IMPACT OF OUT-PATIENT THERAPEUTIC PROGRAM (OTP) ON THE NUTRITION STATUS OF SEVERELY MALNOURISHED CHILDREN BELOW FIVE YEARS: A CASE OF KASARANI DISTRICT IN NAIROBI COUNTY

BY

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DECLARATION

This research project report is my original work and has not been presented for a degree or any other award in any other university.

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DEDICATION

This project report is dedicated to my mother Grace Achieng because of her constant counsel on hard work. My 2011 intake classmates whose positive criticisms of my project work motivated me to work even harder on this project.

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

ABBREVIATIONS AND ACRONYMS

ACF	-Action Contre la Faim (Action Against Hunger)
AMREF	-African Medical and Research Foundation
CIAF	-Composite Index of Anthropometric Failure
IEG	- Independent Evaluation Group
ITHB	-Integrated Theory of Health Behavior Change
SMAF	-Simultaneous Multiple Anthropometric Failures
UNICEF	- United Nations International Children's Emergency Fund
WHO	- World Health Organization
MUAC	-Mid Upper Arm Circumference

ABSTRACT

Due to poverty levels especially in the informal settlements in Nairobi County, many mothers are finding it difficult without the necessary safety nets that they can use to offer appropriate nutrition to their children. When a household cannot get enough food to eat or are hard pressed because of the harsh economic environment, children below five years are worse affected. Due to the prevalence of this problem in Nairobi County, the OTP program that seeks to improve the nutrition status of children below five years who are severely malnourished has been put in place. The main aim of this study was to establish the impact of the Outpatient therapeutic program on the nutrition status of children below five years of age in Nairobi County. The study looks at how the various aspects of the OTP program namely; nutrition and health education, supplementary and complementary feeding, monitoring and evaluation as well as home follow ups/home visits impact on the target population's nutrition status. The study used a correlational research design to study the relationship between different aspects of the independent variable, the OTP program and the dependent variable; nutritional status of children below five years in Kasarani district Nairobi County. The study utilized questionnaires and interview schedules to collect data from respondents. The Pearson correlation coefficient was therefore used to study the relationship between the different aspects of the outpatient therapeutic program on the dependent variable, the nutrition status of children of children below five years in Kasarani District of Nairobi County. The study established that there is a strong positive linear correlation between the nutrition status of children below five years who have been in the program and the health and nutrition education given to the caretakers in the program. The study equally established that there was a strong positive linear correlation between the Ready to Use Therapeutic Feeds given to children below five years and their nutrition status. Minor discrepancies in the implementation of the monitoring system in the program, shortfalls in the implementation of the follow up services and some other problems emanating from poor synchronization of the program were equally established and discussed. Consequently the study concluded that the program has had a positive impact on the nutrition status of the children considering that their frequency of sickness has gone down due to improved immune e system hence healthy living. The caretakers have equally gained lifetime knowledge on childcare that were to be instrumental in taking care of the children through their childhood. Sustainability of the intervention at the household level was however a challenge that must be dealt with through other measures of improving the general livelihoods of such persons.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Nutrition as a whole plays a significant role as a cornerstone of any country's socio-economic development. This explains why it is a vital component in any primary health care as well as in the millennium development goals (MDGs). When children have better nutrition, it manifests in the form of good nutrition status that translates into strong immune system, less childhood illnesses, good health and influences a productive community. All attempts made to provide better nutrition services to the population at large and to children below five years in specific is a concerted effort to preserve human dignity by alleviating hunger as well as malnutrition and uplifting their human rights. Nutrition officers play a significant role ensuring that the nutrition status of children below five years remains optimal so that such benefits can be realized.

Caulfield et al (2006), holds that the role of such nutrition officers starts at the prenatal stage so that the mother can carry a healthy pregnancy leading to a healthy birth weight. They equally assess food sufficiency in household with such children and take appropriate measures where necessary and possible. The nutrition status of these children can either be normal, undernourished or over nourished. The nutrition status of children under the age of five years has constantly been viewed as a good indicator of the nutrition status of the entire population in focus. This is because they are an 'at-risk' population that is very vulnerable to any factors that directly interfere with their nutrition (Caulfield et al, 2006). Since in the event of food scarcity of food the children mostly get the first priority, when they are less nourished, chances are high that the people around them could be suffering more.

From a global perspective, malnutrition in children under the age of five years that the OTP program seeks to deal with is considered a serious public health concern. Bryce et al (2008) held that "The Lancet Nutrition Series" did an estimate where they held that in a population of 555 million children between birth and five years in developing countries, up to 177 million that make up approximately 32.0%, were suffering from stunting (chronic malnutrition), 112 million making up 20.2% were underweight while 19 million that constitutes 3.5% were severely wasted (suffering acute malnutrition) (Bryce et al, 2008).

In Pakistan, it is estimated that about 10% of Pakistani children hardly live to their sixth birthday. The primary factor linked to this state of affairs is the prevalence of malnutrition among the under five children. From history, Pakistan has always struggled with the issue of malnutrition. This is evident in the 1997 report released by UNICEF in which it held that 50% of children in Pakistan were stunted, 38% were underweight and 9% exhibited signs of severe wasting.

The pediatrics department at the Civil Hospital in Karachi undertook a study to determine the effectiveness of "PediaSure", a supplemental feed that is of high-density calories in treating children below five years. In this study, 31 severely malnourished children below five years were recruited and supplied with 'Pediasure' after having been treated of any inherent medical complications. This was done for two weeks and their weight gain as well as clinical tolerance monitored closely. Their chemical as well as hematological parameters were equally monitored over the two-week period. The study results indicated that after the two weeks, the caloric intake of the children increased significantly ($p< 0.01$). The weight gain also increased at an average of 7.5g/kg/day and so was the Z-score weight for age ($p= < 0.01$).

In terms of the biochemical parameters, the potassium levels increased slightly but nothing was noting close to a chemical imbalance in the children's systems. The tolerance level was high and none of the children developed side effects of complications like diarrhea. The study therefore concluded that Pediasure was an effective outpatient intervention in rehabilitating severely malnourished children below the age of five years. Considering that PediaSure and the program in which it was distributed is exactly similar to the Outpatient Therapeutic Care program run in Kenya, it serves to justify for instance that the method has been used elsewhere and worked out.

In Ethiopia, the government through the ministry of health works in partnership with the International Medical Corps to carry out extensive screening of children below five years in especially in the rural areas and the informal settlements to establish the nutrition status of such children. Those who are found to be suffering from severe acute malnutrition without evident medical complications are recruited in Outpatient Therapeutic programs. In the program, the care givers are asked to bring the children back to the clinic on a weekly basis where the children undergo anthropometric assessments, comprehensive medical evaluation to identify any emerging medical conditions and are finally issued with Ready to Use Therapeutic foods (RUTF).

The RUTF issued to these children is a food component that is rich in peanuts, dense in energy and contains all the essential minerals and vitamins that the under fives need. Because malnutrition in under fives can be as a result of various factors including poor hygiene and sanitation practices, lack of/inadequate or even poor breastfeeding practices as well as poor weaning methods, the Out Patient Therapeutic Program equally has a health education component where competent health extension workers provide the caregivers with up to date

information through health education to ensure that the care givers adopt long term behavioral changes in these aspects.

Still in Africa, Liberia, a country that experienced one of the worst civil wars for 14 years has equally utilized the OTP program to handle malnutrition among the under fives. The civil war severely damaged the country's infrastructure hence equally interfering with what could be considered the safety nets for the vast majority of citizens. The urban folks in the capital City Monrovia were left totally disenfranchised and vulnerable to various sudden shocks like food shortages and basic sanitation concerns like inadequate clean water and appropriate toilets and accompanying sewerage systems. Even though there is relative calm in Liberia, many international organizations stopped or scaled down their treatment of children below five years suffering from malnutrition. The country's ministry of health on its part has listed nutrition especially for children below five years as a major component of its "Basic Package for Health Services", lack of adequate facilities, funding and established government departments to deal with malnutrition and implement appropriate programs pushed the malnutrition rate of the under fives in Liberia higher. When ACF (Action Against Hunger) stepped in to deal with the situation in the period leading to 2007, few centers were opened to implement the OTP program as a way of treating and preventing severe acute malnutrition.

The centers offered RUTF (Ready to Use Therapeutic Feeds) to malnourished children below five years whose progress was reported to improve significantly within a month or so. In these centers stationed in Monrovia, the main components of the OTP program aimed at treating the malnourished under fives as well as undertaking massive screening activities to identify those at risk and intervene before they slip from moderate malnutrition to severe acute malnutrition. The program is however not supported by the government due to financial constraints and as

such, handling the widespread cases of malnutrition among the under fives continue to be a challenge both in the urban centers and remote rural areas.

In Kenya, the levels of both chronic and acute malnutrition among children below the age of five years remain significantly high with about 30% of all child deaths of the under fives in Kenya being directly linked to malnutrition. According to UNICEF (2012) currently Kenya has about 2.1 million children who have stunted growth patterns hence impairing their full physical and mental potential. To ensure that such children realize their constitutional right to adequate and quality food as enshrined in the Kenyan Constitution, accelerating nutrition interventions is of utmost importance. In 2010, the budget of the Kenyan government had 0.5% of the health sector allocated to nutrition. Considering that few development partners have identified nutrition as a high priority area, interventions that can be implemented at an appropriate scale and proven to impact on nutrition status of children hence reducing their morbidity and mortality need to be identified and upheld (UNICEF, 2012).

1.2 Statement of the Problem

The field of nutrition is very dynamic. While there are general guidelines and care practices in the management of various conditions that impact on the nutrition status of children below 5 years, new practices continue to emerge and OTP is one of them. OTP is a program that is aimed at preventing and treating children below five years who are suffering from severe acute malnutrition. Several NGOs including Oxfam Great Britain, CARE International and Concern Worldwide in Kenya conducted a food security, nutrition, public health and livelihood technical review using the available data for the informal settlements in Nairobi and came up with startling revelations (Oxfam et al, 2009). These reviews indicated that the rate of malnutrition of children

below 5 years was significantly high in the informal settlements compared to other parts of Nairobi. According to Bhutta et al (2008), while there is little doubt that an intervention like promotion of breastfeeding improves the nutrition status of children from birth and that vitamin A supplementation reduces child mortality, there is little consensus on the various community-based approaches used in prevention and treatment of severe malnutrition in children below the age of five years. This therefore means that various states apply different strategies in dealing with child malnutrition. The OTP program is the most recent approach taken by development partners as well as government agencies in the fight against severe malnutrition among the under fives. The scientific rationale underlying the use of this program appears to be gaining support rapidly but information on the impact of this program on the immediate and long term effect on their nutrition status remain scanty.

According to a report released by AMREF in September 2011 dubbed "Hunger and malnutrition stalk Nairobi urban poor, the author Phyllis Nyambura brought out cases of poor urban dwellers and how they are facing numerous economic challenges that put the entire households including under fives at risk of malnutrition. The report highlighted the worrying trend in urban slums where people take fewer meals per day and noted that it is responsible for the high malnutrition cases witnessed in the informal settlements.

AMREF therefore put both lactating mothers and young children on a supplementary feeding program as a way of reducing the malnutrition cases. This report highlights that in various clinics run by AMREF and supported by other development partners like 'Feed The Children', they organize routine medical camps where they are able to see about 100 children every day. From this number, up to 85% of them present with cases of underweight hence malnutrition. The report equally notes that there is a very high rate of lack of nutrition

knowledge among the mothers; something the report believes has a direct link with the rates of malnutrition.

The population of Nairobi county has been on a tremendous increase from 509, 286 in 1969, 827, 7775 in 1979, 1, 324, 570 in 1989, 2, 143, 254 in 1999 and 3, 138, 369 in 2009 (Census Report, 2009). With the rapid urbanization in Kenya, it is expected that by 2020, 50% of the country's population will be residing in the urban centers. Since 1990, Nairobi county has seen a massive 46.2% increase in population growth based on the census report of 2009. A majority of these city dwellers stay in informal settlements in the slum area. Nairobi has 45% of all the urban dweller population in Kenya. With the slum dwellers in Nairobi only residing in 4% of the total land available in the county, access to basic amenities like housing, sanitation and even education are compounded in the larger prevailing situation of poverty due to joblessness or very low wages. Considering that 1 in every 2 children in Nairobi is considered stunted (APHRC, 2010) and the SAM (Severe Acute Malnutrition) rates in Nairobi stand at 1.9%, it therefore follows that more than 7000 children are therefore severely malnourished in the county. Kasarani is one of the districts in Nairobi where almost 80% of the inhabitants live in the informal settlements of Korogocho, Riverside, Mathare Area 4, Marurui, Kahawa West, Baba Dogo, Huruma, Lucky Summer and Kariobangi. It therefore only follows logically that if the malnutrition problem is high among the informal settlement areas that Kasarani is affected.

Concern Worldwide has been implementing the OTP program in Nairobi County (8 districts) since 2008 in response to the then post election violence that exposed a situation of serious malnutrition in the slums that apparently had been a silent killer in the slums. The OTP program run by Concern Worldwide is one of the interventions that the organization is using to address its key health concerns in terms of fighting malnutrition among the under five children as

well as providing technical, logistic and capacity building support to the ministry of health (MoH). It is a part of the organization's way of providing the High Impact Nutrition Interventions (HINI) targeting children below five years. While the outputs have been seen, there is need to establish the impact of this program for consumption by the custodian of public interest (The government) for purposes of applying the good practices elsewhere in the country where under five child malnutrition is also a problem. A thorough analysis of the interrelating factors in OTP will go a long way in improving the general good health of the population and reducing morbidity rates because proactive measures would be undertaken to curb the same.

1.3 Objectives of the Study

i. To establish how follow-ups in the community impact on the nutrition status of children below five years in Kasarani district in Nairobi County
ii. To determine how the health education given to care givers in OTP impact on the nutrition status of children below 5 years of age in Kasarani district in Nairobi County
iii. To determine how the complementary and supplementary foods (RUTF) given while the child is in OTP impact on the nutrition status of children below five years of age in Kasarani district of Nairobi county
iv. To establish how monitoring & Evaluation in OTP impact on the nutrition status of children below five years of age in Kasarani district of Nairobi County

1.4 Research Questions

i. How does the complementary and supplementary foods given while the child is in OTP impact the nutrition status of children under the age of five years in Kasarani district in Nairobi County?

ii. How does the follow-ups in the community impact on the nutrition status of the under fives in Nairobi County's Kasarani district

iii. How does the health education provided to care givers in OTP impact on the nutrition status of children below five years in Kasarani district in Nairobi County

iv. How does the monitoring & evaluation impact on the nutrition status of the under fives in Kasarani district in Nairobi County

1.5 Research Hypotheses

The study sought to approve or disapprove the following null and alternative hypotheses respectively;

1. **$H0_1$** There is no significant relationship between the health education provided in Outpatient Therapeutic Program and the nutrition status of children below five years in Nairobi County
2. **$H0_2$** There is no significant relationship between the complementary foods given in the outpatient therapeutic program and the nutrition status of children under five years in Nairobi County
3. **Ha_1** There is a significant relationship between the health education provided in Outpatient Therapeutic Program and the nutrition status of children below five years in Nairobi County

4. **Ha_2** There is a significant relationship between the complementary foods given in the outpatient therapeutic program and the nutrition status of children under five years in Nairobi County

1.6 Justification of the Study/Rationale

According to the Kenya Demographic Health Survey 2008-2009, the period between birth and five years is very crucial for a child's optimal growth, development and health in general. The report equally highlights that unfortunately, this period is marked by continued challenges ranging from growth faltering to micronutrient deficiency as well as childhood illnesses that eventually predispose them to malnutrition. According to this survey, the nutrition status of children was assessed by measuring the children's height and weight. This information was used to specifically establish three indices namely; weight-for-age, height-for-age and weight-for height. All this was done taking sex into consideration. The measurement procedures were done according to the guidelines issued by WHO (World Health Organization) and using the growth standards issued by WHO in 2006 (Appendix 8). From the results of this survey, up to 35% of children below five years in Kenya are stunted (chronic malnutrition), a total of 7% of children below five years are wasted and 2% of them being considered severely wasted. The survey equally holds that up to 16% of the children are underweight and hence in need of nutrition care (WHO, 2006).

According to the projections provided by UN HABITAT, the Nairobi County projections indicate that in the year 2000 the population of the county was at 2, 233, 000 and 3, 363, 000 in 2010. It used this basis to postulate that the population will be 4, 8881, 000 in 2020 and 5, 871, 000 in 2025. Because of the population pressure that continues to push Nairobi County dwellers

into informal settlements with poor sanitation, inadequate food supply due to associated factors like joblessness, inadequate health facilities and other relevant amenities, chances that malnutrition among children below five years who are the most vulnerable due to the dependence on adults is likely to be a serious health concern. This therefore justifies the need to further look critically into interventions that can be used or are being used to prevent and treat malnutrition among children in this age group in case they occur.

Establishing the impact of OTP on the nutrition status of children will play a crucial role in informing a decision by health stakeholders to consider either making appropriate substitute interventions in dealing with severe acute malnutrition or scaling up OTP programs from the current few sites (How many sites?).

The study may inform the ministry of public health and sanitation on impact of OTP that it is currently supporting partially in the treatment of acute malnutrition and hence push the country in a positive direction towards the realization of the Millennium development Goals. For instance, treating malnutrition directly deals with hunger and as such contributes towards the realization of MDG 1 that seeks to eradicate extreme poverty and reduce hunger by half.

Because malnutrition impairs children's school performance in later years and therefore the treatment of malnutrition would aid the realization of MDG 2 of achieving Universal free primary education. If malnutrition among girls is not checked, it would have a negative influence on girl child education because they would not be in school to empower themselves. Treating malnutrition through OTP or any other more appropriate method therefore contributes towards the achievement of MDG 3 on achieving gender equality. Because establishing the impact of OTP on the nutrition status of children helps in identifying the most appropriate program to deal with malnutrition among under fives, it touches directly on MDG 4 that seeks for reduction

of child mortality. When girls have impaired nutrition status from an early age, it is likely to be carried on into the future life of the women and hence contribute towards the achievement of MDG5 that seeks to improve and facilitate proper maternal health.

The study findings will therefore inform the ministry of the successes that need to be replicated in other parts of the country and equally provide feedback to the already operating sites for purposes of improvement.

Currently the OTP program is mostly rolled out by development partners like World Vision, UNICEF, Action Aid, Concern Worldwide and Merlin International among others. The government simply facilitates and provides the personnel to help with implementation as well as monitoring. The study will therefore inform the development partners working in Nairobi county on the impact that this program is having on the nutrition status of the under fives and equally highlight any challenges that may be.

The findings of this study will also inform the incoming county government on the trends of under five nutrition status in Nairobi and as such influence its health policy especially on preventive care. It will equally identify any gaps therein that could be filled if the OTP program is to achieve its originally intended purpose as well as the successes that can be scaled up to reap more benefits.

1.7 Basic Assumptions of the study

Generally, the assumption of this study was that the care givers of the under five children admitted into the OTP program would be those committed to continuing care at home as instructed at the OTP facilities and act in the best interest of their children at all times.

Therapeutic feeds; that the feeds provided to be offered to the children were solely given to the recipients without sharing with other family members.

The study also assumed that the respondents in this study were provided with relevant and accurate information in regards to the subjects asked to enable them make informed comments. The study also assumed that the supporting agency, Concern worldwide and the implementing facilities would be able to provide the required data to enable the study identify the recipients admitted in the OTP program. This happened in some cases and not in others hence making the study to be streamlined from nine facilities to six where the records could be accessed.

1.8 Limitations of the study

According to Tramp and Kombo (2006) the limitations of the study are the various challenges the researcher faces or anticipates to face in the process of carrying out the study and which have the potential to influence the study scope, hinder access to the required data as well as some other natural occurrences that influence the study or issues beyond the control of the researcher.

Considering that children admitted in the Outpatient Therapeutic Program are supposed to meet the criteria set to be declared severely malnourished and keeping in mind the guilt that comes with appearing not to be able to feed ones family, this study was thought to be likely to face a limitation of uncooperative caregivers/parents who might want to blame something else as responsible for the condition hence giving false or inaccurate information.

The study sought to overcome this by seeking the help of the community health workers who visit the children admitted in the Out Patient Therapeutic Care program at home and also got some more sensitive information from the health records kept at the OTP centers in Nairobi.

1.9 Delimitations of the study

This study will was undertaken in Nairobi County. Nairobi County boarders Kiambu County, Kajiado County and Machakos County. Kasarani district on the other hand borders Embakasi district, Juja, and Starehe district. The study will however only include children below five years who are either currently in the OTP program or have been in the OTP program in the past few months and reside in Kasarani district.

1.10 Definitions of Significant terms used in the study

Millennium Development Goals (MDGs) – These are the international developmental goals set by the United Nations at the Millennium Summit in 2000. All the 193 members of the UN as well as 23 international organizations signed to strive to achieve the goals by 2015.

Outpatient Therapeutic Program (OTP) - This is an integrated nutrition intervention that is used to rehabilitate severely malnourished children by providing RUTF to children who are severely malnourished but do not suffer any medical complications. The feeds are consumed at home but caretakers bring the children for monitoring at the health facilities either weekly or fortnightly depending on how they agree.

Stunting – This is a failure to grow syndrome that manifests in children who have suffered chronic malnutrition i.e. over a considerably long period of time

Wasting – This is a rapid loss of the body's mass resulting is conspicuous thinness as a result of acute malnutrition due to either disease condition or inadequate nutrients due to inadequate consumption of food among other reasons

Underweight – Underweight is when a person (child in this case) presents with a low weight in kg for either height or age compared to the computed ideal median weight for either males or females (boys or girls)

Ready to Use Therapeutic Foods (RUTF) - In this context, these are mainly Plumpy nuts made up of ground nuts, a multi-vitamin and mineral formula, Lactose

Supplementary feeding – In this context this means providing children with supplemental feedings in the form of RUTF to cater for the nutrient deficiency as well as to aid catch-up growth and development

Complementary feeding – The other foods given to children after six months in addition to breast milk

Community Health Workers – These are health extension workers who perform the duty of mobilizing malnourished children in the community and follow up of those admitted in the program.

Severely Malnourished – Having MUAC below 11.4 cm or a weight for height below 13 Z-score

Malnourished – Severely Malnourished

Not severely Malnourished – Not meeting the OTP admission criteria

1.11 Organization of the study

This study will be organized into five main chapters. Chapter one of the study will constitute the statement of the problem, the purpose of the study, the study objectives and research questions, significance of the study, the assumptions of the study, limitations and delimitations of the study as well as the definitions of the significant terms used in the study. Chapter two will be the literature review part. This portion will be explored under the following sub headings; Nutrition status of children below five years in Kenya: Nairobi county, OTP (Outpatient Therapeutic Program), Health education in the context of OTP. Chapter three highlights the methodology that the study adopted, chapter four presents the study results and findings as well as the discussion of results while chapter five is on the study conclusion, recommendations and contribution the study makes to the body of knowledge.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

Community follow ups make significant contribution to the success of the program because it is then that the community health workers are able to have firsthand experience of what respondents go through. This section seeks to bring out the experiences with follow ups as brought out in various papers and technical papers. A case in Bangladesh will be used to bring out this aspect. The study also brings out a review of the role of nutrition and health education provided to the mothers and the impact it has on conditions that determine the nutrition status of children below five years. Various aspects of complementary and supplementary feedings are explored for impact on the nutrition education. Some of the aspects explored include the use of RUTF, issues of contamination and cases. Finally, this section brings forth how monitoring and evaluation is viewed by various scholars and its thought importance in determining the nutrition status of children below five years of age.

2.2 Community-Based Treatment Of Malnutrition And The Follow-Ups

In a technical paper written and presented at an informal consultation meeting in Geneva attended by UNICEF, United Nations Standing Committee on Nutrition, WHO's Nutrition for Health and Development and Department of Child and Adolescent Health, Ashworth (2005) holds that a total of 33 studies undertaken between 1980 and 2005 were examined to determine the efficacy of community based approach to rehabilitating severely malnourished children. The review held that this can be achieved through four main routes namely; day-care nutrition facilities, the residential nutrition sites or centers, various primary health clinics and even

domiciliary care that can either have food provision or not. Ashworth (2005) holds that while these strategies have recorded success rates in different places, no single approach can fit all the prevailing situations since local factors play a significant role in influencing the outcomes.

Ashworth (2005) also holds that the use of high energy and high protein food substances as well as micronutrient provision is recommended. It however acknowledges that while the rehabilitation of malnourished children at home using homemade food is more cost-effective than when in-patient facilities are set up, the cost effective relationship between home care and the use of ready to use therapeutic foods has not been studied. The technical paper further holds that in places where there is a fully functional primary health care facility, it is better to carry out the rehabilitation process of malnourished children from home instead of the hospital.

The author further holds that while the use of Ready-To-Use-Therapeutic- Feeds(RUTF) is a welcome move, the procurement of the said feeds, methods of distribution as well as the sustainability of the feeds need to be assessed to determine their suitability in different setups. Among the 33 centers assessed in this document was a Dhaka in Bangladesh. The study undertaken by Fronczac in 2010 held that the city's population was prone to high rates of malnutrition as opposed to the popular view that the rural folks were more predisposed to the problem (Fronczac, 2010). Using two centers that were open daily for eight hours for a period of two months and malnourished children with a weight for height Z-score of -3 Standard Deviation, children were offered routine medical support and provided with RUTF. After the period, the mean weight for height of all the children who completed the treatment increased from 73% to 83% that is consistent with an average of 5g/kg/day. The study equally revealed that the attendance of mothers was characterized by occasional absenteeism since the routine attendance affected the mothers' economic undertakings as well as the care of other children.

The results of this study also indicated that the sustainability of this community daycare approach was not guaranteed due to over reliance on external funding.

According to Sandra Woods and Patricia Riley on 'A role for community health care providers in neonatal follow ups' and published the Journal of Pediatrics and child health in 2006, when children are discharged from a healthcare program, they are at risk of developing several medical as well as developmental sequelae. Even though this was about children who are discharged from the intensive care units, the concept of follow up can be borrowed from this piece. They held that it is imperative for the community healthcare providers who do follow-ups be informed or be in the know of the situation of the children in their community areas to facilitate proper care during the follow-up sessions. It is also important that the community worker gets maximum advice and assistance from the other health care workers in charge of the care program be they dieticians, medical doctors, nurses or physiotherapists among others (Woods & Riley, 2006). This piece further holds that the role of the community health workers in terms of community follow ups is very crucial considering that many in-patient health facilities prefer to have some bed space for more serious cases that may arise and to equally to offer care in the home atmosphere where the patient is in the company and comfort of other caring family members.

The other study highlighted in technical document was the study undertaken in South Africa's Gold Field Nutrition Center located 40 km from the country's capital Pretoria by McIntyre at al. This center was established in 1986 as a residential nutrition center and the mothers either attended every day or were admitted into the in-patient facility. The children were given high energy and high protein family foods that were of low cost. In a supportive and very caring environment, the mothers were therefore taught and practiced how to feed their children.

As a way of dealing with the underlying issue of poverty that exacerbates malnutrition, the mothers were taught on various income generating activities while at the facility. The study noted that during the period of the child and their mothers' stay in the program, the care givers comprehension of the emotional needs of their children increased tremendously.

The admission weight for height which stood at 85% increased to 89% within 10 days and therefore the mean weight gain stood at 42g/d hence approximately 6g/kg/day. The children were only discharged when their care givers demonstrated that they were able to execute everything they were taught about child care and when the child achieved the required weight for height. In cases where there was real need to provide support, the children were given skimmed milk and or peanut butter plus a growth monitoring chart to fill up at home ones discharged. At follow up of these case where 80% produced the filled up growth charts, the achieved average weight for height was 99% (12 months after discharge). However, 18% of the children who were discharged following the laid down protocol had deteriorated at the 12^{th} month mark. At the same time, when the follow up was done at 12^{th} month, only 74% of the care givers could remember the advice given to add peanut butter to the child's meals and all of them implemented it. From the 54% who could remember the advice to give children frequent meals, only 26% carried out the exercise.

The follow-up also indicated that only 19% still remembered the instructions given on issues pertaining to hygiene. Compared to the 7% at admission, there was an increase in the number of families who kept poultry by 10% and vegetable gardens by 20%. Up to 60% of the care givers shared what they had been taught with their neighbors and friends.

From all the reviews, this technical paper concluded that indeed the various aspects of community-based rehabilitation of children with severe malnutrition can be effective if only certain factors can be addressed.

The first is that they should exhibit a general awareness of the basics in the treatment of severe malnutrition. Second is that the rehabilitation process can go beyond the confines of the rehabilitation process to equally address the socio-economic and health issues that affect the family members. Advocating for high protein and high energy meals that are given frequently or advising on food mixtures that are accessible to the family concerned or by simply supplying the affected persons with RUTF should also be a priority. The other condition is teaching the care givers in a memorable way through the use of various teaching aids and by giving mothers the opportunity to practice preparing the child's meals before being discharged and finally ensuring that there are highly motivated staffs that are well trained.

Ashworth (2005) therefore held that whether one decides to have a short stay in the nutrition rehabilitation centers while undergoing intensive rehabilitation or stay at home and visit the clinic or nutrition centers occasionally or simply stay at home and access the RUTF with few home visits as well as clinic visits, they both present with various positives and negatives. In the event that one stays at home and accesses RUTF with occasional home visits by health workers or visiting the clinics/nutrition centers, one is likely to reap the several benefits; The RUTF does not need to be cooked, there are likely to be fewer defaulters, eliminates the need to establish the types of foods to promote among the mothers and the free supply of the RUTF can motivate attendance.

On the other side, this study noted that the use of RUTF in this rehabilitation process presents with various demerits; High costs, little opportunity for the mothers to learn about the

best child feeding practices and the need for well trained community health workers for purposes of monitoring can be too demanding. Other demerits include the fact that nothing short of efficient and effective transport as well as distribution channels are required, there is a risk of dependency syndrome and that in case the RUTF are made locally, it might require serious quality control demands.

In its recommendations, the technical paper held that there was need to undertake an operational study to understand the effectiveness of scaling up such community-based interventions in the routine health facilities and in non-emergency situations as well as the barriers that come with the same. It equally recommended that the recommended total number of visits to homes that can bring about optimal results be established. It also noted that because some children are not likely to gain weight after the rehabilitation treatment, there is need to further explore if such children and their families have certain characteristics that can be used to identify them as at risk population hence to receive additional care.

Finally, the technical paper also recommended that there is need to develop a training curriculum that can be used to teach mothers on the feeding practices back at home. It concluded that for purposes of rapid weight gain, the RUTF and the other feeds given should be able to provide sufficient energy at > 150 kcal/kg/day and high protein intake of 4-6g/kg/day as well as sufficient micronutrients.

2.3 Undertaking Impact Evaluations on Nutrition Projects in Developing Countries

According to the Independent Evaluation Group (IEG) (2006), various impact evaluations that have been carried out on the interventions used to treat child malnutrition have indeed shown that there is an impact especially on the anthropometric outcomes like the child's

weight and height. It goes further to hold that depending on the program capacity as well as the various contexts where it is implemented, different results have continually been achieved hence making it difficult to directly answer what works and what does not (IEG, 2006). This piece holds that it is vital that while assessing the impact of a nutrition intervention like the ones used to rehabilitate malnourished children, data that allows for the collection of information on all the causal links associated with the problem so that the weak chain can be identified.

IEG (2006) therefore looked at various evaluated nutrition interventions ranging from food aids to integrated health as well as nutrition services and programs that target early childhood development after birth. All the evaluations adopted research designs where the various project outcomes were compared with the counterfactual (what would have most likely happened to people with the same characteristics but without the intervention). Most of the evaluations equally used randomized assignment to create both the treatment and the control groups. The evaluations indicated that while there was an impact that each of the projects had on the anthropometric variables under study, there was no clear pattern of the impacts across the various interventions i.e. different programs in an intervention group yielded different impacts since not all programs had an impact on a specific indicator and in cases where it happened, the magnitude differed.

The study also held that local contexts, the different ages of the children under the project being evaluated, the duration of the time when the children are exposed to the intervention as well as the variant methodologies applied have a role in the difference witnessed in impact results. This piece takes a position that in evaluating the impact of a nutrition intervention like in the case of community nutrition rehabilitation program for malnourished children, it is better to not just ask what works but move further and establish the specific components of the

intervention that worked, how much and to which population. This has the potential to clarify the significance of the impact measured.

This piece justifies the need to continually evaluate nutrition interventions especially in the developing world because it has very high levels of child malnutrition. It holds that about 178 million children below five years are suffering from malnutrition in the developing countries with 32% being stunted, 10% equivalent to 10 million being wasted. It further clarifies that since underweight, stunting and wasting predispose children to opportunistic infections that can result in death.

It equally highlights the development delay risks as well as the risk of impaired cognitive development. It also states that in the developing world, one third of all the children are stunted while one in every ten children in the developing countries is wasted with children from poor backgrounds being the worst affected. On the point that the local context is equally likely to influence the impact, this piece believes that the behavior of the households where the target children are found as well as the behavior of the community health workers and other staff implementing the program is likely to influence the outcome since they will determine how effective the program is implemented according to design since they directly influence the complimentary services in the program as well as the decision making process.

2.4 The Influence of Maternal Education on the Health and Nutrition Status of Children below Five Years

Jacques Be-Ofuriyua et al (2006) hold that up to 60% of the mortality associated with children under five years are linked to malnutrition. Considering that improving the nutrition status of children below five years is a priority area that needs to be looked at from all angles, this piece maintains that investing in women's education is one of such strategies that can be

utilized in improving or promoting child health. Using the case of the Democratic Republic of Congo, this piece brings out a scenario where the proportion of women who had either secondary school education or higher education increased from 16% in the year 1984 to 30% in the year 2001 while the proportion of those without formal education went down from 50% to 20% within the same period.

Worthy to note however that was despite this improvement in literacy level among the womenfolk, it did not translate into any significant gains in terms of child health. In fact it is documented that the proportion of wasted children below five years went up from 10% in 1995 to 16% in 2001. The infant mortality rate equally went up from 137 in 1984 to 148 per a thousand live births in 1995. All these issues have been linked to a potential influence of the DRC context considering that the country underwent a lot of hardships during the 1965 to 1987 dictatorship and the later instabilities caused by civil unrest. Several researches from World Fertility Surveys as well as health and demographic surveys have held that indeed children born of educated mothers as well as those with more informed mothers on issues of child healthcare are less prone to malnutrition as well as mortality compared to children born to uneducated or less educated mothers (Jacques Be-Ofuriyua et al, 2006).

This has however not the case across the studies since there were several inconsistencies in the existing association between maternal education and the nutritional status of the children. It notes that the benefits of education only become apparent when there are sufficient resources. The inconsistencies are equally attributed to the fact that there are times when the indicators used to establish the nutritional status of the children like stunting, wasting and underweight can actually overlap. Depending on the degree of overlap between the level of malnutrition and the individual anthropometric measurement, the influence of maternal education on the nutrition

status of the children can either be significant or not. Finally on the inconsistencies, it is also evident that maternal education was measured at different levels namely the mothers' last class attended, the high level attended and the total number of years the mother attended school.

From this study's analytical framework, it was highlighted that the mothers' education indeed have been found to influence the mother and the family's socio-economic status, issues of women empowerment, health knowledge and their attitudes as well as the mothers' reproductive and health behaviors. In this regard, this piece holds that when the education level of the child's mother increases, there are chances that the mother will probably access better amenities, access better healthcare, live in better housing and neighborhood as well as have an educated husband hence an educated couple able to make rational decisions on the lives of their children.

In terms of health knowledge, this piece holds that the mother's education plays a crucial role in informing the mother's knowledge about the causality, prevention and treatment of severe acute malnutrition among children and is therefore likely to influence the mother's decisions on issues relating to the same (Jacques Be-Ofuriyua et al, 2006). It also holds that education among the mothers facilitates acculturation since more educated mothers are likely to rise above retrogressive cultural practices to embrace modern medicinal practices in addition to creating a hygienic environment for the young children.

This piece equally highlights results of various findings where the mother's health as well as reproductive health plays a significant role in determining the child's nutrition status. According to Forste (1998), there was a negative relationship between the maternal age and the nutrition status of children below five years. However, the same study established that women who gave birth to children with very short birth intervals were more prone to having malnourished children compared to those who had longer birth intervals. In the children that this

study enlisted, the anthropometric measurements that were the main measurement index of the outcome were adjusted to come up with the anthropometric indicators of the child's nutritional status that has reference to "Composite Index of Anthropometric Failure (CIAF)" (Nandy et al, 2005). The adjusted variables used for measurement include several categories namely; no failure, only wasting, both wasting and underweight, wasting, stunting and underweight, stunting, stunting and underweight, stunting only and even underweight only.

However, for purposes of proper measurement of these indicators, both adjusted wasting, adjusted stunting, adjusted underweight, unadjusted stunting or wasting and/or underweight or finally simultaneous multiple anthropometric failures (SMAF) where the children present with at least two malnutrition problems. For purposes of measuring the effect of maternal education on the nutritional status of the children, even unadjusted underweight, unadjusted stunting and unadjusted wasting were used. Considering that all the children in the study were eventually simply classified as 'malnourished' or 'without malnutrition', all those children who fell in the various categories of malnutrition listed above, whether adjusted or unadjusted were put together.

In assessing the impact of maternal education which was divided into no education at all, those with primary education only and those with secondary education or more on the nutrition education of children below five years, descriptive methods like multivariate analysis and Chi-square that are purely based on frequency distribution were used. The methods used were able to accommodate clustering as well as correlation in data. This was specifically because the women were clustered in their communities and beyond. Regardless of the method used, the analysis was such that the crude effect of maternal education was assessed on all the indicators of child malnutrition using bivariate analysis. Analysis was also performed using the theoretical models

where eventually all the explanatory variables were eventually used to generate one model to help in capturing the maternal net effect on child malnutrition.

Using descriptive analysis, the result of the study indicated that the effect of maternal education on child stunting increased significantly from mothers who did not have education onwards to those with primary school level of education and finally those with secondary and post secondary education who had more effect. It however noted that maternal education had no significant effect on the children of mothers who had more than three children under the age of five years as well as mothers who never got married (Jacques Be-Ofuriyua et al, 2006).

The effect of maternal education was however more pronounced in the extreme cases where the mothers were very poor or rich and this was not the case in all areas since in some places, there was no significant relationship between maternal education and child stunting. However, in the adjusted variables, there was no significant relationship between maternal education and child stunting. There was equally the same trend with the wasting variable where the unadjusted wasting trend disappeared when controlling was done for the mother's socio-economic status. It however held that the only scenario where the worst nutrition status of children in regards to wasting was recorded was in the urban areas.

The study however held that in regards to the third indicator, underweight, the unadjusted variable indicated that increased maternal education was directly proportional to the rate of underweight among children below five years. However, unlike the children who exhibited with stunting and wasting, children with underweight seemed to cut across the education levels (Jacques Be-Ofuriyua et al, 2006). The study therefore concluded that malnutrition as described by the three independent variables namely stunting, underweight or wasting or even a combination of any two of these or all is subject to the context because if educated mothers are in

a setting where they cannot access certain amenities like clean drinking water, equipped health facilities to discharge healthcare services as well as the basic needs of children.

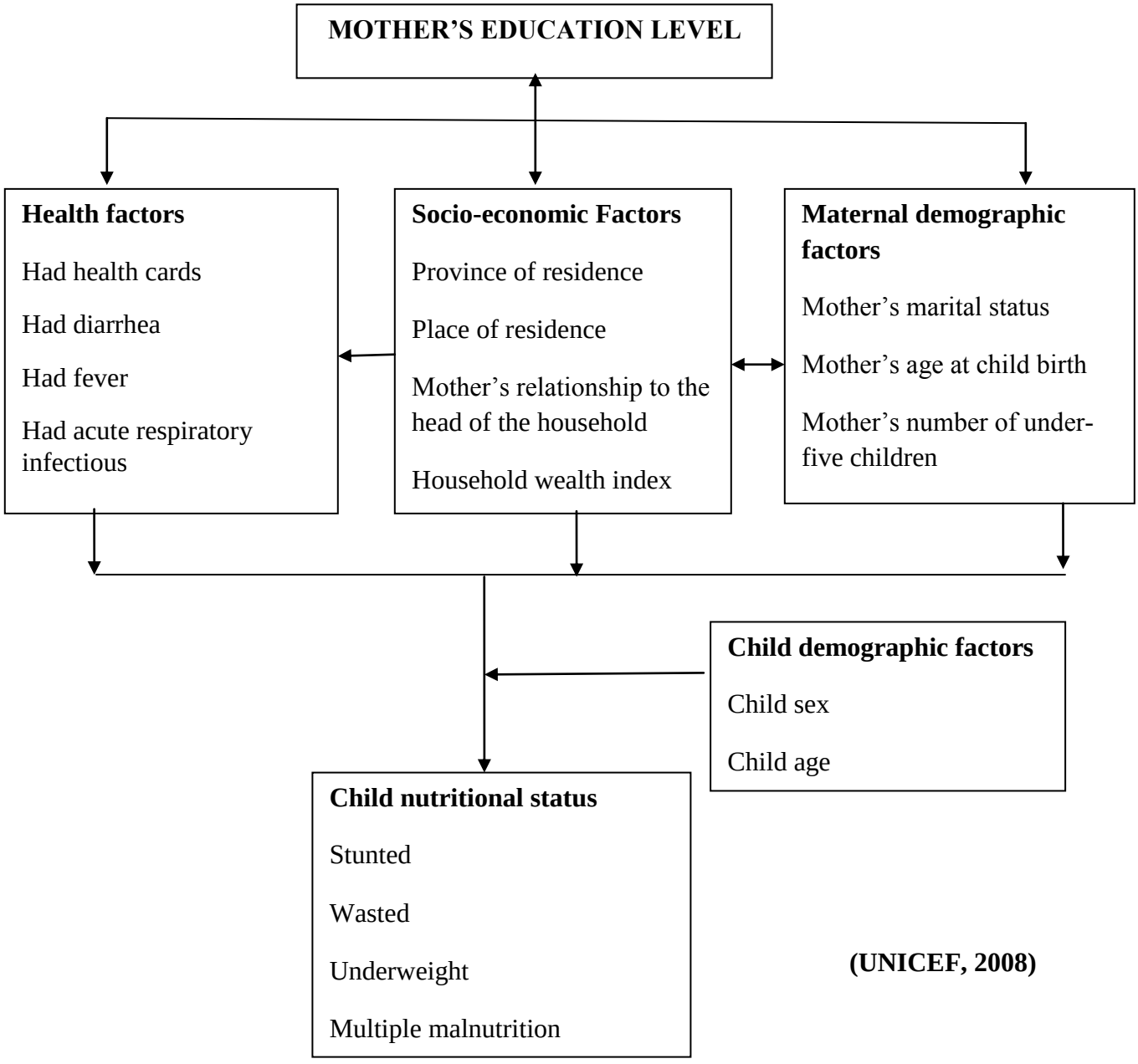

Fig 1. Maternal education and child malnutrition status, analytical framework

2.5 The Effect of Complementary and Supplementary Feeding among the Malnourished Children Below Five Years

Muhimbula et al (2010) highlights the high prevalence rates of malnutrition in children below five years in Tanzania. It asserts that despite the numerous interventions, child malnutrition especially at complementary feeding from six months onwards is still a major challenge because the complimentary feeds are mainly cereal-based porridge without even proteins or vegetables. This piece therefore sought to identify the risks associated with the feeds used in complementary feeding programs in Tanzania.

Muhimbula et al (2010) appreciates that the issue of child malnutrition is indeed an issue in Tanzania with about 725 of the under five children being anemic, 44% are stunted in growth, 22% are underweight and 4% are wasted. It attributes this to poor complimentary feeding where children are started on cereal porridge too early and also due to poor breastfeeding practices where mothers stop breastfeeding earlier than the recommended six months with adherence to exclusive breastfeeding for six months rated at 41% in Tanzania. It holds that while there are up to 7% if children below 2 months who are already on complementary feeding, 32% who age between 2 and 3 months as well as Tanzania's age bracket of between 4 and 5 months are all put on complementary feeding prematurely.

On the other hand, there is still a significantly high number of children between 6 months and 9 months who don't get sufficient complementary feeding as is required hence further contributing to the burden of malnutrition. It reports that the reasons why complementary feeding was either started early or delayed in several cases is an issue that had social and economic underpinnings. For instance, it quotes the nomadic tribes like Wadatonga who because of the availability of milk from their cattle and possible cultural practices, started weaning their children off on milk at the age of 2 months with grains only introduced after nine months.

In Dodoma, complementary feeding started at 3 months while among the Morogoro, the mothers who were more economically stable started off their children on complimentary feeding much earlier than their counterparts with lower economic capability. The piece further holds that complementary feeding has been found to have several adverse effects on the baby including stressing up the child's immature gut as well as the immune system in general and kidney. Allergies and cases of diarrhea leading to increased mortality rates were also highlighted as responsible for the increasing crusade against premature (before six months) complementary feeding. It also holds that since most of the micronutrients found in complementary feeds are not easily absorbed compared to those found in breast milk and therefore their growth is impaired.

Trowbridge (2002) says that the basis of the need not to delay supplementary feeding on the other hand is because at six months onwards, the rate of growth of the baby is really high and therefore it is necessary to ensure that the food intake is not only increased but equally diversified to meet the increasing need for energy as well as physiological development (Trowbridge, 2002). Failure to do this or to provide insufficient complementary foods results in faltering weight among such children, increased risks of diarrheal diseases, malnutrition and reduced immune function. In cross sectional study quoted here by Kulwa et al (2006), even urban areas that were initially thought to be less affected like Daresalam, the stunting, underweight and wasting rates stood at 43%, 22% and 3% respectively (Kulwa et al, 2006).

According to Bryce et al (2005) complementary feeds given to children after six months are linked to various cases of contamination that result in diarrhea and eventually child malnutrition. This piece holds that the global mortality of children below five years stand at between 9.7 and 10.6 million deaths per annum with about 18% of these representing 1.9 million annually directly linked to diarrhea. Up to 53% of all these cases of diarrhea are linked to

malnutrition. A study by Sheth and Dwivedi (2006) established that high incidence of diarrhea among the under fives was reported immediately after six months when children start weaning. They therefore held that because of such, it was very likely that complimentary feeds are infested with diarrhea causing pathogens. This assertion was grounded on the belief that diarrhea has been found to reduce food intake among the children, negatively affect food absorption, result in dehydration and loss of vital nutrients hence putting the child at high risk of malnutrition.

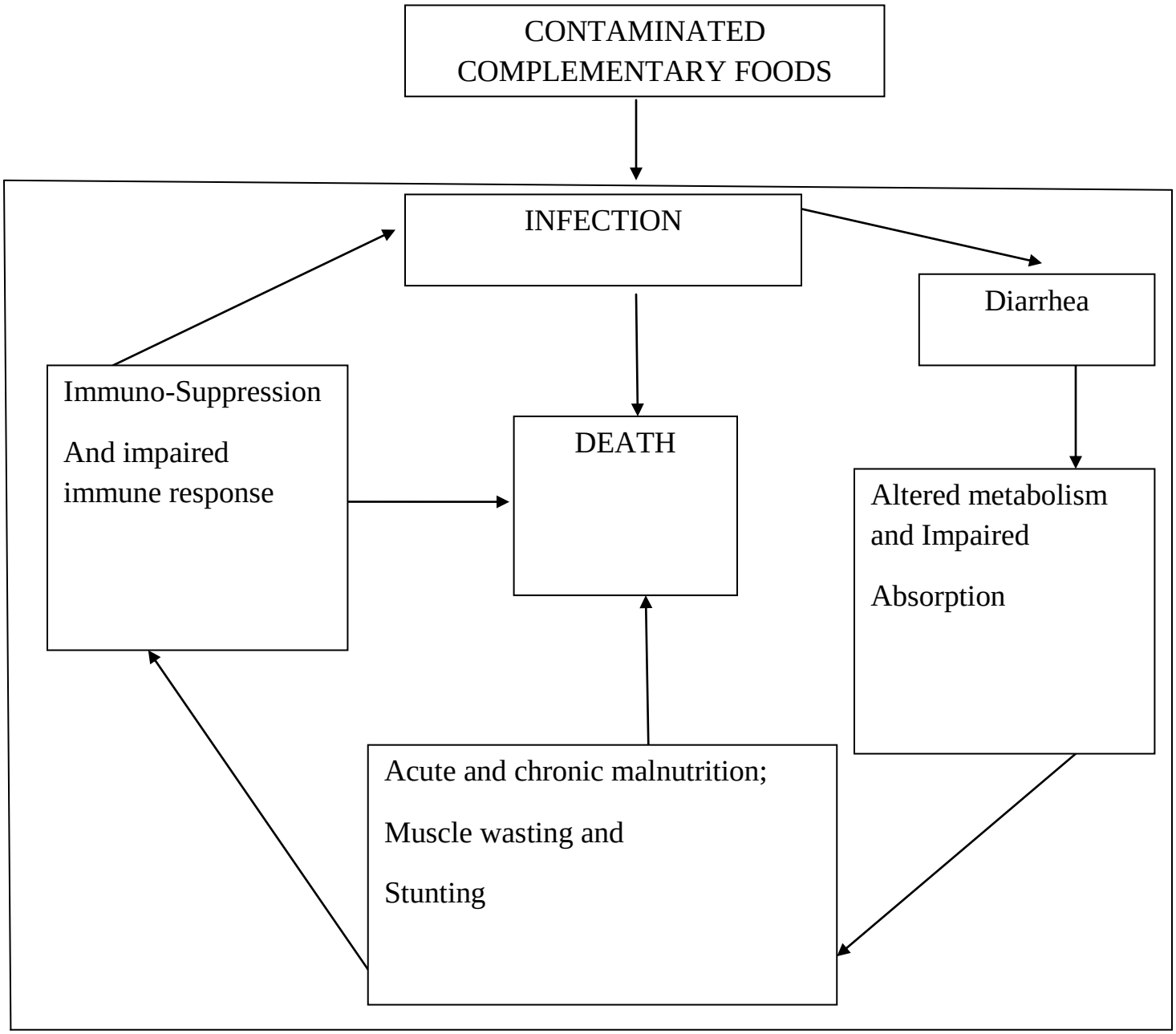

Fig 2 The vicious cycle of food contamination during complementary feeding

On supplementary feeding, according to Patel et al (2005) the supplementary feeding program using ready to use therapeutic feeds has proved effective on Malawian children who are at risk of malnutrition. In a controlled study undertaken in Malawi, a comparative clinical effectiveness involving two supplementary feeding programs covering seven centers in Malawi's rural area was undertaken. All children who were found to be less than 85% of their ideal weight for height were considered at risk and recruited into the supplementary feeding program (Patel et al, 2005).

The children were then supplied with ready to use therapeutic feeds (RUTF) as well as corn soya blends for a period lasting eight weeks. The expected result was an improved weight for height beyond 90% of the ideal weight for height. The result noted that children who received the RUTF were likely to achieve the required recovery at 58% compared to 22% for those fed on corn soya blend and equally exhibited higher weight gain rates at about 3.1grams/kg/day compared to those who fed on the corn soya blend who gained an average of 1.4grams/kg/day (Patel et al, 2005). The results therefore held that the use of Ready to Use Therapeutic Feeds (RUTF) is beneficial to the under five children.

2.6 The Increased Use of Monitoring And Evaluation and Lessons Learnt as a Sign of Confidence in the Process

When James Levinson and Isabel Madzorera (2010) studied the recent experience in the monitoring and evaluation of nutrition-related projects in the developing countries, it acknowledged that in the last few years, there has been a marked increase in conscious effort to try and put in place proper monitoring and evaluation systems in nutrition projects. The authors attribute this rapid increase not only to donor requirements but also because the importance of monitoring and evaluation is continuously being appreciated (Levinson & Madzorera, 2010).

The study utilized the evaluation results from nine nutrition projects across the world that included "The Tamil Nadu Integrated Nutrition Project in South India", "Enhanced Outreach Strategy of the Ethiopian Child Survival Project" and "UNICEF's Dula Project in India's Bahar" among others. From these projects, one of the lessons learnt is that there are times when benefits are indeed realized but it is important to perform an evaluation so that distribution of the project benefits can be ascertained since the resulting benefits could be skewed in favor of a few people (Levinson & Madzorera, 2010).

Through monitoring and evaluation systems, the post project changes can be assessed and compared to the pre-project conditions and the outcomes determined. In the case of nutrition projects like interventions for the under five children, monitoring and evaluation would therefore play a critical role in determining if all the children who received specific 'treatment' generated the same outcome and if not, the reasons for disparities that can further influence the life of the project and the life of the children. By distributing the benefits of the project well among the target population, the impact of the whole project can be measured accurately (Levinson & Madzorera, 2010).

The second lesson is that through monitoring and evaluation, the cost-effectiveness of the nutrition projects/programs can be established. Through the established cost spent to bring about the desired change per unit, comparisons can be done and can also be used as models to guide future undertakings. The other lesson the study drew from the nine project evaluation reports is that many organizations that implement nutrition projects are so much in a hurry to build a track of 'clean records' within a short period of time, a habit that force them to undertake rapid evaluations without looking at the sustainability of the whole initiative. This means that without undertaking a proper monitoring and evaluation process, the nutrition interventions undertaken in

the community are not likely to live beyond the project termination phase (Levinson & Madzorera, 2010).

This study also held that a good monitoring and evaluation strategy should come up with an appropriate exit plan that ensures proper maintenance of the outcome or impact of the nutrition intervention undertaken. In cases where the projects are rehabilitative in nature like in the case of rehabilitating malnourished children, when the sustainability of the project is not well thought out, chances of the rehabilitated children getting re-admitted after a short period of time are very likely. The study concluded that monitoring and evaluation is therefore vital in nutrition project because it directly influences project/program design, the management as well as the sustainability.

According to Troy et al (1999), the impact of monitoring and evaluation undertakings is likely to be positive when it involves the stakeholders in a participatory form. They hold that by involving all the relevant stakeholders actively in an initiative like a nutrition rehabilitation program, the program implementers are able to identify the potential benefits and even the negative effects and as such the intervention would be run in such a way that maximum benefits are reaped (Troy et al, 1999). This piece holds that if the monitoring and evaluation process is done in an efficient and effective way then reasonable conclusions about the effectiveness of the intervention can be made.

Rosen et al (1993) however notes that simply having accurate evaluation results for instance should not be seen to automatically translate into policy or program changes. It instead holds that evaluation results simply make a small but significant contribution to the bigger process of decision making (Rosen et al, 1993). When evaluations are done and reports written, the beneficiaries and other stakeholders are supposed to have a sense of ownership so that they

own the final evaluation report recommendations. Rosen also notes that in cases where the evaluation report generated does not resonate well with the beliefs and true practices of the people or when the recommendations fails to recognize useful structures in the lives of stakeholders, they are likely to rebel against it and disown it (Rosen et al, 1993).

According to UNICEF (2001), without evaluation, it would be difficult to ascertain the true value or even the worth of an intervention. While the results of an evaluation process can be retrospective in nature, it is always looking forward. This report also holds that when an evaluation about an intervention has been undertaken, it should be able to generate several alternatives that decision makers can rely on or consider. Through evaluation therefore, lessons should be learnt, performance improvements made and accountability demonstrated (UNICEF, 2001).

The UNICEF guideline equally acknowledges that monitoring and evaluation creates an environment where cost analysis is easier to do and therefore it would be possible to establish how effective the activities constituting the initiative are financially viable as well as their efficiency. By enabling proper cost analysis of nutrition projects in the community, the monitoring and evaluation enables the implementers to establish the initiative's sustainability in the long run. The guideline equally asserts that through monitoring and evaluation results, it is possible to know how to distribute the benefits that accrue from such initiatives like cash-for-food programs or other community-based nutrition rehabilitative programs (UNICEF, 2001).

According to Baez (2007), the problem of malnutrition continues to be a silent health problem in the developing world. It is acknowledged here that while it is widely accepted that the problem of malnutrition among children can be solved permanently in the long run by reducing the level of poverty so that households are able to access the vital necessities of life. It

however holds that this is a long term measure that would be achieved through steady economic growths as well as more equitable distribution of the available resources, there are other short-term measures used to curb malnutrition including infant feeding programs, care practices as well as disease diagnosis and educating the people on the same (Baez, 2007).

Through monitoring and evaluation of initiatives like feeding programs and care practices, the intricate problems that contribute to the high levels of malnutrition can be identified for further interventions. Because most community nutrition programs are meant for the most vulnerable like children below five years and are mainly meant to tackle malnutrition from three main angles namely; information dissemination, tackling poor infant feeding practices and provision of other healthcare practices, these programs are sensitive and should succeed hence the need to carefully monitor and evaluate them (Baez, 2007).

Because of the nature of the manner of implementation of these programs, they face various challenges that can only be identified well through monitoring and evaluation. It is obvious that the level of knowledge of the caregivers like the nutritionists and the community health workers who do the follow ups in the community significantly determines the program success (Baez, 2007). The other challenge is that in order to successfully implement a nutrition intervention in the community, a unique system that pays attention to the isolated situations in the community. In assessing the impact of a nutrition intervention on children in the community, it is the change in the children's' body mass composition that is used to measure the experienced change against the reference measures of height-f-r-age, weight-for-height and weight-for-age Z-scores depending on where the interest of the researcher is (Baez, 2007).

According to IFAD (1998), the anthropometric measurements used to assess the outcomes and eventually the impact of the nutrition intervention need to be looked at from

various angles putting in mind that a factor like gender must be considered since even the standards are different for boys and girls. However, it notes that the growth patterns of children below five years are independent of racial or even ethnic differences. Nutrition evaluations can be executed in the form of mini-surveys that have been found to be effective in determining the specific program or project's feasibility as well as cost and timeframes (IFAD, 1998).

In order to carry out a proper monitoring and evaluation process, the use of a logical framework is indispensible. It is a summarized version of the whole program with the program objectives, indicators, means of verification and the basic assumptions for the various aspects of the project namely the program goal, the purpose, the outputs and the activities geared towards producing the mentioned outputs. This is a very efficient monitoring tool and is equally instrumental for purposes of evaluations that would in the end influence the process or future initiatives.

2.7 Theoretical Framework

This study was grounded on the Health Belief Model (HBM) which is a psychology-based model that tries to explain or even predict the various aspects of health behaviors. It majorly focuses on the beliefs as well as attitudes of individuals. The model is based on the assumption that people will always undertake a health-related action when it becomes apparent to them that they can be able to avoid a negative health condition through that, a positive health result will emerge and if the person in question believes in his/her ability to successfully undertake the said health action.

2.8 Conceptual Framework

Independent Variable

Intervening Variable

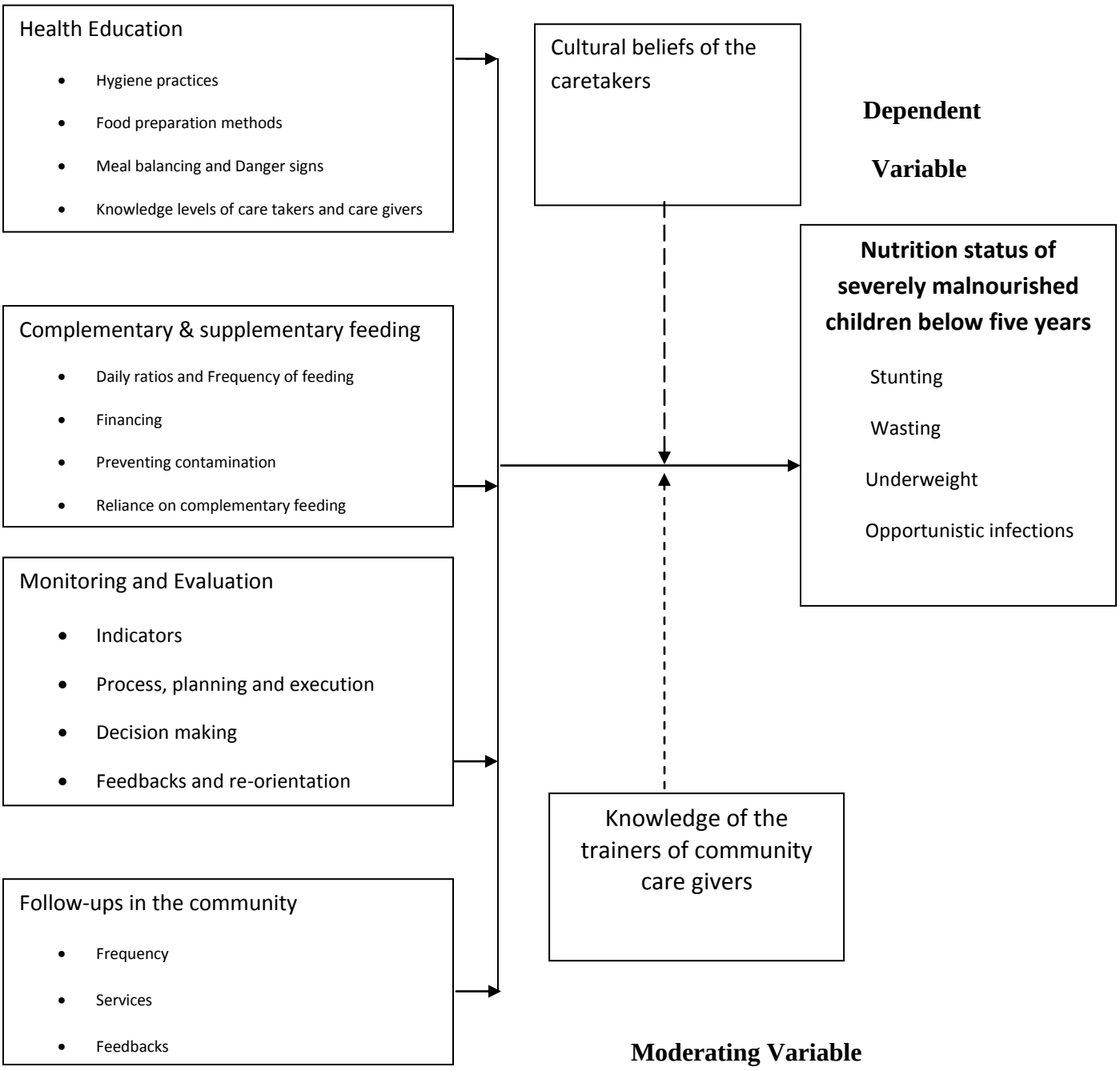

Fig 3: Conceptual Framework

This study was based on the Integrated Theory of Health Behavior Change (ITHB), which is a sub-division of the theory of change. The theory of change holds that an initiative will always seek to bring about changes either in behavior or societal structures and norms/beliefs to enable the generation of specific outcomes. ITHB theory holds that changes in one's health behaviors can be enhanced well through fostering of the knowledge, beliefs as well as increasing the self awareness and by enhancing social facilitation of the individuals in question. In this theory, self-management is seen as the eventual proximal outcome that can influence long-term and distal outcomes in terms of improved health status. When used as person-centered interventions, the theory can guide proper assessments, dispensation of the best-practice interventions and ensuring that appropriate patient outcomes are achieved.

2.9 Summary

The literature review describes the introduction, the community initiatives in treating the problem of malnutrition, the relevance and process of impact evaluations of nutrition projects in developing countries like Kenya, Monitoring and evaluation of nutrition projects in the community, the influence of maternal education levels on the nutrition status of their children below five years and the effect of complementary feeding among malnourished children below five years of age. Under community-based treatment of malnutrition, most of the scholars concur that community-based nutrition interventions like the one seeking to improve the nutrition status of children below five years can be achieved through various approaches but none of the approaches is superior to the other since the success rate depends on the suitability of the prevailing circumstances. The four main initiatives include; day-care nutrition facilities, the residential nutrition sites or centers, various primary health clinics and even domiciliary care.

There is consensus that home-based care with intermittent visit to the health facilities is more acceptable because of affordability and quality of care. Most authors also appreciate that to improve the nutrition status of children below five years, the staff implementing the nutrition intervention must be motivated, the care givers must be taught using appropriate aids, the children must be put on high protein and high energy foods. The popular position is also to the effect that there is need for the rehabilitation process to target socio-economic status of the persons in question. The package should therefore be holistic in nature so that all the causative links of malnutrition are handled. There was also a general agreement that the use of RUTF has more benefits than disadvantages especially in comparison with other forms of complimentary feeding options offered at home.

Divergent opinions were however voiced in regards to the sustainability of such projects considering that they rely almost entirely on donor funding. There was no consensus on the optimum number of home visits that are able to bring the desired results. Apart from the risk of overreliance on the feeds and the likelihood that the caregivers are not given an opportunity to learn how to constitute the meals given to their children since the RUTF come in pre-prepared form. The Literature review also sought to expound on the nature of impact evaluations in the developing world. It is held that indeed the nutrition interventions undertaken in the community have an impact on the nutrition status and health status in general of the under fives. While assessing the impact of the various nutrition projects undertaken in the community, most scholars agreed that different interventions resulted in different results even among the same population further emphasizing the fact that local contexts, the age groups of the children under study as well as time durations when the children were exposed to the intervention significantly influenced the outcomes and hence the impact. While justifying the use of impact evaluations,

this section highlights the problem of under five malnutrition and the need to further ensure that the impacts of nutrition interventions in the community are measured for purposes of enhancing effectiveness and efficiency through monitoring and evaluation. Various cases have been elaborated to bring out the specific influence maternal education can have on the nutrition status of children below five years. According to various authors, the influence that maternal education level can have on the nutrition status of the children below five years can either be direct or indirect. Directly through making informed choices and appropriate care practices and indirectly to provide an enabling environment where proper care is feasible. On complementary feeding, this section highlights the need to get the practice right and enhance both quality and frequency of feeding to maximize benefits. Proper complementary feeding has therefore been advocated because either mothers undertake poor care practices or simply cannot be able to execute it due to poverty or lack of awareness of the same. Contamination is particularly highlighted as a consequence of poor complementary feeding that eventually enters into a vicious cycle that include disease, malnutrition suppressed immune systems, altered metabolism and in worse cases even death.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter seeks to describe the general procedures that were applied in undertaking the study. It has in a descending order the research design, the target population, the sample size as well as the sampling techniques that were applied, the data collection instruments and reliability and validity of the instruments applied. The other components include the data collection procedure, data processing and analysis as well as the ethical issues that the study put into consideration.

3.2 Research Design

This study adopted a correlational research design. In this case, the study was not involved in manipulating the situation or the circumstances as they are or even the experiences of the participants as they are. Correlational research design is not about explaining the causality of factors but seeks to generate data that can be used to explain the relationship between a set of two variables. The relationship between the variables was therefore measured using the Pearson Correlation Co-efficient to bring out the linear relationship that existed between the two variables under investigation at any particular time as shown below;

$$r = \frac{n(\Sigma xy) - (\Sigma x)(\Sigma y)}{\sqrt{[\, n\Sigma x^2 - (\Sigma x)^2 \,][\, n\Sigma y^2 - (\Sigma y)^2 \,]}}$$

(Alston, 2003)

According to Alston (2003), when using the Pearson co-efficient three results are targeted as standard measurements. The results can either be 1 or -1 or 0. 1 means there is a perfect and positive correlation between the two variables under study. -1 on the other hand signify a perfect negative correlation while 0 means there is no linear correlation between the pair of variables under study. However, these perfect states are hardly achieved and only results that lie between them are achievable. In regards to this study, correlational research design was more suitable compared to the other research designs because it provides an ample opportunity to correlate the situations as they exist and to find out if indeed the correlation index points to the existence of an impact of one variable on another (Alston, 2003).

The study therefore collected information/data that was used to correlate the existing situation (The nutrition status of children below five years) and the various aspects/components of the Out-Patient-Therapeutic program which was be tested at 95% confidence level. Despite the fact that correlation does not necessarily allow for inference of causation, it is a very important step towards the establishment of causal link between two variables at a time. This is particularly because variables in a causal relationship have a correlation, only the reverse is not true. This means demonstrating causality requires correlation as a pre-condition (Alston, 2003). The design was therefore important in achieving the set objectives and in testing the 2 hypotheses set.

3.3 Target Population

This study mainly targeted the staff (nutritionists/dieticians who implement the OTP program at the specific sites in Nairobi County, the community-based health workers who perform the follow-ups) and the care givers (Mothers or guardians with the children below five years admitted or exited from the OTP program. The partners in this project therefore consist of the

supporting donor (Concern Worldwide), The Ministry of Public Health and Sanitation and the staff working in the various points of service where the program is run. The direct beneficiaries are children below five years who meet the set admission criteria for the OTP program as well as the parents and the health sector who would have spent colossal amounts of money in dealing with the burden of malnutrition.

3.4 Sample Size and Sample Selection Procedure

3.4.1 Sampling Procedure

This study utilized a non probability sampling methodology. Convenience sampling where respondents are recruited into the study because of their availability and willingness to participate was utilized. Children with characteristics desired for admission into the OTP program are few but the presence of the few is a warning of underlying nutrition concerns to be addressed in the community. The study used clinical records to recruit respondents into the study. The study equally utilized those currently enrolled in the program as well as those who were in the program and have since been exited upon recovery. The main stratum in this study is therefore the health facility because it has the malnourished children recruited in the OTP program. The study had sought to include all the 9 established OTP centers in Kasarani but ended up utilizing only six. The study however intentionally ignored three health facilities due to various limitations including lack of proper records to facilitate follow up of patients in the community, absence of the nutritionists in charge to help with retrieval of the required data and grant the care provider interview via the Key Informant Interview Schedules and also due to inaccessibility resulting from insecurity in the slums where the facilities are located.

Table 3.1 Distribution of samples in the six health facilities

FACILITY	BHC	KHC	MNHC	Ka HC	MHC	BaHC
NUMBER	10	17	15	12	16	18

KEY

KHC- Kariobangi Health Center **KHC** – Kahawa Health Center

BHC – Baba Dogo Health Center

MNHC – Mathare North Health Center

MHC – Marurui Health Center

BaHC – Baraka Health Center

3.4.2 Sample size

The sampling process seeks to select a sub-set of the population in mind to represent the whole population. It needs to be representative enough by ensuring that all the key traits of the population of interest are inclusive. At any particular time, the total number of children admitted in an OTP program in Kasarani district average about 109 in all the health facilities (Ministry of Public Health and Sanitation OTP Report for March 2013 for Kasarani District). From Krejcie's table for establishing sample sizes, at 95% confidence level and a margin of error of 5%, the sample size in this case stands at 80. The same principle could have been used to establish the sample size to be derived from each facility, depending on the number of children recruited in the program in every facility but because the sample size is small, all the 109 was sought for inclusion in the study through convenience sampling.

3.5 Research instruments

This study will seek to utilized two main research instruments namely questionnaires and Key Informant Interviews. The questionnaire to used in this study was divided into six main sections A-F. Part A was the introduction then the respondents' demographic information like gender, employment and even marital status in that order. C had structured questions relating to the outpatient therapeutic program and its application in the treatment of malnutrition then structured questions on the influence of maternal education level on nutrition status of children below five years.

There are also structured questions on complementary feeding among children below five years and the monitoring and evaluation process in the nutrition program. All efforts was be made to ensure that the questions posed in the questionnaire are able to bring out the various aspects of the specific objectives in question to facilitate the collection of relevant data. Both open and closed-ended questions were administered to the care givers and the other stakeholders who are able to provide relevant information being sort.

On the Key Informant Interviews, interviews were conducted to stakeholders in the project implementation office at the head of nutrition offices at the respective program sites. These interviews were conducted by the researcher in a purposive manner since the persons with the right information are known and targeted pre-hand. The information sought from these sources included the OTP program and its implementation, the nutrition and health education administered to caretakers, the monitoring and evaluation process of the whole program as well as how and the frequency of the follow ups.

3.5.1 Pilot Study

The result from this study was compared with the results obtained from a similar study conducted on children on OTP conducted in a different area at the Mbagathi District hospital using a sample of fifteen respondents. Permission was sought from the provincial nutrition officer and the relevant chief nutrition officer at the said hospital in Nairobi County. The sample had 7 respondents who had been in the program but discharged upon full recovery and 8 respondents who were in the OTP program at the time. Within 10 days, the respondents were again contacted and asked to respond to the questionnaire questions to enable the researcher to establish any variations that there may be in the two results. This played a very significant role in enabling the researcher to further enhance the efficiency of the research instruments.

3.5.2 Validity of Research Instruments

According to Mugenda & Mugendi (2003), validity of the research instruments tests the level at which the results obtained from an analysis represent the actual problem being studied.

The research instruments were carefully crafted to ensure that all the required aspects of the problem are explored and relevant information collected. After formulating the research instruments, they were submitted to research method consultants for further fine tuning. The recommendations received from the two consultant researchers were used to further ensure that the validity of the instruments, especially the content was beyond reproach.

3.5.3 Reliability of the Research Instruments

Reliability looks at the consistency of results. In this regard, it will seek to establish the degree to which the results obtained from the research instruments are reproducible. In assessing the reliability of the instruments, a test re-test method was used. The questionnaires for instance were administered to the respondents in Nairobi County's Kasarani district and an independent correlation undertaken. A correlation co-efficient was then calculated using the formula as shown;

Reliability of the whole test $= \frac{\text{Coefficient of correlation (r) x (Reliability of 0.5 test)}}{\text{1 + (Reliability of the 0.5 test) (Coefficient of correlation)}}$

Using a scale of between 0 and 1 and acknowledging that perfection is not possible, a result of more than 0.6 will be acceptable enough to prove the reliability of the research instruments.

3.6 Data Collection Procedure

The data collection process commence upon receiving official approval from University of Nairobi's Graduate School. This was to be followed by securing a research permit from the NCST (Kenya National Council of Science and Technology) but the Extramural department released a letter which was convenient for the same purposes. The letter was then taken to the district nutritionist as a representative of the ministry of public health and sanitation and eventually be shared with the relevant bodies within Kasarani district through letters of transmittal where necessary. The questionnaires were administered to the respondents through well trained research assistants lead by the researcher. Telephone follow ups were also made to confirm the information given at random and to clarify responses or entries that were not clear.

3.7 Data Processing and Analysis Techniques

The data received in the study was processed using both quantitative and qualitative approaches. The analysis commenced by first checking on the completeness of the interview questionnaires. Data cleansing as well as sorting was done and developing a coding system that properly relates well with the study problem was done. Data was analyzed using frequency tables, percentages as well as measures of central tendencies like modes and means via the SPSS software. Qualitative data was analyzed through the application of content analysis techniques. The qualitative data from staff was then transcribed into relevant variables before being reported and used to reinforce the arguments and results obtained from the respondents.

3.8 Ethical Considerations

Near absolute standards was applied to ensure that the confidentiality of the data gathered from respondents are not accessible to any third party. Utmost care was taken to ensure that the research process is not harmful in any way to the respondents and their perspectives on issues asked respected without trying to alter or influence the same in any way. According to Jupp (2009), every research process must involve seeking and getting the securing the informed consent of the respondents. It is only upon receiving the informed consent that the respondent was allowed to participate in the study.

Table 3.2: Operationalization Table
OPERATIONALIZATION TABLE

OBJECTIVE1: To determine how the complementary and supplementary foods impact the nutrition status of children below five years of age						
Variable	**Indicator**	**Measurement**	**Level of Scale**	**Data collection method**	**Type of Analysis**	**The level of Analysis**
Complementary and supplementary foods	Weight for height Morbidity	Quality and quantity of complementary and supplementary feeding	Ratio	Questionnaire	qualitative	Correlation and descriptive
OBJECTIVE 2: To establish how follow-ups in the community impact on the nutrition status of children below five years						
Variable	**Indicator**	**Measurement**	**Level of Scale**	**Data collection method**	**Type of Analysis**	**The level of Analysis**
Services and products during home visits	Frequency of home visits Sicknesses at home	Number of home visits made Opportunistic infections	Ordinal	KII and Questionnaire	quantitative	Correlational and descriptive
OBJECTIVE 3: To determine how the health education given to care givers in OTP impact on the nutrition status of children below 5 years of age						
Variable	**Indicator**	**Measurement**	**Level of Scale**	**Data collection method**	**Type of Analysis**	**The level of Analysis**
Health education	Knowledge level Morbidity	Ability to describe or highlight nutrition concepts to apply at home	Ordinal	Questionnaire/ Key Informant Interview Schedules	Qualitative	Correlational and descriptive
OBJECTIVE 4: How does the monitoring & evaluation and active case finding impact on the nutrition status of the under fives in Nairobi County						
Variable	**Indicator**	**Measurement**	**Level of Scale**	**Data collection method**	**Type of Analysis**	**The level of Analysis**
Nature of monitoring and evaluation	Frequency of re-visits	Number of visits	Ordinal	Questionnaire	Quantitative	Correlational and descriptive

	Wasting levels Underweight levels	Children with low weight for age Children who are underweight for their length/height	Ratio Ratio	Questionnaire Questionnaire	Quantitative Quantitative	

CHAPTER FOUR

DATA ANALYSIS, PRESENTATION AND INTERPRATATION

4.1 Introduction

This chapter brings forth the study findings. The results are presented in a progressive manner from the first to the last study objective and under various subtopics as outlined in the operationalization table. The various subtopics include the impact of complementary feeds and supplementary foods, maternal health and nutrition education, Monitoring and evaluation and Community follow ups on the nutrition status of severely malnourished children below five years In Kasarani district.

4.2 Questionnaire Return Rate

From the study's targeted sample of 109 respondents, only 88 were able to respond to the call for participation. This constitutes 80.73% response rate. Considering that most of the respondents the study sought had been exited from the program and live in the community independent of contact with the program, it was not possible to trace all the respondents within the set deadlines. It was because of the teamwork between the program controllers at the facility level (nutritionists/Nurses in Charge), the community health workers and the research team that fruitfully managed to trace the beneficiaries to come back and accept the research questionnaires to be administered to them hence yielding the 80.73% response rate. It was also not possible to achieve the required targets since some of the respondents had since demised, relocated to far off places, too committed to come back to the facility for the study or the primary care taker who brought the child in the program has since died. There were also cases of children having attained the school going age hence were in school and could not be brought back to the facility

for the anthropometric measurements to be taken. According to Amin (2005) a return rate that stands at or above 60% is acceptable. Therefore, despite the various challenges that denied the team 100% return rate, the achieved 81.65% is still acceptable.

4.3 The Respondents Demographic Characteristics

The study collected demographic information from the respondents at the different health facilities in Kasarani. The data collected in this regard from the facilities included the age of the care takers, age of the children and the marital status of the care takers. This information was instrumental in grouping the children and their caretakers in different age groups. Results are therefore presented in Table 4.3.1, 4.3.2 and 4.3.3 to represent frequency of the respondents under relevant categories,

4.3.1 Administrative Divisions

Table 4.1: Administrative divisions

Health Facility	Number of respondents	Male	Female	Staff
Kariobangi Health Center	17	9	8	1
Kahawa Health Center	12	4	8	1
Baba Dogo Health Center	10	5	5	1

Mathare North Health Center	15	7	8	1
Marurui Health Center	16	9	7	1
Baraka Health Center	18	8	10	1
TOTALS	88	42	46	6

4.3.2 Distribution of Respondents by Age

This study sought to establish the ages of the children in the study because the Outpatient therapeutic program is designed to handle children between six months of age and 59 months. Any child above or below this age bracket does not qualify for the program and would therefore be in the program contrary to terms of implementation. The table below presents the distribution of the ages of the children in the study.

Table 4.2: Distribution of respondents by age

Age in Months	Frequency	Percentage (%)
6-15 MONTHS	23	26.1
16-25 MONTHS	4	4.5
26-35 MONTHS	2	2.3
36-45 MONTHS	22	25.0
46-55 MONTHS	32	36.4
56-59 MONTHS	5	5.7
TOTALS	88	100%

The results indicate that most of the respondents used in this study were in the range of between 46 and 55 months of age (36.4%). The results also show that 23 of the respondents representing 26.1% of the total population were in the range of 6-15 Months, 22 respondents representing 25% were in the range of 36-45 Months and 5 respondents representing 5.7% were in the range of (56-59). The results also show that 4 of the respondents making up 4.5% of the total respondents were in the range of 16-25 months while 2 respondents representing 2.3% were in the 26-35 months age bracket. Loosely translated, this means the age bracket of between 46-55 months were likely to give the study a clear result on the impact that the OTP program has had on children below five years.

4.3.3 Distribution of Respondents by Sex

The study sought to find out the distribution of the respondents in terms of their sex. This was thought to be important since it would shed light on the findings to establish if one gender was more prone to malnutrition or otherwise than the other. The result was as shown in table 3.3 below;

Table 4.3: Distribution of respondents by Sex

Sex	Frequency	Percentage
female	46	52.3
male	42	47.7
Total	88	100.0

This result show that there were 46 female respondents making up 52.3% of the total respondents and 42 male respondents representing 47.7% of the total respondent population used. This can be translated to imply that the number of girls and boys in the OTP program in Kasarani district are relatively the same but with the girls enjoying a slight majority of 4.6%. This means Kasarani district is likely to be having more girls in the program than boys holding all factors constant.

4.3.4 Variation of Weight at admission and Weight at the time of Assessment.

This study sought to establish the weight of the recipients of OTP at admission and their current weights after having been in the program or having been exited. This was to be a useful indicator to establish if indeed there was any significant improvement in the weights of the children in relation to their height; an important indicator of a possible positive or negative influence on the nutrition status of the children. The summary of weight at admission and at the time of the study were as shown below;

Table 4.4: Table showing changes of weight from the time of admission into the program and at the time of the study

Description	Minimum	Maximum	Mean	Std Deviation
Weight at Admission	3.2	11.0	6.090	1.2477
Weight during study	5.3	16.3	10.672	2.6077

The results show that the average weight of the respondents at admission stood at 6.090kg with a maximum weight of admission being 11.0 kg and a minimum of 3.2 kg. The standard deviation that measures the level of dispersion is 1.2477 for weight at admission. This means that most of the weights of the children were close to the mean of 6.090 at admission hence a standard variability of 1.2477. The mean weight at the time of the study for those who have been in the program stood at 10.672 kg. The minimum was 5.3 kg and the highest was 16.3 kg. The standard deviation stood at 2.6077. The variability of the weight at the time of the study compared with the variation at the time of admission reflects the fact that even after subjecting the children to the same treatment in the program, the implementation or response rate to the program varied more.

4.3.5 Variation of MUAC at admission and MUAC at the time of Assessment

The study sought to establish the MUAC (Mid Upper Arm Circumference) of the children at the time they were admitted into the program and their MUAC at the time the study was being undertaken. MUAC is believed to be a sensitive tool for screening children for malnutrition and hence the change between the two measurements was instrumental to enable the study determine the starting point of progress or lack of the same in regards to the nutrition status of children who have been in the OTP program in Kasarani district.

Table 4.5: Changes in the MUAC of the children from the time of admission into the program

Description	Minimum	Maximum	Mean	Std Deviation
MUAC at admission	5.2	13.0	10.648	0.9115
MUAC during the study	7.2	17.0	13.080	1.6130

The results show that of all the children under study, the least MUAC measured at entry into the program was 5.2 cm while the highest was 13.0 cm. The mean MUAC was however at 10.648 cm. This means that averagely, all children admitted into the OTP program meet the MUAC cut-off point of <11.4. On the other hand 13.0cm as the highest MUAC at admission simply goes to prove that other criteria like presence of edema could have been used regardless of whether the MUAC cut-off point was acceptable or not.

4.5 Impact of complementary and Supplementary foods given on the Nutrition status of the children.

The first objective of this study sought to determine how complementary foods given to the children in OTP impact on the nutritional status of the children below five years in Kasarani district. This has been presented under the following themes in a logical order; Informed on the ways of administering the plumpy nuts to the child at home, Noticed improvement on the appetite of the baby after starting the child on the plumpy nuts and whether they Experienced on and off instances of diarrhea and vomiting. The opinion of the nutritionists/nurses in charge of

the program at the facility were equally used to further fine tune the results emanating from the respondents and place the results into perspective.

4.5.1 Informed on the ways of Administering the Plumpy Nuts to the Child at Home

The respondents in the study were asked if they were informed at the time of issuing the plumpy nuts on how they should administer the same to their recuperating children. The answers obtained from the 88 respondents were as follows;

Table 4.6: Those taught how to administer RUTF

Response	Frequency	Percentage
YES	87	98.9
DONT KNOW	1	1.1
Total	88	100.0

From the results, 87 of the 88 respondents representing 98.9% confirmed that indeed they were informed on the ways of administering the plumpy nuts to their babies. This information included the quantity to be administered according to the babies' weight and the method of administering it including eating it as it is with some water. This group held that they were warned not to give the child the plumpy nuts with other foods except water to prevent choking. Only 1 respondent did not know whether she was informed on how to administer or not. This constitutes 1.1%. The study can therefore generally deduce that almost all caretakers of the children in OTP are informed on how to administer the plumpy nuts to their children ones they are back at home. This was reinforced by the findings from the staff in charge of the program at

the facility level who held that the mothers were taught to administer the RUTF to their children based on the child's weight at the time of admission.

4.5.2 Improvement in the Appetite of the Child after Administering the Plumpy Nuts

Before a child is put on the plumpy nuts, an appetite test must be done to determine if the child is able to feed on them. This has a bearing on predicting the possible success rate of putting the child on the feeds and equally proves that nutrition is indeed the main reason behind the child's poor health. It is expected that ones the children are put on the RUTF, they improve on their weight courtesy of increased intake that has a direct link with the child's appetite. The study sought to establish if the caregivers noticed any significant change in the appetite of their children upon commencing feeding them on the plumpy nuts. The results were cross tabulated with whether they were taught on the correct ways of administering the RUTF or not as presented below;

Table 4.7 Noticed appetite improvement

	Did you Notice Appetite Improvement after giving RUTF?		
	YES	NO	TOTAL
Were you taught how to administer RUTF?			
YES	83 (94.31%)	4 (4.54%)	87
DON'T KNOW	1 (1.13%)	0	1
TOTAL	**84 (95.44%)**	**4 (4.54%)**	**88**

The results show that out of the 86 respondents who agreed that they were taught on the ways of administering the plumpy nuts, 83 (94.31%) noticed an improvement in the appetite of their children while only 4 (4.54%) did not notice any change in the appetite of their children. Even the 1 caretaker who did not know if she was trained on how to administer the RUTF to the child or not held that she noticed an improvement in the child's appetite upon the child consuming them.

Hypothesis 1 Testing

The study equally sought to test the second hypothesis which stated that there is no relationship between the Ready To Use Therapeutic Feeds given to children below five years in the OTP program and their nutrition status. The correlation is as shown below.

$H0_1$: There is no significant relationship between the complementary foods given in the outpatient therapeutic program and the nutrition status of children under five years in Nairobi County.

Table 4.8: Correlation of nutrition status of the children vs Those who noticed improved appetite

		The nutrition status of the children at the time of the study	Noticed Appetite Improvement After Giving RUTF
The nutrition status of the children at the time of the study	Pearson Correlation	1	.612
	N	88	88
Noticed Appetite Improvement After Giving RUTF	Pearson Correlation	.612	1
	N	88	88

The results reveal that there is a positive linear correlation between the nutrition status of children and their improved appetite after consuming the RUTF. This goes to prove that according to the study, when children are fed on the RUTF as is done in the OTP program then it contributes to improved nutrition status of the said children.

$r(88) = 0.612$,

$p > 0.05$

H02 rejected at 0.05

Again using the product bivariate correlation, the study established that there was indeed significant evidence to the effect that the RUTF feeds which forms a component of the OTP program; if given to children below five years has a positive impact on them. This means that the

OTP and RUTF in particular for this case continue to play an important role in the rehabilitation of malnourished children below five years.

4.5.3 The child experiencing on and off instances of Diarrhea and or vomiting when put on the RUTF.

The study sought to establish if the children who were on RUTF experienced on and off instances of diarrhea. The main question posed to the caretakers was whether they had noticed instances of diarrhea and or vomiting in their children for a period lasting more than two days while the child was on RUTF. The response generated were as follows:

Table 4.9: Did you Note Instances of Diarrhea and Vomiting After Giving RUTF?

Response	Frequency	Percentage
YES	54	61.4%
NO	34	38.6%
Total	88	100.0%

From the results as presented above, 54 respondents (61.4%) held that they noticed instances of diarrhea and vomiting while feeding the child on the RUTF provided in the OTP program. 34 (38.6%) respondents however held that their children did not experience instances of diarrhea and vomiting while on RUTF. The study therefore holds that a majority of the children who are put on the RUTF as part of the treatment of malnutrition suffered either diarrhea or vomiting or both. The diarrhea and vomiting can therefore be attributed to the RUTF holding all other factors constant. The information from the key informants revealed that indeed

measures were taken to inform parents on how to open the sachets and keep them safe without contamination. This means contamination was safeguarded and hence the only possible thing is that the RUTF had a health side-effect at the onset of feeding in some children. The key informants equally noted that there are channels of sharing plumpy nuts in the different centers using the monthly stock forms. This means distribution is not a problem at all. However, there are no clear substitutes that they recommend to parents in the event the RUTF are not there. This means there was a possibility of caretakers over-depending on the RUTF.

4.6 Impact of Health and Nutrition Education Given to the Mothers on the Nutrition Status of Children Below Five Years.

The second Objective of this study sought to determine the impact of the nutrition and health education given to the caretakers on the nutrition status of their children. The objective was studied under the following sub themes; Taught on the various aspects of the OTP program, Taught on the quantity of plump nuts to give, Taught on the hygiene practices to uphold in childcare, Learnt something new or not and Rating the effect of the knowledge received on a scale of 1-5 on the nutrition status of the children.

4.6.1 Taught on The Various aspects of The OTP Program

The study sought to find out from the respondents if they were taught on the various aspects of the program, what it intends to achieve and what is expected of them. Since the program is implemented both in the clinic setup and at home with the larger part being undertaken by the mothers at home, establishing if the mothers were taught on what the program

is all about and what is expected of them is a sure way of assessing its impact since without the knowledge, implementation is not likely to be properly done. The result was as follows;

Table 4.10: Were you taught on the Various Aspects of the OTP program at the start

Response	Frequency	Percentage
YES	82	93.2%
NO	4	4.5%
DONT KNOW	2	2.3%
Total	88	100.0%

The results show that 82 respondents (93.1) admitted that they were taught on the various aspects of the program as well as what is expected of them. 4 respondents making up 4.5% held that they were not taught anything on the OTP nor are they aware of what the program intends to achieve except that they heard it cures children suffering from malnutrition. Another 2 respondents from the 88 respondents making up 2.3% did not know if they were taught on the program or not. These findings means that a superior majority of the caretakers of the children recruited in the program were informed what the program was all about and how they could play their part in helping to rehabilitate their children. Care givers or the key informants mentioned the availability of the Integrated Management of Acute Malnutrition guidelines by WHO as well as Integrated Management of Childhood Illnesses guidelines as some of the guidelines whose contents they use to teach the mothers whose children are in the OTP. This confirms that there are proper sources of information to be disseminated to the parents. The in charge were also having a minimum of diploma in terms of education and hence were likely to have the necessary

skills to pass the information across in an appropriate manner. They however did not have special arrangements for persons who are illiterate. They confirmed that all respondents received the same amount of information. This means they did not take into consideration the fact that the less educated are likely to get mixed up when the information load is too much or beyond their retention level.

Table 4.11: Cross tabulation of the number taught on the various aspects of the OTP program and the nutrition status of children as at the time of the study.

Nutrition status at the time of the study	**Were you taught on the various project aspect**			
	YES	NO	DON'T KNOW	TOTAL
Not severely Malnourished	74 (80.09%)	2 (2.275)	1(1.13%)	77
Severely Malnourished	8 (9.09%)	2 (2.27%)		1(1.135) 11
Total	**82 (89.18%)**	**4 (4.54%)**		**2(2.27%) 88(100%)**

The correlation results show that a majority of respondents who were taught on the various components of the OTP program had a nutrition status that was not severely malnourished according to the weight Z-score as indicated in the reference table attached. Only 8 malnourished children accepted they were taught on the various projects. Not severely malnourished as used in this case mean those children who no longer qualify for inclusion into

the OTP program i.e. those who can safely be discontinued from the program because they have attained a weight for age of more than -3 Z-score standard deviation and lack edema. They can then be fed on home-made meals as advised and attain the healthy weight for age. Severely malnourished means those who still qualify for recruitment into the OTP program i.e. with Z-scores less than or equal to -3 standard deviation.

Testing of Hypothesis 1

This study sought to establish if there is a significant relationship between the health education and the nutrition status of children below five years of age in Kasarani of Nairobi County.

$H0_1$: There is no significant relationship between the health education provided in Outpatient Therapeutic Program and the nutrition status of children below five years in Nairobi County.

r (88) = 0.688, p> 0. 05

Using the product moment bivariate correlation, there was significant evidence with r (88) = 0.688, p> 0.05 that indeed there is a strong positive and hence significant relationship between the nutrition status of the children below five years in Kasarani district of Nairobi county and the nutrition and health education they are given in the OTP program. This can be understood to mean that if the health education given to mothers with children in the OTP program is enhanced, then the nutrition status of children below;

Table 4.12 Correlation of the Mothers taught on various project aspects and the nutrition status of the children at the time of the study

	Taught On Various Project Aspects
The nutrition status of the children at the time of the study	
Pearson Correlation	0.688**

****. Correlation is significant at the 0.05 level (2-tailed).**

4.6.2 Taught on the quantity of Plumpy Nuts to Give

This study also sought to know if indeed the caretakers were trained on the quantity of RUTF to give to the children because this has a bearing on their health and catch-up rate. It serves to equally reinforce the fact that indeed the caretakers were taught on the aspects of the program as was asked on the first question of the second objective.

Table 4.13: Taught on the Quantity of RUTF To Give

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	YES	80	90.9	90.9	90.9
	NO	5	5.7	5.7	96.6
	CANT REMEMBER	3	3.4	3.4	100.0
	Total	**88**	**100.0**	**100.0**	

The result were as shown above where 80 respondents (90.9%) agreed that they were taught on the quantity to give their children while 5(5.7%) said they were not taught and 3 (3.4%) held that they did not know at the moment if they were indeed taught or not. With a large majority confirming that they were trained on the quantity of RUTF to give to their children and how to administer it at home, it confirms that if indeed the scientific components of the RUTF aid improvement of children's nutrition status then an important step has been made towards the same by the majority knowing how to administer the feeds.

4.6.3 Taught on hygiene issues to observe in the OTP program

Hygiene is very fundamental in the OTP feeding program since failure to observe high standards of hygiene is likely to result in contamination that would present with diarrhea and vomiting among children as well as other disease conditions. The study therefore also sought to find out if indeed the caretakers were trained on the best hygiene practices to maintain while taking care of children at home. These are practices that if maintained would go a long way in

reducing cases of child morbidity that contribute to child malnutrition due to the disease burden among other factors. The results were therefore as shown below;

Table 4.14 superior majority of 80 respondents

Response	Frequency	Percentage
YES	80	90.9%
NO	5	5.7%
CANT REMEMBER	3	3.4%
Total	88	100.0%

The results show that a superior majority of 80 respondents (90.9%) accepted that they were taught on the best hygiene practices to maintain. Another 5 respondents (5.7%) held that they were not taught while 3 respondents (3.4%) held that they could not remember if they were taught or not. This goes to prove that indeed a convincing majority of the caretakers of children recruited in the program were taught on the aspect of hygiene practices to maintain while taking care of the children at home. This makes a major contribution because hygiene issues if left unchecked can pose a serious challenge to the rehabilitation process.

A further analysis to establish the relationship between those who were taught on the hygiene issues to observe and those who observed an improvement in the appetite of their children was done and the results were as follows;

Table 4.15: A cross tabulation of respondents who noticed appetite improvement after giving RUTF and Those who were taught on Hygiene issues in the program

	Taught on Hygiene Issues			
Noticed Appetite Improvement After Giving RUTF	YES	NO	DON'T KNOW	TOTALS
YES	71	9	4	84
NO	4	0	0	4
Total	75	9	4	88

From the cross tabulation of those taught about hygiene issues and those who noticed an improvement in the appetite of their children, 71 respondents out of 88 said yes while 4 said they did not see an improvement in appetite even after being taught. 9 of those who were not taught on hygiene issues noticed an improvement in appetite of their children while 4 respondents who did not know whether they were taught or not also noticed appetite improvement in their children after feeding their children on the RUTF.

4.6.4 Learnt something new that they still remember

For a learning experience to have a long lasting impact on the lives of those put through it, it should be about things that the learners associate with and are able to remember anytime. The study therefore sought to establish if the respondents are takers were taught anything new they did not know and are still aware of it and apply it in their lives. It would shed light on the long term effect that the education aspect had on the mothers. The results obtained from the respondents were as shown below;

Table 4.16: Did you learn something new in the OTP program?

Response	Frequency	Percentage
YES	81	92.0%
NO	5	5.7%
DONT KNOW	2	2.3%
Total	88	100.0%

The result show that a majority 81 (92%) learnt something new in the program they still value and apply to date. 5 respondents (5.7%) however maintain that they did not learn anything and a further 2 (2.3%) not knowing if there was anything they learnt they can still remember. This result emphasizes that a majority of the respondents benefited from the program in terms of knowledge. The fact that they remember the knowledge two to three years later confirms that indeed the program had a positive impact on them in regards to imparting knowledge.

4.6.5 Rating the effect of knowledge received in the OTP program

By being given an opportunity to rate the knowledge they have received or lack of the same on a scale of 1 to five as very low, low, average, high and very high, respondents provide insight on the impact of the knowledge they received on their lives. This is what the study sought to establish and the results achieved were as highlighted below;

Table 4.17: How do you rate the effect and impact of the Knowledge you received in this program?

Response	Frequency	Percentage
LOW	4	4.5%
AVERAGE	21	23.9%
HIGH	6	6.8%
VERY HIGH	57	64.8%
Total	88	100.0%

The results show that a majority 57 (64.8%) thought that the effect of the program in their life in terms of knowledge received was very high. They held that they thought it was high because their children were fully rehabilitated, they learnt new things among others. 21 (23.9%) thought the effect of the knowledge they received was average, 6 (6.8) thought that the effect of the knowledge they received was high while 4 (4.5%) held that the effect of the knowledge they received was low.

4.7 How the Monitoring and evaluation components impact on the nutrition status of children below five years

The OTP program is supposed to designed in such a way that it must be monitored beyond just the clinical records indicating "Cured" or "Transferred" or "Died" which were the main criteria of assessing the success or failure of the program as was mentioned by the key informants. There is need to ensure that the feedbacks gained in the monitoring process are used to further streamline the program and ensure that the cure rates are increased and death rates as

well as other complications reduced or eliminated. This objective therefore seeks to establish whether the monitoring process was done properly and efficiently because only then would it be possible to realize the program success in terms of improving the nutrition status of the under fives in a sustainable manner.

4.7.1 The number of times the mothers went back to the health facility for monitoring by the nutritionists and dieticians in charge.

The study sought to establish if indeed the mothers went back for growth and progress monitoring at the facility after being supplied with the RUTF for home use. This was meant to provide insight into the effectiveness of the monitoring process considering that most children stay in the OTP program for one month before being declared either exited or "Non responsive" hence being transferred to a health facility for further medical investigation. A weekly or fortnightly assessment would be in order in this case because it would also provide an amble opportunity to address any arising issues like diarrhea or vomiting among other issues if present. The results achieved were as follows;

Table 4.18: What is the number of times you went back to the clinic for growth monitoring while the child was in the program?

Response	Frequency	Percentage
WEEKLY	33	37.5%
TWO-WEEKLY	20	22.7%
THREE-WEEKLY	35	39.8%
Total	88	100.0%

From the results, it became evident that a majority of the respondents 35 (39.8%) went back to the clinic ones in three weeks. The main argument for this trend is that they were given three weekly supplies and therefore were given return dates immediately they run out of the RUTFs. Almost in equal measure, 33 respondents (37.5%) reported that they went back for growth monitoring ones a week while 20 respondents (22.7) went for the child's weight monitoring two times a week. The results therefore show that Most of the respondents took their children back for monitoring either on a weekly basis or after three weeks. If the threshold of keeping children in the program for a month is anything to go by, then the weight monitoring or progress monitoring is not right for about half of the respondents. Three weeks is too long for a child to be brought back for growth monitoring especially for children in OTP. Most of the children who went for the growth monitoring every week were for mothers who had children in the age bracket of 6-15 months. It means mothers with younger children were more careful than those with older children.

4.7.2 Did the children experience faltering weight?

Faltering weight is an indication that something is not alright in the care of the child. In most cases, the child is likely to be suffering from intermittent and unreliable supply of food or could be suffering certain childhood illnesses due to poor feeding practices, food contamination during cooking or feeding as well as other hygiene issues among others. The results generated were as shown below;

Table 4.19: Did the child experience faltering weight during the time he/she was in the program?

Response	Frequency	Percentage
YES	41	46.6%
NO	44	50.0%
DONT KNOW	3	3.4%
Total	88	100.0%

A total of 44 (50%) did not experience faltering weight during the time when their children were admitted in the program. 41 (46.6%) experienced faltering growth experienced weight faltering while only 3 (3.4%) did not know if their children experienced weight faltering or not. The main reason why a majority of respondents experienced growth faltering is because their children experienced diarrhea and vomiting on certain occasions during the time the child was on RUTF. There is no clear majority worth concluding that children experience or don't experience growth faltering since the margin is slim between those who experienced and those who did not. The high number of children with faltering growth weight is an indication that something was not done right in the program.

4.7.3 Received nutrition Counseling every time they went Back to the Clinic

By asking the mothers if they received nutrition counseling every time they went back to the clinic for progress monitoring, the study sought to know if the nutritionist in charge of the various health facilities visited played their role in the monitoring and evaluation process as would be necessary for program success. It also sought to find it if there was an opportunity to pinpoint the faults in the implementation and correct them at the earliest opportunity the same way it sought to ensure that reinforcing of the message passed on was done. The results were as follows;

Table 4.20: Did you have nutrition counseling every time you went back to the clinic?

Response	Frequency	Percentage
YES	47	53.4%
NO	28	31.8%
DONT KNOW	13	14.8%
Total	88	100.0%

This shows that a majority of respondents 47 (53.4%) agreed that they were subjected to nutrition counseling every time they reported back to the clinic. It shows that 28 (31.8%) respondents did not receive nutrition counseling every time they went back to the clinic while 13 (14.8%) did not know if they received nutrition counseling every time they went back or not. Considering that those who said 'No' in this question are not necessarily people who held that they were never put through nutrition counseling at all, it can be held that they were subjected to at least one or a few nutrition counseling sessions. This confirms that the nutritionists or representative figures in the health facility did a commendable job in terms of nutrition

counseling. The respondents therefore benefitted from the component of nutrition counseling as is supposed to be offered in the program.

The information from the key informant interviews revealed that there is a disconnect between the implementing agency and them since they hardly get to meet the officers in charge at concern Worldwide to discuss the program implementation in detail. The key informants at the public facilities held that they communicated to the project donors or country implementers for UNICEF via a long and tedious chain of command and since they hardly get their recommendations implemented in time, they felt the communication barrier exists. Intimidation from seniors was equally mentioned as one of the reasons why the key informants sometimes don't speak their mind on how the program should be improved but rather perform the formalities to avoid rubbing shoulders.

4.8 How follow ups done by Community Health Workers impact on the nutrition status of children below five years in Kasarani district, Nairobi County

The fourth objective of this study sought to determine how the follow ups done by the community health workers in the community impact on the nutrition status of children below five years of age. The objective will be discussed under the following sub themes; Number of times the caretakers were visited at home by community health workers to check on the progress of the child, If the caretakers were satisfied with the services they received from caretakers, If they thought the services offered by the CHWs were essential and finally, how they would rate the services they received in the OTP program.

4.8.1 Times visited by the CHWs at home

By asking the mothers the number of times they were visited at home by the CHWs, the study sought to establish the thoroughness of the follow up component of OTP program. By visiting the respondents at home, the CHWs would have an opportunity to see for themselves how the mothers implement every aspect of the program they are supposed to undertake. They would also have a first-hand experience with the situations under which the children are being brought up. This would enable them make necessary referrals incase of defaults, sickness or other necessary checkups. They would also use the opportunity to reinforce what the mothers have already been taught and to help with the management of small complications that may arise. The results were as follows;

Table 4.21: What is the number of times you were visited by a community health worker at home while the child was in the OTP program?

Response	Frequency	Percentage
0 TIMES	42	47.7%
ONE TIME	19	21.6%
LESS THAN 3 TIMES	14	15.9%
MORE THAN 3 TIMES	12	13.6%
CANT REMEMBER	1	1.1%
Total	88	100.0%

A vast majority of respondents 42 (47.7%) confirmed that indeed there was no follow up the moment they were recruited into the program. It is obvious that this does not mean they have never come in contact with the community health workers since some are equally referred into the program by the CHWs. However, the follow up component appears to suffer a major blow in

this program. 19 respondents (21.6%) were only visited ones, 14 (15.9%) were visited two times, 12 (13.6%) were visited more than three times while 1 (1.1%) did not know the number of times she was visited. The follow up component of the OTP program therefore appears not to have been done satisfactorily all factors remaining constant.

4.8.2 Satisfied with the services you received from the CHWs?

The study sought to know from those who were followed-up by the CHWs at home if they were satisfied with the services they received from them. This would provide the study with a direct barometer of what the people really felt about the services offered by the CHWs. The results were as follows;

Table 4.22: Were you satisfied with the services you received from the Community Heath Worker(s)?

Response	Frequency	Percentage
YES	37	42.0%
NO	1	1.1%
PARTLY	2	2.3%
DONT KNOW	1	1.1%
N/A	46	52.3%
55	1	1.1%
Total	88	100.0%

The results show that indeed a majority of respondents 46 (52.3%) could not answer this question because they were never followed up at home. 37 (42%) confirmed that they were satisfied while 2 (2.3%) were partly satisfied. 1 (1.1%) and another 1 (1.1%) held that they were not satisfied and didn't know if they were satisfied or not respectively. It therefore appears that a majority of those who were visited by the CHWs at home were satisfied with their services. The key informant interviews held that they are in charge of the facilities but have no powers to direct the CHWs who are put on meager allowances since most of them work as volunteers and are answerable to the donor. This means there is no proper coordination nor is there a proper working relationship between the in charge and the CHWs. This means there is no clear sense of direction on how the follow ups should be done nor are there proper and recognizable chains of commands in the follow up services.

4.8.3 Do you think that services offered by CHWs in the community are essential?

This study wanted to know from the respondents if they think the services offered by the CHWs are very important. This was a response that was to emanate from the respondent's own experiences or knowledge of the community health workers. The results were as follows;

Table 4.23: Based on your experience or knowledge, are services provided by CHWs essential?

Response	Frequency	Percentage
YES	87	98.9%
DONT KNOW	1	1.1%
Total	88	100.0%

Surprisingly, while over 50% were not followed up, they have at least interacted with them and that is probably why the study held that 87 (98.9%) held that they thought the work of the CHWs are essential. Only 1 (1.1%) held that they did not know if their work was essential or not.

4.8.4 Rate the follow up service you received in the OTP program

Respondents were asked to rate the services they received from the follow up services. This was supposed to be answered mainly by persons who were visited at home by the CHWs after they were recruited into the program. The response was to enable the study gain a general view of the follow up services, the way it was implemented and the possible impact it had on the nutrition status of the children under study. The results were as shown below;

Table 4.24: How would you rate the follow-up services based on your experience?

Response	Frequency	Percentage
HIGH	14	15.9%
VERY HIGH	28	31.8%
DONT KNOW	4	4.5%
N/A	42	47.7%
Total	88	100.0%

From the results achieved, 42 (47.7%) could not rate the follow up services because they were not followed up. 28 (31.85%) rated the services they received as of 'very high' influence, 14 (15.9%) as high and 4 (4.5%) said they did not know how to rate the follow ups.

4.8.5 Did the child experience any health complications at home in which the CHW was useful?

This question was posed to the respondents to further determine the impact of the follow ups on the nutrition status of children below five years in the program. It sought to establish if the CHWs had any other important role to play apart from just making referrals. This would mean the CHWs are either well trained to do their work hence impacting the program positively or they are not well trained and are involved directly hence are likely to impact the program negatively. The results are as shown below;

Table 4.25: Did the CHWs help with the management of the child's health complications at home while on OTP?

Response	Frequency	Percentage
YES	19	21.6%
NO	25	28.4%
DONT KNOW	5	5.7%
N/A	39	44.3%
Total	88	100.0%

The results show that 39 (44.3%) respondents were not in a position to answer this question because they were never followed up or simply that their children never suffered any complications while at home. 25 (28.4%) said that their children suffered complications but the CHWs did not help, 19 (21.6%) held that indeed the CHWs helped them while 5 (5.7%) did not know if they helped on not. The key informants held that with the level of knowledge most CHWs have, it is only necessary that they perform screening and then refer these at risk to the clinic for specialized attention without necessarily trying to solve anything since they may do it

wrongly. There are those who do the same, however; some still try to solve the problems like telling the mothers how to handle danger signs like lack of appetite, diarrhearing, vomiting and lack of appetite.

CHAPTER FIVE

SUMMARY OF FINDINGS, DISCUSSIONS, CONCLUSSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter provides a summary of the findings of this study. The summary is discussed in line with the four main objectives of the study which look at impact of the health and nutrition education given to mothers whose children are in OTP program, the Ready To Use Therapeutic Feeds, The follow ups in the community and the monitoring and evaluation on the nutrition status of children below five years in the OTP program in Kasarani district of Nairobi County.

5.2 Summary of the Findings

The first objective of the study was about establishing how follow ups done by the community health workers impact on the nutrition status of the under five year olds. Follow ups by the community health workers was studied under; the number of times the respondents were visited by CHWs at home, if the caretakers were satisfied with the services they received from the CHWs, their thoughts on the essentiality of the CHW services and finally how they would rate the follow up program. Follow ups in the community are believed to provide the program implementers with an opportunity to have a firsthand experience of what the clients go through at home. It provides avenues for the community health workers to look at what the mothers practice at home. This way, they would be able to identify mistakes in the general baby care to maximize the results of being in the OTP program. On the number of times the respondents were visited at home by CHWs while in the program, a majority 42 (47.7%) said they were not visited at home while in the program, 19 (21.6%) were visited only ones, 14 (15.9%) were visited two

times, 12 (13.6%) were visited more than three times while only 1 (1.1%) respondent could not remember being visited or not. The second aspect of this objective sought to find pout from respondents if they were satisfied with the services they received from the CHWs. This was to provide a firsthand knowledge on how the beneficiaries felt about the services offered by the CHWs. 46 (52.3%) were categorized under N/A because their responses could not be valid on this since they were never visited or simply got word that the CCHWs came to their homes but never found them (referrals from other beneficiaries). 37 (42%) confirmed that they were satisfied with the services they received from the CHWs, 2 (2.3%) were partly satisfied while 1 (1.1%) did not know if she was satisfied or not. It therefore follows that a majority of those visited and found at home were satisfied with the services they received from the CHWs. When asked if they thought the services of a community health worker was essential in the program, 87 (98.9%) answered in the affirmative while only one person did not know. This means that even those who were not visited by the CHWs had an idea about what they do and thought their services are essential. Finally, the respondents were asked to rate the follow up services in the OTP program and 42 (47.7%) were categorized under N/A since they were never followed up. 28 (31.8%) rated the program as very high, 14 (15.9%) as high and 4 (4.5%) did not know how to rate the follow up services.

Lastly, the study sought to find out from the respondents if while at home, the child experienced any health complications in which the CHW who visited helped out. 39 (44.3%) were registered under N/A because they held they were not visited, 25 (28.4%) said NO, meaning that the CHWs never helped and or the baby never experienced any health complications at home, 19 (21.6%) said the CHWs indeed helped them out while 5 (5.7%) did not know if the CHWs helped or not. The key informants held that it was necessary for the

community health workers who mostly do not report to them as a rule of thumb, to simply refer those with children at risk without necessarily trying to handle the same in the community since they may make mistakes considering that most of them have little knowledge in the same and are not trained professionals. This is in tandem with the findings of Woods & Riley (2006) who held that it is necessary that the community health workers/health extension workers must work closely with the trained professionals who include nurses, dieticians, nutritionists and doctors for a follow up service in the community to be effective. While this happened, it was not by a rule of thumb. This means it is something the CHWs can do or fail to do as they wish.

The second objective of the study was to establish the impact that the nutrition and health education given to the mothers as a component of the OTP program influence the nutrition status of their children. The study established that 93.2% (82) were taught on various aspects of the OTP program before being allowed to undertake most of the activities on their own at home. Only 4.5% (4) were not taught on various aspects of the job while 2.3% (2) did not know if they were taught or not. This confirms that the OTP program has an education component that duly informs the caretakers of the beneficiaries the importance of various aspects of the program to the well being of the child. A cross tabulation of the respondents taught on various components of the program and the nutrition status of the children at the time when the study was done show that up to 74 (84.09%) who were taught on the various aspects of the project had a nutrition status that is not severely malnourished (more than -3 z score of weight for age). This proves that a majority of the respondents confirmed that indeed the level of nutrition and health education given in the OTP program had a bearing on the nutrition status of the children.

On the second hypothesis which sought to establish if there was a relationship between the health education provided in the OTP program and the nutrition status of the children in the

OTP program rejected the null hypothesis and accepted the alternative hypothesis which held that; "There is a significant relationship between the health education provided in Outpatient Therapeutic Program and the nutrition status of children below five years in Nairobi County". The correlation between the nutrition status of the children and those taught on the various aspects of the program generated a Pearson product correlation coefficient of 0.688 and hence rejected the null hypothesis at 0.007 confidence level. This shows that there is a positive linear correlation between the health and nutrition education given in the OTP and the resulting nutrition status of the children below five years in the OTP program. On the nutrition and health education aspect, the study established that 90.9% (80) were taught on the quantity of plumpy nuts to give to their children, 5.7% (5) were not taught while 3.4% (3) could not remember if they were taught or not. It therefore confirmed that a majority of the mothers were taught on an aspect of the program (quantity of RUTF to give to their children).

The study equally established that a majority of respondents 80 (90.9%) were taught on the hygiene standards to maintain during the time when the child is in the OTP and after, 5 (5.7%) were not taught while only 3 (3.4%) can't remember if they were taught on that aspect or not. With a majority of the caretakers having been taught on the hygiene issues, the study can confidently conclude that holding all factors constant, teaching caretakers on hygiene issues plays a major role in preventing food contamination as well other opportunistic infections and as such contributes to the general well being of the child as shown by the child's nutrition status. To further confirm that indeed the education component of the OTP program is executed well, 92% (81) confirmed that indeed they can still remember something they learnt in the program. When probed to name what they had learnt, the most recent persons to be exited from the program or still in the program like the 2013 respondents, even the 2010 respondents confirmed the same

elements. This confirmed that the information passed was the same and that most respondents did not forget the various aspects of the program as taught. Only 5.7% (5) did not think there is anything new they still remembered while 2.3% (2) did not know. The study also asked the respondents to rate the effect of the knowledge received in the program on their children. The result indicated that 64.8% (57) saw the knowledge to have a very high effect on them, 23.9% (21) rated the knowledge average, 6.8% (6) as high and 4.5% (4) as low. Most of those who rated the knowledge effect as high or very high agreed that they knew the knowledge helped them because upon practicing what they were taught, they stopped making mistakes and their children started progressing well.

The third objective of this study sought to establish the impact of the feeds given in the OTP program (RUTF) on the nutrition status of children below five years of age in Kasarani District of Nairobi County. In a logical order, the study established that 87 (98.9%) of the respondents under study were duly informed on the ways of administering the plumpy nuts to their children and only 1 (1.1%) did not know whether she was informed or not. As a component of the OTP program, teaching mothers how to feed their children with the therapeutic feed contributes a great deal towards the realization of the therapeutic benefits the feed provides. On whether there was any significant improvement on the appetite of the children as is supposed to be the case, the result was very good. A cross tabulation of those children who noticed appetite improvement and those from mothers who were taught on how to administer the plumpy nuts, the result indicated that 83 (94.31%) confirmed they were indeed taught on how to administer and noticed an improvement in the appetite of the children. Up to 4 (4.54%) of the respondents were taught but never noticed any improvement while only 1(0.1%) respondent who could remember if she was trained on how to administer the feeds or not acknowledged that indeed

there was an improvement in appetite. This confirms that indeed improved appetite is a result of properly administered RUTF hence a positive impact emanating from the OTP program. The first hypothesis sought to establish if there was a relationship between the RUTF feeds given to children below five years as a mainstream component of the OTP program. The result of the correlation between the nutrition status of the children at the time of the study and those who noticed appetite improvement after eating the RUTF generated a Pearson product correlation of 0.082 hence disapproving the null hypothesis and accepting the alternative hypothesis that indeed there is a relationship between the RUTF given to children below five years in the OTP program and the nutrition status of such children. The null hypothesis was disapproved at p> 0.05 (0.445) significance level.

The study also sought to establish the degree or prevalence of diarrhea/vomiting instances among children fed on RUTF. The results show that up to 61.4% (54) noticed instances of diarrhea/vomiting after feeding their children on the RUTF. Further probing established that most mothers were informed that it was a side-effect of the food cum medicine (RUTF) they are given. A majority also confirmed that their children had no underlying medical conditions as confirmed at the clinic when they took them back for medical evaluation after the onset of diarrhea. The diarrhea instances were also short-term lasting between 2-4 days only. Overall, the findings here confirm that indeed the RUTF had a general positive impact on the nutrition status of the children below five years in Kasarani district. This particularly because a significant majority of children put on the RUTF had nutrition status above the requirement for admission into an OTP program. This means they had graduated a few steps from severe malnutrition to nutrition status more than -3 Z-score of the child's weight for age. The positive impact is also because a majority experienced improved appetites and the caretakers were taught on the proper

ways of administering the plumpy nuts as well as the hygiene practices to observe and maintain. This study therefore supports the findings of Patel et al (2005) where controlled study in Malawi found malnourished children put on supplemental feeding program with RUTF gained weight significantly (3.1 g per day) hence the feeds were found to be very beneficial to a child's growth and overall well being.

The fourth and final objective sought to establish how the monitoring and evaluation component impact on the nutrition status of children below five years in Kasarani district. This objective was studied under the following sub-themes; the number of times the caretakers took the children back to the hospital for progress monitoring, if the children experience faltering growth patterns in terms of weight and those who received nutrition counseling every time they went back to the clinic. On the number of times the respondents went back to the facility for monitoring by the nutritionists in charge, the study established that a slim majority 39.8% (35) went back for the monitoring process ones in every three weeks. This, they said was because they were given three weeks supplies of RUTF or supplies that could be used for slightly more than two weeks (14 days). Another 37.5% (33) went back ones a week, 22.7% (20) went back to the clinic ones every two weeks. Considering that the mothers who went back for growth and progress monitoring weekly were those with younger children in the age bracket of 6-15 months, the study concluded that caretakers with younger children are more careful with their children than those with older ones. The study also concludes that the monitoring aspect was not properly implemented in the OTP program in Kasarani because the average time the child remains in the program is 1 month so going to the clinic ones in three weeks does not provide an ample opportunity to establish the problems that might interfere with the recommended progress and make the necessary corrections. Whether the children experienced faltering growth weight while

in the program, the study established that 50% (44) respondents did not experience faltering growth weights with their children during the time they were in the program. Up to 46.6% (41) respondents experienced growth faltering with their children while only 3.4% (3) did not know if their children experienced growth faltering or not. The high number of children with faltering weight in the program confirmed that indeed there were a substantial number of children who suffered instances of diarrhea and vomiting as has been found since this is likely to make them lose weight and then later gain as they get over the instances of diarrhea and vomiting. It is still possible that because of poor monitoring as has been established under this objective, it was not possible to correct the problems that caused the weight to fall in time. This can also mean the mistakes that resulted in the weight dropping were committed intermittently due to lack of timely intervention and hence the mothers kept repeating them without knowing.

The study also established that 53.4% (47) received nutrition counseling every time they went back to the clinic, 31.8% (28) never received nutrition counseling every time she went back to the clinic and 14.8% (13) didn't know if they received the counseling every time they went to the clinic. The nutrition counseling session provides an opportunity for the dietician in charge to identify any faults in the feeding program at home or any other aspects of child care and correct it in time. It is almost half-half with those who received the counseling all the time enjoying a minor advantage. The incoherent monitoring through re-visits and constant counseling sessions must have contributed to the slow rehabilitation rate since a majority of the children who were of 'not severely malnourished nutrition status were simply having Z-scores of >-3. This means they did not meet the requirement to be in the OTP program anymore but does not necessary mean they are devoid of any nutrition shortcomings. It is however important to note that they had made improvements from their previous nutrition status in terms of their weight for age.

5.3 DISCUSSION

It is held that the quality of life that a child receives within the 59 months bracket of age is very instrumental in determining the development of the child in the after years. This has made rehabilitation of malnourished children that are at risk of poor mental and physical development a priority in the health sector today. The OTP program works towards this end. The study sought to explore four main components of the OTP program to determine its impact on the nutrition status of children below five years in Kasarani namely; the Ready To Use Therapeutic Feeds, The monitoring and evaluation aspect, health and nutrition education and the follow up services.

The first objective of this study sought to determine the impact of the follow up services done by the community health workers on the nutrition status of the under five year children in Kasarani district of Nairobi County. A majority of respondents were never visited at home by the CHW after their children had been enrolled in the program. This in turn meant that they could not rate the follow up services they received nor could they hold a position whether they were satisfied with the services offered by the CHWs. However, those who were visited were happy and satisfied with the same. It therefore follows that it is likely that the services offered by the CHWs are satisfactory but the coverage is low or there are areas that do the follow up while others don't. Based on their knowledge or experience or a combination of both, the majority respondents felt the services offered by community workers are essential. This confirms that most respondents have either met with the CWHs in different platforms, have heard about them or were informed about their work by colleagues. It confirms that the engagement of the CHWs should be enhanced because the respondents view it as a positive thing.

The second objective was on health and nutrition education component given to the mothers and how it impacted the nutrition status of the children. Again, this aspect of the OTP was mostly positive because a majority were taught on the various aspects of the OTP hence were prepared well to play their role, were taught on hygiene issues that most of the time contributes to malnutrition among the under fives and could confirm that they learnt something that they still remember and contributes to the general good health of their children. There was equally a positive correlation between the nutrition status of the children and teaching mothers on various aspects of the OTP program. This means that while the intervention is from the donor, for it to have a successful impact the caretakers must be equipped with the right knowledge because only then can the positive influence be sustained to bring about a positive impact in the long run. Considering that the study has found a linear positive correlation between the level of nutrition and health education of caretakers and the nutrition status of the children under their care, it is therefore in agreement with the findings of Jacques Be-Ofuriyua et al, (2006). It therefore follows that the more the mothers are given health education on how to take care of their children in the OTP program, the more they improve their nutrition status. The $H0_1$ was hence rejected at 0.01 significance level and the Alternative hypothesis H_{a1} which states that there is a positive linear correlation between the health education given to mothers and the nutrition status of their children below five years in Kasarani district in Nairobi County upheld.

Even when asked to rate the impact of the knowledge they have received in the program, the highest cluster was those who held that the knowledge received had a very high effect of their lives. The reasons given by those who did not say it was very high ranged from the children still suffering from other ailments they thought would not be a problem anymore to poor public relations between them and the caregivers who either quarreled them, belittled them in a way or

provided the needed help under tough conditions. It shows therefore that while the gesture was a welcome move, there were some problems in implantation that did not leave the children's' mothers with maximum satisfaction. The findings of this study in regards to the relationship between maternal awareness of health education contents and the nutrition status of their children ($r= 0.688$, $p>0.05$) are therefore in agreement with the findings of Jacques Be-Ofuriyua et al (2006). In his study, Jacques Be-Ofuriyua et al established that the level of maternal education as well as health education directly influence the nutrition status of children holding all other factors constant.

On the third objective covering RUTF, a majority of the respondents held that the due process and enlightenment when it comes to the issuance of the therapeutic feeds was done because proper ways of administration of the RUTF was done, they were briefed on what the program is all about and they noticed an improvement in the appetite of their children after commencing the feeding hence improved nutrition status. This is in agreement with the findings of Patel (2005) who undertook a study to determine the impact of supplementary feeding among Malawian children and found a positive correlation. However, most of them noticed instances of diarrhea for a few days after initiating the feeds. On further probing to establish the measures taken by the mothers whose children exhibited diarrhearing and vomiting symptoms, all the mothers mentioned that they took the children back to the clinics and were informed that those were possible side effects of the RUTF. They also uninanimously acknowledged that they were informed of lack of any underlying medical issue and that the child was simply "reacting to the medicine (RUTF)". This confirms that the cases of vomiting and diarrhea for the children below five years in OTP program in Kasarani were attributed to the RUTF holding all other factors constant. Also the children who suffered diarrhea at this point experienced brief weight faltering

before eventually catching up. This is in agreement with the assertions of Sheth and Dwivedi (2006) that held that diarrhea not only reduces food intake in children but equally results in the loss of vital micronutrients and negatively affects food absorption hence malnutrition. Therefore, while all the other aspects of the ready to use therapeutic feeds were positive in promoting improved nutrition status of the children, the side-effects were likely to contribute to lose of weight hence negatively influence the nutrition status of the children. The study upheld the findings of Ashworth (2005) that the use of RUTF in this rehabilitation process presents with various demerits; High costs, little opportunity for the mothers to learn about the best child feeding practices and the need for well trained community health workers for purposes of monitoring can be too demanding (Asworth, 2005).

The fourth objective sought in this study looked at the monitoring and evaluation aspect and how it impacts on the nutrition status of the under five children in Kasarani district. A slight majority went back for progress monitoring ones in three weeks with a slightly lower margin going back ones a week. Upon probing, the study established that those who went back to the clinic more frequently (weekly) were not necessary doing so because it was a requirement in the program but because they had younger children who were supposed to be assessed in the normal growth monitoring in the child welfare clinics done weekly. This means either the program does not have a properly entrenched system of checking progress or it is not functioning. There is also a possibility that ones the parents noted slight progress in their children, they did not find it necessary to go back. However, most caretakers held that they received nutrition counseling on the few occasions they went back to the clinic and that their children experienced mild weight faltering at the time of admission into the program due to diarrhea due to the RUTF. There is however a very slim margin between those whose children experienced growth faltering and

those whose children did not. Faltering weights therefore can be an issue depending on how it is looked at but in the context of this study, it was viewed as a side effect of the RUTF since it was short term and at the time of admission. According to Troy et al (1999) the impact of monitoring and evaluation is best achieved when it takes a participatory approach. The theoretical framework of the OTP program is in agreement with this assertion but what is done practically does not meet the threshold.

5.4 CONCLUSION

This study's main aim was to establish the impact that the OTP (Outpatient Therapeutic Program) has on the nutrition status of children below five years in Kasarani District of Nairobi County. In line with the study objectives as the guide, the study made various conclusions as highlighted below;

The OTP program has generally had a positive impact on the nutrition status of the children below five years in Kasarani district. The program has equipped the parents with vital skills and knowledge that they would use in childcare. The fact that most women confirmed that they have learned new things they did not know before and could still remember them when probed at the time of the study confirms that indeed the knowledge imparted in the mothers had played a role in the experienced improved health of the children who no longer depend on the therapeutic feeds. So many mothers were equally taught on hygiene issues. This means the general perspective held by the mothers on matters of hygiene had been changed for the better and hence they would no longer tolerate poor hygiene as a choice but rather as a condition if they must. Many parents confirmed that their children have enjoyed improved health status since they were exited from the program.

The program's follow up aspect is a good one but the study established that so many persons were not followed up after being released into the community. This makes evaluation of the program's impact a bit difficult and can equally hamper the program's implementation in the future since feedback channels are not clear. The clients who were visited were however happy and pleased with the services they received from the community health workers. This means if rolled out well, the follow up services would be able to boost the impact of the OTP program. Feeding the malnourished children on RUTF is equally a successful venture as was determined by the study and plays a significant role in determining the nutrition status of the children.

Finally, the monitoring and evaluation aspect of the program which is supposed to be key in informing minor or major changes to the program was equally lacking in some aspects. The study established that there were no proper schedules to allow the nutritionists in charge at the facilities to periodically check the progress of the children under rehabilitation.

5.5 RECOMMENDATION FOR POLICY ACTION

The study holds that the following recommendations need to be looked into for policy action:

1. It is necessary for the implementing agency to ensure that there is a pre-set monitoring schedule to be followed to ensure that any mistakes made in the process of implementation are identified and corrected in time
2. The implementing agency should bridge the gap between itself, the community health workers and the nutritionists who are in-charge of the program at the facility level.
3. The community health workers need to be employed permanently and be remunerated as part of the program so that they can be given the opportunity to do all the follow ups and their work output measured and sanctioned

4. The implementing agency must make the necessary steps to ensure that the side-effects of the RUTF like diarrhea and vomiting that the study established are managed well without further leading to a drop in the children's growth curve
5. The study established at the time of calling respondents from the register that there were respondents who had since passed on and were not reflected as such in the records. This included those who had been in the program for only the last two years or so.
6. The follow-ups need to be streamlined so that everyone who has been in the program is kept in the radar until such a time when impact evaluation would be conducted. This is vital since at the time of the study, there are children who even died after being exited from the program.
7. Record keeping in some facilities was rather disappointing. There are facilities that did not have some records or could not trace where they are within the facility. This indeed has a bearing on even the monitoring and evaluation aspect and should be established afresh.

5.5.1 SUGGESTIONS FOR FURTHER STUDIES

This study utilized a correlation research design. This means it was more interested in describing the relationship between the independent variable and the various components of the dependent variable. This means the study left out an important part on explaining the actual causality. The following areas need to be investigated further to further enhance comprehension of the impact of the OTP program on the nutrition status of children below five years;

1. The challenges that face implementation of a proper monitoring and evaluation system as well as community follow ups in the OTP program

2. Controlled experimental study to determine the difference between malnourished children rehabilitated on therapeutic feeds alone and those rehabilitated on a combination of therapeutic feeds, breast milk and other complementary foods.
3. Influence of the level of motivation among staff implementing the OTP program at the facility level and the successful rehabilitation of children in the OTP program

5.5. 2 CONTRIBUTION TO THE BODY OF KNOWLEDGE

Objective	**Contribution to the body of knowledge**
How does the complementary and supplementary foods (RUTF) given while the child is in OTP impact the nutrition status of children under the age of five years in Kasarani district in Nairobi County?	The study determined that feeding malnourished children with the Ready To Use Therapeutic feeds has a positive impact on them. This is because they exhibited an improved weight for age (improved nutrition status) and a significantly reduced morbidity rate over the years. The impact of these feeds would however be improved by managing the side-effects (diarrhea and vomiting) and by teaching mothers methods of preparing high protein and high calorie meals at home to sustain the initiated progress
How does the follow-ups in the community impact on the nutrition status of the under fives in Nairobi County's Kasarani district	The follow ups done in this program had a relatively small impact on the nutrition status of the children below five years purely because it did not cover a substantial majority. Only a minority of respondents were reached through this program. The few who were reached recorded high levels of satisfaction meaning

	that if the CHWs are motivated enough to work, they would be able to go out and reach everyone in the program.
How does the health education provided to care givers in OTP impact on the nutrition status of children below five years in Kasarani district in Nairobi County	The study established that the health and nutrition education given to the mothers had a positive influence and impact on the nutrition status of the children below five years in Kasarani district. This was in the form of knowledge imparted in the mothers that would then be used even into the future to ensure that the child continues to enjoy good nutrition for a healthy life even into the future. The mothers who were taught equally acknowledged retention of that knowledge and continued application of the same. Therefore when caretakers are taught on various aspects of the OTP program like hygiene, feeding patterns and amounts among others they own the project and are able to participate by playing their part to ensure high success rates and few cases of relapse.
How does the monitoring & evaluation impact on the nutrition status of the under fives in Kasarani district in Nairobi County	The study established a very small positive correlation between the nutrition status of the under five children and monitoring and evaluation aspect as undertaken in the OTP program. The rate of return to the facility for monitoring was varied among the respondents meaning that there are no laid down rules or schedules for respondents to go back and be assessed for progress. Nutrition counseling

	during this time, an appropriate monitoring schedule, coordinating the working arrangement between the in-charge and the CHWs and proper record keeping would greatly enhance this aspect of the OTP and hence further improve the nutrition status of the children.

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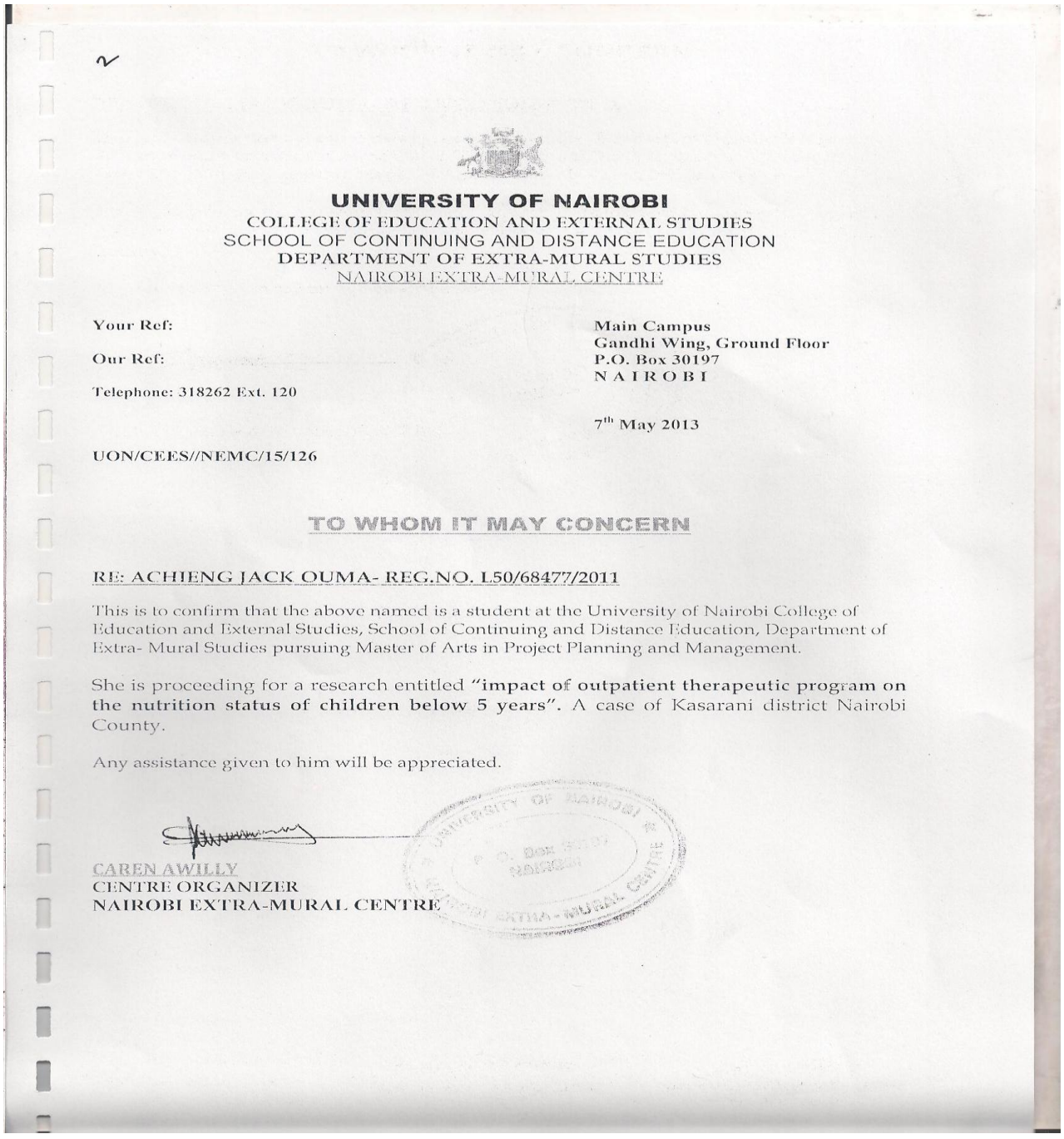
www.unhabitat.org,

APPENDICES

APPENDIX 1: Letter of Introduction



UNIVERSITY OF NAIROBI
COLLEGE OF EDUCATION AND EXTERNAL STUDIES
SCHOOL OF CONTINUING AND DISTANCE EDUCATION
DEPARTMENT OF EXTRA-MURAL STUDIES
NAIROBI EXTRA-MURAL CENTRE

Your Ref:

Our Ref:

Telephone: 318262 Ext. 120

Main Campus
Gandhi Wing, Ground Floor
P.O. Box 30197
N A I R O B I

7th May 2013

UON/CEES//NEMC/15/126

TO WHOM IT MAY CONCERN

RE: ACHIENG JACK OUMA- REG.NO. L50/68477/2011

This is to confirm that the above named is a student at the University of Nairobi College of Education and External Studies, School of Continuing and Distance Education, Department of Extra- Mural Studies pursuing Master of Arts in Project Planning and Management.

She is proceeding for a research entitled **"impact of outpatient therapeutic program on the nutrition status of children below 5 years".** A case of Kasarani district Nairobi County.

Any assistance given to him will be appreciated.

CAREN AWILLY
CENTRE ORGANIZER
NAIROBI EXTRA-MURAL CENTRE

APPENDIX 2: Permit

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E-mail:

Ministry of Public Health and Sanitation

OFFICE OF THE DMOH
MATHARE NORTH HEALTH CENTRE
P. O. Box 48651-00100 GPO
NAIROBI

KASARANI DISTRICT

When replying please quote the ref / date

9th May 2013

Dear Sir/Madam,

\

REF: ACHIENG JACK OUMA

The person named above is a Masters student at the University of Nairobi (Student ID: L50/ 68477/2011) pursuing a degree course in project planning and management. He is currently scheduled to undertake an academic research in Kasarani district on the topic "Impact of the outpatient therapeutic program on the nutrition status of children below five years: A case of Kasarani district, Nairobi County". To undertake this, he will need to have access (With the guidance of the in-charge person) to the data relating to children who have been recruited into the program as far as the records can allow across the ten facilities where we are currently implementing OTP in Kasarani district. Kindly accord him the necessary help he may need during this academic study. With him is a letter from the University to authenticate the same. Thanks in advance.

DISTRICT HEALTH ADMINISTRATIVE OFFICER
KASARANI DISTRICT
P. O. BOX 30108 NAIROBI

Caroline Omufira,

District Nutrition Officer

For: **DISTRICT MEDICAL OFFICER OF HEALTH, KASARANI DISTRICT**

APPENDIX 3: RESEARCH QUESTIONNAIRE
The target group- Caretakers (Mothers or guardians who feed the babies)

INTRODUCTION PROCESS AND SEEKING THE CONSENT

Good morning/good afternoon, my name is Jack Achieng; I am a current student at the University of Nairobi pursuing a Masters degree in Project Planning and Management. We are currently. We are currently undertaking a research that seeks to establish the impact of the OTP program on the nutrition status of children below five years in Nairobi County. We approximate that the interview process will take approximately 30 minutes to 40 minutes. In the course of the interview we will require some personal information including your age, education status, marital status as well as your income levels. This brief is important for purposes of expounding on the nature of the research we intend to execute so that you make an informed decision on whether to participate or not. You have an opportunity to seek clarifications on what we intend to do so that at the point when everything is clear, you can make an informed choice of participating or not. Upon accepting to participate in this study, we will endeavor to generate information that will reveal the impact of the OTP program on the nutrition status of children below five years. This information will then be used to generate useful recommendations that can be used by the relevant bodies to bring about the desired results. All considerations have been taken to ensure that you are free from risk of harm and your involvement will be treated with utmost discretion and full confidentiality. Just to remind you again that there is no reward of any nature given directly to the participants and therefore your involvement will only be voluntary. It is still our hope that you agree to participate in this study and if you have questions

please ask. Do you agree to participate in this process? If yes, kindly append your signature to the section below.

Participant's statement:

I have fully understood the nature of this study and had an opportunity to seek clarifications where relevant and hence agree to participate;

Signature…… Date…….

In the event that some other issues emerge in future and you would want to seek more clarification kindly reach the person in charge of this study using the information provided below;

Jack Achieng

Cell: 0720 464 033; Email: kaachieng@yahoo.com

QUESTIONNAIRE FOR THE CARETAKERS

This tool seeks to collect information on the impact of the OTP program on the nutrition status of children below five years. It is divided into six sections. Please endeavor to offer accurate information as possible for this interview. Kindly read and understand the question before you give any response. The information you give will be handled with utmost good faith and confidentiality. The information you give will purely be used for the research purposes only.

IMPACT OF OUT PATIENT THERAPEUTIC PROGRAM ON THE NUTRITION STATUS OF CHILDREN BELOW FIVE YEARS IN NAIROBI COUNTY		
QUESTIONS	**RESPONSE(S)**	**INSTRUCTIONS**
1.0 INTRODUCTION		
Date of the Interview		DD/MM/YY

	……/……/ 2013	
Interviewer		Write your code
Facility	…… …..……. …… …….. …….. ……. …….. …….	Tick the appropriate district and then write the facility/OTP site

2.0 BACKGROUND INFORMATION

What is your age For the child?	……Yrs ……Yrs/Months	Indicate the number of years
Marital Status	Single……....1 Married……..2 Divorced……3 Widowed……...4 Separated……..….5	Circle the correct answer

3.0 COMPLEMENTARY FEEDING USING THE THERAPEUTIC FEEDS

3.1. Were you informed of the ways of administering the plumpy nut to the child?	YES…….1 NO……..2 DON'T REMEMBER……..3	

3.2. Have you noticed an improvement in the appetite of the baby since you started using the feeds? 3.3. Have the baby experienced on and off instances of diarrhea lasting for about two days or more during the period he/she was/is on the plumpy nuts If Yes, was there an underlying disease condition diagnosed or you simply bought medicine off the counter?	YES……..1 NO……2 DON'T KNOW……3 YES……1 NO…….2 CANT REMEMBER……3 YES……..1 NO……2 DON'T KNOW……3	Circle the most appropriate after probing
4.0 HEALTH AND NUTRITION EDUCATION		

<table>
<tr>
<td>4.1 Were you taught on the various aspects of OTP/This program?
(If yes, Like what?)</td>
<td>YES……1
NO…….2
CANT REMEMBER……..3</td>
<td></td>
</tr>
<tr>
<td>4.2 Were you taught on the quantity of plumpy nuts to give your child per day?
(If yes, How many?)</td>
<td>YES……1
NO…….2
CANT REMEMBER……..3</td>
<td>Circle the most appropriate after a brief probe</td>
</tr>
<tr>
<td>4.3 Were you taught on the hygiene practices to uphold in childcare?</td>
<td>YES…….1
NO……...2
CANT REMEMBER…….3</td>
<td>Circle the most appropriate</td>
</tr>
<tr>
<td>4.4. Did you learn something new about child care from the program?</td>
<td>YES……..1
NO…….2
DON’T KNOW…….3</td>
<td></td>
</tr>
<tr>
<td>4.5 On a scale of 1-5, how would you rate the effect of the knowledge you have received in this program on the nutrition status of your</td>
<td>
<table>
<tr><td>1</td><td>Very low</td></tr>
<tr><td>2</td><td>Low</td></tr>
<tr><td>3</td><td>Average</td></tr>
<tr><td>4</td><td>High</td></tr>
<tr><td>5</td><td>Very High</td></tr>
</table>
</td>
<td>Circle the most appropriate after probing</td>
</tr>
</table>

child?		
5.0 MONITORING AND EVALUATION		
5.1 How many times did you go back to the facility for growth monitoring?	<weekly 1 Weekly 2 2 Weekly 3 3 weekly 4 > 3 weekly 5	Circle the most appropriate
5.2 Did/have your child experienced faltering growth as shown by the weight for height chart during this period or the period when the child was in the program?	YES……1 NO……2 DON'T KNOW……3	Circle the most appropriate
5.3 Did you receive	YES……1 NO……2	

nutrition counseling every time you went for a revisit at the clinic?	DON'T KNOW…….3	Circle the most appropriate
6.0 FOLLOW UPS IN THE COMMUNITY		
6.1 How many times did or were you visited or have you been visited by a community health worker in this program	0 times……..1 Ones…….2 Less than three times……..3 More than three times…….4 Can't remember…….5	Circle the most appropriate answer
6.2 Were you satisfied with the services that you received from the community?	YES……..1 NO……2 PARTLY……3 I DON'T KNOW……4 Why?**.....** ……	Circle the most appropriate answer and probe for explanation to the answer
6.3 In your own opinion, do you think that the services offered by the community health workers in the	YES……1 NO…….2 I DON'T KNOW……..3 Explain…… 1 Very low	Circle the most appropriate and probe

community are very important?	2	Low	
	3	Average	
	4	High	
	5	Very High	Circle the most appropriate and probe further for an explanation
6.4 How would you rate the services you received in the OTP program?	Kindly explain why? YES……1 NO…….2 I DON'T KNOW……..3 Explain……		
6.5 Did your child experience any health complications while at home? If yes did the community health worker help or you went to the hospital?			Circle the most appropriate and probe further for the explanation

ANTHROPOMETRIC MEASUREMENTS OF THE CHILD

	Weight for Age	**Height for Age**	**Weight for Height**	**MUAC**
Standard				
At admission				
Actual at the time of the study				

(Choose the most appropriate as was used for admission)

APPENDIX 4: THE KEY INFORMANT INTERVIEW GUIDE
Target Group: The project Partners

IMPACT OF OUT PATIENT THERAPEUTIC PROGRAM ON THE NUTRITION STATUS OF CHILDREN BELOW FIVE YEARS IN NAIROBI COUNTY		
QUESTIONS	**RESPONSE(S)**	**INSTRUCTIONS**
1.0 INTRODUCTION		
Date of the Interview	……/……/ 2013	DD/MM/YY
Interviewer		Write your code
District & Facility	…… …..…… …… …… …… …… …….. ……..	Tick the appropriate district and then write the facility/OTP site
2.0 BACKGROUND INFORMATION		
What is your age	……Yrs	Indicate the number of years
Marital Status	Single……..…1 Married……...2 Divorced…….3 Widowed…….4 Separated……5	Circle the correct answer
3.0 COMPLEMENTARY FEEDING USING THE THERAPEUTIC FEEDS		

Questions	**Response**
i. What are the standards that you use to distribute the rations of plumpy nut given to every child per day? ii. What is the financing structure of this program and what is your opinion on its sustainability? iii. What measures do you have in place to prevent contamination of these rations at home and do you advise mothers on the need to	

observe them? iv. What measures do you have in place to prevent overreliance on these feeds by the beneficiaries and how would you gauge the effectiveness of such measures? v. What challenges are associated with the distribution of the plumpy nuts in this program?	
4.0 HEALTH AND NUTRITION EDUCATION	
Questions	**Response**
i. Do you train the care takers on the appropriate hygiene practices? ii. What is your opinion on the completeness and effectiveness of the training manual you use in this program? iii. Are care takers taught on the appropriate food preparation methods for their children? iv. Do you teach the care takers on the health danger signs to look out for while taking care of children back at home? v. Do you take into consideration the education levels of the care takers and how do you handle those with different levels of education? vi. What is your highest verifiable education level and professional training background?	
5.0 MONITORING AND EVALUATION	
Questions	**Response**
i. What indicators do you use to ascertain that indeed the OTP program has produced or failed to produce some results? ii. How long do you keep a child in the OTP program? iii. How do you get your feedbacks from the program and the channels of incorporating them into the mainstream program? iv. What are the challenges you continue to face or have faced with the OTP program? v. Have the challenges faced been addressed conclusively, if not, why? vi. Who are the stakeholders in this program and what is their level of participation in this program? vii. How is the decision making process structured in this program? viii. Do you experience cases of relapse and how do you handle such?	
6.0 FOLLOW UPS IN THE COMMUNITY	
Questions	**Response**
i. What do you intend to achieve by putting in place the community follow-ups?	

ii. Have the community follow-ups been effective and how do you know that? iii. What channels or media do you use to get feedbacks from the community outside the facilities implementing OTP? iv. What do the community health workers do when they visit the recipients of the OTP program at home? v. Any challenges that emerge from the follow ups/ How do you handle them?	
THANK YOU SO MUCH FOR TAKING YOUR TIME TO PARTICIPATE IN THIS INTERVIEW	

APPENDIX 5

TABLE FOR DETERMINING A SAMPLE SIZE FROM A STUDY POPULATION

Required Sample Size								
	Confidence = 95%				Confidence = 99%			
Population Size	Margin of error				Margin of Error			
	5.0%	3.5%	2.5%	1.0%	5.0%	3.5%	2.5%	1.0%
10	10	10	10	10	10	10	10	10
20	19	20	20	20	19	20	20	20
30	28	29	29	30	29	29	30	30
50	44	47	48	50	47	48	49	50
75	63	69	72	74	67	71	73	75
100	80	89	94	99	87	93	96	99
150	108	126	137	148	122	135	142	149
200	132	160	177	196	154	174	186	198
250	152	190	215	244	182	211	229	246
300	169	217	251	291	207	246	270	295
400	146	265	318	384	250	309	348	391
500	217	306	377	475	285	365	421	485
600	234	340	432	565	315	416	490	579
700	248	370	481	653	341	462	554	672
800	260	396	526	739	363	503	615	763
1,000	278	440	606	906	399	575	727	943
1,200	291	474	674	1,067	427	636	827	1,119
1,500	306	515	759	1,297	460	712	959	1,376
2,000	322	563	869	1,655	498	808	1,141	1,785
2,500	333	597	952	1,984	524	879	1,288	2,173
3,500	346	641	1,068	2,565	558	977	1,510	2,890
5,000	357	678	1,176	3,288	586	1,066	1,734	3,842
7,500	365	710	1,275	4,211	610	1,147	1,960	5,165
10,000	370	727	1,332	4,899	622	1,193	2,098	6,239
25,000	378	760	1,448	6,939	646	1,285	2,399	9,972
50,000	381	772	1,491	8,056	655	1,318	2,520	12,455
75,000	382	776	1,506	8,514	658	1,330	2,563	13,583
100,000	383	778	1,513	8,762	659	1,336	2,585	14,227
250,000	384	782	1,527	9,248	662	1,347	2,626	15,555
500,000	384	783	1,532	9,423	663	1,350	2,640	16,055
1,000,000	384	783	1,534	9,512	663	1,352	2,647	16,317
2,500,000	384	783	1,536	9,567	663	1,353	2,651	16,478
10,000,000	384	784	1,536	9,594	663	1,354	2,653	16,560
100,000,000	384	784	1,537	9,603	663	1,354	2,654	16,584
300,000,000	384	784	1,537	9,603	663	1,354	2,654	16,586