

**FACTORS CONTRIBUTING TO SEVERE ACUTE MALNUTRITION IN CHILDREN
UNDER FIVE IN NKONDO, BUYENDE DISTRICT**

BY

BUTENYE LAZARUS

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**A RESEARCH REPORT SUBMITTED TO THE FACULTY OF CLINICAL MEDICINE
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SUPERVISOR

ASS. PROFESSOR: MELVIS BERNIS MAREN

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DECLARATION

I, BUTENYE LAZARUS, declare that this research proposal is my own work and it has never been presented to any institution for any award and is being submitted with the approval of my supervisor. Where the work of other people has been included, acknowledgement to this has been made in accordance to the text and references quoted.

Signature.....

Date.....

BUTENYE LAZARUS

RESEARCHER

Approval

This research proposal has been done under my guidance and is hereby submitted for consideration with my approval as the supervisor.

Signature.....

Date:

ASS. PROF. MELVIS BERNIS MAREN

MBChB, M.MED PAEDIATRICS

SUPERVISOR

DEDICATION

This report is dedicated to my beloved parents Mr.Mawerere Benefansio and Mrs.FelisterNakiirya, brothers and sisters and those parents whose love and nurture provide the foundation for the optimal development and good health of their children everywhere.

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List of abbreviations

FANTA	Food and Nutrition Technical Assistance
FAO	Food Agricultural Organisation
GOU	Government of Uganda
MDG	Millennium Development Goals
MOH	Ministry of Health
MUAC	Mid Upper Arm Circumference
NNMB	National Nutrition Monitoring Bureau
RDA	Recommended Dietary Allowance
PEM	Protein Energy Malnutrition
SD	Standard Déviation.
UBOS	Uganda Bureau of Statistics
UDHS	Uganda Demographic Health Survey
UGAN	Uganda Action for Nutrition
UNICEF	United Nations Children's Fund
WHO	World Health Organization
SAM	Severe Acute Malnutrition
MAM:	Mild Acute Malnutrition

Definition of terms

Malnutrition: This is a condition whereby there are inadequate or insufficient nutrients.

Protein energy malnutrition: This is a condition characterised by lack of proteins and energy in the diet.

Acute malnutrition: Is a new term used to describe protein energy malnutrition. Is assessed through weight-for-height, visible wasting or mid-upper arm circumference (MUAC) in children aged 6-59 months old, with MUAC for pregnant and lactating women (PLW), and by Body Mass Index (BMI) for adults.

Severe acute malnutrition :Is defined by a very low weight for height (below -3 z scores of the median WHO growth standards), by visible severe wasting ,or by the presence of bilateral nutritional edema. In children aged 6–59 months, an upper arm circumference less than 110 mm is also indicative of severe acute malnutrition (WHO, 2005).

Stunting: The term means short for age.

Underweight: The term means low weight for age.

Wasting: This means low weight for height.

Prevalence of a disease:

The prevalence of a disease is the number of cases in a defined population at a specified point in time.

Questionnaires: Written list of questions to be answered by area people.

Abstract

A cross sectional descriptive transverse study was carried out in Nkondo sub-county, Buyende district from February 2014 up to November 2014 aimed at assessing factors contributing to severe acute malnutrition in the under fives in the area so as to develop strategies of improving the welfare health conditions of children.

Severe acute Malnutrition in Uganda affects a large number of children under 5 years and remains a major public health problem in the country and Nkondo sub-county in particular. If cases of PEM in children under 5 years are not solved, it would lead to complications like poverty as a result of un productivity, mental retardation, frequent infections in children and increased morbidity and mortality..

A total of 160 respondents (mothers) of child bearing age / care takers who had children under five years of age and were residents of the sub-county were interviewed.

The study revealed that 120 (75%) of the respondents had knowledge about PEM. A significant percentage of the respondents 32 (20%) did not exclusively breastfeed and of those who breastfed exclusively, 48 (37.5%) did so for less than the recommended six months. Due to cultural influences, 60 (37.5%) of the respondents reported weaning of their children before the age of 1 year, well below the recommended 18-24 month by WHO which could predispose them to SAM. With regard to the social economic factors contributing to SAM, 116 (72.5%) of the respondents had a daily income of less than 1000 shs thus potentially limiting the purchasing power and their ability to access the required foods for their children

From the findings, the study concluded that, the majority of the respondents had some knowledge about SAM. However, a significant number of them had their children predisposed to the risk of developing SAM because of the inadequate knowledge about it, socio economic, and cultural factors that influenced them as above.

Therefore, the study went forward and recommended that there is need for health promotion, information, education, and awareness about SAM in the area and improvement of the income per capita using a multi-sectoral collaboration approach between the MOH and local leaders with community participation and involvement.

CHAPTER ONE: INTRODUCTION

1.1 Introduction

This chapter deals with/ presents the background to the study, statement of the problem, purpose of the study, specific objectives, research questions and justification of the study.

1.2 Background

SAM in young children is currently the most important nutritional problem in most countries in Asia, Latin America, the Near East and Africa. The number of underweight children worldwide has risen from 195 million in 1975 to an estimated 200 million at the end of 1994, which means that more than one-third of the world's under-five population is still malnourished (FANTA, 2012). In Uganda, nearly half (49%) of the population is under the age of fifteen (Banstola, 2002). The national average of stunting in children younger than five years old is 32% (UNICEF, 2008). Prevalence of stunting is generally highest for the poorest segments of the population (Bhalani&Kotecha, 2008).

Stunting is associated with higher mortality and lower cognitive development. The prevention of stunting has the potential to bring about important health, educational, and economic benefits (Tierney et al, 2010). It therefore follows that failure to grow adequately is the first and most important manifestation of SAM. The term SAM is used to describe a broad array of clinical conditions ranging from the mild to the most serious severe acute malnutrition.

The current view is that most SAM is the result of inadequate intake or poor utilization of food and energy, not a deficiency of one nutrient.

Clinical manifestations of acute malnutrition

Acute malnutrition is assessed through weight-for-height, visible wasting or mid-upper arm circumference (MUAC) in children aged 6-59 months old, with MUAC for pregnant and lactating women (PLW), and by Body Mass Index (BMI) for adults. The individual is then classified as overweight/obese, normal, with moderate acute malnutrition (MAM), or severe acute malnutrition (SAM) based on specific cut-offs for interpretation of anthropometric measures. Acute malnutrition is also assessed through the presence of nutritional edema, which is, swelling due to excess fluid retention on both sides of the body which indicates severe acute malnutrition (WHO, 2005).

Severe acute malnutrition is defined by a very low weight for height (below -3 z scores of the median WHO growth standards), by visible severe wasting ,or by the presence of bilateral nutritional edema. In children aged 6–59 months, an upper arm circumference less than 110 mm is also indicative of severe acute malnutrition (WHO, 2005).

Acute malnutrition (wasting) refers to a form of malnutrition that reflects recent weight loss. Individuals often appear very thin.

Acute malnutrition may also present as liver enlargement, hypoalbuminaemia, steatosis, and possibly depigmentation of skin and hair, moon face and diarrhoea (Bhalani&Kotecha, 2008), minimal subcutaneous fat, increased appetite, dehydration, skin sores, diarrhoea and abnormal serum albumin levels (Boyd et al, 2012).

1.3 Problem Statement

A recent analysis that compared different causes of mortality and morbidity showed that maternal and child under nutrition is the single leading cause of health loss worldwide (WHO, 2005)

Malnutrition among children in developing countries is a major public health concern since it places a heavy burden on already disadvantaged communities. Poor physical growth, an indicator of poor nutritional status, is high in sub-Saharan countries, where approximately 21.9% of children are underweight and 40.1% are stunted. The most vulnerable group of children are those under 5 years of age (WHO, 2005).

In Uganda, 21% of children under 5 are underweight in the poorest quartile, versus 8% of under five children in the richest (UDHS, 2006).

Observational studies by the researcher following pre-field visits to the study area showed that SAM exists in the area. In Nkondo health centre III, the records office indicated that malnutrition and SAM in particular is a problem in the area as shown in the table below despite the fact that not all malnourished children visit the health centre and possibly not all those who visit it are appropriately diagnosed especially the mild ones which later become the severe forms of malnutrition. Hence, the need to identify the factors contributing to the prevalence of SAM in the area.

Table 1: Cases of malnutrition in the under-fives at Nkondo Health Centre III, Jan-June 2014.

MONTH	JAN	FEB	MARCH	APRIL	MAY	JUNE
Cases of Malnutrition	28	22	34	25	44	37
SAM	5	1	5	8	7	10
TOTAL	33	23	39	33	51	47

SOURCE: HMIS, (Nkondo Health Centre III) monthly Reports.

1.4 Purpose of the study

The purpose of the study was to assess and establish the factors contributing to PEM in children under five years in Nkondo sub-county so as to develop strategies of improving the welfare health conditions of children.

1.5 Specific objectives

- 1) To assess the knowledge among caretakers regarding PEM in children under five years in Nkondo Sub-County.
- 2) To specify the socio-economic factors contributing to PEM in children under five years in Nkondo Sub-County.
- 3) To identify the cultural factors contributing to PEM in children under five years in Nkondo Sub-County.

1.6 Research questions

- 1) What is the care takers knowledge regarding PEM in children under five years in Nkondo Sub-County?
- 2) What socio-economic factors contribute to PEM in children under five years in Nkondo Sub-County?
- 3) What cultural factors contribute to PEM in children under five years in Nkondo Sub-County?

1.7 Justification of the study

Adequate and appropriate nutrition is a fundamental human right, nonetheless, malnutrition remains a leading cause of death and lifelong ill health. Women and children are often at the greatest risk of long-term damage caused by early life under-nutrition, which can lead to permanent, intergenerational impairment (WHO, 2005).

The double burden of undernutrition and obesity is one of the leading causes of death and disability globally. In 2011, 165 million children under the age of 5 years were stunted and 52 million had acute malnutrition, while 43 million were overweight or obese. Childhood malnutrition is the underlying cause of more than one in three deaths among children under the age of 5 years, and negatively affects cognitive development, school performance and productivity. Approximately 200 million children are unable to attain their full development potential because of stunting and micronutrient deficiency (WHO, 2010). Improving nutrition is central to achieving the Millennium Development Goals (MDGs) and to the agenda for sustainable development. A healthy diet is an important means for preventing and controlling non communicable diseases (WHO,2010).

Acute malnutrition is a major risk factor for child mortality. A child with MAM is up to three times as likely to die as a well-nourished child where as one with SAM is nine times as likely to die as a well nourished one (Waterlow, 2004).

Severe malnutrition leads not only to increased morbidity (incidence and severity) and mortality, but can also lead to impaired psychological and intellectual development. Growth retardation in early childhood, for example, has been linked to the delayed acquisition of motor and to delayed mental development. These outcomes can have severe consequences in adult life, such as

significant functional impairment that can affect a person's economic productivity. A small adult may have a lower physical work capacity than a larger adult, thus reducing economic potential. Not surprisingly, malnutrition is also closely associated with socioeconomic status variables such as income and education to the caretakers of these children such as meeting the transport costs, failure to attend to economic activities and other family members in an attempt to alleviate the resulting consequences(WHO, 2005). Even those who afford to go to hospital stay there for weeks and more often months implying that the caretakers have to bear the bulky of hospital expenses on addition to failure to attend to their socio-economic activities, which increase most caretakers preferences to nurse their children at home with increased morbidity and mortality rates.

In Uganda, a high prevalence of malnutrition has been reported by UDHS in the last thirteen years. Despite Uganda's recent economic success, malnutrition is still an important public health problem and little information is available on the socio-economic risk factors for severe protein energy malnutrition(Muller and Krawinkel, 2005).

Therefore the scientific knowledge from this study is expected to be useful in improving on the management of malnutrition. It will bring the attention of mothers in provision of proper feeds of nutritive value using locally available foods. This will be through creating awareness on the importance of a balanced diet, which forms the basis of food health in children as they might be lacking the knowledge or ignorant.

It will promote the health of the children and reduce mortality rate resulting in severe acute malnutrition.

This study will also help to re-emphasise the existing solutions and also give new suggestions and recommendations.

The study may also work as a future reference material for other researchers focusing on protein energy malnutrition.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter presented the reviewed literature from textbooks, journals and websites to determine the factors contributing to the prevalence of PEM. In this chapter various studies were reviewed and arranged according to the objectives.

Malnutrition is from two words-Mal and nutrition. Mal means bad, a disease or a disorder. Malnutrition is therefore bad nutrition, disease or disorder associated with nutrition (Kikafunda et al, 2006).

Over nutrition or eating too much of certain foods (fats, sugars and refined carbohydrates) causes obesity and a number of degenerative and cardiovascular diseases. This is common in the overfed nations of the western world and among some elites in poorer countries.

Under nutrition is a situation in which the body's nutritional requirements are not met, due to under consumption, or to impaired absorption and use of nutrients (Kumaret el, 2012).

Under nutrition (underweight, wasting and micronutrient deficiencies) can be either acute or chronic. Chronic malnutrition (height for age indicator of under nutrition), a measure of skeletal growth, reflects the cumulative impact of events affecting the nutritional status that result in stunting and is mainly useful for assessing the nutritional status of a population. Weight for height or wasting on the other hand is a measure of acute malnutrition. (Ibekwe and Ashworth, 2004). Acute malnutrition can be either acute or chronic. It ranges from mild, moderate to the more life threatening severe acute malnutrition (SAM), traditionally known as protein energy

malnutrition (PEM). SAM is defined as weight-for-height of below -3 SD, MUAC of below 115mm for children ranging from 6-59 months old or presence of bilateral pitting edema (WHO, 2005).

Malnutrition in all its forms is closely linked, either directly or indirectly, to major causes of death worldwide. Maternal and child under nutrition has long-term consequences for intellectual ability, economic productivity, reproductive performance and susceptibility to infections, metabolic and cardiovascular disease (Black et al., 2008; Victora et al., 2008).

The greatest risk of under nutrition occurs during pregnancy and in the first five years of life; the effects of this early damage on health, brain development, intelligence, education ability and productivity are potentially irreversible (Kumaret el, 2012).

2.2 Knowledge of mothers/caretakers about PEM

2.2.1 Inadequate knowledge

Hien and Kam (2008) documented in a study about the nutritional status and the characteristics related to malnutrition in children under five years of age in Nghean, Vietnam, that most mothers/caretakers interviewed had inadequate knowledge about protein energy malnutrition, what caused it as well as what could be done to prevent it.

Similar findings were presented by Babington and Patel (2008) whose study about understanding the child feeding practices of Vietnamese mothers revealed that the majority of mothers with children under five years lacked adequate knowledge about protein energy malnutrition and how it could be prevented. Furthermore, most mothers could not name the major foods for a balanced diet as well as the recommended daily intakes for their children under 5 years of age.

Further still, it's noted that young women and mothers face many underlying challenges to meet their nutritional needs, which include alack of education on healthy diets and infant care, access toa diverse variety of affordable, nutritious foods, health care,and sanitation and restrictive culturalpractices which result in unequal and/or insufficientaccesstoadequate nutrition(<http://portal.pmnch.org/>).

2.2.2 Level of educational attainment

Allen (2006) mentioned in a study about the causes of nutrition-related public health problems of preschool children that among the causes of protein energy malnutrition, findings showed that most respondents did not have sufficient knowledge about protein energy malnutrition. This was attributed to the low level of educational attainment of mothers.

2.3 Socio-economic factors contributing to PEM in children under five:

2.3.1 Environmental crisis

Barrios et al, (2007) revealed in a study about the nutritional status of children under 5 years of age in three hurricane-affected areas of Honduras, findings reveal that protein energy malnutrition may be caused by poor economies or environmental crises, such as droughts or weather disasters, which caused a shortage of critical foodstuffs and a portion of the population suffers from malnutrition.

2.3.2 Unbalanced or inadequate diets

In a study about nutritional status as a predictor of child survival and summarizing the association and quantifying its global impact, that protein energy malnutrition may be caused by eating unbalanced or inadequate diets, digestion problems or other medical conditions, however,

on the other hand, malnutrition could also be caused from poor eating habits when food was abundant (Schroeder and Brown, 2004).

Waihenya et al, (2006) also noted that the factors influencing protein energy malnutrition among children under 5 years of age, was the over-consumption of unhealthy foods. It was further noted that consuming more calories than needed can cause PEM just as not eating enough calories and over-consumption of unhealthy foods usually goes along with deficiencies in essential vitamins and minerals, thus leading to malnutrition.

2.3.3 Poverty

In Sub Saharan Africa, PEM was usually found among the children of low socioeconomic families. These families are barely surviving with low purchasing power (Roy, et al, 2008). The government must think of creating safety nets of food for the less privileged in society. Such safety nets may be in the form of additional free food rations and other essential commodities for such families. Besides macronutrient deficiency, deficiencies in iron, iodine, vitamin A, and zinc are the main manifestations of malnutrition in developing countries, and indirect factors such as high rate of unemployment, poverty, illiteracy, and overcrowding contribute to the development of PEM (Badaloo, et al 2012). Furthermore, it was revealed that having a large number of dependants also contributed to PEM as caretakers were not in position to purchase all the required food for their children.

2.3.4 Household food insecurity

Access to nutritious food for a mother and her child is as important as access to information about adequate feeding practices(UN,2012).

Household food insecurity, or the lack of food, is a major factor in many humanitarian emergencies. Displaced populations were often separated from their normal source of food

(Bhalani, 2006). Although some agencies, such as the World Food Programme, have standardized methodologies specifically to assess food insecurity, there are no consensus recommendations regarding assessment methods. One simple way to crudely estimate the contribution of household food insecurity in a malnourished population was to compare the prevalence of acute protein-energy malnutrition in children less than 2 years of age to the prevalence in children 2-4 years of age. Older children normally have a lower prevalence rate of acute malnutrition, but if food insecurity was an important factor, they too would become significantly malnourished.

2.4 Cultural factors contributing to PEM in children under five years

2.4.1 Breast feeding practices

Greer et al, (2008) documented in a study on the effects of early nutritional interventions on the development of atopic disease in infants and children under 5 years and the role of maternal dietary restriction, breastfeeding, timing of introduction of complementary foods, and hydrolyzed formulas that cultural factors which prolonged the duration of breast feeding and delayed the introduction of complimentary foods could negatively influence protein energy malnutrition among children under 5 years of age.

Similarly, Ojofeitimi et al, (2005) revealed in their study about breast feeding practices in urban and rural health centres and the impact of baby friendly hospital initiative in Ile-Ife, Nigeria that the majority of urban dwelling mothers did not practice adequate breast feeding and the minority who breast fed were not willing to breast feed up to the required duration and this could influence protein energy malnutrition.

Even in developed contexts breastfeeding mothers face hurdles, such as societal pressure not to breastfeed in public and the lack of proper facilities that enable breastfeeding at the workplace.³⁹ At the same time, the lack of paid maternity leave or maternity leave that does not cover the WHO-recommended six months of exclusive breastfeeding often leaves no choice to young mothers but to return to work and to stop/reduce breastfeeding (UN, 2012).

2.4.2 Influence of extended family members

Kamau-Thuita et al (2009) documented in a study about child care practices and nutritional status of children aged 0-2 years in Thika, Kenya that common cultural practices of leaving infants with extended family members before they were ready in an effort to stop breast feeding could influence protein energy malnutrition if the infant does not receive adequate replacement feeding and care.

2.4.3 Poor social and care environment

Poor social and care environment often consisted largely of poor infant feeding practices, poor home care for ill children, and poor health care seeking behaviour. It was also noted that over reliance on herbal medication rather than modern medication had been one of the contributing factors to PEM. (Kotecha, 2006).

CHAPTER THREE: METHODOLOGY

3.1 Introduction

This chapter focuses on the methodological aspect of the study. The sub-topics covered include: study area, study design and rationale, study setting and rationale, study population, sample size, sampling technique (procedure), inclusion criteria, definitions of variables, research instruments, data collection procedure, data management, data analysis, ethical considerations, study limitations and dissemination of results.

3.2 Study Design and Rationale.

A cross-sectional descriptive study was done. It involved qualitative and quantitative methods of data collection.

3.3 Study setting and rationale.

The study was carried out in Nkondo Sub-county, located in west Budiope County; in Buyende district. Buyende district is located in Busoga region in central east Uganda, being bounded by Lake Kyoga in the north and west, Kamuli and Luuka districts in the south; and Kaliro and Palisa districts in the east.

The main economic activities carried out in the area include: agriculture and cattle rearing.

The study area was selected because the researcher comes from the same area and hence made observational studies on the prevalence of malnutrition in the area.

3.4 Study population

The study comprised care takers of children under five years of age. According to UCC, by 2011 Nkondo sub-county had a total population of 24,200 people of which 12,400 were women and 11800 men.

3.4.1 Sample size determination

The sample size (n) was calculated using the standard formula below:-

$$n = \frac{Z^2 P (1-P)}{d^2} \text{ (Lwanga and Tye 1986).}$$

Where d = margin of error of setting a significance level of 0.05 (i.e. 5%).

Prevalence of PEM in Uganda and is known to be 24% (UBOS; 2006)

P to be used for this study is 24%

Z=Level of significance (1.96) for confidence interval of 95%.

With the above formula a minimum of 156 respondents had to be recruited into the study. A total of 160 respondents was recruited.

3.4.2 Sampling procedure

Simple random sampling technique was used so that people are provided equal chances to participate in the study.

Groups of participants were chosen to represent the entire population under the study. Papers were written on 1-60 numbers and put in a box; each potential respondent was required to pick one paper and only once. All potential respondents who picked papers having even numbers were given questionnaires to fill after consenting.

3.4.3 Inclusion criteria

The respondents who participated in the study were women of child bearing age/ care takers who had children under five years of age. They were residents of Nkondo Sub-county, found at their respective homes and required to consent to participate in the study.

3.4.5 Exclusion criteria

Respondents who meet the inclusion criteria above but refused to consent to their voluntary participation in the study, those with mental illness and the non permanent residents were excluded from the study.

3.5 Definition of variables

The independent variables were socio-demographic characteristics of the respondents eg age, education level, parity. The dependent variables: Were be responses about factors contributing to the prevalence of protein energy malnutrition in the study area.

3.6 Research instruments

The researcher used semi-structured questionnaire to collect information from respondents. This comprised both closed and open ended questions in sections according to the study objectives.

3.7 Data collection procedure.

The researcher used an interview guide to get data from the respondents and they were assisted by the researcher and research assistants to interpret the questionnaires in their local language since some of them did not know how to read and write.

3.7.1 Data management

Questionnaires were collected and checked for completeness and consistency; they were then counted before leaving for home. They were then kept in a safe place.

3.7.2 Data analysis

Data analysis was done manually by the researcher through coding, editing and tabulation of results using statistical package for scientists (SPSS) and Microsoft Excel. The results were then presented in form of tables, pie-charts and graphs.

The researcher then interpreted the study results and compiled a report on the study findings.

3.8 Ethical considerations

On approval of the proposal an introductory letter was obtained from the Dean faculty of clinical medicine and dentistry of KIU-WC. The letter was used to introduce the researcher to the DHO, Buyende district, and the chairperson, Nkondo Sub-county for permission to carry out the study within the area. The permission was sought from the respondents and were voluntarily chosen to participate and consent to their participation in the study with assured confidentiality from the researcher and research assistants.

Signatures instead of names of the respondents were used, and data was safely kept in locked cupboards to ensure security from the public.

3.9 Study limitations

- ❖ Insufficient funds; since the research was financed by the researcher funds were inadequate thus were solved by borrowing and seeking sponsors for research funds.
- ❖ Limited time.

3.10 Dissemination of the results

Copies of this dissertation are to be distributed to the following;

- Kampala international university, western campus (KIU-WC) for award of a bachelor of medicine and bachelor of surgery.
- The District Health Officer, Buyende district for proper planning.
- Kampala international university, western campus (KIU-WC) library, for future references.
- The chairperson, Nkondo sub county, Buyende district
- The incharge, Nkondo Health centre III, for proper planning.

CHAPTER FOUR: RESULTS

4.1 Introduction

This chapter presented results from respondents. The researcher gathered data from questionnaires. The findings were analyzed and presented in form of tables, figures and graphs where frequency and percentages were used. The study interviewed a sample of 160 respondents.

4.2 Section A: Demographic Characteristics

The questionnaire contained questions on demographic data of respondents, knowledge of mothers/caretakers about SAM, socio economic factors and cultural factors contributing to protein energy malnutrition in children less than five years in Nkondo Sub County, Buyende District. The results were presented as follows:

Table 2: Demographic data of the respondents**(n=160)**

Variables	Frequency	Percentage (%)
Sex		
Male	40	25
Female	120	75
Age		
18 – 25 years	100	62.5
26 – 35 years	40	25
36 years and above	20	12.5
Education level of mother/caretaker		
None	28	17.5
Primary level	96	60
Secondary level	12	7.5
Tertiary level	24	15
Marital status		
Single	36	22.5
Married	88	55
Widowed	12	7.5
Separated/divorced	24	15
Occupation of the mother/caretaker		
House wife	68	42.5
Civil servant	12	7.5
Self employed	20	12.5
Peasant/farmer	60	37.5
Religion		
Catholic	80	50
Protestant	60	37.5
Muslim	20	12.5
Tribe		
Ateso	44	27.5
Basoga	80	50
Bagishu	20	12.5
Baganda	16	10

Information about the child

Table 3: Relationship of the respondent to the child

(n=160).

Relationship	Frequency	Percentage (%)
Mother	120	75
Guardian	24	15
Father	16	10
Total	160	100

Table 4: Whether respondents stayed with their children

(n=160).

Variables	Frequency	Percentage (%)
Yes	136	85
No	24	15

The majority of respondents 120 (75%) were female while the least 40 (25%) were male. Most respondents 100 (62.5%) were in the age range of 18 – 25 years, followed by 40 (25%) who were in the age range of 26 – 35 years while the least 20 (12.5%) were 36 years and above.

More than half of the respondents 96 (60%) had attained primary level education, followed by 28 (17.5%) who had not attained any formal education while the least 12 (7.5%) had attained secondary level education. More than half of the respondents 88 (55%) were married while the least 12 (7.5%) were widowed.

A total of 68 (42.5%) were house wives, followed by 60 (37.5%) who were peasants, 20 (12.5%) who were self employed while 12 (7.5%) were civil servants.

Half of the respondents 80 (50%) were Catholic while 20 (12.5%) were Muslims.

Half of the respondents 80 (50%) were Basoga, followed by 44 (27.5%) who were Ateso while 16 (10%) were Baganda. The majority of respondents 120 (75%) were mothers while 16 (10%) were the fathers of the children. The majority of respondents 136 (85%) stayed with their children while the least 24 (15%) did not stay with their children.

4.3 Section B: Knowledge of mothers/caretakers about SAM

Table 5: Distribution of respondents who had ever heard of SAM

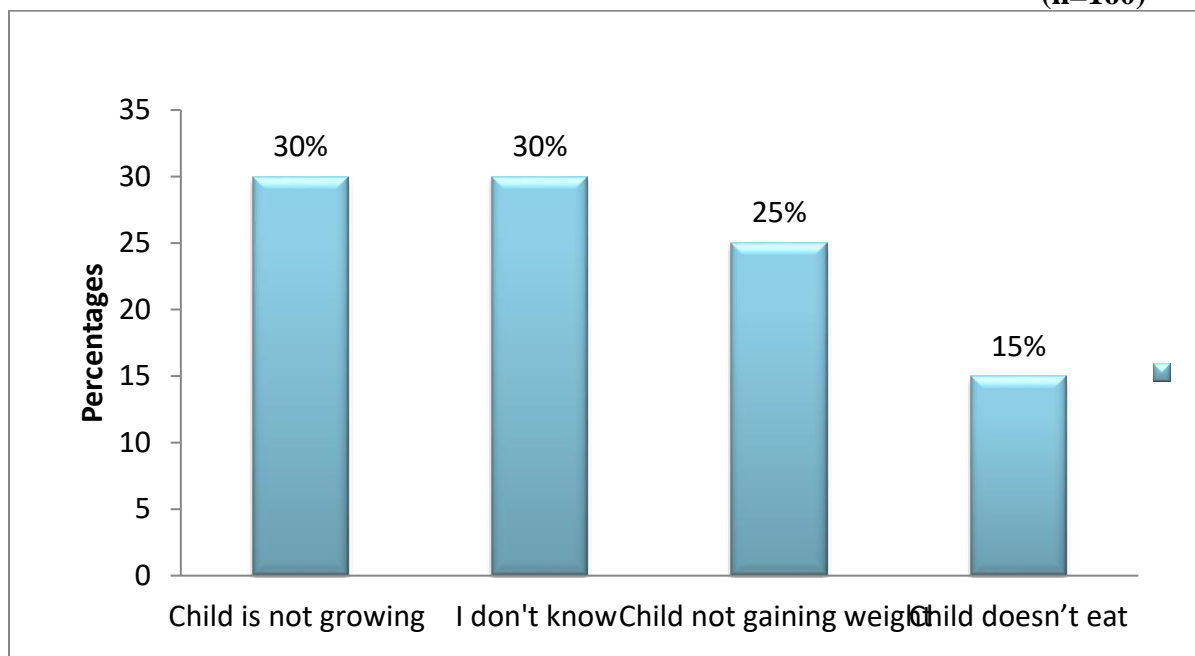
(n=160.)

Responses	Frequency (n=160)	Percentage (%)
Yes	120	75
No	40	25
Total	160	100

One hundred twenty (75%) of the respondents had ever heard of protein energy malnutrition while 40 (25%) had never had about SAM.

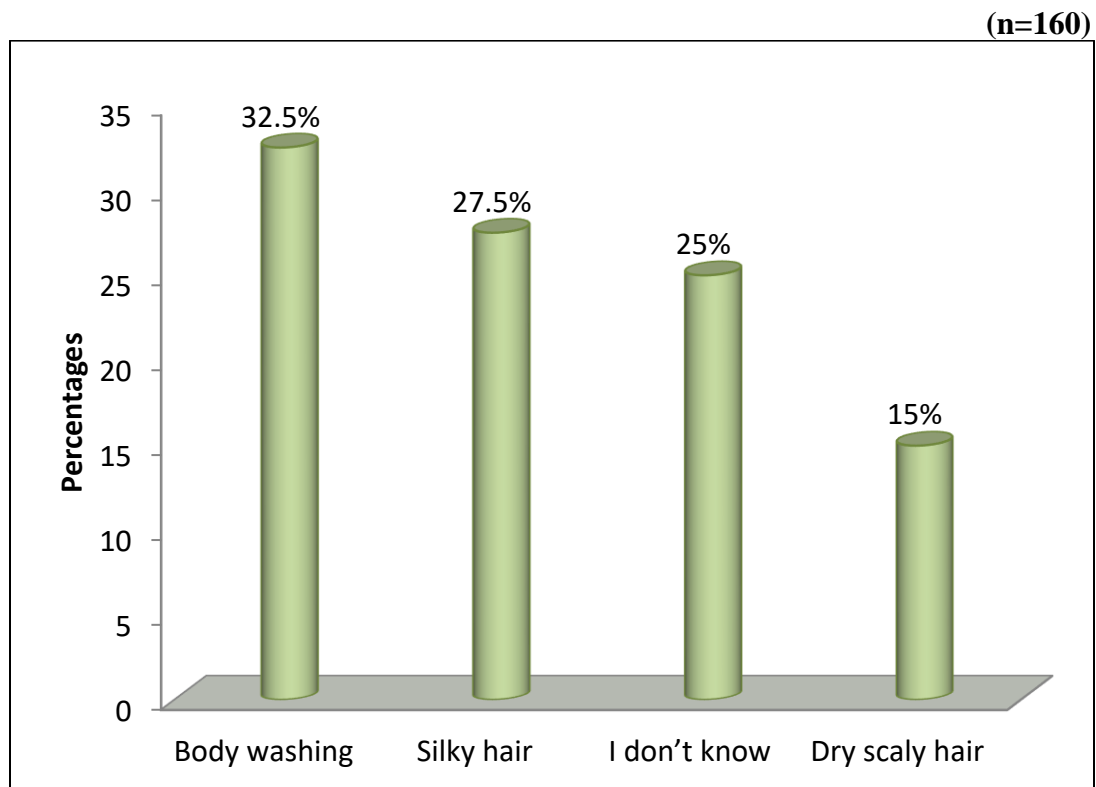
Figure1: Respondents' understanding of protein energy malnutrition

(n=160)



Findings showed that the majority of the respondents had an idea about the meaning of SAM as 48 (30%) understood protein energy malnutrition as 'the child not growing well', followed by 40 (25%) as the 'child not growing well', and 24 (15%) understood it as the child not eating well while 48 (30%) did not have an idea about the meaning of SAM.

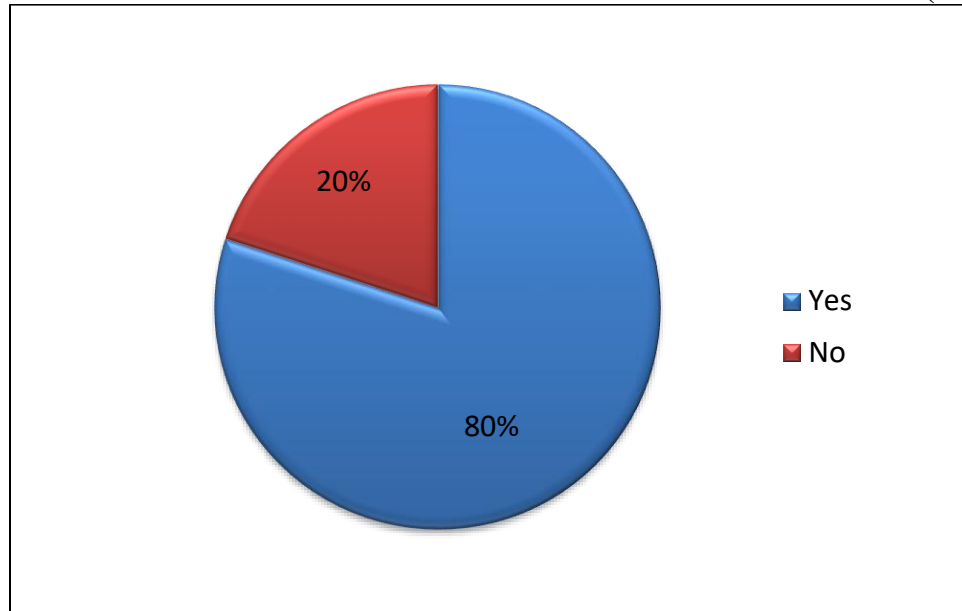
Figure 2: Signs and symptoms of protein energy malnutrition



Results showed that the majority of the respondents 52 (32.5%) mentioned body wasting as a sign/ symptom of protein energy malnutrition, followed by 44 (27.5%) who mentioned silky hair, 24 (15%) mentioned dry scaly hair while 40 (25%) did not have any idea about the signs/symptoms of SAM.

Figure 3: Distribution of respondents who exclusively breast fed their children

(n=160)



The pie chart shows that the majority of respondents 128 (80%) exclusively breast fed their children while 32 (20%) did not exclusively breast fed their children.

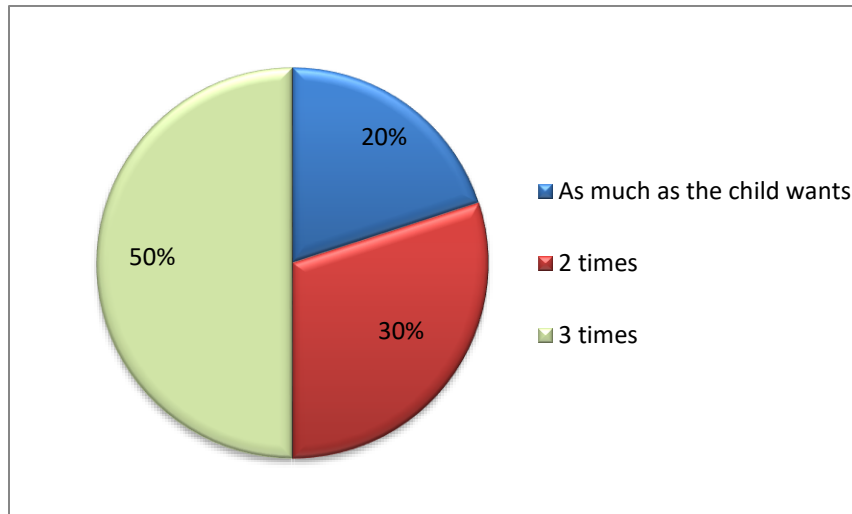
Table6: Duration of exclusive breast feeding by the respondents.

(n=128)

Responses	Frequency	Percentage (%)
3 months	80	62.5
6 months	48	37.5
Total	128	100

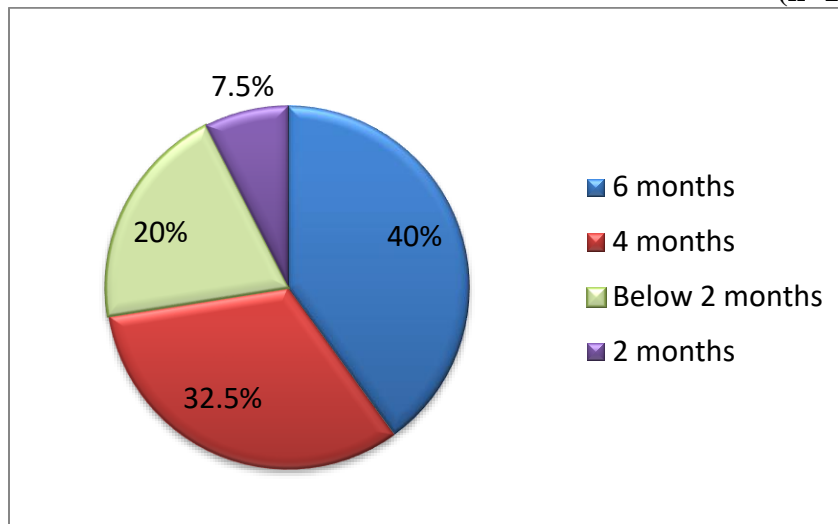
Out of the 128 respondents who exclusively breast fed their children, 80 (62.5%) exclusively breast fed for 3 months and the remaining 48 (37.5%) breast fed exclusively for 6 months.

Figure 4: Number of times respondents breast fed their children in 24 hours
(n=160)



Half of the respondents 80 (50%) breast fed their children 3 times in 24 hours, followed by 48 (30%) who breast fed their children 2 times while 32 (20%) breast fed as much as the child wanted.

Figure 5: Age at which respondents introduced other foods other than breast milk
(n=160)

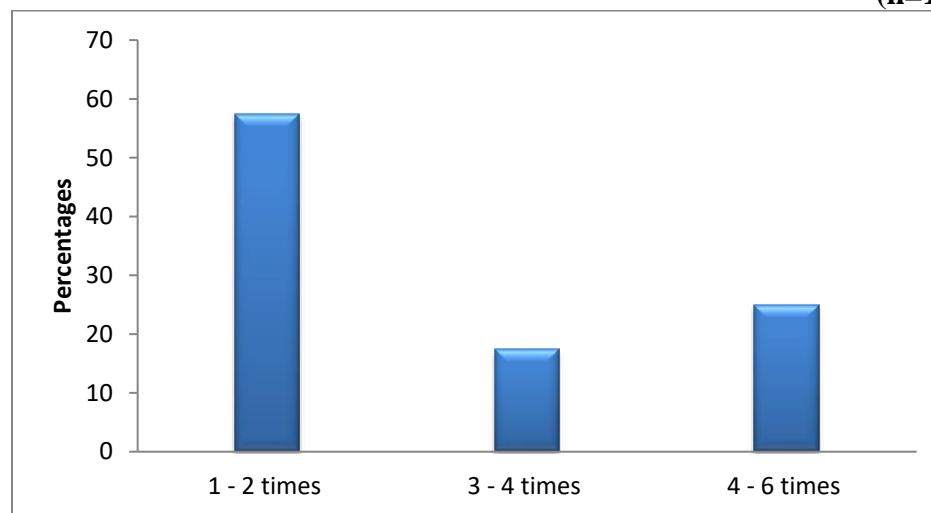


The majority of the respondents 64 (40%) reported 6 months as the age at which they introduced other foods, followed by 52 (32.5%) who mentioned 4 months, 32 (20%) below 2month and 12 (7.5%) who mentioned 2 months.

Table 7: Foods used by respondents as weaning foods**(n=160)**

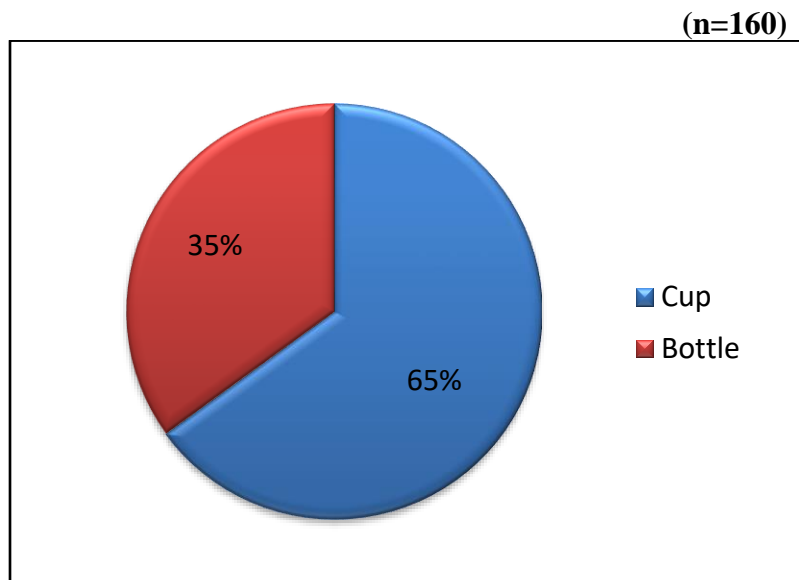
Responses	Frequency (n=160)	Percentage (%)
Cow's milk	40	25
Baby soya porridge	20	12.5
Maize porridge	60	37.5
Soft foods/mashed food	8	5
Foods of animal origin	28	17.5
Others	4	2.5
Total	160	100

A total of 60 (37.5%) mentioned maize porridge as a food used for weaning children, followed by 40 (25%) who reported cow's milk, 28 (17.5%) mentioned foods of animal origin, 20 (12.5%) mentioned baby soya porridge, 8 (5%) mentioned soft foods/mashed food while 4 (2.5%) reported use of other foods than the above.

Figure 6: How often respondents fed their children in 24hours.**(n=160)**

The majority of respondents 92 (57.5%) reported feeding their children 1 – 2 times, followed by 40 (25%) who mentioned feeding them 4 – 6 times while the least 28 (23.3%) mentioned 3-4 times.

Figure 7: What respondents used to feed their children.



The majority of respondents 104 (65%) used cups to feed the children while the least 56 (35%) mentioned using bottles.

Table 8: How often respondents' children got sick

(n=160)

Responses	Frequency (n=40)	Percentage (%)
Once a month	40	25
Twice a month	88	55
More than twice a month	32	20
Total	160	100

More than half of the respondents 88 (55%) said their children got sick twice a month, followed by 40 (25%) who said they got sick once a month while 32 (20%) said their children got sick twice a month.

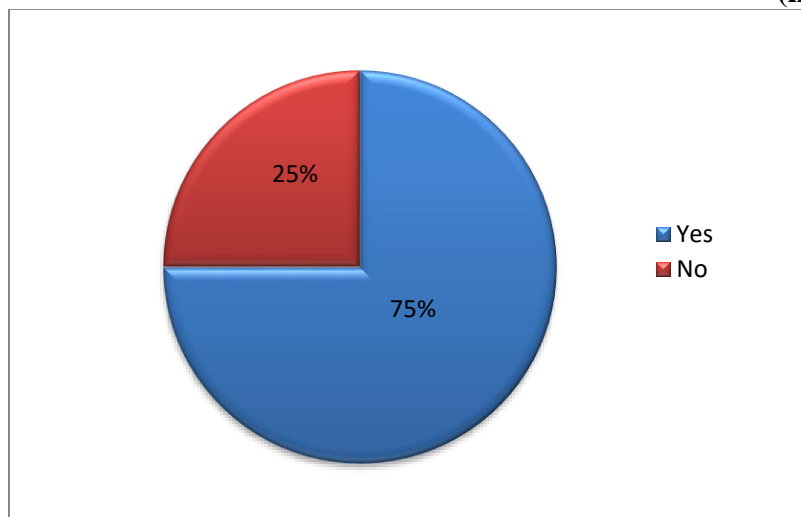
4.4 Section C: Socio economic factors contributing to protein energy malnutrition

Table 9: Daily income of respondents

Daily incomes	Frequency (n=160)	Percentage (%)
Less than 1000shs	116	72.5
1000 – 10,000shs	40	25
>10,000– 20,000shs	4	2.5
>20,000 Shs	0	0
Total	160	100

Most respondents 116 (72.5%) reported having a daily income of less than 1000shs, followed by 40 (25%) who had an income of 1,000 – 10,000shs, 4 (2.5%) with an income of >10000-20000shs while no respondent had an income of >20000shs.

Figure 8: Whether respondents thought their children received enough food (n=160)



The majority of respondents 120 (75%) thought that their children received enough food while the least 40 (25%) thought they did not get enough food.

Table 10: Reasons why respondents' children did not get enough food.

(n=160)

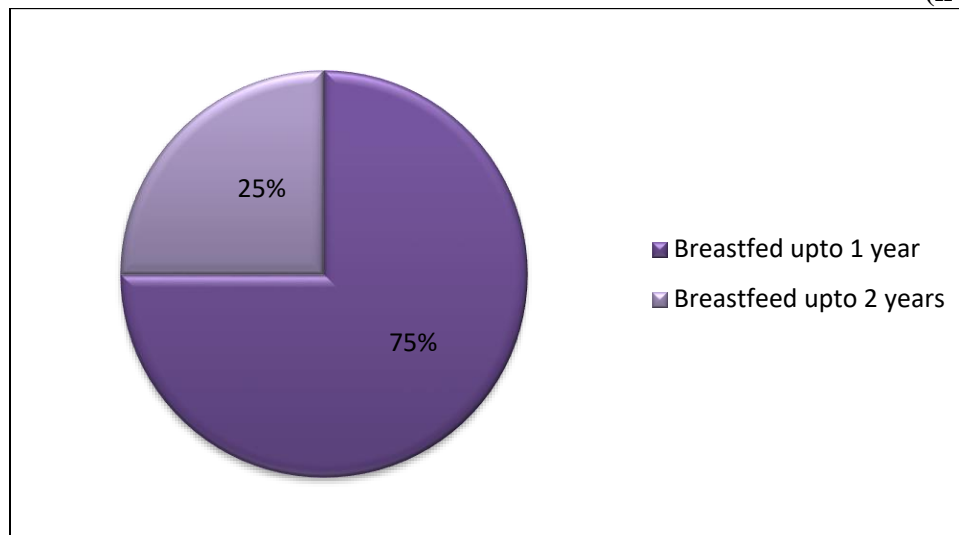
Reasons	Frequency	Percentage (%)
Inadequate finances	112	70
We do not have enough food	48	30
Total	40	100

The majority of respondents 112 (70%) mentioned inadequate finances as a reason why their children did not get enough food while 48 (30%) mentioned lack of adequate supply of food. All the respondents 160 (100%) were overcoming the above problems by growing more food and getting involved in income generating activities.

4.5 Section D: Cultural factors contributing to protein energy malnutrition

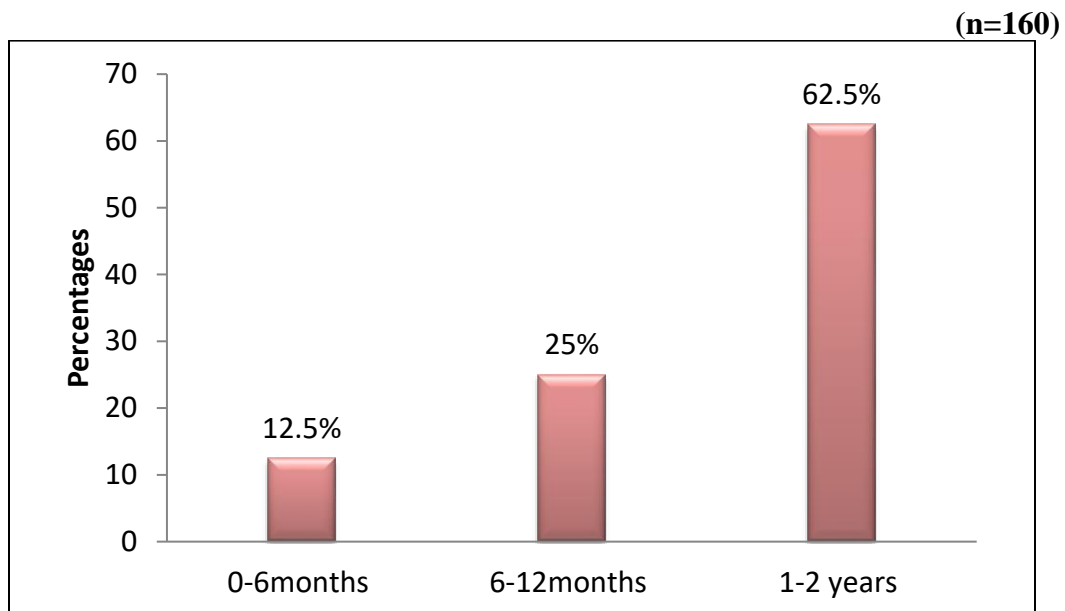
Figure 9: Respondents' beliefs about breast feeding

(n=160)



The majority of respondents 120 (75%) reported that their cultural beliefs about breast feeding required them to breast feed up to 1 year while the least 40 (25%) mentioned 2 years.

Figure10: Age at which culture allowed introduction of weaning foods



The majority of respondents 100 (62.5%) reported that their culture allowed introduction of weaning foods at 1 – 2years, followed by 40 (25%) who mentioned 6 –1 2 months while 20 (12.5%) mentioned 0 – 6 months.

Table 11: Whether respondents got support from family members and spouses when the child got sick

(n=160)

Responses	Frequency (n=160)	Percentage (%)
Yes	40	25
No	120	75
Total	160	100

The majority of respondents 120 (75%) did not get support from family members and spouses when the child is sick while the least 40 (25%) got support from family members such as material and financial support.

Table 12: Where respondents took children when they were sick

Responses	Frequency (n=160)	Percentage (%)
Traditional healer	40	25
To the nearby clinic or hospital	56	35
Give herbal medicine	64	40
Total	160	100

Findings showed that 64 (40%) mentioned giving children herbal medicine when they are sick, followed by 56 (35%) who reported taking the children to the nearby clinic or hospital and then 40 (25%) who reported taking the children to the traditional healer.

CHAPTER FIVE:DISCUSSIONS

DISCUSSION, CONCLUSIONS, RECOMMENDATIONS AND MEDICAL IMPLICATIONS

5.1 Introduction

This chapter presented the discussion of findings, conclusions and recommendations and medical implications of the study which were obtained after data analysis.

5.1.1 Demographic and Social Characteristics

The majority of respondents 120 (75%) were female which was expected as it is mostly women who play the caretakers role and remain at home to care for the kids although a few men were also involved.

Most respondents 100 (62.5%) were in the age range of 18 – 25 years, followed by 40 (25%) who were in the age range of 26 – 35 years which demonstrated that most respondents were relatively young and they may not have acquired enough knowledge and experience in caring for children, ensuring the nutritional status of these children as well as prevention of protein energy malnutrition.

More than half of the respondents 88 (55%) had attained primary level education, which demonstrated that most respondents had attained little education and this could negatively affect their knowledge and awareness of the importance of maintaining the nutritional status of their children and ensure the prevention of protein energy malnutrition. This study was in line with Allen (2006) who mentioned in a study about the causes of nutrition-related public health problems of preschool children that among the causes of protein energy malnutrition, findings showed that most respondents did not have sufficient knowledge about protein energy malnutrition. This was attributed to the low level of educational attainment of mothers.

A total of 68 (42.5%) were house wives, which implied that since most respondents did not have any economic activity which moved them from home, they had ample time to care for their children under 5 years, ensure adequate feeding and nutrition and prevent protein energy malnutrition.

Half of the respondents 80 (50%) were Basoga. This was expected as the study area was inhabited by respondents of this tribal background hence their cultural practices may have a significant impact on the findings of the study. However, respondents of other tribal backgrounds also participated in the study.

The majority of respondents 136 (85%) stayed with their children which implied that they were in a better position to ensure adequate nutrition for their children and prevent SAM. This avoided the common cultural practices of leaving infants with extended family members before they were ready in an effort to stop breast feeding which could influence SAM if the infant did not receive adequate replacement feeding and care (Kamau-Thuita et al 2009).

5.1.2 Knowledge of mothers/caretakers about SAM.

Most of the respondents, 120 (75%) had ever heard of SAM and the largest number of respondents had a rough understanding of SAM; 48 (30%) understood it as the child not growing well, followed by 40 (25%) who understood it as failure of the child to gain weight, 24 (15%) understood it as failure of the child to eat food while 48 (30%) did not know. Furthermore, most, 52 (32.5%) respondents mentioned body wasting as a sign and symptom of SAM, followed by 44 (27.5%) who mentioned silky hair, 40 (25%) mentioned dry scaly hair while a few, 24 (15%) reported dry scaly hair. This showed that most of the respondents had some knowledge but was inadequate about SAM hence probably acted as one of the protective factors on the prevalence of

SAM in the study area. This study was in line with *Hien, N.N., Kam, S (2008) who documented* that most mothers/caretakers had inadequate knowledge about SAM, what caused it as well as what could be done to prevent it.

The majority of respondents 128 (80%) exclusively breast fed their children and this could be one of the protective factors to the development of SAM in the study area. However, of those who exclusively breast fed, only 80 (62.5%) of them exclusively breast fed for 6 months as recommended by WHO. Perhaps the remaining 48 (37.5%) who exclusively breast fed for less than six months were predisposed and were at an increased risk for the development of SAM on addition to the 32 (20%) who never exclusively breast fed at all.

A total of 60 (37.5%) mentioned maize porridge as a food used for weaning children, followed by 40 (25%) who reported cow's milk, 28 (20%) mentioned foods of animal origin, 20 (12.5%) mentioned baby soya porridge, 8 (5%) mentioned soft foods/mashed food while 4 (2.5 %) mentioned other foods. This showed that most respondents were aware of the various foods which were provided to children. This study was not in line with the finding that the majority of mothers with children less than five years lack adequate knowledge about protein energy malnutrition and how it can be prevented (Babington and Patel 2008).

On the other hand however, SAM in this area probably also arises from the study finding that, most mothers could not name the major foods for a balanced diet as well as the recommended daily intakes for their children under 5 years of age.

The majority of respondents 92 (57.5%) reported feeding their children 1 – 2 times in a day. This showed that most respondents did not adequately feed their children and this could potentially predispose their children to increased risk of developing SAM. This study was in agreement with

the finding elsewhere that the factors influencing SAM among children under 5 years of age, is the over-consumption of unhealthy foods; that is consuming more calories than needed can cause SAM just as not eating enough calories, essential vitamins and minerals, thus leading to malnutrition (Waihenya, Kogi-Makau and Muita 2006).

More than half of the respondents 88 (55%) said their children got sick twice a month, followed by 40 (25%) who said they got sick once a month. This demonstrated that most respondents' children were sickly and this may be due to poor nutritional status and feeding. On the other hand, recurrent infections or sickness is a strong predisposing factor to SAM development.

5.1.3 Socio-economic factors contributing to protein energy malnutrition

An over whelming number of the respondents 116 (72.5%) had a daily income of less than 1000 shs. This showed that most respondents had a low level of income and this could potentially limit purchasing power and their ability to access the required foods hence predisposing them to SAM. This finding was in line with a study which revealed that in Sub Saharan Africa, PEM was usually found among the children of low socioeconomic families (Roy, et al, 2008).

Although the majority of respondents 120 (75%) thought their children received enough food, a significant number 40 (25%) mentioned that their children did not get enough food because of inadequate finances, and lack of adequate supply of food. Hence the 40 (25%) of the respondents' children were at risk of developing SAM.

5.1.4 Cultural factors contributing to protein energy malnutrition

The majority of respondents 120 (75%) reported that their cultural beliefs about breast feeding required them to breast feed up to 2 year while the least 40 (25%) mentioned 1 year. This

showed that some respondents 40 (25%) had cultural influences which limited the duration of breast feeding and this greatly affected the nutritional status of children under 5 years which predisposed to SAM.

The majority of respondents 100 (62.5%) reported that their culture allowed introduction of weaning foods at 1-2 years, followed by 40 (25%) who mentioned 6 – 12 months while the least 20 (12.5%) mentioned 0 – 6 months. This demonstrated that a significant number of the respondents were well below the recommended age for weaning which is 18-24 month as per WHO. This could predispose them to SAM.

The majority of respondents 120 (75%) did not get support from family members and spouses when the child got sick which implied that lack of support and involvement of spouses and other family members also increased the risk of exposure to protein energy malnutrition among children under 5 years as mothers were unable to get both economic and social support required. Findings showed that 64 (40%) mentioned giving children herbal medicine when they got sick, followed by 56 (35%) who reported taking their children to the nearby clinic or hospital and the least 40 (25%) mentioned traditional healer. This therefore demonstrated that there was over reliance of respondents on herbal medication and traditional healers which could lead to poor health status of the children. This study was in agreement with the finding that poor social and care environment often consists largely of poor infant feeding practices, poor home care for ill children, poor health care seeking behavior and that over reliance on herbal medication rather than modern medication had been one of the contributing factors to SAM (Kotecha, 2006).

5.2 Conclusion

In conclusion, majority of the respondents had some knowledge about SAM. For instance more than a half of the respondents had ever heard of SAM and were also aware of some of its signs and symptoms.

However, a significant number of respondents had their children predisposed to the risk of developing SAM because;

- Some respondents did not exclusively breast feed their children and introduced other foods earlier than the recommended time by WHO.
- Most of the respondents had low socio economic status as they reported having a daily income of less than 1000shs.
- A reasonable number of respondents reported cultural beliefs about breast feeding which required them to breastfeed up to only one year, well below the recommended 18-24 months by WHO. This affected the nutritional status of their children under 5 years hence predisposing them to SAM.

5.3 Recommendations

In a bid to reduce and prevent protein energy malnutrition in Nkondo Sub County, Buyende District, the following recommendations were made:

- ❖ The Ministry of Health should emphasize health promotion, education, information and awareness about good child nutrition in Nkondo Sub County and the country at large.

- ❖ Health education and awareness about SAM should be emphasized by Nkondo health centre III team with multi-sectoral collaboration with the office of the DHO Buyende district, the ministry of health of Uganda and local leaders in the sub county.
- ❖ Community participation and involvement. Mothers/caretakers of children under 5 years of age should ensure that they exclusively breast feed their children for 6months, feed their children on a balanced diet, wean their children at the recommended age with appropriate weaning foods and to be involved in more income generating activities as this helps to ensure that they have the ability to purchase recommended food items as well as ensuring food security in their households.

5.4 Implications to medical practice

The implications of these findings to the medical practice include the following:

Health workers in Nkondo Sub County have an important role to play in ensuring that protein energy malnutrition among children under 5 years of age is prevented and this includes frequent interaction and sensitization of mothers/caretakers about how to ensure adequate nutrition and diet for their children as well as sensitizing mothers on dangers of not ensuring adequate nutrition for children under 5 years of age.

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APPENDICES


Appendix I: Research Budget

No.	Item	Quantity	Unit Price (Ug. Shs.)	Amount (Ug. Shs.)
1.	Stationery			
	Photocopying paper	2 reams	15,000	30,000
	File folders	6pcs	1,000	6,000
	Pens	5	300	1,500
	Flash disk	1	50,000	50,000
	Sub-total			
2.	Typing Services			
	Questionnaire	40	400	16,000
	Proposal	4 copies	25,000	100,000
	Report	4 copies	40,000	160,000
	Binding (Proposal and Report)	8 copies	3,000	24,000
	Sub-total			300,000
3.	Data Collection			
	Transport to study area			105,000
	Lunch	4 days	7,000	28,000
	Sub-total			133,000
4.	Literature search (libraries, Internet)			100,000
	Sub-total			100,000
	Grand Total			620,000

Appendix II: Work Plan

S/ No	ACTIVIT Y	TIME FRAME 2014									RESPONSI BLE PERSON
		FE B	MAR CH	APR IL	MA Y	JUN E	JUL Y	AU G	SEP T	OC T	
1	WRITING PROPOSA L										Researcher
2	DATA COLLETI ON										Research Assistants
3	DATA ANALYSI S										Researcher
4	REPORT WRITING										Researcher
5	REPORT BINDING										Researcher
6	SUBMISS ION OF REPORT										Researcher

Key

 Activity done per month

Appendix III: Consent Form:

Introduction

I am a medical student offering a bachelor of medicine and bachelor of surgery of Kampala international university western campus. I am carrying out a research to assess factors contributing to the prevalence of protein energy malnutrition in Nkondo Sub-county, Buyende district.

You have been selected as a potential participant in the study. This research is absolutely for academic purposes and all responses obtained from you shall be treated with maximum confidentiality. You are free to participate and you may drop out of the study at any point of time. We shall use signatures instead of names for the purpose of confidentiality thank you.

Consent

I (sign/thumbprint only)..... Willingly allow to participate in the study after being explained to its purpose.

Respondents Sign / Thumb Print

Researcher's / researcher assistant's Sign.....

Date.....

Appendix IV: Questionnaire

Factors contributing to severe acute malnutrition among children under five in Nkondo Sub-County, Buyende District.

Instructions:

You are requested to answer the questions by ticking in the appropriate box where options are given / or fill in answers where gaps are provided.

THE INDEPENDENT VARIABLE (CARETAKER)

Section A: Demographic data of Respondents

Q 1) Sex

1) Male

☐

2) Female

☐

Q 2) Age(years).

1) 13-20

2) 21-26

3) 27-32

4) 33-38

5) >38

Q 3) Education level of mother/caretaker

1) None

☐

2) Primary

☐

3) Secondary

☐

4) Tertiary / university ☐

Q 4) Marital status

1) Single ☐

2) Married ☐

3) Widowed ☐

4) Separated/divorced ☐

5) Others.....

Q 5) Occupation of the mother/caretaker

1) House wife ☐

2) Civil servant ☐

3) Self employed ☐

4) Peasant/farmers ☐

Q 6) what is your religion?

1) Catholic ☐

2) Protestant ☐

3) Muslim ☐

4) Others(specify)

Q7)What is your tribe.....

Q 8) Relationship to the child

1) Mother ☐

2) Guardian ☐

3) Father ☐

Q 9) Do you stay with your child?

☐

1) Yes

2) No

☐

Section B: Knowledge of Mothers/Care Takers about SAM

Q 10) what do you understand by severe acute malnutrition?

- ❖ Has knowledge if she/he knows/mentions one or more of the conditions below.
- ❖ Has no knowledge if he/she does not know/mention any of the conditions below:

1) Child is not growing well.

2) Child doesn't eat.

3) Child is not gaining weight.

4) Child is wasted.

5) Child's body is swollen

6) Child has silky/scanty/dry scaly/ easily pluckable hair.

Q 13) Do you exclusively breast feed your baby?

1) Yes

2) No

☐☐

Q 14) If yes, for how long?

1) 3 months

2) 6 months

3) Others (Specify).....

☐☐

Q 15) How many times do you breast feed your child in 24 hours?

1) 2 times

2) 3 times

☐☐

- 3) As much as the child wants ☐
- 4) Others (Specify).....

Q 16) At what age do you start introducing in other foods?

- 1) 2 months ☐
- 2) 4 months ☐
- 3) 6 months ☐
- 4) Others (Specify).....

Q 17) What foods do you use?

- 1) Cow milk ☐
- 2) Baby soya porridge ☐
- 3) Maize porridge ☐
- 4) Soft foods/mashed food ☐
- 5) Foods of animal origin ☐
- 6) Others (specify).....

Q 18) How often do you feed the child?

- 1) 1-2 times ☐
- 2) 3 times ☐
- 3) 4-6 times ☐
- 4) Others (specify).....

Q 19) What do you use to feed the child?

- 1) Bottle ☐
- 2) Cup ☐
- 3) Other(specify)

Q 20) How often does your child get sick?

Q 21) what are the common infections/diseases that your child often gets?

- a) Diarrheal diseases
- b) Respiratory tract infections
- c) Urinary tract infections
- d) Malaria
- e) Others (specify).

Section C: Socio-economic factors contributing to Severe Acute Malnutrition

Q 21) What is your daily income?

- 1) less than 1,000 shs.
- 2) 1,000-10,000 shs
- 3) >10,000-20,000 shs
- 4) Above 20,000 shs

☐
☐
☐
☐

Q 22) Do you think your child receives enough food?

- 1) Yes
- 2) No

☐
☐

Q 23) If no, why?

- 1) Inadequate finances

- 2) Lack of time

- 3) We do not have enough food

- 4) Other (Specify).....

☐
☐

Q 24) How are you solving the above problem?.....

Section D: Cultural factors contributing to Severe Acute Malnutrition.

Q25) What are your beliefs about breast feeding in your culture.....

.....

Q 26) When does a child start eating other foods during the period of breast feeding according to your culture?

Q 28) Where do you take your child when he or she gets sick?

- | | |
|-------------------------------------|--------------------------|
| 1) Traditional healer | <input type="checkbox"/> |
| 2) To the nearby clinic or hospital | <input type="checkbox"/> |
| 3) Give herbal medicine | <input type="checkbox"/> |

Q 29) Do you get support from family members or spouse when your child is sick?

- | | |
|--------|--------------------------|
| 1) Yes | <input type="checkbox"/> |
| 2) No | <input type="checkbox"/> |

Thanks for your participation

APPENDIX V: INTRODUCTORY LETTER



**KAMPALA
INTERNATIONAL
UNIVERSITY**

Ishaka Bushenyi * PO BOX 71 Ishaka, Uganda
Tel: +256 (0)771696711/0703817216 Fax: +256 (0) 41 - 501 974
E-mail: admin@kiu.ac.ug * Website: <http://www.kiu.ac.ug>

**OFFICE OF THE DEAN
FACULTY OF CLINICAL MEDICINE & DENTISTRY**

03/05/2014

TO WHOM IT MAY CONCERN

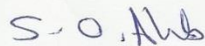
RE: BUTENYE LAZARUS (BMS/0108/91/DU)

The above named is a student of fifth year at Kampala International University pursuing a Bachelor of Medicine, Bachelor of Surgery (MBChB) programme.

He wishes to conduct his research project in your area Nkondo sub county, Buyende district.

Topic: Factors contributing to severe acute malnutrition in children under five in Nkondo, Buyende.

Thank you


Dr. Akib Surat
Asso. Dean, FCM &D



"Exploring the Heights"

Appendix VI: Permission letter

Nkondo Sub-County

P.O. Box ...

Buyende district

Uganda.

Date: 01/09/2014

Butenye Lazarus

Kampala International University- Western Campus


P.O.BOX 71, Bushenyi

RE: PERMISSION TO CONDUCT RESEARCH

I write to inform you that you have been granted permission to conduct research titled "Factors contributing to severe acute malnutrition in children under five years in Nkondo Sub-county, Buyende District.

You are required to share your findings with the Nkondo Sub-county team at the end of your research.

.....
BASALIRWA WILBERFORCE
Chairperson L.C III
Nkondo Sub-county



The map displays the following districts and their locations:

- North:** Moyo, Lamwo, Kitgum, Kaabong, Kotido, Abim, Moroto, Napak, Amudat, Katakwi, Nakapiripiri, Binyiny, Bukwa, Bududa.
- West:** Koboko, Yumbe, Maracha, Arua, Zombo, Nebbi, Bulisa, Kiryandongo, Masindi, Hoima, Ntoroko, Bundibugyo, Kabarole, Kasese, Rubirizi, Bushenyi, Kanungu, Kisoro, Kabale.
- Central:** Adjumani, Kilak, Nwoya, Anyeke, Lira, Kole, Apac, Kaberamaido, Amolatar, Nakasongola, Kyankwanzi, Kiboga, Kibale, Kyenjojo, Mubende, Kyegegwa, Mityana, Kamwenge, Kanoni, Sembabule, Kiruhura, Kalungu, Masaka, Rakai, Mbarara, Isingiro, Ntungamo.
- East:** Pader, Agago, Otuke, Alebtong, Amuria, Dokolo, Soroti, Kapchorwa, Sironko, Mbale, Bubulo, Namutumba, Tororo, Busia, Namayingo, Kitamilo, Jinja, Luwero, Kayunga, Wakiso, Mpigi, Kalangala.

Major cities and towns include: Kampala (capital), Jinja, Entebbe, Iganga, Mayuge, Busia, Tororo, Namutumba, Bududa, Bukwa, Binyiny, Nakapiripiri, Katakwi, Amudat, Moroto, Napak, Abim, Kotido, Kaabong, Kitgum, Lamwo, Moyo, Yumbe, Koboko, Maracha, Arua, Zombo, Nebbi, Bulisa, Kiryandongo, Masindi, Hoima, Ntoroko, Bundibugyo, Kabarole, Kasese, Rubirizi, Bushenyi, Kanungu, Kisoro, Kabale, Kibale, Kyenjojo, Mubende, Kyegegwa, Mityana, Kamwenge, Kanoni, Sembabule, Kiruhura, Kalungu, Masaka, Rakai, Mbarara, Isingiro, Ntungamo, Mpigi, Kitamilo, Jinja, Luwero, Kayunga, Wakiso, Kalangala, Nakasongola, Kyankwanzi, Kiboga, Kibale, Kyenjojo, Mubende, Kyegegwa, Mityana, Kamwenge, Kanoni, Sembabule, Kiruhura, Kalungu, Masaka, Rakai, Mbarara, Isingiro, Ntungamo, Mpigi, Kitamilo, Jinja, Luwero, Kayunga, Wakiso, Kalangala.

Appendix VIII: Map of Buyende district showing Nkondo Sub County

