% CI, p=0.02) more likely to get treated successfully if they develop malnutrition and registered on the CMAM OPC programme. Compared to the client who were denied plumpy nuts due to shortages at both the district and regional level, those who were not denied were about 3.6 times (AOR=3.57, 95% CI, p<0.001) more likely to get successfully treated on the programme (Table4.6b)

Table 4.6b: Factors that Influence the Successful Treatment on CMAM Programme

		B	S.E.	Wald	Df	Sig.	Exp(B)
Step la	Perceived groups affected by malnutrition	0.423	0.180	5.495	1	0.019	1.526
	CHN relationship with clients	0.093	0.152	0.372	1	0.542	1.097
	Time spent to get to OPC site	-0.429	0.445	0.931	1	0.335	0.651
	Time spent at OPC site	-0.152	0.139	1.207	I	0.272	0.859
	Is there sharing of plumpy nut at home	-0.213	0.412	0.267	1	0.605	0.808
	Loss of interest	-3.694	0.870	18.026	1	0.000	0.025
	Client taught how to give plumpy nut	-0.190	1.886	0.010	1	0.920	0.827
	Negative reaction to plumpy nut	-0.921	0.671	1.884	1	0.170	0.398
	Duration on programme	-0.717	0.271	6.980	1	0.008	0.488
	Denier of plumpy nut due to shortage	1.272	0.337	14.277	1	0.000	3.568
	How plumpy nut is given	-0.681	0.654	1.083	1	0.298	0.506
	Constant	2.491	2.781	0.802	1	0.370	12.075

Source: field survey 2014

4.5 Results of the Qualitative Studies

The results of the qualitative data is presented according to common themes that were identified during discussions. This was done by reading through the transcribed interviews to understand some of the issues that were raised.

In all, forty Focus Group Discussion (FGDs) were conducted in 10 communities **(4 in each community), three with lay people (including (i) grandmothers, (ii)** women of **child-bearing age and (iii) men who were opinion leaders) and one with beneficiaries in each community. In addition, thirty Key Informant Interviews (KIIs) were held, three in each community with one each of the following: (i) religious leaders (an Imam, Pastor and** church leader). **(ii) CHV, and (iii) health staff (Nurses who conduct CMAM clinic)**

4.11 Outcome of Interview with Administrators of CMAM Programme

4.11.1 Budgeting, Personnel and Logistics in DOTS Administration

According to the Nutrition Officer there is no yearly budget for Community-based Management of Acute Malnutrition (CMAM) programme. With the case of defaulters, he ascribed to the fact that there are not enough personnel to attend to these children likewise follow up.

There has being improvement in the establishment of satellite Out-Patient Care (OPC) sites to improve coverage each patient has a community based surveillance volunteer to do occasional follow ups and but that has not been effective due to volunteer fatigue and lack of incentives.

4.11.2 Surveillance and Monitoring

Promotion, advocacy and awareness creation was done by staff trained in communication on their monthly follow up. Logistic are available for the programme but occasionally run short of plumpy nuts and OPC cards. Good records are kept on the CMAM patients and are kept all over the OPC sites.

The comments expressed by the interviewees from the communities have therefore been summarized together below:

4.11.3 Understanding of the Concept of Malnutrition

The understanding of the concept of malnutrition among the interviewees ranged from what would be considered as poor to average. Some of the symptoms of malnutrition described by the interviewees included "loss of appetite", "wasting", "vomiting", "swollen legs, hand, and face", fever", "sunken eyes", "shiny face". Some grandmothers said that children "with light skin" and those "destined to come and worry their parents" become malnourished. These "symptoms" were repeated by the various groups

4.11.4 Understanding of the causes of malnutrition

Some interviewees said Severe Acute Malnutrition (SAM) may be caused by "lack of a good mother-care", "poor food, water and hygiene", "early child weaning", and "inappropriate introduction of complementary food" but in general, the interviewees' understand of the causes of SAM was weak, which was probably not surprising. Interviewees attributed malnutrition to all manner of causes, including:

- Supernatural or spiritual forces, such as "familial curses", "punishment by dwarfs (which thought to be supernatural beings, according to traditional beliefs) and that it is dangerous to even talk about SAM because one could be cursed to death by doing so".
- Superstitious beliefs, such as "mother walking across a grave during pregnancy", and "mother seeing a monkey climbing a tree whilst pregnant".
- Societal myths such as sleeping with a male partner too soon after giving birth, child consuming "hot" breast milk because of the mother's long exposure to the sun, "consumption of cold foods", "something inherited from the mother, which runs through the family", and
- Misconceptions such as "consumption of oily or fatty foods at an early age", "eating fruits from the sheanut tree", and "malnutrition related to blood type".

4.11.5 Community Outreach of the Community-based Management of Acute Malnutrition (CMAM) Program

Community outreach activities including case finding, referral, and follow-up of Sever Acute Malnutrition (SAM) cases were said to be conducted by community health nurses and Community Health Volunteer (CHVs) in the districts. However, there were some interviewees (eg. some opinion leaders) who said they had not seen any such activities in their communities. Some health workers observed that most mothers who have children with SAM often try to hide

those children, and do not want to take them outside the home because those mothers probably feel ashamed about the children's conditions. Some CHVs said they usually receive little motivation from the health authorities, and they had severe difficulty performing their job due to lack of means of transport and logistics. These assertions suggest major weakness in outreach activities, which could be potential barriers to the uptake of the Community-based Management of Acute Malnutrition (CMAM) program in many communities.

In line with the focus group discussion above, one health worker had this to say:

Some is the distance to the health facility. Like our health centre like this, is somehow far from the community so when they default they find it difficult to do follow up since almost all their motor bikes have broken down. (IDI, nurse, Tampion)

4.11.6 Health Seeking Behavior among Community Members

The various interviews revealed that when faced with health-related issues particularly SAM, most people in the communities often tend to seek informal health care from drug peddlers, traditional healers and spiritualists first, before attending the health facilities as the last resort. Informal health care seems attractive because usually it is cheap, it does not require travel over long distances, and it is in tandem with the spiritual and superstitious beliefs which are very common in the communities. Along with this, there are many traditional and spiritual healers in the communities who profess to offer treatment to nearly all diseases including SAM. On the other, various comments from the interviews corroborated by the different groups suggested that the update of Community-based Management of Acute Malnutrition (CMAM) services in the districts may be hindered by several factors including lack of money (or claims of "no money"),

inability to have a valid health insurance card, shortage of RUTF,Iong travel distances to health centers coupled with little means of transportation, and so on.

4.11.7 Awareness of the Community-based Management of Acute Malnutrition (CMAM) Program

Most, but not all, of the interviewees said they had heard about the CMAM program in the community. Some said they heard through CHV and others from health workers or women in the community. Some of those who did not know about the CMAM program however said they had seen RUTF being used. In the Savelugu Municipal in particular, the level of awareness about the CMAM program appeared low compared to the other OPC site.

4.11.8 Perception about Community-based Management of Acute Malnutrition (CMAM)

Interviewees' perception about the Community-based Management of Acute Malnutrition program was generally favorable. Except for some grandmothers in Nanton who said they could not tell whether the service was good or bad, nearly all of interviewees said the program could help the lives of children with SAM. One CHV said some women had the perception that RUTF was just groundnut paste, and therefore criticized the program for giving sick children only groundnut paste.

4.11.9 Standard of the Community-based Management of Acute **Malnutrition (CMAM)** Services

Although most interviewees said they had heard about the CMAM program, their knowledge of the full range of services provided under the program was low. Women in general seemed unaware of how to receive CMAM services in their communities, what kinds of services are available, and what the cost might be. It seemed quite clear from the various interviews that many mothers would refuse to seek treatment for their malnourished children at the health

facilities because of the fear of incurring financial costs, particularly those women who said they had no valid national health insurance cards.

4.11.10 Stigma of Malnutrition

Stigmatization against families with SAM children has a negative impact on health seeking behaviors. The discussions revealed that the stigma of malnutrition was probably stronger and more problematic in some of the communities than others. Within the district, the perception of the various groups of people interviewed about SAM and stigma also differed. Some people, even health workers, were said to believe that mothers of SAM children do not take good care of their children well. A health staff reported that community members sometimes think that households with SAM children have eaten a prohibited food or broken taboo. In Diare, most of the groups agreed that the stigma of malnutrition existed in the communities, but some women groups as well as opinion and religious leaders thought otherwise.

4.11.11 Attitude of Health Staff

In general, there seemed to be a good working relationship between health staff and CHVs. However, perception of the attitude of health staff towards mothers of SAM children seemed mixed. There were reports that health staff were "friendly towards caregivers", whilst a beneficiary mother said "health staff do not insult me, they have good human relations because they ask me to come for reviews, and explain how to use the medicine". However, there were several other reports that health workers were "rude", "harsh", or "condescending towards mothers of children with SAM". In several cases, health staffs were reported to absent themselves too frequently from the OPC sites, which discouraged mothers from seeking treatment. One woman also describes the behaviour **of** some of the health workers:

We those who didn't attend school if you go there it looks as if we are useless because we didn't attend school. If you go there they don't regard you as a human being. They will look down upon you, what they are not supposed to say they will say it to you and be shouting on you because you have not been to school. They should know we didn't get the chance of going to school and refused. As they have just sacked the woman we thank God, because her behaviour was not good, but we cannot thank God yet because the young nurses who are there now, came and met the woman and so she has trained them with her character. So the life that she was having, the young ones are also leaving that life. Is the same life they are also living. The young ones they don't chew the chewing gum but they don't regard human beings (FGD, woman, Savelugu).

4.11.12 Knowledge and Utilization of Ready to Use Therapeutic Food (RUTF)

Most of the interview participants, particularly the women groups, knew about RUTF, although some including grandmothers and opinion leaders said they had no knowledge at all about RUTF. In most communities, RUTF has been given local names (such as *Bigbaamatiingor BinwimaSemaaor* food for malnourished children) and is seen as medicine for rehabilitating skinny children. There were reports from several of the groups that shortages of RUTF from the OPC sites were very common, and could be a major reason some children receiving CMAM services at those sites default from the program. According to the reports, mothers of these children simply stop attending the OPC sites, after a number of unsuccessful attempts to obtain RUTF.

4.11.13 Referral System of the Community-based Management of Acute Malnutrition (CMAM) Program

Most SAM cases are said to be identified during child welfare clinic (CWC) sessions or home visits by CHVs, after which those children are referred to the appropriate health centers **(IPC** or OPC site) for treatment. When referrals are done from OPC to IPC or vice versa, referral forms are not given. This is a major weakness in the CMAM program because many mothers with severely malnourished children were reported to often want to keep their malnourished children from being noticed (probably to avoid stigmatization), and therefore those women would normally disregard the referral, unless CHV followed-up on them.

4.12 Ways of improving Community-based Management of Acute Malnutrition (CMAM) program

Most of the key informants, stated that, community sensitization should be prioritized with more focus on dissipate the stigma of malnourished children and their mothers. Very few however disagreed with the focus area of the community education.

Also mentioned was the idea of increasing the Community-based Management of Acute Malnutrition program. Though they could not categorically state ways of increasing coverage, they believe that will alleviate the situation of acute malnutrition faster and possibly permanently.

From the Health staffs that were interviewed, staffing was a major concern to them. The services of volunteers were relentless but there were not readily available throughout the year.

Logistics mainly motorbikes to the very remote communities was imperative. The very few bikes available were broken down. Therefore if there were at least a motorbike available per every three communities, it will have a great bearing on the capacity of staff to deliver quality

services as well as increase coverage areas of the Community-based Management of Acute Malnutrition program.

Motivation in the form of reward schemes will also be a good incentive in the process. The basic awarding of the hardworking staff of year is worthy within the municipal.

CHAPTER FIVE

DISCUSSION

5.0 Introduction

5.1 Maternal Nutritional Knowledge

The study revealed that, about six in ten women had access to nutrition knowledge or information from various sources and most of them had the knowledge in the area of applied nutrition and food preparation (44.2 % and 47.0 % respectively) and to this regard most of the mothers believed and strongly agreed to the fact that eating well is very important and necessary for the growth **and** development of children below 59 months. However, the overall nutrition knowledge among women in the study area was low, that is about two out of every ten the women sampled would have adequate nutrition knowledge which they would rely on to practice good nutrition during pregnancy and even beyond. This is consistent with findings of the Australian Bureau of Statistics (2008) where they found nutrition-related knowledge of postpartum women to be poor. However, it is in contrast to the findings of Emily et al. (2011) where they found nutrition knowledge among first time mothers to be high or adequate. The study findings indicate that, mothers had some information about maternal nutrition but it was not enough and could be detrimental to the health of the mothers depending on how it is applied and this could even affect the compliance to the dietary guide lines for food consumption among pregnant women and during other periods of human development.

The study revealed that, most of the women studied were knowledgeable in areas incuding causes of shortage of blood in pregnant women, whether pregnant women should eat eggs whether women should drink alcohol during pregnancy, whether pregnant women should eat more during pregnancy and whether babies should be fed with colostrum when they are

delivered. However, lack or inadequate knowledge was obviously reported among the women studied in areas such as what women should do to have enough breastmilk, benefits of consuming iodized salt and foods that is good in building strong bones and teeth. This could have been due to the fact that, the nurses who provide nutrition knowledge or education to women who attend Community-based Management of Acute Malnutrition clinics talk more about the topics stated above to the neglect of others. This could have negative implication on the health and nutrition of the mothers and their children since partial knowledge could be dangerous and misapplied.

5.2 Coverage of the Community-based Management of Acute Malnutrition Programme

Each of the five (5) sub-districts has an outpatient care center which serves its underlying communities. This does not show a fair distribution of the programme throughout the Savelugu/ Nanton Municipal since most of the facilities and CHPS compound under the sub-districts are not implementing the programme at their level.

Coverage refers to individuals who need treatment against those actually receiving treatment. Coverage can be affected by the acceptability of the service, location and accessibility of program sites, security situation, frequency of distributions, waiting time, service quality, extent of mobilization, extent of home visiting and screening, and admission criteria alignment. Program sites should be close to the targeted population in order to reduce the risks and costs associated with travelling long distances with young children and the risk of people being displaced to them. Methodologies to measure coverage vary in the level of reliability and type of information generated.

Tanahashi l 978 describes a 'booster' as anything that encourages or enables access to a program or leads to an increase in coverage. Factors commonly identified as having a positive effect on coverage include:

- Active and regular case finding by motivated volunteers
- Good knowledge and understanding of the programme by the local population
- Key community figures actively support the programme
- Effective systems in place for referral transfer and follow up of cases
- Good relationships between CMAM actors and adequate support and supervision given to volunteers, health center staff, and program personnel
- Good and continued supply of RUTF.

A 'barrier', also known as a 'bottleneck' is anything that restrains, obstructs, or delays access to a program or restrains coverage. (Tanahashi, 1978). Factors frequently identified as having a negative effect on coverage include:

- Lack of knowledge of the program
- Lack of awareness of malnutrition or mismatch between program definition and community understanding
- Distance to program site
- Previous rejection by health center staff
- Limited active case finding / few or demotivated volunteers
- Service-related problems (especially RUTF out of stock) (Collins et al., 2006)

All malnourished children with SAM were referred to the hospital/health center in the district for treatment and then referred back to the sub-district OPC center closest to the place of residence of the family of the child. Each sub-district has its own out-patient day during which mothers are attended to (GHS-Savelugu Annual Report, 2013).

5.2.1 Staff Strength

According to WHO, we face a global shortage of 4.3 million health workers. Out of 57 countries with critical shortages of health workers, 36 are in sub-Saharan Africa. Although the region has 25% of the global burden of disease, it has only 3% of the world's health workers. Persons responsible for the Community-based Management of Acute Malnutrition (CMAM) programme have undergone the required training making them equipped and informed about the CMAM programme and its requirements of them. The issue was about staff attrition and also the idea of focal persons for the programme. This was seen as 15.3% the respondents said that they were not attended to because the absence of the focal person for the programme. This creates burden in the course of service delivery since the required numbers are not present. Out of the percentage at post, some of them sometimes attend workshops or leave their post for personal reasons, thereby leaving their post vacant during the outpatient days when they are required to see to mothers and their children. This contributed to the high defaulter rate, since 40.4% of the defaulters interviewed attributed it to absence of health officials and so are not encouraged to continue their participation in the programme.

They said that, state registered nurses and doctors do not want to work in the rural areas. As a result, they combine doing outreach health-care work with seeing large numbers of patients at the health center. This is affecting their coverage and effective supervision of the CMAM programme at home level in terms of reinforcing health and nutrition messages and the importance of attending the Community-based Management of Acute Malnutrition programme. It was observed that the community health nurses were doing their best to correct the myth about malnutrition but were lacking the capacity because of heavy workloads on their priority list.

5.2.2 Community Volunteers

According to Paul Kagame, with more than 45,000 Community Health Volunteer (CHVs) and less than 1000 doctors, Rwanda has recorded revolutionary improvement in health outcomes facilitated by strong leadership and the use of community health volunteers is have yielded great experience and good results.[-]

Also in Ethiopia, Hailemariam Desalegn revealed that the flagship health extension programme in his country involving 38,000 health extension workers has led to a significant reduction in HIV infections and the number of women dying in childbirth, and has also increased the number of children immunized.

These achievements suggest that CHVs could be key to achieving the Millennium Development Goals (MDGs). They can also speed up progress towards Universal Health Care (UHC)

Malnourished children are identified through community outreach programmes and referred to the various health facilities for treatment. In other literature, the integration and strengthening of the Female Community Health Volunteers system is a positive outcome - not only for the purposes of the pilot, but also for ensuring the successful continuation of the Community-based Management of Acute Malnutrition (CMAM) programme (Guerrero, 2010). This is done by the help of the Community Volunteers and sometimes the community health workers when they go for follow up visits or go to visit mothers who are far and cannot come to designated health facilities. From the study results, 40.2% of malnourished children were identified by community volunteers but only 11.6% were referred to the health facility for CMAM services. This shows a weak referral system between the volunteers and health facility. This is not surprising as it was revealed in the FGD/KII that only two (2) out of the 10

volunteers interviewed had knowledge about theCommunity-based Management of Acute Malnutrition (CMAM) programme.

Even though these group of people work as volunteers, they still complain of lack of motivation which affects their level of involvement in their work. These volunteers attested to the fact that, parents of malnourished children were very cooperative when it came to the measurement of their children's Mid Upper Arm Circumference (MUAC) and comply with instructions given them by taking their children to the nearest outpatient center or to the district hospital in case of medical complications noticed by the volunteer (even though some refused referrals).

The quality of engagement with target communities is a vital determinant of the success of a community-based programme. Volunteer involvement is keen in the CMAM programme as that is one of the four components of the programme.

5.3 Level of Access to the Programme

The potential public health impact of treating SAM is therefore great, but access to appropriate care is severely limited. It is currently estimated that only 5% of SAM cases have access to treatment (Horton et al. 2010).

The out-patient care (OPC) involves the mother bringing the child to the center weekly or bi-weekly for the services, so the mother has time for her family and job (in case of any). The study results showed that common barriers affecting accessibility of the services were related to distance, time spent at OPC site, high opportunity costs, knowledge of services, shortage of plumpy nut, knowledge on malnutrition and Community Health Nurse (CHN) relationship with clients. Eventhough the district focal person said community sensitization mechanisms were generally strong in the district, the study revealed that only a few knew about the programme in the district most especially the remote areas with less programme exposure. Households

experienced a number of barriers IN hen accessing SAM treatment services. Integration of SAM treatment with other community-based interventions, as the UN recommends, can improve access to life-saving services was not so. Efforts to integrate SAM treatment into national health systems should not neglect the community component of health systems and dedicated funding for the community component is needed to ensure access (Chloe Puett and Saul Guerrero, 2014).

However, what is worrying from the cross tabulation was that most clients (80%) who spent more than 16 weeks in the programme were not successfully treated. From the focus group discussion and data analyzed, various reasons which spanned from geographical access to the Community-based Management of Acute Malnutrition (CMAM) service, absence of CHN and lack of support from their spouses to attend came up. It was also noticed that some of the mothers were withdrawing because of the perception held by grandparents about malnutrition. In Ghana and most especially northern Ghana, grandparents seem to have great influence on the upbringing of children, including their feeding. When father-to-father groups were interviewed they seemed to hold the perception that malnutrition comes about as result of mothers' disregard of traditional norms and beliefs. To them, the treatment of malnutrition should also incorporate traditional medicine.

As the four main principle of Community-based Management of Acute Malnutrition holds; maximum access and coverage, should be made to ensure that most malnourished cases are being discovered and to have access to CMAM treatment routine to prevent deaths. There should be timely detection of cases. Finding children before SAM becomes serious and medical complications arise, good community outreach is of the essential, screening and referral by workers (e.g., Community Health Nurses [CHNs], volunteers).Appropriate medical and nutrition care and care for as long as needed, i.e. care for the management of SAM is provided

as long as needed. Services to address SAM can be integrated into routine health services of health facilities, if supplies are present and additional support to health facilities can be added during certain seasonal peaks or during a crisis depending on the performance of the site.

Also findings of this study revealed that most of the clients (78.8%) complained about no follow up on them when they default or absent.

From the data analyzed, it was statistically significant that most of the clients who were not successfully treated in the programme, was due to shortage of plumpy nut (p=0.000).

Irrespective of the place of health care women should be able to access CMAM services. Women who are busy or for one or two reason cannot access the service on an OPC day at the health facility should be able to alert the health worker for a bi-weekly ration or other options in order to have access to the service.

The absence of Community Health Nurse (CHN) at post influences a woman's decision to utilize Community-based Management of Acute Malnutrition services. Respondents (15.3%) complained about going to health facility and not meeting CHN or they refuse to attend to them because the focal person was absent. They therefore preferred staying at home or going about their business since there is no guarantee that there will be a Community Health Nurse at post to attend to them. This was also due to the absence of health facilities/CHPS compound in those communities and for that reason most of the respondents could not access the services. This is in line with a study by Maine and colleagues (1996) that provides evidence from a scientifically `stronger' epidemiological study using intervention and control village clusters conducted at a demographic surveillance site in Matlab, Bangladesh. The intervention group had an increased number of trained community nurses posted at rural sub-centres, a functional referral system with stand-by transport to a health centre and to a district hospital. This arrangement of adequate

numbers of skilled attendants working within an enabled health system showed a marked decline in mortality in the intervention area (Maine et al., 1996). The absence of a health facility in most of the communities implied that they will have to travel a long distance to the nearest health facility to access the service. This will surely require considering money for transportation, availability of a means of transport and the condition of the road. This findings contrast a study in Morocco and Burkina Faso that found no significant effect of number of health workers or infrastructure on health service delivery. (Hotchkiss et al., 2003; Hounton et al., 2008). The presence of health facility in communities will ensure the frequent and consistent health care delivery to women. If health facilities are absent or Community Health Nurse not present in the communities where these health facilities even exist, there cannot be a consistent delivery of health care services to malnourished children.

The findings revealed that most of the respondents who defaulted said the OPC site was far (47.5%) and it also showed to be significant when (87.5%) of the non-successfully treated cases spend more than 2 hours on road to access the services (p=0.02).Women who were far from health facility (> 4 km) were 85 % less likely to make 5 continuous visit without absenting (AOR= 0.15, 95 % Cl [0.07, 0.29]). Also since most of the clients were traders, they can only access the service on market days which might not necessarily fall on the OPC day of the health facility and when that happen the Community Health Nurse turn them away or sometimes attend to them at their own comfort with insults.

This goes to support the findings of Savelugu Health Directorate in 2013 stating that defaulter rate is undoubtedly high in the district and some possible reasons for defaulting were absence of health workers from post and outpatient relying on mobile teams to cover many decentralized sites when roads are impassable (e.g., rains, sandstorm) or insecure (e.g. weak bridges). Some

of the reasons also coincide with reasons given in the Technical review meeting Report (GHS/UNICEF, 2011), such as: migration of people and other non-implementing districts coming to access the service but withdrawing later due to long distance.

In rural communities in the northern region of Ghana, the road network is very poor, and the geographical location of some communities is very far from any nearest health facility so getting means of transport to access Community-based Management of Acute Malnutrition (CMAM) services from the nearest health facility becomes very difficult. This therefore makes it difficult for a clients to access service.

This is consistent with a study in Haiti that showed that the road condition and geography constrain affects access to health service for women living in rural areas (Guttmacher Institute, 1995). This is also consistent with another Study in Zambia, Ghana and Malawi that have shown the long distances experienced by a woman to reach health facility. Differences in distance exist among urban and rural areas. A rural woman has to travel longer distance than an urban woman to a health facility in most cases (Stekelenburg, et al., 2004; Thaddeus and Main 1994; Mills et al, 2007). This is also consistent with another study in Ethiopia that showed that in rural Gimbie due to poor road conditions such as muddy and mountainous accompanied by lack of transport, women deliver at home and delay to seek and reach to health facility ((Duffy, 2007; Mills, et al, 2007).

CHN relation with clients was also seen not to be good as 5.2% and 2.4% said that it was poor and very poor respectively. Mothers complained about rude attitude of health workers towards them when they visit the health facility. Some recounted how they were shouted at whilst others too said nurses were unresponsive to their plight and reluctant in attending to them according to this study. Consequently this resulted in women refusing to visit the health facility to access the

services. This finding is consistent with a study in Niger which showed that the main reason for delays to go to health facility was due to past experience during treatment. Clients may choose a place for health services because they feel that staff non responsive, rude, refusal to assist them, lack of empathy, lack of confidentiality and privacy. Further the experience of long waiting time also affects a client choice of treatment. (Meyer, L. et al, 2007; Duffy, 2007; D'Ambruoso et al., 2005).

This is in line with this research as Chi-square (x^2) analysis showed to be statistically significant for factors such as time spent on road to get to the OPC center and time spent at OPC site (p=0.02, p=0.002) respectively for clients who were successfully and not successfully treated . From the research 63.3% of cases which were not successfully treated spent more than 2 hours in a health facility. This goes to buttress the point made by Rutherford et al (2009) citing several studies that simple traditional measures, such as distance from household to a health facility, time spent in a health facility, availability of transportation and health care cost are used to determine accessibility.

5.4 Programme Standard and Quality of Service

The research sought to find out the programme effectiveness and quality of services based on the four CMAM components: Community Outreach, Outpatient Treatment Services for children with Severe Acute Malnutrition (SAM) without medical complications, inpatient care for children with SAM and medical complications, and services for children with Moderate Acute Malnutrition (MAM). The effectiveness of each of the component activities is assessed in the district against programme indicators and standards, as well as coverage, quality, timeliness and sustainability. Also the supply, storage and acceptability of the Ready to Use Therapeutic Food (RUTF) was also assessed.

5.4.1 Community Outreach

Community outreach is a fundamental concept for CMAM which is defined as stimulating the understanding, engagement and participation of the target population in prevention, identifying and active referral, follow-up and monitoring of malnutrition (WHO, WFP, UN/SCN and UNICEF, 2007). Community outreach is to ensure that the maximum possible number of severely malnourished children are captured and access treatment to achieve good programme coverage.

From the research, a wide range of sources were given, most of them got to know about the programme through community outreach programmes by Community Health Nurse (72%), some through referrals from hospital **(14%), (12%)** from community volunteers and a few (2%) through friends who have had the service. To increase community awareness on malnutrition, the district needs to be involved in activities such as active case finding and screening of children to identify those with SAM or MAM, referring the identified severely malnourished children to OPC for validation and admission and moderately malnourished children to SFP and home visits to monitor SAM treatment.

In a minority of cases, outpatient care protocols will trigger a follow-up home visit to check on a child who is not thriving or responding well to the treatment or learn why a child was absent from an outpatient care follow-on session or learn why a child defaulted (defined as missing three consecutive outpatient care follow-on sessions **in** a row). The "National Medical Protocol for CMAM" states that "where possible, Village Health Workers (VHW) or volunteers, Maternal and Child Health Workers (MCHWs) and FCHVs can trace those patients that default and need to be followed up. This is to encourage defaulters to return and complete treatment, but also to find out what are the reasons for defaulting and if there is anything that needs to be

changed in the programme to prevent defaulting. This was in contrast with the research as out of the number of clients who defaulted, only 21.2% were followed-up by a CHN or volunteer.

Although the Health Worker Manual mentions that visits should be recorded on a follow up/home visit form, in practice home visits are not always documented by the CHVs or CHN. Home visits by CHVs and CHN were seen to be inadequate. From the research it was seen that access problems, such as lack of transport and very wide and/or scattered catchment areas with long distances between villages and lack of motivation were reasons for weak follow-up through home visits.

Discussions held during the research suggested that absence of CHN, distant to OPC site, time spent at OPC site, sharing of plumpy nut in household, shortage of plumpy nut and wrong administration of the plumpy nut are the primary reason for defaulting and not being successfully treated. These are common reasons affecting CMAM programme attendance in the district. Experience has also shown that addressing these issues can rapidly improve programme performance. However, some experts and programme managers as well as literature mention the importance of household level support to encourage women to practice good feeding practices and the need of mothers to hear words of encouragement.

Previous experience with integrated CMAM programmes has shown that complementary, mass media activities to support grassroots efforts (e.g. FCHVs) significantly increase programme performance (Nepal Country Case Study, July 2012). Limited human and financial resources are likely to hamper any integration of these activities into MoHP national and district level plans, but as part of the national roll-out of CMAM, alternatives should still be explored.

5.4.2 Outpatient Therapeutic Programmes (OPC)

The treatment for severely malnourished children without medical complications and good appetite is managed in Outpatient care (OPC).Most of the OPCs are located in a room or building in primary health centers (PHCs), hospitals and health posts (HP). They are staffed by health system staff, typically nurses who are seconded from their normal work posts. The treatment in the OPC is totally free of charge and this was confirmed in the research when 100% of the respondent confirmed that they were not charged for CMAM services. **All** the necessary medicines for children can be procured through the NHIS by the government or CIMCI drugs provided by UNICEF. From the research although the Community Health Nurses claim they give routine drugs to all clients, but it was not recorded on their admission cards. This shows a poor record keeping at the facility level. They also attested to the fact that clients who do not have Health Insurance are not given the routine drugs since they can't purchase and there is regular shortage of the CIMC1 drugs from time to time. The functions of the OPCs as stipulated in the National Medical Protocol for CMAM (these are based on the protocol of the IMCI programme assessment) are:

•Take anthropometric measurements to confirm screening and referral results

•Administer appetite test

•Assess condition of child and presence of complications and refer to the SC as needed

•Provide nutritional treatment through the distribution of RUTF and instruction on its usage

•Monitor the child's progress through visits to the OPC at stipulated periods

•Discharge the child when the weight gain of 15% is reached.

Discussions with the Nutrition Officer indicated that, referrals from health facilities during child growth monitoring activities were poor, in the sense that, when children were brought for weighing, those with a continuous decline in weight were not always referred to the out-patient

centers for more examinations. This reduces the chances of identifying malnourished children through this method. This indicates that the integration of the CMAM programme into the already existing health system is poor. According to review of some literature, the MOH of the country must take up Community-based Management of Acute Malnutrition (CMAM) responsibilities and rely less on external support (FANTA, 2008).The linkage of the Community-based Management of Acute Malnutrition programme with programmes such as Integrated Management of Childhood Illnesses and Growth Monitoring and Promotion, creates an opportunity for the easy integration of CMAM into the health system. Presence of NGO'S may lead to a risk of decline or stagnation when emergency funding comes to an end (FANTA, 2008).

Data showed that, the standard protocols were used in the district. Only one Refresher training for health personnel has been organized by the Region since the inception of the programme in the district to ensure adherence to standard protocols for quality performance. This is not consistent with national guidelines for the management of acute malnutrition.

However, indication from insufficient staff proved a major factor in quality of service. This was in line with the statement that, the approach requires many trained staff and substantial inpatient bed capacity. Where these are available and sufficient attention is paid to the quality of care, there is good evidence that these protocols can substantially decrease case-fatality rates in both stable (Ahmed et al, 2006) and during emergency humanitarian interventions (SHPERE project team 2003).

From the interview, it was also established that there was poor staff recording and reporting system even though there is the presence of a District Nutrition Unit, CMAM Monitoring Plan and Routine Data Cleaning in all the facilities operating the CMAM programme. It was also

realized that data was only analyzed at the district level but feedbacks were not given to the various OPC sites for them to know their performance. As none of the five OPC sites knew their cure rate, death rate nor defaulter rate since the inception of the programme and this can affect the programme. This problem was also recorded in a technical report stating that an effective monitoring and evaluation team is necessary for the success of the CMAM programme. Although this calls for extra financial commitments and human resource, it is worth the investment to ensure a successful programme (Deconinck et al, 2008).

The research revealed that, all health facilities running the program uses standard admission criteria of MUAC measurement and test of oedema which correspond to CMAM protocols. Children are screened, referred and admitted by MUAC and presence of bilateral pitting oedema (based on the grades of oedema). If children fulfill any criteria, they are given a medical check and their appetite is assessed. Children can be admitted directly to the OPC as long as they have no medical complications and are able to eat the RUTF.

The child's medical condition is assessed by a health worker. The assessment includes a history of the child's condition, taken from the career. The health worker also gives the child a full medical examination to rule out complications requiring inpatient care. The examination includes checks for oedema, appetite, vomiting, temperature, respiration rate, superficial infections, and alertness and hydration status. All information from the medical check is recorded on the child's OPC card (USAID, 2008).

The use of proportional weight gain as a discharge criterion was used by OPC sites until a recent study was conducted by Lily Schofield that tested the use of weight gain as a discharge criterion from outpatient care was inadequate. However, with the introduction of MUAC as independent criteria for admission to CMAM, there is the possibility that the child's weight for height at

admission may be greater than the weight for height discharge criteria. Thus, children admitted on the MUAC criteria cannot be discharged based on a weight for height criteria. During an informal meeting on community-based management of acute malnutrition, a role for proportional weight gain in discharge was discussed. Nevertheless, the results indicate that percentage weight gain as a tool for discharge when using MUAC as an admission criterion is a promising alternative to WHM. (WHO, 2008).

5.4.3 Inpatient Care (IPC)

As per the National Medical Protocol for CMAM, inpatient care is provided in hospitals for severely or moderately malnourished children with medical complications and/or no appetite and to infants below 6 months of age. The medical complications are generally severe nutritional oedema, anorexia, convulsions, lethargy, unconsciousness, high fever (> 39° C), severe dehydration, severe anaemia, hypoglycemia, and hypothermia (< 35° C) (WHO,2008).WHO recommends to establish IPC centers and to build their capacity according to the expected number of SAM cases with medical complications.

The In-Patient Care (IPC) center in Savelugu hospital can be found in the pediatric ward. No beds have been designated in a separate room but are mixed in with other beds for people receiving inpatient care in a hospital. Children are admitted to IPC either through referral from OPC or CHVs.

The role of the IPC is to stabilize medical complications of children admitted, and to ensure feeding with therapeutic milk, using feeding tubes if there is no appetite, as per the WHO protocol. The children in the IPC must be accompanied by their caretaker and full time staffing is required to monitor the feeding process. When medical complications are stabilized and the appetite has returned, severely malnourished children are referred to OPC. At the time of the research only two children were on admission. It was also observed during the research that the

two malnourished children were even on the floor due to shortage of bed and no play area or toys available to aid in stimulation. Some health workers complained about workload and beside none of the staff present have been trained in the In-Patient Care for malnourished children. Staff who were trained have either left to school or re assigned to different wards.

Overall, the inpatient care in the research area has not been able to serve it purpose as the National protocols are not been adhered to and not a single report or data could be retrieved from the center. Some health workers interviewed attested to the fact that since they have not been trained they also find it had to use the National protocol when such children are referred to them. According to key respondents and the analysis of available data, the inpatient CMAM component cannot be considered effective in Savelugu/Nanton Municipal and improvements are needed in the procurement of beds, play areas, toys, staff and data monitoring.

5.4.4 Services for Children with Moderate Acute Malnutrition (MAM)

According to the National Medical Protocol for CMAM the treatment for MAM is to provide caretakers with counselling on child feeding and care practices as per the Infant and Young Child Feeding protocol. Children identified with MAM are generally enrolled in the Targeted Supplementary Feeding Programmes (TSFP). However, they may receive some Supplementary Foods through World Food Programme Targeted Supplementary Feeding (TSFP) distribution. There is TSFP in the district but the linkage cannot be felt since the TSFP is run at the community level through wet ration by employed community members. The protocol directs Community Health Volunteers to provide counseling of caretakers of moderately malnourished children in the community.

The Community Health Nurses said they give counseling to caretakers on the importance of nutrition for child development and proper child feeding and child care practices, with special

attention to the home based preparation of child food and feeding frequency, hygiene and sanitation, and the importance of sharing responsibilities for child care among family members as per their time availability.

They also try to link them to the closet feeding center but are refused admission by center attendants because they are not from that community or they have achieved their target population.

5.5Ready-to-Use Therapeutic Foods (RUTF) Supply, Storage and Acceptability Issues

The National Medical Protocol for CMAM notes that the amount of RUTF a child should consume is 200 kcal/kg/day, which is comparable to the WHO recommendation of 150-220 kcal/kg/day for Phase 2 of the in-patient management of SAM.The CMAM recommendation allows for some sharing with siblings. On the use of RUTF's, mothers were happy because they said it was easy to feed the children with. This is in line with findings from Singh (2011), where an interview with mothers about their experiences with CMAM and their use of a Ready-to-use Therapeutic Foods (RUTF), known as Plumpy Nut, was more reassuring. However discussions with the Nutrition Officer and Community Health Workers,25.3% some mothers share the weekly ration of the malnourished child's RUTF with the other children in the household, thereby reducing the required amounts for the malnourished child. Some mothers even go to the extent of eating some of their child's Ready-to-use Therapeutic Foods (RUTF). The study shows that, shortages of the Ready-to-use Therapeutic Foods have resulted in malnourished children not getting their required rations regularly and further defaulting.

Health workers are in charge of prescribing the recommended amount of Ready-to-use Therapeutic Foods (RUTF) for SAM cases and to provide information to caretakers on how to use it.

UNICEF regularly supplies the Region with Ready-to-use Therapeutic Foods (RUTF). As per the government system, each OPC records receipt and distribution of supplies. The DNOs in turn are in charge of delivering the Ready-to-use Therapeutic Foods to functioning Out-Patient Care sites based on their caseload.

To prevent stocks from running out, procurement and supply of Ready-to-use Therapeutic Foods and other therapeutic foods, which are obtained from outside the country must be efficient. Delivery of supplies has been unpredictable and resulted in delays in the initiation of CMAM activities.

Health workers interviewed in the districts said that Ready-to-use Therapeutic Foods was not supplied on regular basis eventhough they usually order the required quantity three months in advance. .This has largely been successful although District Health Officers do not always have optimum and large enough storage facilities and problems have been experienced with crowding and rodents. The Ready-to-use Therapeutic Foods is also very dense and its weight adds to storage and transport issues.

5.6 Community-based Management of Acute Malnutrition Service Performance

Overall, 67.4% of children were discharge cured, which is below the recommended Sphere target of >75%., 2.2% of children di ed, which is an acceptable rate for the management of SAM and below the Sphere standard of <10% and 30% of the children defaulted treatment. This was high and above the recommended Sphere standards of <15% (Savelugu Health Directorate Annual Report 2013).

The proportion of children who recovered was well below results obtained in CMAM programs and below the sphere standards (>75%). The proportion of defaulters was greater than the usually observed in Community-based Management of Acute Malnutrition (CMAM) and

outside sphere standards (<15%). The high defaulter could reflect the low recovery rates. The fact that only a few children died could reflect low treatment failure. Indeed, low case fatality rates compared with the lowest observed in CMAM programs and is well below the criteria for success according to sphere standards (<10%). However, many untraced defaulters may have died at home without being registered.

The high defaulter rate was explained to be a result of, difficulty to follow up cases from communities that have not initiated CMAM, as soon as child starts to show improvement, the mothers discontinue treatment. It is assumed as scale up continues and there is more access to CMAM services, the default rate will decrease. Also seasonal migration of caregivers of children with SAM already receiving treatment, especially during planting and harvest seasons.

CHAPTER SIX

SUMMARY, CONCLUSION AND RECOMMENDATION

6.0 Introduction

This chapter presents the summary of results, conclusion, recommendations and limitations of the study. The main objective of the study was to describe the implementation realities of the Community-based Management of Acute Malnutrition (CMAM) programme.

This research work was carried out in the Savelugu/Nanton Municipal. A retrospective cohort study design and purposive sampling methods were used. Key informant interviews and focus group discussions were also used to obtain firsthand information from five community health workers each from the five (5) OPC centers in the program. The program Community-based Management of Acute Malnutrition (CMAM) provides its services within existing MOH/GHS service health delivery structures in the district.

The District Health Management Team (DHMT) carries out a quarterly supportive supervision. The quality of the management of SAM is high party due to this intensive supportive supervision making the health facilities sticking to the standard admission criterion of CMAM and a discharge criterion of 15% weight gain.

6.1 Summary of Main Findings

The main findings of the study are as follows:

- Most of the households 96.8% (241) were headed by males and 95.2 % (237) of the households had more than six members.

- Most of the respondents 110 (44.2%) had knowledge of applied nutrition, 22 (8.8%) had perceived confidence in cooking skill and 117 (47.0%) had knowledge of food preparation.
- Overall maternal nutrition knowledge among the women studied was relatively low (15.8%) in the study area.
- About half (45.8%) of the respondents first seek medical treatment from a traditional healer even with the presence of CMAM in the district.
- More than half (61.4%) of the respondents get to the OPC site on foot and (82.3%) spend 1-2 hours on road before getting to the nearest OPC site.
- About one-third (32.1%) of beneficiaries spend 1-2 hours at a health facility before getting treatment.
- About one-third (35.7%) of beneficiaries were sent back or refuse treatment due to shortage of plumpy nut.
- Eventhough CMAM is community-based only (11.6%) of the clients knew about the programme through the Community Volunteer
- The results of the study showed that, the two main reasons for default was distance to OPC site (47.5) and absence of a CHN during CMAM clinics (40.4%).
- Almost all the clients (78.8%) who defaulted were not followed up by a CHN to know the cause or reason for not coming.
- Most of the clients (44.6%) spend 8-16 weeks in the programme before been cured or defaulting.
- A significant positive association ($p<0.01$) between clients who were successfully treated and those not successfully treated on the assessment of CHN relationship with

them. Most(66.7%)of those who were not treated successfully or defaulted said the CHN relation with them was poor

> Time spent on road and at the OPC site were determinants of treatment failure or default. Time spent at OPC site was strongly associated positively with treatment failure ($r = 8.28$, $p < 0.02$) and time spent at the site($r = 12.89$, $p < 0.002$) for treatment failure or default.

> Women who were far from health facility (> 4 km) were 85 % less likely to make 5 continuous visit without absenting (AOR= 0.15, 95 % CI [0.07, 0.29]).

> The study found that most clients who were denied service due to shortage of plumpy nut were not successfully treated or defaulted ($R=31.03$, $p<0.001$) and also those who shared the plumpy not with other siblings in the household were also not successfully treated ($r=5.61$, $p=0.02$).

> Compared to those who did not experience plumpy nuts shortages, those who experienced shortages were about 3.6 times likely not to recover successfully (95% CI, AOR=3.6, $p<0.001$)

> The study findings showed that, most of the implementation protocols of the CMAM programmehave not been adhered to in the Municipality.

> Efforts aimed at increasing access and coverage should be perused; adequate staffing, adequate logistics provision, increasing communal education with focus on care givers or mother groups and institutionalization of best practices and reward/motivational schemes.

6.2 Conclusions and Recommendations

In conclusion, there is full implementation of the program in the district, but scale-up to all facilities and CHIPS compounds has been an issue.

There is insufficient staff in health facilities. Adherence to standard protocols has not been effective. Misclassification of cases did occur during review of cards admitted clients

Over the years, Cure rates and defaulter rates have not met the acceptable targets respectively, unlike the recorded death rate which is within the set targets of Community-based Management of Acute Malnutrition (CMAM). Although, there is still a long way to go, the program has made great progress in the treatment of malnutrition cases in the district and when on, will give impressive results in the treatment of malnutrition and averts a large number of child deaths.

The following are considered high-priority recommendations developed primarily to address the barriers identified, but were also informed by the lessons learnt in the course of the study:

a) Engage opinion leaders, herbalists and traditional healers in CMAM sensitization and obtain their support.
b) Organize regular, eg quarterly, active case-finding campaigns for SAM children and use the mass media to make important announcements and/ or to encourage community members to support the campaigns.
c) At the national level, treatment of SAM (including outpatient and inpatient therapeutic supplies and medicines) should be made entirely free.
d) Strengthen monitoring within the CMAM program in order to reduce staff worker absenteeism at the various OPC sites, and improve attitude of health staff towards mothers of children with SAM. Along with this, all staff workers must receive training on CMAM

e) Create more awareness about the CMAM program in communities by using such platforms as community durbars, jingles and mass media.

f) Intensify community education about the causes and treatment of SAM, the importance of early treatment for children with SAM, and the need to avoid superstitions that have been associated with children suffering from severe acute malnutrition. Appropriate mechanisms such as durbars and statements from chiefs, queen-mothers, religious leaders, etc. may be used to achieve these.

g) Institute a reward scheme that would appreciate volunteers and health staff for cases of SAM identified and referred to OPC sites and followed-up until discharge.

h) Strengthen the SAM case-detection processes by adopting various strategies including on-the-job technical and skills training for frontline health staff and CHVs, provision of appropriate tools and job aids such as tapes, drawing, posters, bicycles, etc. to facilitate case detection, and increased material and/ or financial motivation for CHVs.

i) Nutrition education should be intensified by nurses and health promoters to include all topics concerning the health and nutrition of women and children during out-reach and fixed health delivery points.

j) The D/MHMT should organize programmes through the local radio station, posters in the local language to help increase nutritional knowledge of pregnant women thereby, improve their dietary intake.

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APPENDICES

Appendix I: Consent form

THE COMMUNITY-BASED MANAGEMENT OF ACUTE MALNUTRITION (CMAM) PROGRAMME: IMPLEMENTATION REALITIES IN THE SAVELUGU NANTON MUNICIPALITY OF NORTHERN GHANA

INFORMED CONSENT

Good morning/afternoon/evening. My name is (name of enumerator), a student at University for Development Studies (UDS) conducting a study on the topic "Community-based Management of Acute Malnutrition (CMAM) Programme: Implementation realities' I would like to have an interview with you on the topic and would very much appreciate your participation in this study. This interview usually takes between 20 and 30 minutes to complete. All of the answers you will give will be confidential and will not be seen by anyone other than members of our team. If we should come to any question you don't want to answer, just let us know and we will go on to the next question. However we hope you will participate fully in the survey since your views are important.

May we begin the interview now?

I. Yes 2. No

1.9	Ethnicity of respondent	.....	
1.10	Apart from your own housework, what do you do to earn income	1. Trader/vendor	2. Farmer
		3. Civil servant	4. Health care worker
		5. Educational Worker	
		6. service worker(e.g. hair-dresser, seamstress)	
		7. Others(specify)	
1.11	What is your religion	1. Islam	2. Christianity
		3. ATR	4. No religion
		5. Others(specify)	
1.12	How many people live in your household		
SECTION2	**2.0 SOCIO-ECONOMIC STATUS**		
2.1	What is your estimated monthly income	.....	
2.2	Does your household have a guaranteed food supply all year round for all members of the household?	1. Yes	
		2. No	
2.3			

	In times of inadequate food supply, what measures do you take?	1. reduce the amount and/or number of times food is eaten by the household including children	
		2. reduce the amount and/or number of times of food eaten by adults only	
		3. reduce expenditure on other needs and use savings for food	
2.4	Does your household have any of these assets	ASSET	
		I. Radio	
		2. Color/black TV	
		3. Mobile phone	
		4. Bicycle	
		5. Motorcycle	
		6. Car	
2.5	What kind of toilet facility do members of the household use	1. own flush toilet	2. Public toilet
		3. Free range	4. Pit latrine
2.6	What type of fuel is mostly used for cooking	1. Electricity	2. Charcoal
		3. LPG	4. Firewood
2.7	Did/do you pay for CMAM services	1. Yes	2. No
2.8	If yes what did you pay for and how much		

SECTION 3	**3.0 KNOWLEDGE OF MALNUTRITION AND CMAM**		
3.1	What are the common health problems that children in the household experience	1. Malaria/fever	2. Diarrhoea
		3. Pneumonia	4. Malnutrition
		5. Anaemia	6.Skin infection
		7. Others(specify)	
3.2	What is the local name of malnutrition in the community		
3.3	How was it treated		
3.4	How did you hear about malnutrition	1. CHN outreach	2. Hospital
		3. Volunteer	4. From a friend
		5. NGO(specify)	6. Other(specify)
3.5	What was the first action taken when you realize your child was unwell?		
3.6	What were the symptoms showed by the child?		
3.7	Prior to hearing about malnutrition, what was your belief/impression about your child's condition?		
3.8	Which group of people are usually affected by malnutrition	1. People of all ages	2. Pregnant women
		3. Children O-59mths	
		4. Other (specify)	
3.9	What do you think causes malnutrition		

3.10	Who detected and told you your child was malnourished?	1. friend 3. CHN	2. volunteer 4. Hospital/Nurse 5. other(specify)
3.11	How did you learn about CMAM	1. friend 3. CHN 5. other(specify)	2. volunteer 4. Hospital/Nurse
3.12	Do you know what a plumpy nut is	1. yes	2. No
3.13	Have you tasted or eaten plumpy nut before	1. Yes	2. No
3.14	Do other children in household eat some of the plumpy nut	1. Yes	2. No
3.15	If yes, why		
3.16	Did CHN explain why they are putting your child on the programme	1. Yes	2. No
3.17	How many weeks has/did your child stayed in the programme?		
3.18	Have/did you see any improvement	1. yes	2. No
3.19	what is the child's status in the programme	1. active 3. Non-recovered 5. Relapse/re-adm.	2. defaulted 4. cured
3.20		1. Just last OPC day	3. Three weeks ago

	When was the last time you visited the OPC center?	2. Two weeks ago	4. Four weeks ago
3.21	Why were you absent or defaulted (if Applicable)	1. was busy	2. child got better
		3. center is too far	
		4. did not know	
		5. other(specify)	
3.22	Have there been any follow-up on your absence?	1. Yes	
		2. No	
	If no did the CHN ask why you absented on next visit	1. Yes	
3.23		2. No	
3.24	Have you ever had any cause to lose interest in the CMAM programme	1. Yes	
		2. No	
	If yes, Why?		
3.25	Were you taught how to give plumpy nuts to your child?	1. Yes	2. No
3.26	If yes, how do you give plumpy nuts to the child	1. give it alone	3. mix with water
		2. mix with porridge	4. other (specify)
3.27		1. Yes	

	Have there been times the child refused the plumpy nuts?	2. No	
3.28	What was the reason and what did you do?		
3.29	Does your child react negatively when (name of child)takes the plumpy nut	1, yes	2. No
3.30	If yes what is the reaction		
3.31	Have you ever been turned away because plumpy nuts weren't available?	1. Yes	
		2. No.	
3.32	If yes, for how many OPC days?		
3.33	Were you given routine drugs on admission?	1.Yes	2. No
3.34	If yes, which of the routine drugs where you given?	1. Antibiotics	2. Vitamin A
		3. Dewormer	
		4. Other (specify)	
3.35	Did the CHN examine your child	1. yes	2. No
3.36	if yes, which of these examinations did Cl-IN do	1.MUAC	3. malaria test
		2.temperature	4. conjunctiva
		5.other(specify)	
3.37		1. Yes	

	Have there been times you did not meet CHN during an OPC day?	2. No.	
3.38	If yes, what was the reason given?		
3.39	How will you rate the CNN's relationship with you?	1. Good	2.Very Good
		3. Poor	4. Satisfactory
			5. very poor
3.40	How much time do you spend at the OPC centre?	I. 30min.	2. > 2 hours
		3.1-2hrs	
SECTION 4	**4.0 ACCESS AND UTILIZATION OF HEALTH SERVICES AND CHILD MORBIDITY**		
4.1	How do you get to the OPC centre?	1. On foot	2. bicycle
		4. Motorbike/tricycle	3. Car
4.2	How long does it take to get to the OPC centre?	1l. 30min.	2. 1-2hrs
		3. > 2hrs	
4.3	Has(name of child)suffered from any of these conditions in the last two weeks (If yes tick)	1. coughs that come from the chest	
		2. Diarrhoea(loose watery stools more than 3times)	
		3. Fever/Malaria(high temperatures with shivering/suspected malaria	
4.4	What amount of breast milk did you offer when the child was on plumpy nuts?	1. Less	4. DNK
		2. The same amount	
		3. Child does not breastfeed	
4.5	If less, ask why?		
4.6		1. Less	2. more

	What amount of solid/semi-solid foods do you offer to (child's name) in the child's malnourished condition?	3. The same amount 4. Child does not eat	5. DNK
4.7	Where did you first seek health care assistance when (name of child) was sick/malnourished?	1. sought no assistance	
		2. Own medication	
		3. Traditional healer	
		4. Private clinic	
		5. Public Health facility	
		6. Drug Peddler	
		7. Pharmacy/chemical store	
		8. Others(specify)	
4.8	Is child fully immunized for age? Confirm from child health record book.	1. Yes 2. No.	
4.9	Is child currently breastfeeding?	1. Yes	2. No
4.10	When did you start giving (name of child) other foods apart from breast milk	1. < 2mths	
		2. 3-4mths	
		3. 6mths	
		4. > 6mths	
4.11	What challenges do you face in the CMAM programme		

SECTION 5 - MATERNAL NUTRITIONAL KNOWLEDGE							
5.1	Have you had any nutrition knowledge, education or access to nutrition information	1	Yes			2	No
5.2	If Yes, on what subject matter	1	Knowledge of Applied Nutrition	2	Perceived Confidence in Cooking Skills (PC)	3	Knowledge of Food Preparation (KP)

ANTHROPOMETRY OF CHILD				
Name of Child.....				
Sex of Child (M/F).....				
	Date	Weight(Kg)	Oedema (YIN)	MUAC(cm)
Admission				
Discharge (if applicable)				
Now (day of data collection)				

COMMUNITY VOLUNTEER			
SECTION 1			
1.1	Name of Volunteer		
1.2	Age		
	Name of community		
1.3	Highest schooling level completed by respondent	1. Primary	2. JHS
		3. Tertiary	4. Adult Education

		5. SHS/Voc 7. None	6. Other(specify)
1.4	Occupation		
1.5	Ethnicity		
1.6	How were you chosen as a volunteer?		
1.7	How long now have you been a volunteer?		
1.8	What are your roles as a CMAM volunteer?		
1.9	Have you been trained on CMAM	1. Yes	2. no
1.10	Do you know the MUAC tape	1. Yes	2. no
	Was demonstration of use good?		
1.11	What is the perception of people about Malnutrition in the community?		
1.12	Is there any stigma associated with malnutrition in the community and what is the stigma		
1.13	Have you ever detected a case of malnutrition in your community?	1. Yes 2. No	
1.14	What did you do?	1. Did nothing 2. Referred mother to OPC Centre 3. Called a CHN 4. Others(specify)	
1.15	If you referred, did you do any follow-up	1. Yes 2. No	
1.16	What do you reckon are the reasons mothers refuse to go the OPC centre?		
1.17			

	Which month do you experience this malnutrition in the community		
1.18	Do you do case search and home visit of clients	1. yes 2. no	
1.19	If yes, which month do you find it hard to reach your clients?		
1.20	Has the CMAM programme helped in curbing the malnutrition situation in your community	1. yes	2. no
1.21	How often do you engage with CHNs on the issue of Malnutrition and CMAM?	1. very often 2. less often	3. Rarely engage 4. never engaged
1.22	If less often, what is the reason?		
1.23	Was a community sensitization organized on the programme in your community?	1. yes 2. No	
1.24	Do you receive any incentive for the work you do?	1. Yes 2. No	
1.25	If yes, What is your motivation for working as a volunteer?		
1.26	Do you have a CMAM role model in the community	1.yes	2. No
1.27	How does your daily income generating work affect your effectiveness as a volunteer?	1. Does not affect me 2. I do not get enough time 3. I become tired and unable to perform	
1.28	What other health issues/concern do you engage the community with?		

1.29	What improvements do you think are needed to increase the success of CMAM?	

SECTION I	OPC STAFF		
1.1	Sub-district name -	Date	
1.2	Have you been trained on CMAM	1. Yes	2. No
1.3	How long have you been working on CMAM		
1.4	What is the staff strength of your sub-district		
1.5	How many are trained on CMAM		
1.6	How many refresher trainings have you had?		
1.7	Indicate whether or not you have these CMAM aid tools? (TICK IF APPLICABLE)		
		1. Uni-scale	
		2. MUAC tape	
		3. Table to identify target weights	
		4. RUTF look-up table	
		5. Tally sheets for SAM	

		6. Monthly report form	
		7. Child Counseling cards	
		8. CMAM illustration cards	
1.8	Are there times you have to turn away clients due to unavailability of plumpy nuts?	1. Yes	
		2. No	
1.9	How often does that happen?	1. Very often	3. Rarely happened
		2. Less often	4. Never happened
1.10	How do you usually identify cases for CMAM?	1. During GP sessions	
		2. Referrals from Volunteers	
		3. Directed by other beneficiaries	
		4. Directed by other person in the village	
		5. Others(specify)	
1.11	How often do you have wrong referrals from volunteers?	1. Very often	3. Rarely happened
		2. Less often	4. Never happened
1.12	What do you do when you get wrong referrals from volunteers?		
1.13	How do you refer clients to IPC?		
1.14	How do you know if they arrived at the IPC		
1.15	Which month do you have high case turnout		
1.16	Which month do you have low case turnout		
1.17		1. Very serious	3. Low

	What will you say is the situation of defaulting in your sub-district?	2. Serious	4. Non-existent
1.18	Which month do you find it hard to reach your defaulting clients		
1.19	Why do you think are the reasons why children default or are absent for OPC days?		
1.20	What do you do when a child has not turned up for treatment?	ABSENTEES:	
		DEFAULTERS:	
1.21	Do you engage the volunteers to do follow-ups on absentees and defaulters?	1. Yes	
		2. No	
1.22	Do they report back when they do a follow-up?	1. Yes	
		2. No	
1.23	Is there any stigma associated with malnutrition in these communities and what is the stigma?		
1.24	How often do you see the volunteers?	1. Very often	3. Rarely
		2. Less often	4. Never
1.25			

	How helpful are the volunteers at mobilizing communities for your work?		
1.26	What is your view on the reporting form provided by the DHMT to compile reports?	1. Complicated	
		2. Difficult to understand	
		3. Simple	
		4. Needs improvement	
1.27	Do you analyze CMAM data at your level	1. Yes	2. No
1.28	If no, how do you able to know your performance as a site?		
1.29	What difficulty do you have on a CMAM day?	1. High number of patients	
		2. Time constraints	
		3. Completing paperwork accurately and keeping reports up to date	
		4. No difficulty	
		5. Others(specify)	
1.30	What improvements do you think are needed to make CMAM more acceptable and successful?		
1.31	Has the CMAM programme helped in your service delivery	1. yes	2. no

1.32	What are the challenges been faced		

SECTION 1	DHMT		
1.1	Position of responding officer?	1. District Director of Health	
		2. District Nutrition Officer	
		3. Disease Control Officer	
		4. Public Health Nurse	
		5. Health Information Officer	
1.2	How long has the district been implementing CMAM?		
1.3	How many times do you go on monitoring?	1.quater	2. monthly
		3.weekly	4. yearly
		5. NA	6. other (specify)
1.4	How many functional OPC sites are in the district?		
1.5	What is the acute malnutrition rate of the district?		
1.6	Do you have regular supply of plumpy nut and other logistics to run the programme?	1. Yes	2. No
L7	What is the staff strength of your districts?		

1.8	How many has been trained in the programme?		
1.9	Are all the communities in the district **sensitize** on the programme?	1. yes	2. no
1.10	How was the sensitization done?	1. durbar 2. gong gong	3.talks at outreach 4. other (specify)
1.11	Which sex group is normally admitted in the programme?	1. male	2. female
1.12	Do you see the CMAM programme achieving its purpose?	1. Yes	2. No
1.13	What are the challenges faced at your level?		

Appendix III: QUESTIONNAIRE GUIDE FOR FOCUS GROUP DISCUSSION

The discussion should flow naturally and leads/interesting points should be followed/explored as they come up. The question list should not be rigidly adhered to. This is just a guide as to the kind of topics which are important and the type of question which could be asked. The direction the discussion takes will depend on what is said by the participants. It **is** always important to probe and ask follow up questions.

UNDERSTANDING OF MALNUTRITION

1. What are common health problems that children experience here?
2. Which are the most frequent?
3. Are any more frequent at certain times of the year? Why?
4. Which are the most serious? Why?

If malnutrition mentioned ask:

5. What symptoms do these children have?
6. What terms do you commonly use to describe this condition?
7. Which children get this condition? Why

HEALTH SEEKING BEHAVIOR

8. What do you do when your child has this (insert name of most common illnesses) problem
   a. Probe fully for different illnesses
9. Which? How far is it? Why do you go there?
10. Are there any alternative/anything else you might do/anyone you might ask for advice nearer home?

11. What factors determine which treatment/approach you use for a particular illness?

    a. Cost
    b. Access
    c. Father permission
    d. Habit/familiarity

If malnutrition not already mentioned ask/show pictures:

12. Have you seen children like this (those who have lost weight/become very thin or whose feet/legs/hands have started to swell?
13. What do you call this condition?
14. When do you see this condition? Why?
15. Which children get this condition? Why?
16. What do you do when your children get this condition? Why?

AWARENESS OF CMAM SERVICE

17. Do you know of a place where this condition can be treated?
18. Where did you hear about it?
    a. Who told you?
    b. When?
    c. What do you know about it

19. What are children given for this condition?
20. Do you know children receiving this treatment?
21. Do you know children who have this problem but who are not going for the treatment? Why?

PERCEPTIONS OF CMAM

22. What are people saying about this service?
23. What do you think of this service?

If people say it is good ask:

a. What is good about it?

24. How are children identified for treatment?
    a. Have you seen anyone doing this in your community?
    b. How often does the volunteer measure children?
25. Do you know of children who have been to the clinic and have not been given the treatment?
    a. If yes, why not?
    b. What were they told?
    c. How did they feel?
26. Do you know of any child who have stopped going for treatment?
    a. Why is this?
    b. What would encourage them to return?

If caregivers of beneficiaries are in the group ask separately as a case study:

27. Tell me about your experience of the service?
28. What have u said to other people about it?

If caregivers of defaulters are in the group ask separately as a case study:

29. Why did you stop going?
    a. After how many weeks?
    b. What have you said to other people?
    c. How is your child's health now?
    d. What would encourage you to take your child back to the clinic?
30. What messages do you want us to pass to the people organizing the CMAM service?

Appendix IV: KEY INFORMANT INTERVIEW GUIDE (KII)

KNOWLEDGE OF CMAM

1. Are you aware of any nutrition service at your local clinic?
2. Who told you about it?
3. When did you hear about it?
4. What do you know about it?
    a. Target children?
    b. Admission criteria?
    c. Treatment given?
    d. Free treatment?
    e. OPC day?
    f. Identification of children

ROLE/SENSITIZATION

5. Have you have told others about the service? How? When?
    a. Usual channels/message dissemination?

BARRIERS

6. Are you aware of any children who need treatment but are unable to access service?
    a. What stops them coming? (distance/family/beliefs/other)
    b. How could we reach these children/encourage them to attend?

KNOWLEDGE OF CASES

7. Do you know any children receiving treatment?
    a. What can you tell me about them?
8. Do you know any children who have defaulted/stopped coming?
    a. Why is that?
    b. How can we encourage them to return for treatment?
    c. What do you other key community **figures** think of it?
    d. If I wanted to find out about malnourished children in your community
        i. What would be a better question to ask

ii. What questions should I avoid asking

iii. Who do you think would be best to identify such children in your settlement

iv. What do people in this area say/think of families with such children? (Probe if there is any stigma of malnutrition in the area/settlement?

COMMUNICATIONS

9. Do you know who the volunteer is for this service?
   a. When did you last see them?
   b. What do they do? (frequency and organization of activities)
10. Have you had any feedback from the volunteer/clinic staff/MOH officials about the service?
    a. Do you know what the results are?

PERCEPTIONS OF CMAM

11. What are people saying about CMAM?
12. What do you think of the service?

IMPROVEMENTS OF CMAM INTERVENTIONS

13. How can we improve the service/ what are the ways you believe CMAM can be improved in terms of

    I. Standard and Quality
    II. coverage,
    III. Essence and appreciation of CMAM programme?

14. Do you have any messages for those running the service?