

**FACTORS AFFECTING THE LENGTH OF HOSPITAL STAY FOR CHILDREN  
AGED 6-59 MONTHS MANAGED FOR SEVERE ACUTE MALNUTRITION  
AT NALUFENYA CHILDREN'S HOSPITAL  
NUTRITIONAL UNIT**

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UNIVERSITY**

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## **DECLARATION**

I, BUTESI NAFISA declare to the best of my understanding that this research report is my original work and an outcome of my personal investigation and has not been submitted in any University for an academic award.

I duelly take this opportunity to present it to the Institute of International Public Health and Management as partial fulfillment of the requirement for the award of bachelor's degree in public health sciences- health management of international health Sciences University

Signature.....

BUTESI NAFISA

Date.....

## **APPROVAL**

This work has been under the supervision of Ms. Komuhangi Alimah

I, Komuhangi Alimah, supervised this work from the development of the proposal to completion of the report and I approve that the work should be submitted to the institute of Public health and management at IHSU

DATE:.....

SIGN: .....

## **DEDICATION**

I dedicate this research report to the Almighty God for the unending grace, everyday mercy, undeserving favor and the gift of life he has blessed me with all which has enabled me achieve this accomplishment. My lovely mother Kekibira Edrade for her unending support and lastly to my best friend Arinaitwe Dianah for her encouragement throughout this study

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## **OPERATIONAL DEFINITIONS**

**Malnutrition;** refers to a condition resulting from eating inadequate nutrients which are essential for the body.

**Length of hospital stays;** refers to the length of time a patient takes during the inpatient hospital care period, According to this study the short length of stay is 2 weeks.

## **LIST OF ABBREVIATIONS**

GDBCGM	Global Database on Child Growth and Malnutrition
IHSU	International Health Sciences University
IMAM	Integrated Management of Acute Malnutrition
IPD	In patient Department
MoH	Ministry Of Health
OPD	Out Patient Department
RTUFs	Ready to Use Foods
SAM	Severe Acute Malnutrition
UBOS	Uganda Bureau of Standards
UDHS	Uganda Demographic Health Survey
UNICEF	United Nations International Children's Fund
WHO	World Health Organization

## ABSTRACT

**Background to the study:** In Uganda, 2.3 million children below the age of five years are chronically malnourished (Government of Uganda, 2011). Statistics show that nationally an estimate of 6% of children is acutely malnourished and almost 2% of these have severe acute malnutrition. (UD H S, 2006). The integrated management of acute malnutrition guidelines deals with acute malnutrition identification, treatment and management. It seeks to improve acute malnutrition management in children by treating cases with severe acute malnutrition that have medical complications.

**Objective of the study:** To assess the average length of hospital stay for children aged 6-59 months managed for severe acute malnutrition at Nalufenya Children's Nutritional Unit in Jinja District, Uganda

**Methodology:** this was a cross sectional study involving 119 parents/caretakers of children aged between 6 to 59 months being managed for severe acute malnutrition at Nalufenya children's hospital nutritional unit in Jinja. Respondents were selected using sampling non probability method (convenience and purposive) for both quantitative and qualitative data. Data was collected using a questionnaire and key informant guide for the key informants. Data was analyzed using SPSS were chi- square test and logistic regression at bivariate and multivariate analysis respectively were done. Variables were significant at  $p < 0.05$ .

**Results:** A total of 18.6 % of the children admitted had long hospital stay. Children that resided in the villages were 0.36 times less likely to have a shorter hospital stay ( $p = 0.027$ ). Children that had a history of pervious admission were 0.176 times less likely to have a shorter length of hospital stay ( $p = 0.020$ ). children whose parents/ caretakers were in the formal sector were 8.167 times more likely to have a shorter length of hospital stay, those who reported adequate staff were 0.452 times less likely to have a shorter hospital length of staff ( $p = 0.034$ ). Children whose parents bought medicine for themselves were 0.462 times less likely to have a shorter length of hospital stay (0.040).

**Conclusion and recommendations:** 18.6% of the children had long stay influenced by village residence, informal employment of the parents/caretakers, inadequate staff and shortage of medicines at the unit. The following recommendations are suggested; village outreaches to sensitize parents on prevention of malnutrition, advocacy for early seeking of health services, the government to provide income generating activities for those parents in the informal sector, so that they can make extra income, increase the staff at Nalufenya children's hospital nutritional unit and provide the required medicines for managing acute server malnutrition and also support the unit with children feeds.

# CHAPTER ONE

## INTRODUCTION

### 1.0 Introduction

Malnutrition refers to both under nutrition and over nutrition; under nutrition results from inadequate food intake. There are different types of malnutrition such as; Protein-energy malnutrition which has two severe forms i.e. marasmus as a result of lack of protein and calories., and the second form is kwashakoir as a result of lack of just proteins, (Kramer et al., 2006).

Malnutrition is categorized into; Acute (recent) and Chronic malnutrition (long term). Severe acute malnutrition is a life threatening condition and it is characterized by low weight, height and presence of nutritional of nutritional edema (WHO, 2013). This research intends to concentrate on the Severe Acute Malnutrition (SAM), specifically concentrating on the length of hospital stay for children managed with SAM.

This chapter presents the background to the study focusing on the historical, theoretical, conceptual and contextual perspectives. It also presents the problem statement, general objective of study, specific objectives of the study, research questions, the conceptual framework, and significance of the study.

### 1.1 Background of the study

Globally up to 161 million children less than five years of age were estimated to be stunted, 51 million wasted, 42 million overweight and 99 million underweight (Amoroso, 2016). There are

about 20 million severely malnourished children worldwide who make up an estimated 2% of the child population in underdeveloped countries (Nick et al., 2009).

Asia has the highest number (70%) of malnourished children in the world. South Asia has the highest prevalence of stunted and underweight children, some of the countries in Asia that contribute to this high prevalence include; Malaysia, Singapore, India, Indonesia and China (Gl et al., 2003).

Out of 34 countries that are responsible for up to 90% of global burden of malnutrition, 22 are in Africa. In Africa, an estimate of up to 56 millions of children under 5 years of age have stunted growth, 13.4 million are wasted (WHO 2012) with the prevalence of underweight in children less than 5 years in Nigeria, South Africa, standing at 19.8% and 26.1% respectively (WHO, 2012).

In East Africa, the prevalence of underweight and stunting is estimated to be at 36% and 48% respectively in East Africa. In Kenya the proportion of stunting among children is 37% in rural areas and 26% in urban areas. And in 2009 it was estimated that the proportion of the population that is stunted is 35% (Dennis et al., 2014).

In Uganda, 2.3 million children below the age of five years are chronically malnourished (Government of Uganda, 2011). Statistics show that nationally an estimate of 6% of children is acutely malnourished and almost 2% of these have severe acute malnutrition. (UD H S, 2006).

The integrated management of acute malnutrition guidelines deals with acute malnutrition identification, treatment and management. It seeks to improve acute malnutrition management in children by treating cases with severe acute malnutrition that have medical complications.

There are three care plans for acute malnutrition patients in Uganda and these include; Supplementary Feeding for the management of moderate acute malnutrition, outpatient



therapeutic care for severe acute malnutrition for patients without medical complications who pass the ready to use therapeutic food appetite test and in-patient therapeutic care for patients with severe acute malnutrition with medical complications (MoH Uganda, 2010). It's upon this background that we intend to determine the average length of hospital stay for children managed for SAM at Nalufenya children's nutritional unit in Jinja district, this will help determine whether all the effectiveness of the integrated interventions and relieve caretakers the burden of having to spend many days in hospital caring for the children with SAM.

## **1.2 Statement of the problem**

Nalufenya children's nutritional unit receives 15 to 20 malnourished children daily, yet their ward can admit a maximum of 40 children. To make matter worse, this nutritional unit is located in one of the regions (Busoga) that has a prevalence of severe acute malnutrition (6%) greater than that of the 2% for the nation (Walukamba et al., 2013).

According to Dr. Sanya, to be able to manage the influx of severely malnourished children, the unit is supposed to admit and discharge the children timely on description of a balanced diet to reduce the risk of being readmitted. However, data from 3 health centers in the same region indicates that 20 out of 100 children seen per day are suffering from malnutrition of which some have been earlier on diagnosed and treated for severe acute malnutrition.

Prolonged hospital stay for children denies them their right to play, to go to school, they could develop nosocomial infections and its puts a financial burden onto the caretakers who have to make out time to take care of these children, so it's upon this background that a study to assess the length of hospital stay among in children aged 6-59 months managed for severe acute malnutrition at Nalufenya children's hospital nutritional unit will be conducted.

Despite the interventions put in place; nutritional policies where the government launched multispectral Uganda Nutrition Action Plan (UNAP) in November 2011 to reduce under nutrition, burden of care that malnourished children present and public sensitization on malnutrition (UNAP, 2011) there is insufficient data on the recommended length of hospital stay for children managed for severe acute malnutrition though WHO and UNICEF recommend discharging severely malnourished children using Mid Upper Arm Circumference ( MUAC) and a weight gain of 15% to 20%.

### **1.3 Research objectives**

#### **1.3.1 Main Objective**

To assess the length of hospital stay for children aged 6-59 months managed for severe acute malnutrition at Nalufenya Children's Nutritional Unit in Jinja District, Uganda.

#### **1.3.2 Specific Objectives**

- i. To identify the characteristics of children aged 6 to 59 months managed for severe acute malnutrition contributing to their length of hospital stay at Nalufenya Children's Hospital Nutritional Unit during the period of August to November 2016.
- ii. To determine the household factors of parent/ primary care takers of children aged 6 to 59 months managed for severe acute malnutrition associated with their length of hospital stay at Nalufenya Children's Hospital Nutritional Unit during the period of August to November 2016.

- iii. To establish the clinical factors of children aged 6 to 59 months managed for severe acute malnutrition contributing to their length of hospital stay at Nalufenya Children's Hospital Nutritional Unit during the period of August to November 2016.
- iv. To assess the health provider factors influencing the average length of hospital stay of children aged 6 to 59 months managed for severe acute malnutrition at Nalufenya Children's Hospital Nutritional Unit in period of August to November 2016.

#### **1.4 Research Questions**

- i. What are the characteristics of children aged 6 to 59 months managed for severe acute malnutrition contributing to their length of hospital stay at Nalufenya Children's Hospital Nutritional Unit in the period of August to November 2016?
- ii. What are the household factors of parent/ primary care takers of children aged 6 to 59 months managed for severe acute malnutrition associated with their length of hospital stay at Nalufenya Children's Hospital Nutritional Unit in the period of August to November 2016?
- iii. What are the clinical factors of children aged 6 to 59 months managed for severe acute malnutrition contributing to their length of hospital stay at Nalufenya Children's Hospital Nutritional Unit during the period of August to November 2016?
- iv. What are the health provider factors influencing the average length of hospital stay of children aged 6 to 59 months managed for severe acute malnutrition at Nalufenya Children's Hospital Nutritional Unit in period of August to November 2016?

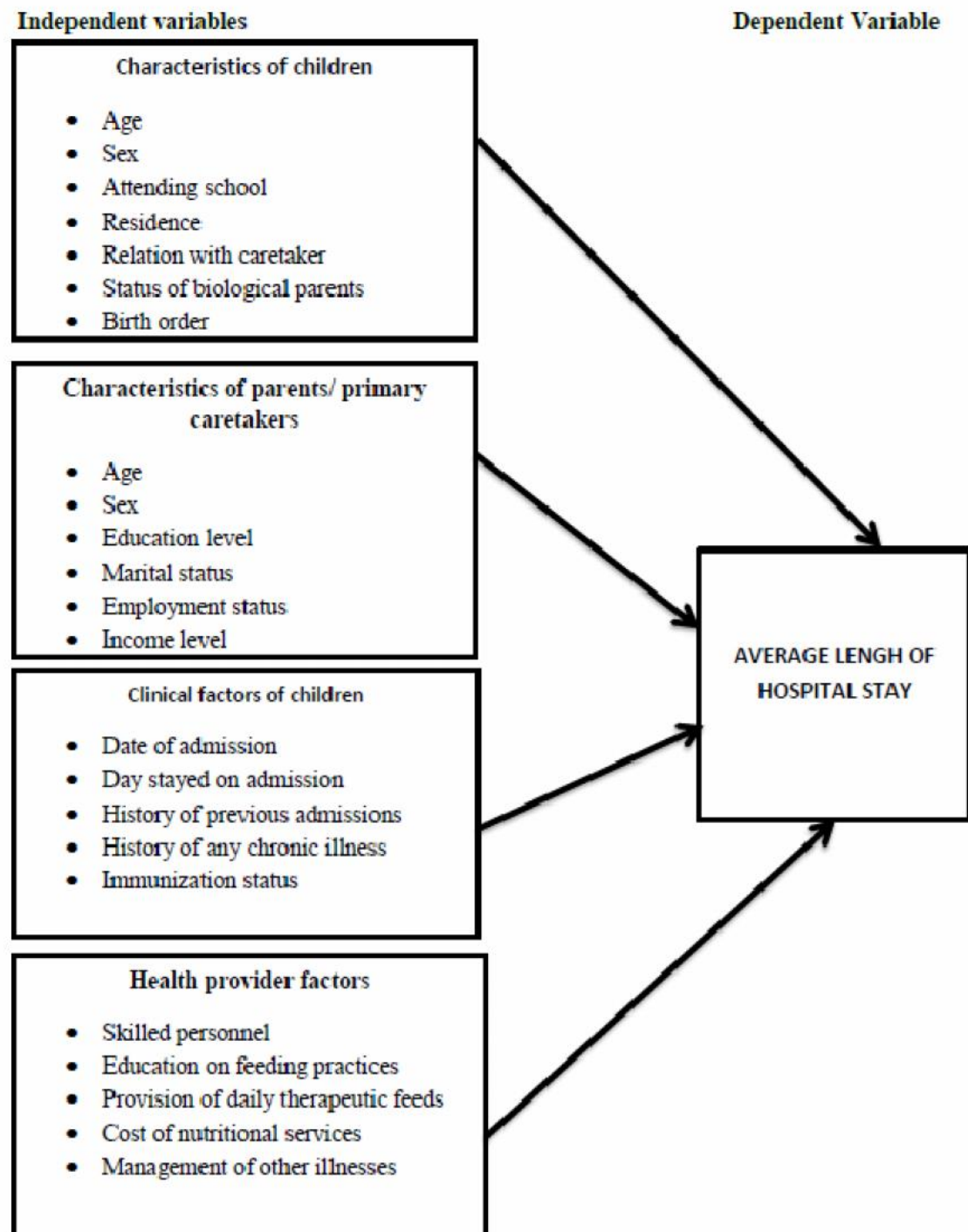
## **1.5 Significance of study**

The findings of this study will benefit health workers managing malnourished children below five years by providing information that will be useful in devising strategies to manage SAM so that the children can be discharged as early as possible to exercise their right to play back home. The parents/ primary care takers of children below five years managed for SAM will be able to be productive if their children are treated and discharged as soon as possible.

The results from this study will also inform policy makers at the Ministry of health at draft policy reforms aimed at improving treatment outcomes of children managed for severe acute malnutrition.

Last but not least, the information generated from this study will be useful to future scholars conducting studies related to length of hospital stay for children managed for SAM.

## 1.6 Conceptual framework



*Source: Modified by the researcher*

## **Narrative of the frame work**

There are various factors that may influence the length of hospital stay for children aged 6-59 months managed for severe acute malnutrition, they may include characteristics of the children and parents/care takers, clinical factors of children and health provider factors.

Characteristics of children such as; age, sex, school going, residence, relationship of primary caretaker and status of parents and birth order, then characteristics of parents / primary caretakers include; educational level, age, sex, marital status, employment status, occupation income levels.

Clinical factors of children that may influence the average of hospital stay include; diagnosis on admission, presence of co-infection (like TB, HIV), history of immunization and number of previous admissions.

Last but not least; the health provider factors such as; skilled personnel, education on feeding, provision of therapeutic feeds, cost of nutritional services and management of other childhood illnesses may also influence the length of hospital stay for children managed for severe acute malnutrition.

## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.0 Introduction**

This chapter presents reviewed relevant literature from different scholars on the study matter according to the objectives of the study.

#### **2.1 Characteristics of children aged 6-59 months managed for severe acute malnutrition**

A study on prevalence of malnutrition in pediatrics hospital patients was carried out in 2007 in Germany. The aim of this study was to determine the prevalence of malnutrition in patients admitted as inpatients in a tertiary care children hospital. Weight and height were measured. The weight of 81 – 90 median values were considered to show mild malnutrition, 70-80% moderate malnutrition then 70% and below indicated severe malnutrition in reference to water low cut off points. It was recommended that the systemic screening and treatment of malnutrition needs to be refined and implemented in pediatric patients. The study concluded that there was an intolerably high rate of malnutrition among children (Joosten and Hulst, 2008).

Another cross sectional survey was conducted among children under the age of five years in the Democratic Republic of Congo research noted that according to existing research, malnutrition affects 48% of children in the Democratic Republic of Congo. The aim of the study was to assess the impact analysis of geographical location as a proxy for distal factors and their influences on the children's nutritional status. The study noted that according to research, the nutritional status of children under five years indicated deterioration in terms of acute malnutrition. The study

involved sample coverage from all regions, both rural and urban areas and up to 9000 households were sampled. The women between the ages of 15 to 49 years were interviewed and the data collected provided information on 9995 women and 8992 children under the age of five. About 3663 (41%) out of the 8992 children, had their weight and height measured in order to determine their nutritional status and 50.8% of those were females. The prevalence of malnutrition was 43.9%. The malnutrition prevalence in boys was higher than in girls whereas in rural areas malnutrition was higher with 48.4% compared to 37.2% in urban areas. The study found a linear relationship between social economic status of household and malnutrition where among children from the poorest household malnutrition was higher. Malnutrition also had a linear relationship with maternal education where it was found to be high among children from a non-educated mother, followed by children from mothers with a primary education background but lower among children from mothers with a secondary or higher educational background. The study therefore concluded that childhood malnutrition is spatially structured and was able to determine that malnutrition rates remained high in the mining relying provinces compared to others (Friedman et al., 2005).

A cross sectional study was carried out among internally displaced people in Omoro county, Gulu district to estimate prevalence of protein –energy malnutrition among children under the age of five years. 672 children aged 3-59 months were selected and their caretakers interviewed. Qualitative data was got through key informant interviews, observation and focus group discussions. The results of the study included the following; global prevalence of stunting was found to be 52.4% and the global acute malnutrition was 6.0%. Male children in the age group 3-24 months were at high risk of acute malnutrition. The study concluded and recommended that, protein energy malnutrition prevalence was high among children in internally displaced



people's camp. The male children were at an increased risk of protein-energy malnutrition. Children aged 3-24 months were at high risk of suffering from acute malnutrition. Efforts to improve nutritional status of children in internally displaced people's camp should be intensified by the government and other stakeholders like the relief organizations. Activities such as food supplies, child feeding and child illness management in the camp setting should be strengthened (Olwedo et al., 2009).

### **2.3 Household factors of parents/ primary care takers of children aged 6-59 months managed for severe acute malnutrition**

In 2014, a field study of malnutrition among children was conducted at Mwanamugimu Nutritional Unit Mulago Hospital in Uganda. The study noted that according to research about 34.6% suffer from malnutrition nationally. The study further identified the immediate causes of children being malnourished in the country, these included; Inadequate dietary intake as a result of poor feeding frequencies and practices and Insufficient diverse diets. The underlying causes noted here included; house-hold food insecurity etc. Furthermore, it was also found that the ward's physical environment made it hard for high standards of hygiene for both parents and health care providers' to be maintained. Due to the prevailing conditions, it was hard for the parents to meet hygiene expectation aspects despite the fact that the nurses tried to educate them. It was recommended that the government should increase public awareness of malnutrition and also provide adequate nutrition (Bartz et al., 2014).

A nutritional survey was undertaken to investigate whether food insecurity due to post election violence resulted in the high prevalence of acute and chronic malnutrition among children aged

6-59 months in Kenya. The results of the study included, out of 1310 children that were selected; 23.4% were severely stunted, 3.1 % were severely underweight and 2.6% severely wasted, boys were more stunted than girls. The study recommended that childhood stunting is a high priority that should be tackled and the malnutrition prevalence strategies should include the urban poor and not only the rural areas and refugees camps. In a concluding remark, the study suggested that stunting was a sustained problem within these urban informal settlement (Olack et al., 2011).

A cross sectional study was conducted in the rural community of southern eastern Kenya to determine factors associated with stunting among children under the age of five years to household food insecurity level. A structured questionnaire was used to collect information on; demographic characteristics, household food information and household socioeconomic status. The results gathered by the study included, out of the 404 children that were selected, stunting prevalence was 23.3%, 62.5% households suffered severe food insecurity. There was no significant association of children that were younger than school going. The study recommended that childhood stunting measures should be optimized in accordance to the community food insecurity level. Conclusively, the study identified a quarter of the children under age of five years were found suffering from chronic malnutrition. The results suggested optimum measures should be taken against childhood stunting (Shinsugi et al., 2015).

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### **2.3 Clinical factors of children 6-59 months managed for severe acute malnutrition**

A study on prevalence of malnutrition in pediatric hospital patients was carried out in 2007 in Germany. According to the study, a total of 1.7% were severely malnourished, 4.4% were moderately malnourished. The rates of malnutrition differed with the different medical complications for example; patients with various diagnoses had the biggest percentage where 42.8% of these were malnourished, among those with mental retardation 40.0% were malnourished, among patients with infectious diseases and cystic fibrosis 34.5% and 33.3% respectively were found to be malnourished (Joosten and Hulst, 2008).

A retrospective study among hospitalized children less than 5 years with severe malnutrition was conducted to determine the severe malnutrition incidence, symptoms and signs of malnutrition and immunization status. The findings of the study were as follows; 2453 were hospitalized out

of 3370 and 72.78% were children under the age of 5 years. 312 were suffering from severe malnutrition, of these 131 had marasmus, 87 had kwashiorkor. The age group of 0 – 2 years had the highest prevalence of severe malnutrition. 95% had diarrhea and 22% had bronchopneumonia. The immunization status comprised of DPT III 13.7%, OPV III 10.5% and BCG 50.6% (Barus et al., 1989).

Another case control study was carried out to determine socio-economic risk factors for severe protein energy malnutrition among children aged 0-60 months at Mulago Referral and Teaching Hospital, Uganda, 66 severely malnourished children aged 0-60 months were matched, for age and sex, with 66 well-nourished controls, and demographic, socio-economic, health facility utilization and feeding practices were compared between the two groups. The findings of the study included the following; severe protein energy malnutrition was associated with young age of the caretaker ( $p = 0.005$ ), living in a mud walled house (OR 2.44, CI 1.13 - 5.32), lack of breast feeding (OR 3.22, CI 1.31- 8.02), failure to complete immunization (OR 3.68, CI 1.53 - 9.011), no land ownership (OR 4.62, CI 2.09 - 10.3), and no ownership of livestock (OR 13.65, CI 3.60 - 60.84), by the caretaker. The level of formal education of the caretaker was not associated with severe malnutrition. The study concluded that there seems to be a strong association between severe malnutrition and some indicators of poverty, lack of breastfeeding, and failure to complete immunization. Programs aimed at poverty alleviation, promotion of breastfeeding and immunization, will go a long way in preventing malnutrition (Owor et al., 2000)

A study was carried out to identify clinical parameters associated with a longer length of hospital stay in patients with acute exacerbations of chronic obstructive pulmonary disease. Electronic medical records of patients with acute exacerbations of chronic obstructive pulmonary disease

admitted between January 1, 2006, and December 31, 2010 were reviewed. The inclusion criteria were age 45 years or older. The quartile was compared with the longest length of stay group with the other 3 quartiles using routine clinical data. The findings were as follow; 217 patients met inclusion criteria. The mean age was  $67.4 \pm 10.9$  years, 47% were male, and the mean length of stay was  $9.0 \pm 6.0$  days. Univariate analysis demonstrated that nursing home status, low albumins, the presence of pleural effusions, intubation, and high were associated with increased length of stay ( $P < .05$  for each factor). Multivariate logistic regression demonstrated that the need for intubation ( $P < .001$ ) predicted an increased length of stay. The study concluded that intubation for mechanical ventilation increased the length of stay in patients with acute exacerbations of chronic obstructive pulmonary disease It was recommended the more intensive interventions in these patients might decrease the length of stay and improve outcomes.(Limsuwat et al., 2014)

A retrospective study was conducted to determine the prevalence, risk factors, co-morbidities and case fatality rates of Protein Energy Malnutrition admissions at the pediatric ward of the University of Nigeria Teaching Hospital Enugu, Nigeria. Information was retrieved from the case notes, admission and mortality registers of the hospital's medical records department. The study sample included a total of 212 children aged 0 to 59 months with protein energy malnutrition admitted into the hospital between 1996 and 2005, which comprised of 127 males and 85 females. The study found that the most common age groups with protein energy malnutrition were 6 to 12 months (55.7%) and 13 to 24 months (36.8%). Marasmus (34.9%) was the most common form of protein energy malnutrition noted in this review. Diarrhea and malaria were the most common associated co-morbidities. Majority (64.9%) of the patients were from the lower socio-economic class. The overall case fatality rate was 40.1% which was slightly

higher among males (50.9%). The study concluded that most of the admissions and case fatality were noted in those aged 6 to 24 months which coincides with the weaning period. Marasmic-kwashiokor is associated with higher case fatality rate than other forms of protein energy malnutrition. The study suggested the following recommendations; strengthening of the infant feeding practices by promoting exclusive breastfeeding for the first six months of life, followed by appropriate weaning with continued breast feeding. Under-five children should be screened for Protein Energy Malnutrition at the community level for early diagnosis and prompt management as a way of reducing the high mortality associated with admitted severe cases. (Ubesieet al.2005)

Another cohort study was conducted to investigate the prevalence and effect of diarrhea and HIV infection on inpatient treatment outcome of children with complicated Severe Acute Malnutrition receiving treatment in inpatient units of Zambia University Teaching Hospital. A total of 430 children aged 6-59 months old with complicated Severe Acute Malnutrition admitted to stabilization centre from August to December 2009 were followed. On enrollement the data on nutritional status, socio-demographic factors, and admission medical conditions were collected. T-test and chi-square tests were used to compare difference in mean or percentage values, whereas logistic regression was used to assess risk of mortality by admission characteristics. The findings of the study were as follow; 238/430 were boys. The median age of the cohort was 17 months, among the children 295/428 had edema at admission, 261/388 presented with diarrhea, 162/420 tested HIV positive and 174/430 of the children died. The median Length of stay of the cohort was 9 days. Children with diarrhea on admission had two and half times higher odds of mortality than those without diarrhea. The odds of mortality for children with HIV infection was higher than children without HIV infection. The study

concluded that diarrhea is a major cause of complication in children with severe acute malnutrition. It recommended that under the current standard management approach, diarrhea should be well managed to reduce substantial death odds in patients with severe acute malnutrition. (Irena et al.,2009)

A descriptive study was conducted to find out the clinical profile of children admitted of children from 6 months to 60 months of age admitted in Nutritional Rehabilitation Centre in Dharmapuri Medical College and hospital India, which are set up to facilitate therapeutic care for Severe Acute Malnutrition children as per WHO Protocol. The children were exposed to inpatient management by trained personnel and mothers were also given counselling services. In this study, children aged 6-60 months were screened through the Out -Patient Department was screened and those with Severe Acute Malnutrition were identified and admitted. Any presenting complaints along with nutritional history were obtained. Anthropometric measurements including height, weight, mid arm circumference, head circumference was measured and clinical signs for various vitamin deficiencies and bipedal edema were assessed. F75 foods and cereal based starter diet were given to children and used for treatment. Findings of the study included; 110 children had severe acute malnutrition out of 2142 which was the total number of admissions in the 6 months to 60 months age group between September 2013 and May 2014. According to criteria for diagnosis of Severe Acute Malnutrition by WHO, 85 children had height criteria satisfied whereas only 3 children had Mid Arm Circumference criteria satisfied. There was no child observed to have nutritional edema.

The peak prevalence of Severe Acute Malnutrition was found in the age group between 6 months to 12 months (30.9%) followed by 13-24 months (21%).

Among the morbidity pattern viral infections (21.4%) was found to be the commonest disease for which they were hospitalized. Viral infections among children with severe acute malnutrition were 17.3%. Acute watery diarrhea was the second commonest condition, 13.4% in normal children compared to 14.5% in children with severe acute malnutrition. Third commonest cause of admission was lower respiratory tract infections, 8.8% in normal children, whereas it was 10% in Severe Acute Malnutrition children. Sepsis was a cause of admission in only 1.5% of admission of normal children whereas it was 9% in children with acute malnutrition. Bronchopneumonia for normal children was around 3.7% whereas for Severe Acute Malnutrition children it was around 5.4%. Measles as a cause of admission was found to be 4.3% in normal children, whereas for children with severe acute malnutrition it was 3.6%. The average duration of stay in the hospital was 7.02 days in this study. In conclusion, the study was able to find out the causes of morbidity of Severe Acute Malnutrition children admitted in the hospital, it also found out that the shorter duration of stay in the center is a major handicap to the outcome as the parents prefer leaving earlier due to various socio economic reasons. Therefore it is here that the study recommended that this hurdle can be overcome by strategies like offering incentives to the parents during the period of stay and also advised the need for establishment of more centers for provision of skilled therapeutic nutritional care, guidance and counseling that were beyond the reach of children with Severe Acute Malnutrition would be a major investment to ensure the future of its children in the country. (Ganesh J et al.2013,)



## **2.4 Health provider factors influencing the average length of hospital stay**

A descriptive study was carried out to investigate the service provider factors associated with delivery of HIV testing in the treatment of acute malnutrition among children in Malawi. The results were as follows; 2981 children were enrolled and 1738 were tested for HIV. The findings below were realized through the in-depth community based interviews, lack of resources for HIV testing, HIV testing and counseling skilled staff shortage, low staff commitment in referring children for HIV test and shortage of trained staff. The study recommended concluded that the health system should be functional to help in the reduction of child mortality in relation to uptake of HIV testing (Chitete and Puoane, 2015).

Another study was carried to compare the effectiveness of Ready to use therapeutic feeds and a corn/soy blend based pre-mix for the treatment of Moderate Acute Malnutrition in the supplementary feeding programs .Due to the newly introduced World Health Organization growth standards, more children at an early stage of malnutrition are to be treated following the dietary protocols as for severe acute malnutrition, including ready-to-use therapeutic food. Children measuring 65 to <110 cm, newly admitted with Moderate Acute Malnutrition with weight-for-height between 70% and <80% were randomly chosen to receive either Ready to use therapeutic feeds and children were followed weekly up to recovery for 2 consecutive weeks. In total, 215 children were recruited in the Ready to use therapeutic feeds group and 236 children in the corn/soy blend based pre-mix group. The findings of the study were; an overall recovery rate of 79.1 and 64.4%, respectively ( $p < 0.001$ ), there was no evidence for a difference between death, defaulter and non-responder rates, more transfers to the inpatient Therapeutic Feeding Centre were observed in the corn/soy blend based pre-mix group (19.1%) compared to the Ready to use therapeutic feeds group (9.3%) ( $p = 0.003$ ). The average weight gain up to discharge was

1.08 g kg<sup>-1</sup> day<sup>-1</sup> higher in the Ready to Use Therapeutic Feeds group [95% confidence interval: 0.46–1.70] whereas the length of stay was 2 weeks shorter in the Ready to Use Therapeutic Feeds group ( $p < 0.001$ ). The study concluded that for the treatment of childhood Moderate Acute Malnutrition, Ready to Use Therapeutic Feeds resulted in a higher weight gain, a higher recovery rate, a shorter length of stay compared to corn/soy blend based pre-mix. The study recommended the use of ready to use therapeutic feeds for better outcome. (Nackers et al., 2010)

Another study was carried out to evaluate the nutritional status of hospitalized children in Belgian hospitals and to analyze the impact of under nutrition on the degree of weight loss and duration of hospitalization. A hundred hospitalized children were eligible for the study in each of the three hospitals that were chosen. 379 of these were included for analysis and body weight, length and mid-upper arm circumference were measured at admission and body weight also at discharge. The results of the study included; the median age was 2.1 years, 29 children were chronically malnourished and between 2.4% and 9.8% acutely undernourished, whereas 12.1% had at least one subnormal parameter. The range of hospitalization duration was four 1–64 days. Median hospital duration was 50% longer for chronically malnourished children 6 versus 4 days. The study concluded that acute under nutrition and chronic under nutrition remain frequent findings in hospitalized children in Belgium. Children with chronic under nutrition had a 50% longer hospital stay. The study recommended nutritional support for hospital-related under-nutrition acutely malnourished children. (Huysentruyt et al., 2013)

A prospective study was conducted to determine the relationship between nutritional status, length of stay in hospital, discharge and readmission rates, and hospital costs and charges in hospitalized patients. Information regarding medical diagnosis, length of stay, hospital costs,

charges, discharge destination, and readmission rates were collected from medical records and through patient interviews on patients admitted to the medical service who were classified to be at risk or not at risk for malnutrition. Data was collected on 173 patients who were admitted directly to any of three medicine units during December 1994. At-risk and not at-risk patients were compared for length of stay, costs and reimbursement, and discharge placement (to home, to home with home health care services, or to another facility for further care). Two sample *t* tests and survival analysis technique were used to compare continuous variables between the two study cohorts. Nonparametric tests were used for length of stay and readmission data. <sup>2</sup> Tests were used for categorical variables and 0.05 percentage error was used throughout to determine statistical significance. The study found that the median length of stay in the not-at-risk population (n=56) was significantly greater than in the not-at-risk population (n= 117): 6 days (25th percentile=4 days, 75th percentile=8 days) versus 4 days (25th percentile=3 days, 75th percentile=7 days). The mean hospitalization cost per patient was also higher in the at-risk group. Readmission rate per month of follow-up was not significantly different. At-risk patients were significantly less likely to be discharged home with self-care and at-risk patients were significantly more likely to use home health care service than not-at-risk patients. The study identified that the patients at risk for malnutrition had significantly higher length of hospital stay, costs, and home health care needs, despite the fact that 51, received nutrition intervention while hospitalized. The study suggested need for further research to explore the use of nutrition screening and intervention before, during, and after hospitalization to ensure that appropriate nutrition intervention. (Chima et al., 1997)

A study was carried to determine the level and factors associated with rehabilitative effectiveness of corn soy blend in children aged 6 - 36 months in a supplementary feeding program based at

Mary Immaculate Nutrition Centre, Mukuru, and Nairobi. The study conducted, between September 2011 to April 2012, applied two phases; i) a cross sectional study with an analytical approach of the household demographic and socio economic characteristics, food security and health factors, utilization and compliance to the use of corn soy blend by mothers/caretakers, dietary intake and morbidity experience of the children and ii) a retrospective study on weight gain, length of stay in the program. A total of 150 children participated in the cross sectional study through exhaustive sampling. Mothers of the children were interviewed using a pretested semi structured questionnaire to obtain information on the children and their households. Eleven mothers were interviewed using a focus group discussion guide, and 5 key informants were interviewed to obtain data on their experience and perceptions related to the feeding program. Data for 153 children was collected from records of children in the feeding program in the previous one year up to October 10th 2011, for the retrospective study. Data was coded, entered and analyzed using means and standard deviation for continuous data, proportions and frequency distributions for categorical data. T test. Analysis of variance, correlations and Chi - square were used to test for significant differences and associations between group characteristics. Most of the mothers were of primary level education (57.7%) and not employed (61.7%) in any income generating activity. Stunting, underweight and wasting were very high in the study children at admission and after three weeks in the program at 48%, 39% and 22% respectively. The results of the study were; the mean z scores for stunting, underweight and wasting increased significantly by 0.68, 0.59 and 0.23 respectively after 3 weeks in the program. Nevertheless, the mean daily weight gain was lower than 5g at 1.65g/kg body weight and mean length of stay was longer than the recommended 4 weeks at 12 weeks, which was attributed to diet inadequacy of the children, not using corn soy blend flour as recommended by 54.5% of the mothers and

missing supplementary feeding program sessions or illnesses. The study established that almost half of the respondents missed the supplementary feeding program sessions at least once in the previous month. The factors associated with dietary intake were distance to water source, household size, marital status, and gender of the household head. The factors associated with the child's progress in the supplementary feeding program were the employment status of the mother and length of stay of the child in the program, employment status and person who fed the child. (Omolo et al., 2016)

## **CHAPTER THREE**

### **METHODOLOGY**

#### **3.0 Introduction**

This chapter presents the study design used, study population used, the sources where data was got, inclusion and exclusion criterion, the method used to get the sample size, procedure used to get the sample size, study variables, quality control methods, the data analysis plan, the plan for dissemination used and also limitations incurred during the study.

#### **3.1 Study Area**

Jinja is the largest town after Kampala, located 80 kilometers east of the capital city of Kampala and approximately 45 kilometers north of the Equator. The town lies along the highway of Kampala city and the Kenyan cities of Nairobi and Mombasa which also connect to the Northern and Northern Eastern Uganda. Jinja is situated on the east shore of River Nile and northern shore of Lake Victoria at the source of River Nile. The town is a plateau that covers approximately 28 kilometers and stands at an altitude of 1230 meters above sea level. The total population of Jinja municipality is 71,213 (UBOS, 2005), and about 3 million in whole district.

Jinja municipality consists of 3 divisions, i.e. Central division, Mpumudde/ Kimaka/ Nalufenya division and Massese / Walukuba division, each headed by a chairman Local Council III. The leading economic activity of this town is commerce, followed by energy where the main power source is hydropower and, manufacturing, construction, agriculture and sectors. Jinja's strategic location at the source of Nile and Lake Victoria make it a great tourist attraction, tourist

sites include falls like; Bujagali, Musoke –Itanda, and Kalagala falls and cultural sites like; Mpumudde hill, Kyabazinga’s palace and much more (Naigaga et al., 2011).

### **3.2 Scope of the Study;**

The study will be carried out at the Nalufenya Children’s Hospital Nutritional Unit. The hospital is located at Nalufunye, a few metres from the main hospital. According to a source at the hospital, the center receives about 35 to 40 clients daily. The hospital has got both the in-patient and out-patient departments, with an admission of about 30 clients in the in-patient wing. The hospital has got several donors funding it such as the Madhvani Foundation. As part of Jinja Regional Referral Hospital, the hospital provides medical care services to the following districts; Kaliro, Mayuge, Luuka and Iganga among others.

### **3.3 Study Design**

A descriptive cross sectional study design involving both quantitative and qualitative data collection methods. This study design is best suited for this kind of study because respondents will be assessed at that point in time with no follow ups to be made. It is very inexpensive and also provides results in the shortest possible time (Institute for Work & Health, 2015).

### **3.4 Sources of Data**

Data was primarily collected from parents / caretakers of children aged 6-59 months managed for severe acute malnutrition.

Secondary data was obtained from the children's medical files, and it included dates of admission and medical history of the children.

### **3.5 Study Population**

The study population included parents / caretakers of children aged between 6–59 months that were managed and for severe acute malnutrition and discharged, at Nalufenya Children's Hospital Nutritional Unit.

### **3.6 Inclusion and exclusion criteria**

#### **3.6.1 Inclusion Criteria**

All parents/ caretakers of children between the age group 6 – 59 managed for severe acute malnutrition and discharged at Nalufenya Children's Hospital Nutritional Unit Jinja District.

#### **3.6.2 Exclusion criteria**

All parents/caretakers of children between age group (6- 59 months) managed for severe acute malnutrition and are still on admission at Nalufenya Children's Hospital Nutritional Unit, and those that have children that are critically ill.

#### **3.6.3 Sample Size Determination**

Since it is an infinite population size, the sample size was determined using Kish and Leslie formula (Kish, 1965), as illustrated below;



$$n = z^2 pq / e^2$$

Where;

n= desired sample size

z= Standard score of 1.96 at 95% confidence level.

P= Proportion of malnutrition in Uganda; (14%) according to Uganda Demographic Health Survey 2011 Underweight Malnutrition Prevalence.

e = Margin of error at 95%; 0.05.

Substituting in the formula

$$n = 1.96^2 * 0.14 * 0.84 / 0.0025$$

n= 181parents/ care takers of children

To cater for non-response, 10% of 181 was added hence the sample size = 199parents /care takers of children below 5 years managed for severe acute malnutrition at Nalufenya children's nutritional unit.

### **3.7 Sampling procedure**

#### **3.7.1 Selection of Participants for qualitative data**

The researcher used non probability sampling i.e convenience sampling method where parents/ caretakers of children aged between 6 -59 months were selected at random during ward rounds. The researcher interviewed parents/ caretakers of children aged between 6-59 months that were admitted with severe acute malnutrition and had been discharged. Convenience sampling method was used because it is fast, inexpensive, easy and the respondents were readily available at a

particular time(Tong et al., 2007). Since the nutrition unit did not have the capacity to admit 199children, this procedure was continued for 3 months till the sample size of 199 was attained.

### **3.7.2 Selection of Participants for qualitative data**

A total of 3 nutritionists at Nalufenya children's nutritional unit were selected using purposive sampling. This Non-probability sampling method was used based on the fact that the key informants (nutritionists/ health workers) were more knowledgeable about the subject matter. Purposive sampling is best suited for selecting respondents that have full knowledge regarding the area of study (Kothari, 2004).

## **3.8 Study Variables**

### **3.8.1 Dependent Variable**

Length of hospital stay was the dependent variable in this study. According to this study, this variable was categorized into either short stay or long stay and the time measured in weeks. The ideal time of stay was two weeks and below and this was regarded as short stay in this study, above two weeks was regarded as long stay.

### **3.8.2 Independent Variables**

The following independent Variables were measured to assess the factors influencing the length of hospital stay among children aged between 6-59 months managed for severe acute malnutrition.

## **1. Characteristics of children**

- Age
- Sex
- Attending school
- Residence
- Relation with caretaker
- Status of biological parents
- Birth order

## **2. Characteristics of parents/care takers**

- Age
- Sex
- Education level
- Marital status
- Employment status
- Income level

## **3. Clinical factors of children**

- Date of admission
- Day stayed on admission
- History of previous admissions
- History of any chronic illness
- Immunization status

#### **4. Health provider factors**

- Skilled personnel
- Education on feeding practices
- Provision of daily therapeutic feeds
- Cost of nutritional services
- Management of other illnesses

#### **3.9 Data Collection Technique**

Qualitative was collected by use of key informant interviews. The key informants included the In-charge nutritional unit, nutritionist, and 2 nurses at the nutrition unit. Quantitative data was collected by use of face to face interviews. Research assistants interview some of the parents/ caretakers of children aged between 6-59 months admitted with severe acute malnutrition and discharged at Nalufenya children's hospital nutritional unit.

#### **3.10 Descriptive data collection**

The key informant guide was used to collect qualitative data from the selected health personnel. The guide included different sections to address different issues for example challenges faced, what can be done to reduce length of stay, malnutrition management in terms of personality, staff and treatment outcomes.

A semi structured researcher administered questionnaire was used to collect quantitative data from the selected parents / care takers of children below 5 years. The questionnaire had 4 parts, part 1 was on the characteristics of the children, part 2 was on the characteristics of the parents/

caretakers; part 3 was on the clinical factors and lastly part 4 was on the health provider factors contributing to the length of hospital stay. It consisted of 29 questions that were translated in Lusoga during the interview with the respondents. Lusoga was selected since it is the most spoken language.

### **3.11 Quality Control**

#### **3.11.1 Validity**

Here a researcher asked colleagues in the field to vouch for the items measuring what he intended to measure. However, the researcher was able to find a group of people to test that had the exact opposite behaviors he was interested in measuring the validity. A formula for Law she was used to measure the validity of research, as indicated below:

$$CVR = (n - N/2) / (N/2)$$

CVR= content validity ratio, n= number of respondents indicating "essential", N= total number of respondents. This formula yielded values which ranged from +1 to -1; a positive value indicated that at least half of the respondents rated the item as essential. The closer to one the CVR value was, the more valid the instrument was, as suggested by as suggested Amin (2005).

The mean CVR across items was used as an indicator of overall test content validity.

#### **3.11.2 Reliability**

According to Zikumund (2003) reliability refers to the degree to which measures are free from error and therefore yield consistent results; the extent to which a research instrument is able to provide the same results repeatedly each time it is used.

The researcher ensured reliability of the data collection instruments by pretesting them on 20 respondents from Bugembe Health Center (IV) in Jinja district and the results were subjected to alpha reliability which is internal test reliability.

Parents/ caretakers of Bugembe Health Center (IV) were chosen because they were not the study population but posed similar characteristics as the study population.

The researcher used Respondent debriefing technique of pretesting in order to establish whether there were any misunderstandings of terms or phrases used in the data collection tool, to ascertain the extent to which respondents' understandings of questions and concepts were consistent with official definitions, to evaluate whether some questions in the main survey were superfluous, to examine whether alternate versions of a question did a better job of identifying or measuring specific activities and to construct comparable subsets of respondents from different questionnaire versions to allow comparative analyses.

According to Esposito et al., 1993, respondent debriefing is the best pretesting technique for self-administered questionnaire. The tool was reliable when a higher degree of consistent results was achieved.

### **3.12 Data Analysis**

#### **3.12.1 Analysis of Quantitative Data**

Proper data analysis was carried out to identify inconsistencies and any missing data.

### **Descriptive Analysis of Quantitative Data**

Data was entered, cleaned and analyzed using SPSS software. Descriptive analysis was done and frequencies and percentages results were presented in tables, bar graphs, and pie charts. Child and parent ages were the only continuous variables hence their distribution were summarized in histograms and their mean and standard deviation were presented as shown in the descriptive analysis results section.

### **Bivariate Analysis of quantitative data**

Since we were measuring association between the dependent variable with several independent variables, the chi square test was therefore preferably chosen because it is the most ideal statistical test in cases like this. The independent variables were statistically significant at 95% level of significance ( $p < 0.05$ ).

### **Multivariate Analysis of quantitative data**

A binary logistic regression model was done to determine the strength of the statistically significant associations established at the bivariate analysis stage. All the statistically significant variables with a P value less than or close to 0.05 ( $p < 0.05$ /  $p = 0.05$ ) were that were taken to the regression model where odds ratios and 95% confidence intervals and p-values less than 0.05 were calculated. Results were significant at 95% confidence level.

#### **3.12.2 Analysis of Qualitative Data**

Data collected from key informants was transcribed from audio recordings, edited, coded and tabulated to make it reliable for analysis using both thematic analysis and content analysis. Data

was divided into meaningful analytical units and marked with descriptive words. The codes were merged into larger categories and themes. Content from each coded groups was summarized and illustrated with direct quotes from the discussion. A 10% back translation was done for quality control.

Thematic and content analysis was done because the two approaches complement each other since the theme emerges from the researcher and the description summaries from the respondent. This data was analyzed by sorting out major concepts and ideas that relate to the variables of the study so as to make meaning and draw conclusions.

### **3.14 Ethical consideration**

Permission and approval to conduct the study was obtained from International Health Sciences University and Nalufenya children's hospital nutrition unit. A letter of introduction was obtained from IHSU and presented to the administration of the nutrition unit.

Respect for patients was ensured by seeking informed consent. Informed consent was obtained from respondents after explaining adequately the aim, procedures and anticipated benefits of the study. It was also explained to the study participants that their participation was voluntary with no payment involved and they were free to withdraw consent at any time during the study and patients who were not ready to be interviewed at a particular time were scheduled for another day.

Confidentiality was also maintained throughout the study period by using serial numbers as opposed to using patient names. Justice was ensured by causing no emotional, physical or psychological harm at all during all the time of the study.



### **3.15 Plan for Dissemination**

The researcher submitted the report findings to International Health Sciences University Institute of Health Policy and Management in the partial fulfillment of a bachelor's degree of Public Health Science and another copy was submitted to Jinja Regional Referral Hospital Research body where Nalufenya Children's Hospital Nutritional Unit is under.

### **3.16 Limitations of the study**

Due to the nature of the sampling, the respondents may not have exhausted all the factors influencing the length of hospital stay for children aged 6-59 months managed for severe acute malnutrition.

## **CHAPTER FOUR**

### **RESULTS**

#### **4.0 Introduction**

This chapter presents the results of descriptive analysis and interpretation of data as per the study in line with the study objectives.

#### **4.1 Descriptive Analysis**

Data was entered in SPSS for frequencies of variables in terms of tables, charts and graphs.

##### **4.1.1 Characteristics of children aged 6-59 months managed for severe acute malnutrition**

Majority of the respondents were male (55.8%), the vast majority of the children were not in school (98%), vast majority of children were from the rural area (86.9), vast majority of the children had both parents alive (92.5%), the highest proportion of the children had biological parents (90.5%), and the highest proportion of the children were second born in terms of birth order as indicated in table 1 below.

*Table 1: Characteristics of children aged 6-59 months managed for severe acute malnutrition.*

<b>Variable</b>	<b>Frequency</b>	<b>Percentage</b>
<b>Child Sex</b>		
Female	88	44.2
Male	111	55.8
<b>School Going</b>		
Yes	4	2.0
No	195	98.0
<b>Child Residence</b>		
Village	173	86.9
Town	26	13.1
<b>Parents Alive</b>		
Both parents alive	184	92.5
One parent alive	15	7.5
<b>Relationship</b>		
Biological parent	90.5	90.5
Foster parent	2.5	2.5
Uncle/ aunt	7.0	7.0
<b>Birth Order</b>		
First born	78	39.2
Second born	90	45.2
Third born	31	15.6

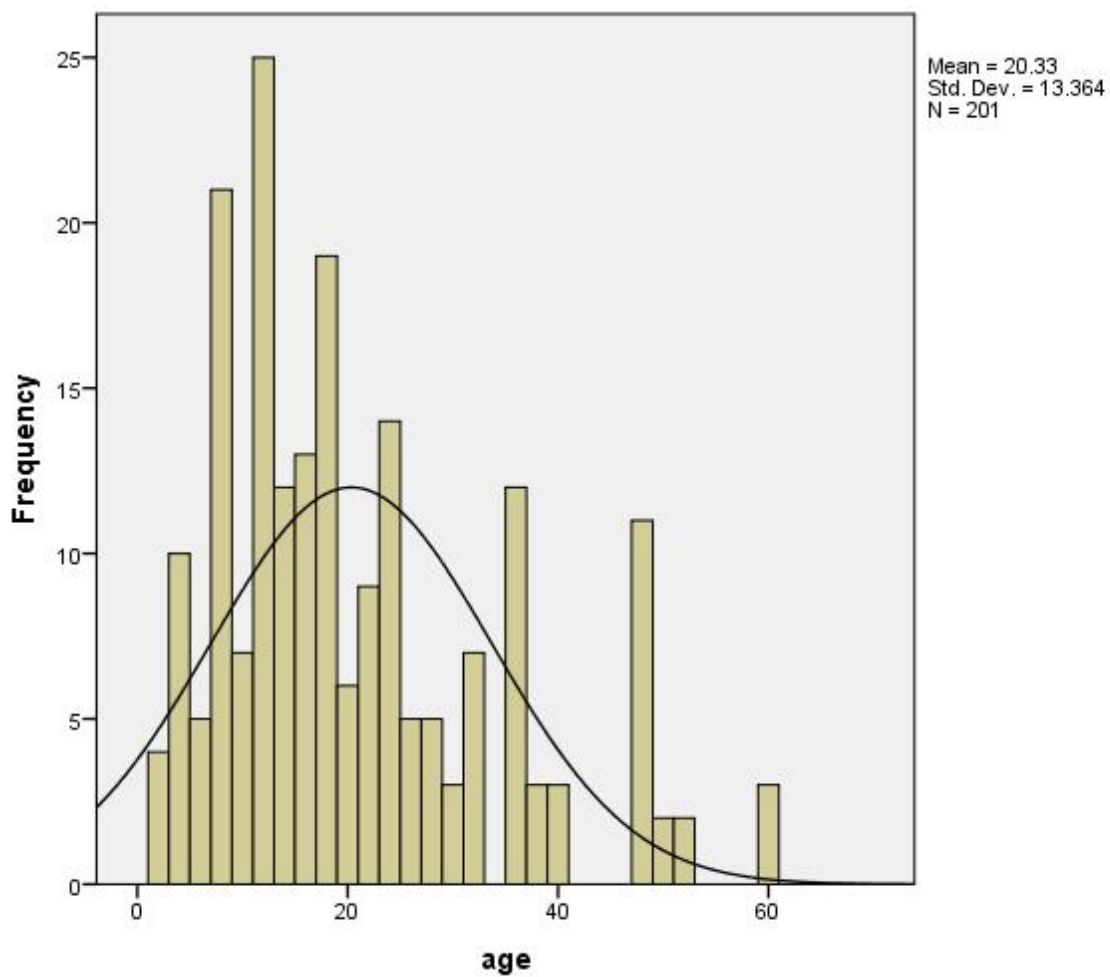
*Source; primary data from respondents*

#### 4.1.1.1 Age distribution of children

Data on age was collected continuous data and summarized in figure 1 below;

Form figure 1 below, the age of the children was normally distributed with mean of 20.3 months and a standard deviation of 13.4 months.

*Figure 1:Age distribution of the child*



*Source; primary data from respondents*

#### 4.1.2 Household factors of parents/ primary care takers of children aged 6-59 months managed for severe acute malnutrition.

The vast majority of parents were female (93%), the highest proportion of the caretakers/parents were had primary level of education (51.8%), the vast majority of the parents/caretakers were in union (83.4%), the highest proportion of parents /care takers were unemployed (69.8%) and the earning below 100,000shs a month (74.1%). Majority of parents' nature of employment was informal at (73.3%).

*Table 2: Showing household characteristics of parents/ primary care takers of children aged 6-59 months managed for severe acute malnutrition*

<b>Variable</b>	<b>Frequency</b>	<b>Percentage</b>
<b>Parent sex</b>		
Female	185	93.0
Male	14	7.0
<b>Educational level</b>		
None	70	35.2
Primary	103	51.8
Secondary	23	11.6
Tertiary	3	1.5
<b>Marital status</b>		
In union	166	83.4
Not in union	33	16.6
<b>Employment status</b>		
Yes	60	30.2
No	139	69.8
<b>Nature of employment</b>		
Formal	16	26.7
Informal	44	73.3
<b>Monthly earning</b>		
< 100,000	43	74.1
100,001 – 400,000	12	20.7
400,001 – 700,000	3	5.2

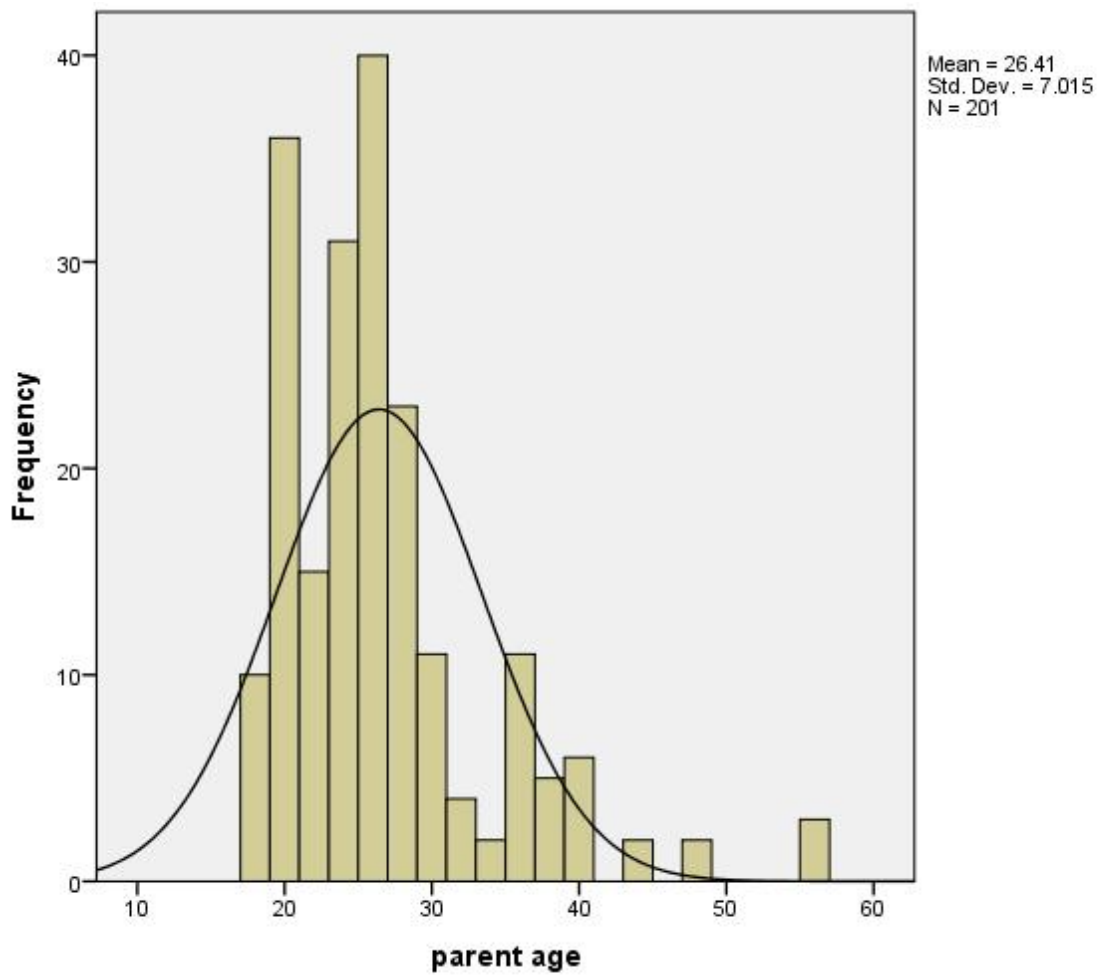
*Source; primary data from respondents*

#### 4.1.2.1 Age distribution of parents/ caretakers

The age of the parents/ caretakers of children was also collected as continuous data and presented in a histogram below;

Figure 2 below shows a mean of 26.4 years and standard deviation of 7 years.

**Figure 2: Age distribution of Parents/Care takers**



*Source; primary data from respondents*

#### 4.1.3 Showing clinical factors of children 6-59 months managed for severe acute malnutrition

The vast majority of children had a short length of hospital stay (81.4%), the highest proportion of the children had edema (51.3%) and the commonest type was moderate (39.2%), the vast majority of children had malaria (89.6%), the highest percentage of children did not have history of past admission (78.9%)

*Table 3: Clinical factors of children 6-59 months managed for severe acute malnutrition.*

Variable	Frequency	Percentage
<b>Length of admission</b>		
Short	162	81.4
Long	37	18.6
<b>Presence of edema</b>		
Yes	102	51.3
No	97	48.7
<b>Type of edema</b>		
Mild	25	24.5
Moderate	40	39.2
Severe	37	36.3
<b>Illness on admission</b>		
Yes	71	35.7
No	128	64.3
<b>Type of illness</b>		
Diarrhea	25	66.2
HIV	22	78.6
Malaria	21	89.6
<b>Immunization status</b>		
Yes	196	98.5
No	3	1.5
<b>History of past admission</b>		
Yes	42	21.1
No	157	78.9

*Source; primary data from respondents*

#### 4.1.4 Showing health provider factors influencing the average length of hospital stay

The vast majority of the children were attended to on the first day (85.9%), the vast majority of parents/caretakers received child feeding lessons (98.5%), all the respondents' consented.

*Table 4: Health provider factors influencing the average length of hospital stay*

<b>Variable</b>	<b>Frequency</b>	<b>Percentage</b>
<b>Attended to on the first day</b>		
Yes	171	85.9
No	28	14.1
<b>Child feeding lessons</b>		
Yes	196	98.5
No	3	1.5
<b>Therapeutic feeds</b>		
Yes	199	100.0
No	0	0.00
<b>Free nutritional services</b>		
Yes	184	92.5
No	15	7.5
<b>Payment for medicine</b>		
Yes	123	61.8
No	76	38.2
<b>Skilled personnel</b>		
Agree	180	90.5
Disagree	7	3.5
Not sure	12	6.0
<b>Adequate staff</b>		
Agree	136	68.3
Disagree	63	31.7
<i>Source; primary data from respondents</i>		



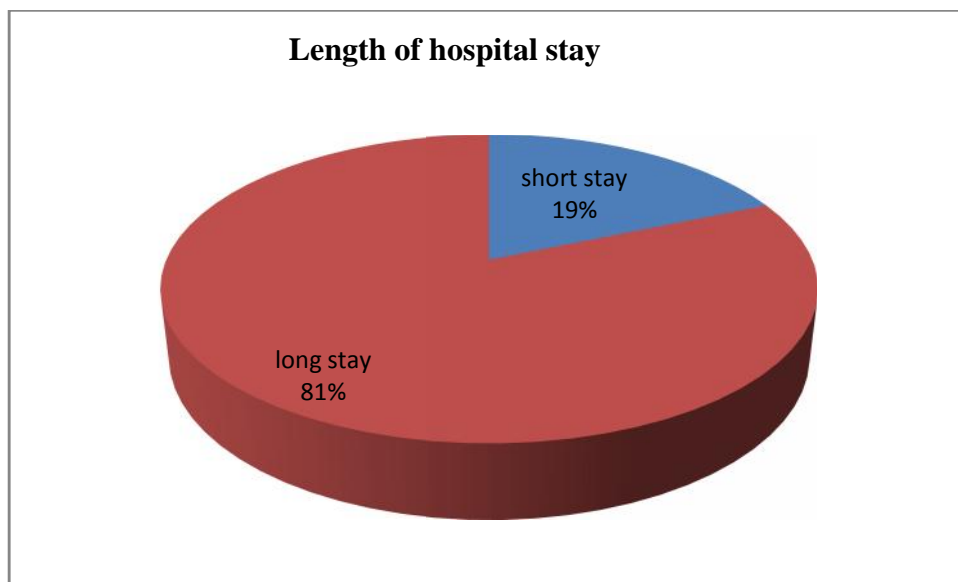
#### 4.1.5 Dependent Variable

The dependent variable was measured in weeks where any child that had stayed on admission of for 2 weeks or less was categorized as having had a short hospital stay, while beyond 2 weeks was categorized as having had a long stay.

Data on the length of hospital stay was collected and presented in the pie chart below;

From figure 3 below, 19% of the children between the age of 6 -59 months spent a short time of hospital stay compared to the 81% who had a longer length of hospital stay.

**Figure 3: Length of hospital stay**



**Source: primary data from respondents**

## 4.2 Bi-variate Analysis

### 4.2.1 Characteristics of children aged 6-59 months managed for severe acute malnutrition

Table 5 below shows that child residence is statistically related to the average length of hospital Stay of children aged between 6 – 59 months managed for severe acute malnutrition at Nalufenya Children’s Hospital Nutritional Unit ( $X^2 = 5.073$ , P- value= 0.020)

*Table 5: Characteristics of children aged 6-59 months managed for severe acute malnutrition.*

Variable	Average length N=199				Total	X <sup>2</sup>	P-Value
	Short (%) n=162		Long (%) n=37				
<b>Child Sex</b>							
Female	72	81.818	16	18.182	88	0.018	0.144
Male	90	81.081	21	18.919	111		
<b>School Going</b>							
Yes	25		2	50	4	2.660	0.137
No	160	82.051	35	17.949	195		
<b>Child Residence</b>						5.073	0.020**
Village	145	83.815	28	16.185	173		
Town	17	65.38	9	34.615	26		
<b>Relationship</b>							
Biological	149	82.778	31	17.222	180	5.962	0.223
Foster	2	40	3	60	5		
Uncle/ aunt	11	78.571	3	21.429	14		
<b>Parents Alive</b>							
Both Alive	149		35		184	0.297	0.255
One Alive	13		2		15		
<b>Birth Order</b>							
First	66	84.615	12	15.385	78	1.438	0.418
Second	70	77.778	20	22.222	90		
Third	26	83.871	5	16.129	31		

\*\* Significant at 95% CI

#### **4.2.2 Household factors of parents/ primary care takers of children aged 6-59 months managed for severe acute malnutrition**

Both marital status and nature of employment of the parents/caretakers are statistically related to the average length of hospital stay of children aged between 6-59 months managed for Severe Acute Malnutrition at Nalufenya Children's' hospital nutritional unit. ( $\chi^2 = 3.584$  and P- value= 0.034, for marital status and  $\chi^2=9.414$ , P- value = 0.005 for nature of employment respectively) as indicated in table 6 below.

**Table 6: Household factors of parents/ primary care takers of children aged 6-59 months managed for severe acute malnutrition**

Variable	Average Length N=199				Total	X <sup>2</sup>	P-Value
	Short (%) n= 162		Long (%) n= 37				
<b>Parent Sex</b>							
Female	150	81.081	35	18.919	185	0.185	0.273
Male	12	85.714	2	14.286	14		
<b>Educational Level</b>							
None	56	80	14	20	70	14.361	0.112
Primary	91	88.350	12	11.650	103		
Secondary	14	60.870	9	39.130	23		
Tertiary	1	33.333	2	66.667	3		
<b>Marital Status</b>							
In Union	139	83.735	27	16.265	166	3.584	0.034**
Not in union	23	69.697	10	30.303	33		
<b>Employment Status</b>							
Yes	49	81.667	11	18.333	60	0.004	0.157
No	113	95.683	26	18.705	139		
<b>Nature of Employment</b>							
Formal	9	56.25	7	43.75	16	9.414	0.005**
Informal	40	90.909	4	9.091	44		
<b>Monthly Earning</b>							
<100,000	38	88.372	5	11.628	43	9.727	0.160
100,000-400,000	6	50	6	50	12		
400,001-700,000	3	100	0	0	3		
** significant at 95%CI							

#### 4.2.3. Clinical factors of children 6-59 months managed for severe acute malnutrition

Figure 7 below shows that; history of past admission is statistically related to the average length of hospital stay of children aged 6 – 59 months managed for severe acute malnutrition at Nalufenya Children’s Hospital Nutritional Unit. ( $X^2= 6.728$ , P-Value =0.004 for history of past admission).

**Table 7: Clinical factors of children 6-59 months managed for severe acute malnutrition**

Variable	Average Length of stay N = 199		Total	X <sup>2</sup>	P-value
	Short (%) n = 162	Long (%) n = 37			
<b>Presence of Edema</b>					
Yes	81 79.412	21 20.588	102	0.550	0.110
No	81 83.505	16 16.495	97		
<b>Type of Edema</b>				3.480	0.100
Mild	18 72	7 28	25		
Moderate	30 75	10 25	40		
Severe	33 89.189	4 10.811	37		
<b>Illness on Admission</b>				0.209	0.138
Yes	59 83.099	12 16.901	71		
No	103 80.469	25 19.531	128		
<b>Type of Illness</b>				4.674	0.246
Diarrhea	23 92	2 8	25		
HIV	15 68.182	7 31.818	22		
Malaria	18 85.714	3 14.286	21		
<b>Immunization Status</b>				4.651	0.083
Yes	161 82.143	35 17.857	196		
No	1 33.333	2 66.667	3		
<b>History of Past Admission</b>				6.728	0.004**
Yes	40 95.238	2 4.762	42		
No	122 77.707	35 22.293	157		

**\*\*Significant at 95% CI**

#### 4.2.4 Health provider factors influencing the average length of hospital stay

Table 8 below shows that both adequate staff and payment of medicine are statistically related to the average length of Hospital stay of children aged between 6-59 months managed for severe acute malnutrition at Nalufenya children's' hospital nutritional unit. ( $X^2= 3.335$ , p-Value = 0.029 for payment of Medicine, and  $X^2= 4.288$ , P-Value =0.019, for adequate staff respectively).

**Table 8: Health provider factors influencing the average length of hospital stay**

Variable	Average length of stay		Total	$X^2$	P-Value
	Short (%) n=162	Long (%) n=(37)			
<b>Attended to on the first day</b>					
Yes	138 80.702	33 518.182	171	0.399	0.182
No	24 85.714	4 14.286	28		
<b>Child Feeding Lessons</b>				0.696	0.538
Yes	159 81.122	37 18.878	196		
No	3 100	0 0	3		
<b>Therapeutic Foods</b>				-	-
Yes	162 81.407	37 18.592	199		
No	0 0	0 0			
<b>Free-Nutritional Services</b>				0.297	0.255
Yes	149 80.978	35 19.022	184		
No	13 86.667	2 13.333	15		
<b>Payment For Medicine</b>				3.335	0.029**
Yes	105 85.366	18 14.634	123		
No	57 75	19 25	76		
<b>Skilled Personnel</b>				3.329	0.295
Agree	147 81.667	33 18.333	180		
Disagree	7 100	0 0	7		
Not Sure	8 66.667	4 33.333	12		
<b>Adequate Staff</b>				4.288	0.019**
Agree	116 85.294	20 14.706	136		
Disagree	46 73.016	17 26.984	63		

\*\*significant at 95% level of significance

### **4.3 Multivariate Analysis**

#### **4.3.1 Multivariate analysis of factors affecting the length of hospital stay**

From the table 9 below, children that resided in the villages were 0.36 times less likely to have a shorter hospital stay ( $p= 0.027$ ). Children that had a history of pervious admission were 0.176 times less likely to have a shorter length of hospital stay ( $p= 0.020$ ). children whose parents/ caretakers were in the formal sector were 8.167 times more likely to have a shorter length of hospital stay, those who reported adequate staff were 0.452 times less likely to have a shorter hospital length of staff ( $p=0.034$ ). Children whose parents bought medicine for themselves were 0.462 times less likely to have a shorter length of hospital stay (0.040), marital status was found not to be significant.

**Table 9: Showing multivariate analysis of factors affecting the length of hospital stay**

<b>Variable</b>	<b>OR (C I)</b>	<b>P- Value</b>
<b>Child Residence</b>		
Town	1	
Village	0.360 (0.146 – 0.888)	0.027 ****
<b>Ever been admitted</b>		
No	1	
Yes	0.176 ( 0.040 – 0.765)	0.020 ****
<b>Marital Status</b>		
Not in union	1	
In union	0.463 ( 0.199 – 1.077)	0.074
<b>Nature of Employment</b>		
Informal	1	
Formal	8.167 ( 1.966 – 33.918)	0.004 ****
<b>Adequate staff</b>		
Disagree	1	
Agree	0.452 ( 0.218 – 0.941)	0.034****
<b>Asked to buy medicine</b>		
No	1	
Yes	0.462 ( 0.220 – 0.967)	0.040 ****

**\*\*\*\* Significant at 95% CI**

#### **4.4 Qualitative Data**

A total number of 4 health workers at the nutritional unit of Nalufenya children’s’ hospital were interviewed as for key informants and these included the sister in charge nutritional unit, 2 nurses and one nutritionist of the nutrition unit. The questions that were asked were as below;

##### **Nutritional services in the unit in terms of Personnel;**

The team indicated that there is shortage of personnel. They noted that there are few nurses to cover all the 3 shifts, i.e. day, evening and night duties. They further expressed that personnel is



low compared to the work load in the unit. They suggested they needed more personnel at the unit.

### **Nutritional services in the unit in terms of Malnutrition management;**

The team agreed that babies with malnutrition were being well management at the unit with a proof at a time that there were not so many under admission; many had improved and were discharged. They also confirmed that the unit only handles under nutrition both severe and acute cases, the different stages of management included; babies with severe acute malnutrition with edema and medical conditions are given F75, F100 and plumpynut. Those without medical conditions are managed under outpatient department with plumpy nut.

### **Nutritional services in the unit in terms of Challenges;**

Some of the challenges mentioned by the team included,

*“ At times drugs are not enough, if drugs are there and children well fed on time, they can improve easily, where there is poverty and ignorance they may have food but don't know how to feed their children” (KI/ Nurse)*

Similarly another key informant also went ahead to say the following;

*“Ranaway cases are still a challenge much as the number has gone down, we cannot afford to give patients supper they only receive lunch. The nutritional unit is an expensive ongoing program, it requires unique utensils in order to render in patient care thoroughly well. We need items like food demonstration kits, measuring cylinders to mention nut a few. A challenge of more man power like kitchen attendants, domestic assistants to give extra care on the nutrition side”*

(KI/ Sister- In charge)

Further still another key informant had this to say about the challenge at the unit;

*“Shortage of labor force, the nurses are not enough to cover the 3 different duties.”*

(KI/ Nutritionist)

More still the fourth key informant also mentioned other challenges they face at the unit;

*“At times some mothers delay to come, because they are ignorant they don’t know about malnutrition, so they take their time. They bring their children when they are severely malnourished. Then also other causes include poverty, they don’t have and maybe family planning.”* (KI/Nurse)

#### **Nutrition services in the unit in terms of Treatment outcomes;**

*The team indicated that since apart from malnutrition babies also come with other infections like T.B, HIV, malaria, diarrhea and others. A key informant made the following remarks*

*“Treatment outcomes depend on availability of drugs and also the patient, sometimes we treat but the mother is not willing to cooperate with us, she tells you she doesn’t have money to buy medicine because the hospital normally goes out of stock.”* (KI/ Nurse)

Average stay of a severely malnourished child stay on admission;

The team estimated that average stay ranges between 2 to 3 weeks, however there are those children that are discharged after 2 weeks, and others even after a week depending on their condition at admission.

**Characteristic of parents/ caretakers of those children that stay on admission longer than others;**

The team noted that mothers that do not want to do what they are told to do stay longer on admission for example mothers hide and give food to their children yet they are supposed to be managed on therapeutic feeds only.

One of the key informants had this to say,

*“The young mothers, they take children to grandparents of the child and for her she goes to look for something to keep her going. They have a problem, they stay longer, and when you dig up the history you find out that the baby was staying with grandmother”*

(KI/ Sister-In charge)

## CHAPTER FIVE

### DISCUSSION OF RESULTS

#### 5.0 Introduction

This chapter discusses the findings of the study, compares and contrasts them with the findings of other studies done before which are related to this particular study.

#### 5.1 The characteristics of children aged 6-59 months managed for severe acute malnutrition;

The study findings show that the proportion of children residing in the village between age of 6-59 months managed for severe acute malnutrition at Nalufenya children's' hospital nutritional unit was 86.9% (Table 1), which is high compared to those residing in town and slums. This is consistent with results from a cross sectional survey conducted among children under the age of five years in the Democratic Republic of Congo to assess the impact analysis of geographical location as a proxy for distal factors and their influences on the children's nutritional status noted that in rural areas malnutrition was higher with 87.2% compared to 48.4% in urban areas, (Friedman et al., 2005).

This consistence therefore clearly indicates that child residence;( to be specific, children that reside in the villages) is a statistically significant factor that influences the length of hospital stay among children aged between 6- 59 months managed for severe acute malnutrition.

There's therefore need to improve the nutritional status of children that reside in villages, through for example giving them knowledge about malnutrition since this can help them

understand more about it. Further still, results from the same study also went ahead to note that the prevalence of malnutrition was higher in boys than in girls yet in regard to the findings of this study child sex was not found to be statistically related to the average length of stay. The discrepancy could be due to population difference, where maybe his sample size included more boys than girls.

According to another cross sectional study carried out among internally displaced people in Omoro county, Gulu district to estimate prevalence of protein –energy malnutrition among children under the age of five years. Male children in the age group 3-24 months were at high risk of acute malnutrition.

## **5.2 Household factors of parents/ primary care takers of children aged 6-59 months managed for severe acute malnutrition**

The marital status of the parents/caretakers of the children aged between 6-59 managed for severe acute malnutrition at Nalufenya children's' hospital was found to be one of the factors affecting the length of hospital stay at the nutritional unit. The children of parents in union were 0.5 times (OR= 0.463, CI= 0.199-1.077, P-Value=0.074) more likely to meet the average length of hospital stay compared to those not in union, however it was not significant. No study reviewed had associated marital status to average length of hospital stay.

Another factor that contributed to the length of stay was the parents/care takers' nature of employment, where the children of parents/care takers with formal employment were 8.2 times more likely to meet the length of hospital stay than their counterparts (P=0.004). No study review had associated nature of employment to average length of hospital stay, however. Friedman reported that his study found a linear relationship between social economic status of

household and malnutrition were among children from the poorest household malnutrition was higher, which has a small similarity to this since children of parents/care takers whose nature of employment was informal were more likely to have a longer length of hospital stay.

The same study also found malnutrition had a linear relationship with maternal education where it was found to be high among children from a non-educated mother, followed by children from mothers with a primary education background but lower among children from mothers with a secondary or higher educational background (Friedman et al., 2005). However, the educational level of parents/caretakers of children aged between 6-59 months managed for severe acute malnutrition at Nalufenya children's hospital nutritional unit was found to be insignificant at the bivariate analysis level.

### **5.3 Clinical factors of children 6-59 months managed for severe acute malnutrition**

The current study found out that the history of past infection as a clinical characteristic is significant hence it largely influences the length of hospital stay for the children aged between 6-59 months managed for severe acute malnutrition at Nalufenya children's hospital. However there was no study found that associated history of admission to the length of hospital.

The study also found other clinical factors like; immunization status of the children insignificant at the bivariate analysis level but a study by Barus et al., and (Owor et al., 2000) found this factor significant in influencing the length of hospital stay. This could probably be because of the difference in age and level of immunization awareness among care takers.

Further still this study found another factor of clinical characteristics type of illness statistically insignificant to the average length of hospital stay. However different studies found illnesses

were associated with the increase of length of hospital stay, these studies included; a study by Barus et al.,1989 who found out that diseases like diarrhea and bronchopneumonia increased length of stay, a study by Lumsuwat et al,2014 found out that diseases like chronic obstructive pulmonary disease increase the length of stay, also a study by Ubesie et al., that found out that diseases like diarrhea and malaria on admission increase the length of hospital stay and finally a study by Irena et al., whose findings were that diseases like HIV and diarrhea on admission increased the length of hospital stay. The presence of edema in children with severe acute malnutrition according to this study was found not to be statistically related to the average length of hospital stay.

#### **5.4 Health provider factors influencing the average length of hospital stay**

This study found that the factor of whether patients were asked to buy medicine to have a statistical relationship with the length of hospital stays. However there was no study found to be relating the patients being asked to buy medicine to the length of hospital although a prospective study by Chima et al., 1997, identified among the findings that hospital cost per patient was higher in high risk group for patients under admission.

The study found the factor of adequate staff among health provider characteristic statistically significant to the length of hospital stay. This finding is also similar to those of a study by Chitete and Pouane who found that the factor of skilled staff shortage was statistically related to the length of stay.

This study also found that ready to use therapeutic feeds factor was not statistically related to the length of hospital stay; however a study by Nackers et al, 2010 and Omolo et al., 2016 found ready to use therapeutic feeds statistically related to the length of stay.

## CHAPTER SIX

### CONCLUSION AND RECOMMENDATIONS

#### 6.0 Introduction

This chapter consists of the conclusion and recommendations from the study findings as per the objectives of the study.

#### 6.1 Conclusions

The length of hospital stay for children aged between 6-59 months managed for severe acute malnutrition at Nalufenya children's hospital nutritional unit was categorized as short stay ( $\leq 14$  days) and long stay ( $> 14$  days). A proportion 18.6 % of the children aged between 6-59 months had long hospital stay.

Factors that influenced the length of hospital stay among children aged between 6-59 months managed for severe acute malnutrition at Nalufenya children's hospital nutritional unit were the child's residence among the characteristic of children. Children who resided in the village were 0.360 times less likely to have a shorter length of hospital stay than those that resided in town.

The characteristics of parents/ caretakers of children aged between 6-59 months managed for severe acute malnutrition at Nalufenya children's hospital nutritional unit that influenced the length of hospital include; the nature of employment in particular those in formal employment their children were 8.2 times more likely to have a shorter length of hospital than the children whose parents /caretakers in informal employment.



The clinical characteristics of children aged between 6-59 months managed for severe acute malnutrition at Nalufenya children's hospital nutritional unit that influenced length of hospital stay where history of past admission where by children that had previous hospital admissions were 0.176 times less likely to have a short length of hospital stay.

Among the healthcare related factors that influenced the length of hospital stay among children aged between 6-59 months managed for severe acute malnutrition at Nalufenya children's hospital nutritional unit were staffing levels, where by parents who reported adequate staff had children that were 0.452 times less likely to have short hospital stay.

Parents/ caretakers who reported that that they were asked to buy medicine were 0.462 times less likely to have children with shorter length of hospital stay compared to parents/ care takers who were never asked to buy medicine.

## **6.2 Recommendations**

- i. Health workers should do village outreaches to sensitize parents on prevention of malnutrition and advocate for early seeking of health services in case
- ii. The government should provide income generating activities for those in the informal sector, so that they can make extra income to feed their children and prevent malnutrition.
- iii. Parents should be sensitized and briefed in their local language to prevent re-admissions; it is possible that the children re-admitted have not followed the feeding program suggested at the unit or either their parents are not in position to sustain the feeding programs.

- iv. The government should consider increasing the staff at Nalufenya children's hospital nutritional unit to ensure that as these children are admitted they are promptly attended to, and discharged.
- v. The government should provide the required medicines for managing acute severe malnutrition and also support the unit with children feeds so that children don't lack medicines and end up staying long on hospital admission.
- vi. Further research should be carried out to address any gaps that the current study may not have addressed.

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**APPENDICES**

**APPENDIX I: CONSENT FORM**

My name is Butesi Nafisa, a student from International Health Sciences University under the Institute of Health Policy and Management, collecting data to write my academic research report entitled ‘ Factors affecting the average length of hospital stay of children aged 6-59 months managed for severe acute malnutrition at Nalufenya Children’s Hospital Nutritional Unit’.

Participation in this study is voluntary based hence withdrawal from it at any point in time is allowed. You are free to decline to answer any questions you find uncomfortable although answering all questions would largely add your opinion to the contributions of others.

There is no harm you will experience both during and after the study and all your opinions will be handled with at most confidentiality.

Do you have any queries?                      Yes.....,                      No.....

A sign or thumb print on this document means you have received enough explanation, have clearly understood everything about this study and you have accepted to be part of this study out of free will.

.....

.....

Participant Signature/ Thumb print

Interviewer Signature

## APPENDIX II: QUESTIONNAIRE

<b>QUESTIONNAIRE</b>		
<b>Factors affecting the Average Length of Hospital Stay for children aged 6-59 months managed for Severe Acute Malnutrition</b>		
<b>QN</b>	<b>Description</b>	<b>Responses</b>
	<b>Part 1: Characteristics of children</b>	
1	How old is your child?	.....
2	What is the sex of your child?	Female ..... 1 Male ..... 2
3	Does the child attend school?	Yes ..... 1 No ..... 2
4	Where does the child reside?	Village..... 1 Town ..... 2 Slum ..... 3
		Biological parent..... 1

5	How are you related to the child?	Foster parent.....2 Uncle/ Aunt.....3 Others (specify).....4
6	Are both the biological parents of the child alive?	Both parents alive .....1 One parent alive.....2 Both parents dead.....3
7	What is the child's birth order	First.....1 Second.....2 Third.....3 Others (specify).....4
	<b>Part 2:Characteristics parents/ primary caretakers</b>	
8	What is your age?	.....
9	What is your sex?	Female .....1 Male .....2
10	What is your educational	None.....1

	level?	Primary .....2 Secondary.....3 Tertiary / University .....4
11	What is your marital status?	In union.....1 Not in union.....2
12	Are you employed?	Yes .....1 No .....2
13	If employed what is the nature of employment?	Formal employment .....1 Informal employment.....2
14	How much do you earn in a month?	<Shs.100.000.....1 Shs. 100.001-400.000.....2 Shs. 400.001-700.000.....3 Shs. 700.001-1.000.000.....4 >Shs. 1.000.000.....5
	Part 3: Clinical factor	
15	When was the child admitted to this hospital? (date)	.....



16	How long has the child stayed on admission? (Mention in days).	-----
17	On admission did the child have edema?	Yes.....1 No.....2
18	If yes, what type of edema?	Mild.....1 Moderate .....2 Severe.....3
19	Did your child have any other illness on admission?	Yes.....1 No.....2
20	If yes mention the illness?	.....
21	Did the child get immunized against all the immunizable diseases?	Yes.....1 No.....2 Not due for some.....3
22	Before this admission, was the child ever admitted?	Yes.....1 No.....2
	<b>Part 4:Health provider</b>	

	<b>factors</b>	
23	Was your child attended to on the first day of admission?	Yes.....1 No.....2
24	Were you taught on what to feed your child?	Yes.....1 No.....2
25	Does your child receive her/his daily therapeutic feeds while on admission?	Yes.....1 No.....2
26	Are the nutritional services in this unit free?	Yes.....1 No.....2
27	If yes, were you at any point asked at buy the medicines for your child?	Yes.....1 No.....2
28	The health workers at this nutritional unit are adequately skilled personnel to manage any childhood illness.	Agree.....1 Disagree.....2 Not sure.....3
29	The nutritional unit has adequate staff to handle any	Agree.....1

	childhood illness.	Disagree.....2  Not sure.....3
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**APPENDIXIII: INTRODUCTORY LETTER**



*making a difference to health care*

**Dean's Office-Institute of Public Health and Management**

Kampala, 4th Aug 2016

To:  
.....  
THE RESEARCH DEPARTMENT  
.....  
Jinja National Referral Hospital

*Please help Nafisa in anyway possible  
Dr. S Sanyal  
6/8/16*

Dear Sir/Madam,

RE: ASSISTANCE FOR RESEARCH

Greetings from International Health Sciences University.

This is to introduce to you Butesi Nafisa Reg. No. 2013-BSCPH-PT-036 who is a student of our University. As part of the requirements for the award of a Degree of Public Health, the student is required to carry out field research for the submission of a Research Dissertation

Nafisa would like to carry out research on issues related to: **Factors Influencing Length of Hospital Stay for Children Age 6-59 Months Managed for Severe Acute Malnutrition at Nalufenya Children's Hospital-Nutrition Unit.**

I therefore request you to render the student such assistance as may be necessary for her research.

I, and indeed the entire University are thanking you in anticipation for the assistance you will render to the student.

Sincerely Yours,

Alege John Bosco  
Ag. Dean, Institute of Public Health & Management

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