PREVALENCE AND FACTORS PREDISPOSING TO UNDER NUTRITION AMONG CHILDREN UNDER FIVE YEARS ATTENDING KAMPALA INTERNATIONAL UNIVERSITY TEACHING

HOSPITAL IN BUSHENYI DISTRICT

BY

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DECLARATION

This research work is my original work and has not been presented for award of a diploma in any other University.

Signature_____ Date _____

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SUPERVISORS' APPROVAL

This research report has been submitted for examination with my approval as university supervisor.

Signature _____ Date _____

MR.TUTAMWEBWA THOMAS

DEDICATION

I dedicate this research study to my parents and family for their unlimited support and giving me the strength and the will to continue when the situation was tough. I also dedicate this research to my supervisors for their relentless support and guidance all the way.

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My sincere gratitude goes to my supervisor Mr.Tutamwebwa Thomas for his patience, supervision, guidance, expert advice and support which has been invaluable throughout this whole process.

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LIST OF ACRONYMS/ ABBREVIATIONS

BCG: Bacille Calmette-Guerin

BMI: Body Mass Index

CDP: Child Days Plus

Cm: Centimeter

DHS: Demographic and Health Surveys

EPI: Expanded Programme on Immunization

FAO: Food and Agricultural Organization

HAZ: Height for Age Z-scores

HIV: Human Immunodeficiency syndrome

IYCF: Infant and Young Children Feeding

Kg: Kilogram

KIU-TH: Kampala international university teaching hospital

MAAIF: Ministry of Agriculture, Animal Industry and Fisheries

MCH: Maternal child health

MDGs: Millennium Development Goals

mm: Millimeter

MoH: Ministry of Health

MUAC: mid Upper Arm Circumference

NCHS: National Centre for Health Statistics

NPA: National Planning Authority

PEM: Protein Energy Malnutrition

SAM: Severe Acute Malnutrition

SD: Standard Deviation

SPSS: Statistical Package for Social Scientists

TASO: The AIDS Support Organization

UBOS: Uganda Bureau of Statistic

UDHS: Uganda demographic and health survey

UNSCN: United Nations System Committee on Nutrition

USAID: united States agency for international development

WAZ: Weight for Age Z-scores

WB: World Bank

WHO: World Health Organization

WHZ: Weight for Height Z-scores

ABSTRACT

Introduction

Malnutrition is one of the major causes of mortality and morbidity among under- five children in sub-Saharan Africa. Western Uganda has persistently registered highest levels of child malnutrition despite being referred to as*" food basket''* of the country.

Objective

The major objective of the study was to determine the prevalence of under nutrition among children under- five years attending KIU TH Bushenyi district western Uganda

Methods

The study was across sectional descriptive study that used quantitative and qualitative methods. The study was carried out at pediatric ward and pediatric outpatient department of KIU TH.

The study was carried out on children under -five years (3 to 59 months). Nutrition level was determined using anthropometric measurements using the US national center for health statistics (NCHS) reference standards, which was approved for use in developing countries by the WHO. Height for age, weight for age and weight for length were used.

Data was collected using questionnaires in which questions were asked to the care takers and also measurements of weight, length or height were interpreted using z-score. Those children who were below -2 SD were considered to be undernourished. Data was analyzed using Microsoft excel.

Discussion

In the study, stunting, wasting and underweight were 47%, 25% and 27% respectively. Almost half (47%) of children in the study were stunted which was comparable to the national prevalence of 47.8% for western Uganda which is unacceptably high. This was also higher than the national prevalence according to (*Uganda demographic and health survey*, 2016). This may be because the majority of the participants had underlying diseases and diseases are known to cause under nutrition in children due to lack of appetite and diarrhea.

Conclusion

In the study, the prevalence of under nutrition among children under- five years attending KIU TH were 47% stunted, 25% wasted and 27% underweight.

The major determinants to under nutrition among children under five years attending KIU TH Bushenyi district were; age (1-3 years), birth interval of 1 to 2 years, breast feeding for less than 6 months, maternal age of less than 20 years, maternal education level (mothers who did not go to school and those who ended in primary school) and maternal occupation (peasant and business).

Recommendations

Encouraging girl child education, health education about nutrition, exclusive breast feeding and family planning were recommended.

CHAPTER ONE

INTRODUCTION

1.1 Background to the study

The term malnutrition generally refers both to under nutrition and over nutrition but in this research the term is used to refer solely to a deficiency of nutrition (under nutrition).

Under nutrition is a major, global health problem. Children are particularly vulnerable since adequate nutrition is essential to ensure healthy growth and development.

Globally there are 101 million (16 %) children under five years of age estimated being underweight (UNICEF, WHO & WB, 2012). Africa is severely affected and approximately 48 million children under five years are malnourished in Sub-Saharan Africa (UNICEF, 2013b). The majority of the countries in Africa are still struggling with the heavy burden of infectious diseases and poor maternal and child health. These countries need nutrition solutions that are adapted to their circumstances, in order to achieve improved public health (Atinmo et. al, 2009).

In Uganda, 2.3 million children under the age of five are chronically malnourished (Government of Uganda, 2011).

The World Health Organization (2013) estimates that there are 178 million children that are malnourished across the globe, and at any given moment, 20 million are suffering from the most severe form of malnutrition. Malnutrition contributes to between 3.5 and 5 million annual deaths among under-five children. UNICEF estimates that there are nearly 195 million children suffering from malnutrition across the globe.

In 1997, the World Health Organization had observed that 60% of the deaths occurring among all the under five children in developing countries were attributed to malnutrition(Murray, C.J., 1997). Most of the damage caused by under nutrition occurs in children before they reach their second birthday, in the time when the quality of a child's diet has a profound impact on his or her physical and mental development.

It has been estimated by the global burden of disease study that under-five malnutrition alone has caused approximately half of the global loss of Disability Adjusted Life Years (DALYs) that is the sum of years of life lost from premature mortality years lived with disability adjusted for severity (Faruque etal, 2008). This consequently affects the intelligence level of children, their behavior and school performance. The impaired mental development is taken as the most serious long-term handicap associated with under five under nutrition. Malnutrition among under-five children is one of the most important public health problems in developing countries especially Sub-Saharan Africa(Gulati, 2010) and about 35% of under-five deaths in the world are associated with under nutrition. An estimated 230 million under-five children are believed to be chronically malnourished in developing countries. Similarly, about 54% of under-five deaths are believed to be associated with malnutrition in developing countries. In Sub-Saharan Africa, 41% of under-five children are malnourished and deaths from malnutrition are increasing on daily basis in the region. Under nutrition continues to be a significant public health problem throughout the low income countries, particularly in Sub-Saharan Africa and South Asia(Kimokoti, R.W., and Hamer, 2008). In Uganda, under nutrition is a serious health and welfare problem affecting the under-five children to whom it contributes significantly to mortality and morbidity. According to Uganda demographic and health survey of 2016, 29% of children under five are stunted (below -2SD), 9% severely stunted (below -3SD), 11% are under weight (below -2SD),2% severely underweight (below -3SD) ,4% are wasted and 1% severely wasted.

Malnutrition in Uganda starts at infancy and rises steeply, peaking at about two years when about 50% of toddlers are stunted and from the UDHS findings, Northern (40%) and South Western Uganda (50%) regions are more affected than other regions(Uganda Bureau of Statistics (UBOS) and Macro International Inc, 2007). Bushenyi district is among the districts with the highest percentage of stunting (42%) among children below five years old (UDHS 2011).

Under nutrition among children is an outcome of many interrelated factors including environment, economics, education, and culture and food security. Among these, the ones that have immediate and direct effects on under nutrition are feeding practices and infections. Therefore the nutrition levels of children can indicate the socio economic development of a community.

The Uganda food and nutrition policy focuses on nutrition and childhood development as one of the goals with an aim of improving child health especially among those under-five years. This policy is being formulated to address nutrition priority problems with assistance from international

and local agencies like UNICEF, Save the Children, Plan International and TASO. The 2004/2005 Uganda food and nutrition policy reform focuses on policies and guidelines on anemia, breastfeeding, HIV/AIDS and a number of other nutrition related disorders prevalent in the country (MoH and MAAIF. (Ministry of Health and Ministry of Agriculture, 2005). The Ugandan government has put in place tremendous efforts in reducing the prevalence of malnutrition in the country through effective nutrition programs which act directly on feeding practices. However, the yield would be more significant if the government acted on factors that affect under-five child malnutrition. In addition, addressing the plight of women by strategically targeting their economic, education, and health status can improve nutrition at household level since women are the principle providers and care givers of children at this level.

I.2 Problem statement

Effective nutrition is one of the most important health determinants among citizens of any country including Uganda. However, malnutrition with emphasis on under nutrition remains a big threat to almost all regions in Uganda particularly in the cattle corridor districts. Some children under-five years in Uganda have shown signs of growth failure, irritability, swelling of body parts, thin gray-blond hair, diarrhea, as well as poor hygienic conditions according to Ministry of Health (MoH and MAAIF. (Ministry of Health and Ministry of Agriculture, 2005) . Malnourished children have lowered resistance to infection and therefore more likely to die from ailments like diarrhea and acute respiratory infections(Nguyen, N.H., 2008).

Data from the previous five Uganda Demographic and Health Surveys (2011, 2006, 2001,1995, 1989) show that the nutrition indicators have not improved much over the past 15 years and some indicators have even shown a worsening trend (UBOS and ICF International Inc., 2012). For example the UDHS 2006 reported that 16% of children under-five in Uganda are underweight, 38% are stunted and 6.1% are wasted(Uganda Bureau of Statistics (UBOS) and Macro International Inc, 2007). Bushenyi district is among the districts with the highest percentage of stunting (42%) which is higher than the national average of 33% (UDHS 2011). Prevalence of stunting in Buhweju county is 55.6%, Igara county 36.3% with an overall prevalence of 46% in those two county(JK Kikafunda, 2014). An operation framework for nutrition in terms of child survival strategies was developed by the Government of Uganda in 2009. The Government also launched the Uganda Vision 2040 and National Development Plan (2010-2015) that focus on nutritional wellbeing of children. There are a number of USAID programs focusing on nutrition in

Uganda which include PEPFAR, a food for peace Title ii program and STRIDES. Uganda have also joined the committing to child survival, a promise renewed campaign in 2012, and pledged to reduce under five mortality to 20 or fewer deaths per 1000 live births by 2035 by reducing the leading preventable causes of child mortality including under nutrition.(USAID Uganda nutritional profile). Given the fact that a lot of studies on the prevalence of malnutrition among under-five children have been conducted in the developing countries, there is need to examine if the same factors are responsible for malnutrition among children under-five years attending KIU-TH in Bushenyi Ishaka municipality.

1.3 objectives

1.3.1General objective

To determine the Prevalence and factors predisposing to under nutrition among children under five years attending KIU-TH in Bushenyi district.

1.3.2 Specific objectives

1. To establish the prevalence of underweight, stunting and wasting among children under five years attending KIU-TH in Bushenyi district.
2. To determine factors predisposing to under nutrition among children under five years attending KIU-TH in Bushenyi district.

1.4 Research questions

1. What is the prevalence of under nutrition among children under five years attending Kampala international university teaching hospital Bushenyi district?
2. What are the factors that predispose to under nutrition among children under-five years attending Kampala international university teaching hospital Bushenyi district?

1.5 Significance of the study

The study provides information that could be used for nutritional surveillance and targeting programs that would focus more on populations at risk particularly the under-five children.

The study will also make important contribution to future research by contributing to the existing literature particularly on nutrition among under-five children. The study further avails information that could be used in policy planning and implementation particularly in vulnerable groups.

Child under nutrition still remains a major health challenge in Uganda. While the problem of under nutrition in Uganda is relatively well documented; its specific determinants are not well understood. Knowledge and understanding of these factors is crucial for development of

sustainable control measures against under nutrition. To reduce under nutrition one must understand its causes. Nonetheless, there has been insufficient data and information regarding the prevalence and key determinants of under nutrition in different geographic regions. Thus, this study is an attempt to contribute empirical evidence to fill this gap.

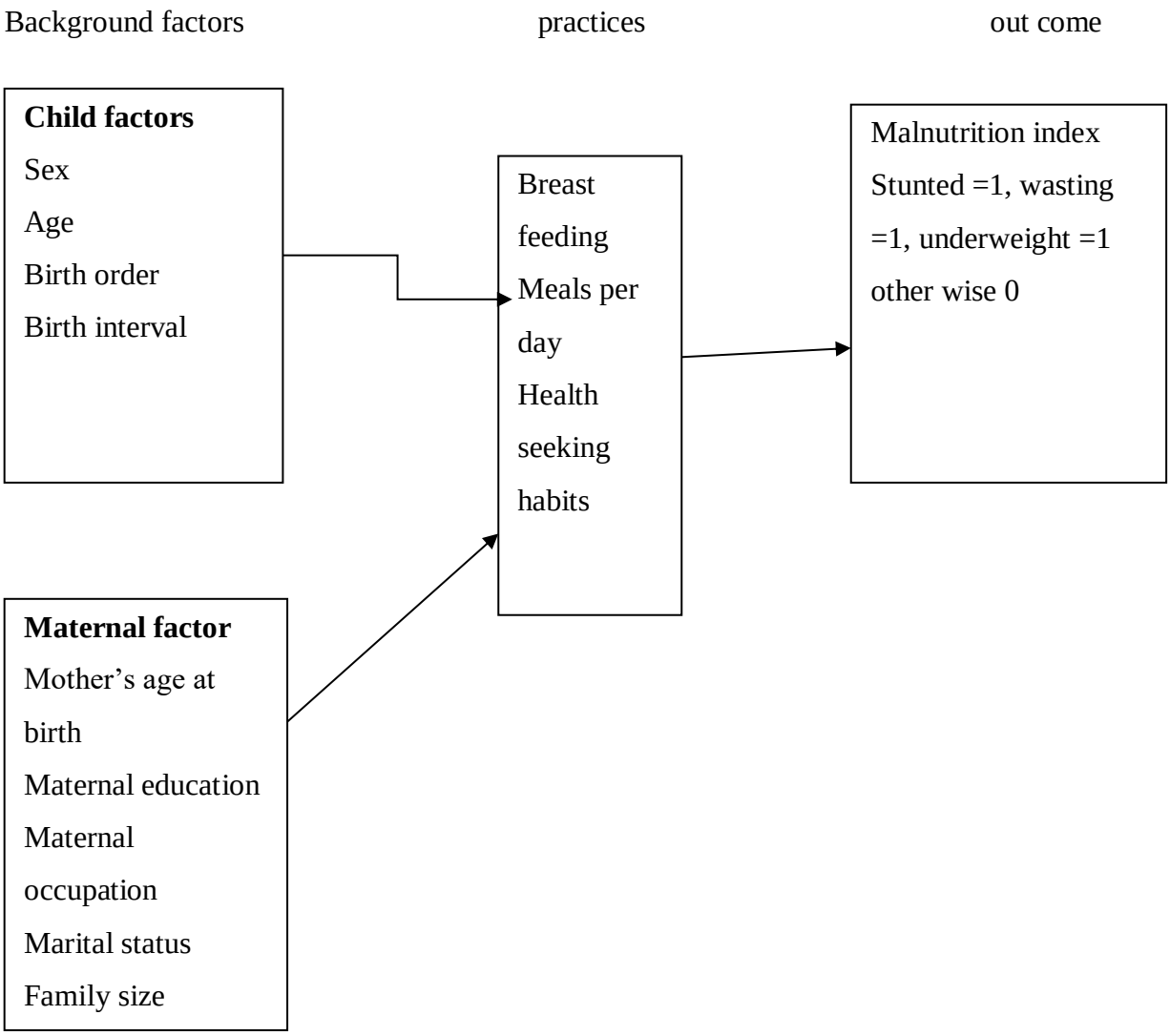
In part the report is expected to serve as a baseline reference for those who may wish to undertake further research in the area.

1.6 Conceptual frame work

Figure 1.1 shows the conceptual framework on the determinants of malnutrition among under-five children in Uganda taking a case study of KIU TH Bushenyi district.

In developing countries and particularly in Sub-Saharan Africa, under-five child under nutrition is normally determined by a large number of factors to the extent that it sometimes becomes difficult to predict the risk factors(Victoria, C. G., Huttly, S.R., Fuchs, S.C., and Olinto, 1997). Such factors act through a number of interrelated proximate determinants to bring about under- five under nutrition that is stunting, underweight and wasting. The demographic (child factors) and socio-economic factors (maternal factors) such as age of child, birth order, mothers age at birth, mothers education level, marital status as well as maternal occupation work through proximate variables like the duration of breast feeding, determine under five malnutrition.

Figure 1.1 conceptual frame work



CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This section presents the reviewed literature on the prevalence of under nutrition among under-five children in different settings particularly in developing countries.

Under nutrition in this study is defined as a measure of wasting (weight/length or height), which represent acute malnutrition.

According to WHO, malnutrition occurs when the intake and the utilization of energy and nutrients are not adequate to maintain well-being health and productivity. Malnutrition (under nutrition) can include micronutrient deficiencies as well as generalized under nutrition which is discernible by stunted growth and low weight (WHO et al., 2009). Under nutrition is therefore a major threat to children's chances of survival as it hinders their optimal health, growth and development. It also increases the risk of infant child morbidity and mortality, diminished cognitive and physical development and impacts on child`s future productivity in life (MOPHS, 2012). Under nutrition, including protein-energy malnutrition and specific vitamin and mineral deficiencies, is an important cause of poor health in underdeveloped countries. Priorities here center on ensuring that the diet provides enough nutrients to maintain health. In healthy people, dietary requirements depend on age, sex and level of physical activity, While the causes and the effects of under nutrition are complex and vary between countries, regions, cultures, ages, and situations, children are the most vulnerable population, and are at a particular risk of under nutrition. According to Rome declaration on world food security (2006), food security exists "when all people, at all times, have physical and economical access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life (FAO, 2006).

2.2 The prevalence of under nutrition among children under five.

According to Wardlaw, 2009, nearly1/6 people worldwide is chronically undernourished of which 1/3 are children. About 55000 people die of hunger each day 3/4 of them being children. About 2 billion people in the world surfer from micronutrient deficiency of which 1 billion people have iron deficiency, up to 500000 are permanently blind each year due to vitamin A deficiency and

currently 2 billion people are at a risk of iodine deficiency.

Death and disease from infections, particularly those causing acute and prolonged diarrhea or acute lower respiratory disease, increase dramatically when infections are superimposed on a state of chronic under nutrition. Currently half of the 4 million African children less than five years of age who die annually are under nourished(Wardlaw, 2010)

The WHO estimated that by the year 2015 the prevalence of malnutrition will have decreased to 17.6% globally, with113.4 million children under five as measured by low birth weight for age. The overwhelming majority of these children, 112.8 million, will live in developing countries with 70% of these children in Asia, 26% in Africa. An addition 165 million (29.0%) children will have stunted length/height secondary to poor nutrition((WHO, 2010).

Currently, more than half of young children in south Asia have PEM which is 6.5 times the prevalence in the western hemisphere(WHO, 2015). In sub Saharan Africa 30% of children have PEM. Despite marked improvements globally in the prevalence of malnutrition, rates of under nutrition and stunting have continued to rise in Africa, where rates of under nutrition and stunting have risen from 24% to 26.8% and 47.3% to 48% respectively, since 2009, with the worst increase occurring in the eastern region of Africa (World Vision, 2015)

2.2.1 Global situation

Malnutrition is a public health problem throughout the developing world. In fact, under nutrition remains a factor in 53% of all the 11 million deaths that occurs each year in the world's 0 – 4 year old children (Müller, O. and Krawinkel, 2005). Globally the nutritional status of children is gradually improving. There has been a global decrease in under nutrition from 47% in 1980 to 33% in 2000(De Onis M, 2000). Despite this, malnutrition is still on the rise in East Africa (Johanna, 2010).

For the past two decades malnutrition has been the leading cause of morbidity and mortality in children below five years worldwide. 1 out of 3 (177 million) under five years children were found to be malnourished in 1990(Torún, B. and Chew, 1994) and by 2002, 199 million children were still suffering from malnutrition (Zere, E., and McIntyre, 2003). In 2004, 55% of child deaths worldwide resulted from under nutrition(Caulfield, L. E., de Onis, M., Blössner, M.and Black, 2004). Again malnutrition contributed to 2.2 million deaths of children under five years old in 2008(Black, R. E., Allen, L. H., Bhutta, Z. A., Caulfield, L. E., De Onis, M., Ezzati, 2008) and in

2009 more than one third of all the children's deaths worldwide were caused by under-nutrition as well(UNICEF), 2009).

Recently adverse malnutrition effects have remained to be the most health burden globally. 7.6 million Children below five years died of under nutrition in 2010(Liu, L., Johnson, H.L., Cousens, S., Perin, J., Scott, S., Lawn, J.E and Black, 2000)and it is estimated that malnutrition still contributes to 60% of 11 million deaths of children under five years old worldwide every year (Mwangome, M., Prentice, A., Plugge, E., and Nweneka, 2010). While cheap and nutritious foodstuffs are readily available in many areas of sub-Saharan Africa region (SSAR), millions of children are chronically malnourished and every year approximately 18 million people, especially children, die from mild to moderate malnutrition (Aboud, 2011). The number of under-five children suffering from malnutrition continues to increase (Smith, L.C. and Haddad, 2000).

2.2.2 Malnutrition in Uganda

Malnutrition is a major public health concern in Uganda and affects both children and adults (Ministry of Health Uganda, 2010). In the country, 34.6 percent of the population suffers from malnutrition. Of all children up to five years, 13.8 per cent are malnourished (UN Association of Sweden, 2013). The Human Immunodeficiency Virus (HIV) pandemic has exacerbated the situation and many of the acutely malnourished children who receive care are HIV-positive.

2.3 Factors that predispose to under nutrition

There are a number of demographic variables that researchers have found significant in influencing under-five under nutrition however the study focused on few of them that included; sex of child, age of child, birth order, birth interval and mother's age at birth of the child

2.3.1Child related factors of under-five malnutrition

2.3.1.1 Sex of child

From the reviewed literature, there seems to be a consensus that malnutrition among under-five children is greater among boys than girls. The cause of this discrepancy is not well established in the literature but it is believed that boys are more influenced by environmental stress than the girls (Henry, W., Anne, N.A., Stefan, P., James, K.T., and Thorkild, 2007).

2.3.1.2 Age of child

Recent studies have found out that younger children are less likely to be malnourished than the older children. In the growth life cycle of children, weaning and less breast milk make them more

vulnerable to under-five malnutrition. According to(Uganda Bureau of Statistics (UBOS) and Macro International Inc, 2007), malnutrition increases with the age of the child through the first three years of life before declining in the fourth and fifth year. The increase is especially rapid during the first two years of life, as evidenced in the rise from 13 percent among children aged 6-8 months to 45 percent among children aged 18-23 months.

2.3.1.3 Birth Order

Research findings indicate that malnutrition is rare among under-five children of birth order 2-3 and that higher birth order (5+) is positively associated with child malnutrition. In a study carried out among 6939 children under-five years in Bangladesh, the prevalence of stunting increased with birth order hence most of the children who were of birth order more than two had greater chances of stunting and wasting(Rayhan, M.I., and Hayat, 2006). Worthy to note is that few studies according to the literature search have been conducted on the subject of child birth order and malnutrition among under-five children.

2.3.1.4 Birth Interval

In another study conducted in Bangladesh, children within the first birth interval were 1.66 times more likely to be stunted and children whose preceding birth interval was less than two years were 1.32 times significantly more likely to be stunted as compared to children of a preceding birth interval 24 months or above. Similar results were observed for underweight children (Nure, A. S., Nuruzzaman, H., Abdul, 2011). According to UBOS and Macro International Inc (2007), malnutrition is highest if the birth interval is less than 24 months (41 percent) since it is an important indicator of the nutritional status of children.

2.3.2 Maternal factors of malnutrition among under-five children

A lot has been written about the socio-economic determinants of malnutrition among children under-five children by several researchers in both developed and developing countries. The study focused on maternal education, marital status and maternal occupation.

2.3.2.1 Maternal Education

Mother's education level affects child's nutrition through her choices and health seeking skills related to nutrition, hygiene, preventive care and disease treatment. Mother's responsibility to care for herself during pregnancy and her child through the most vulnerable stages of its life significantly affects under-five child malnutrition. Several studies have found out that mothers

education is associated with good nutrition practices and particularly under-five child nutrition (Babatunde, R.O., and Qaim, 2010)

2.3.2.2 Marital Status

Being a married mother was positively associated with good nutritional status among children under five years in the Volta region of Ghana(Appoh, L. Y. and Krekling, 2005). Contrary to the above, a study in Tanzania revealed that mothers who are married were more likely to have undernourished children unlike those that were unmarried perhaps because of the cost of maintaining families hence sometimes these families fail to produce nutritious supplements to the under-five children (Nyaruhucha, C.N.M., Msuya, C.N.M., Mamiro, P.S., and Kerengi, 2006).

2.3.2.3 Maternal Occupation

A study in Vietnam revealed that children from mothers who were laborers or farmers and housewives had a greater prevalence of stunting, underweight and wasting than those from mothers who worked in office or were housewives (Nguyen, N.H., 2008). This is because working mothers rarely get time to take care of their children. They also leave their children at home with other siblings who may neglect feeding them following the right frequency and this sometimes worsens the problem of under nutrition. It is also common for mothers to fail to provide complementary feeds including protein foods since most of them cannot afford them (Olwedo, M. A., Mworozi, E. M., Bachou, H., and Orach, 2008)

2.3.2.4 Mothers age at birth

A number of studies have reported that mother's age at birth is one of the most important determinants of malnutrition among under- five children. It has been suggested that the risk is greater in younger mothers particularly those below 24 years because they are not ready to take care of the child including providing all the necessary attention required for the baby. Similarly, under-five malnutrition is higher also among children whose mothers give birth when they are older especially after 35 years.

2.4 Effects of malnutrition

Malnutrition generally affects the entire body, interfering with almost all body systems and functions and resulting in reduced functional capacity and body energy requirements. Malnutrition impairs immune functions which may lead to presence of infection or liver dysfunction resulting in loss of appetite and fever. Low food intakes on the other hand weakens muscles and this may cause

pathological changes of the heart resulting in longer circulation time thus reduced heart rate, blood pressure or even stroke (Torún, 2006).

2.4.1 Underweight

Under weight is a measure of both acute and chronic under nutrition. It is a composite index of weight for height and height for age and thus does not distinguish acute and chronic malnutrition and it is an overall indicator of a population's nutritional health. A child is underweight when the weight is 15% to 20% below that normal for their age group. The child is underweight and under size, while at the same time has relatively normal body proportions, weight-to-height ratios (Golden, MHN. and Golden, 2000). The underweight child is common and an important presentation of malnutrition, which is missed a lot of times. When a diet is insufficient in protein and/or energy there will be a slowing down of linear height, failure to gain weight or weight loss, and this is seen when the child is exposed to an acute food shortage. In the developing world, 129 million of children younger than five years are underweight and 10% are severely underweight.

2.4.2 Stunting

Stunting is a measure of linear growth and is a reflection of chronic under nutrition as a result of failure to receive adequate nutrients for a long period of time and recurrent chronic illness. This results in to reduced growth rate whereby height for age value is less than -2 standard deviations of the WHO child Growth Standards median (WHO, 2014). In infants and children younger than five years stunting is a greater problem than underweight and wasting usually an indicator of nutritional deficiencies or illness that occurred during times of growth and development (Shetty, 2002);((UNICEF), 2009). Stunting is the first clinical sign of malnutrition and it affects about 195 million children younger than five years in the developing world and about one in three children in Africa (Piercecchi23 Marti *et al.*, 2006). As of 2012 an estimated 25% children under 5years of age were stunted worldwide. More than 90% of the worlds stunted children live in Africa and Asia, where respectively 36% and 56% of children are affected (UNICEF and WHO, 2013). In Uganda stunting rates still remain high at 38%((UNICEF), 2009).

2.4.3 Wasting

Wasting (low weight for age) Weight for age is a measure of body composition especially the fat and muscle mass. It is an indicator of recent nutritional deficiency which indicates acute under nutrition. A child is moderately wasted when the weight for height is less than –2 SD from the mean. If the child weight for height is less than 70% of the median and is equal to a standard

deviation score of –3SD then the child is severally wasted("WHO," 2014) . Moderate and severe wasting represents an acute form of malnutrition and children suffering from wasting are at a greater risk of dying (Williams, 2005). In 2011, the proportion of children below the age of five years who were found to be wasted was about 52 million globally and 1 out of every 10 children in Africa (Liu *et al*., 2012). In Uganda the prevalence of wasting is at 6%((UNICEF), 2009). Wasting can be surmount by optimal feeding but may have permanent debilitating impacts such as cognitive impairment.

2.5 Assessment of nutritional status

Assessments are used to provide information on the nutritional and health status of children and are an indirect measure of quality of life in a community or population (Shetty, 2002). The most common ways to assess malnutrition in children is through use of anthropometry, clinical and biochemical parameters.

2.5.1 Use of body measurements (anthropometry)

Weighing a child and measuring his or her height; involves taking a measurement of their weight and height and then comparing it against what would be the expected average height and weight for a child of that age. Some children will be below average as they are naturally smaller, but a significant drop below the expected level for an individual could indicate a risk of malnutrition (Müller, O. and Krawinkel, 2005). Measuring the circumference of the mid-upper arm; a mid-upper arm circumference (MUAC) measurement band has different colors along the strip. If the arm band lands in the orange section it means the child is suffering from moderate acute malnutrition. If it lands in the red section, the child is suffering from severe acute malnutrition (Mother & Child nutrition, 2009). Checking for fluid retention or swelling in the lower legs or feet. Edema affects a child's appearance, giving him or her puffy, swollen look in either lower limbs and feet or face. It can be detected by small pits or indentations remaining in the child's lower ankles or feet, after pressing lightly with the thumbs. The presence of edema in both feet and lower legs is always considered a sign of severe acute malnutrition (Garrow, 2005).

2.6 Summary of the literature review

Whereas the literature reviewed indicates that malnutrition among children below five years is determined by several factors, a need to find out if similar factors are responsible for under nutrition in Kampala international university teaching hospital is quite important. This is part of the research gap that this study seeks to examine.

CHAPTER THREE
METHODOLOGY

3.1 Study design.

The study design was a cross sectional descriptive study.

3.2 Study area

The study was carried out in Kampala international university teaching hospital. Kampala international university teaching hospital is located in Ishaka in Igara County, Bushenyi District, in western Uganda. It is located approximately 60 kilometers (Km), by road, west of Mbarara, the largest city in the sub- region(Uganda Bureau of Statistics (UBOS) and Macro International Inc, 2015). KIU-TH is located approximately 6 km by road, west of Bushenyi district headquarters. It is located along Mbarara- Kasese road and it is approximately six hours by road from the main airport at Entebbe. The hospital is private / public partnership and it is government aided. It has admission capacity of 700 beds. The hospital has a good range of specialist departments and clinics which include; the general surgery, orthopedics, obstetrics and gynecology, ophthalmology, ENT, dental, mental health and pediatric unit. Bushenyi district has mixed tribes the majority of people being Banyankole and Bakiga. The main economic activity is agriculture were people grow mainly matooke, tea, and also cattle keeping

3.3 Study Population

The study population consisted of children less than five years

3.3.1 Inclusion criteria

Only those care takers who consented for their children to participate in the study were interviewed
All under five year old children both male and female children whose care takers consented were included in the study.

3.3.2 Exclusion criteria

All care takers who did not consent for their children to participate in the study will not be interviewed.
Children without care takers were excluded
All babies less than 3 months were not included in the study.

3.4 sample size determination.

To determine the sample size, the researcher used Fisher's formula.

$$N=\frac{Z^2pq}{d^2}$$

Where N= desire sample size.

Z= standard normal deviation as 1.96 at a confidence level of 95%

P = prevalence of characteristic under investigation, since there is no baseline, 50% was used to give the widest possible variability. Therefore=0.5 and q= standardized 1.0-0.5=0.5

d= margin of error 0.05 0r 5%

Therefore $$n= \frac{(1.96)^2x0.5x0.5}{(0.05)^2} =384$$

Since the average admission number of children at pediatric ward is 206 which is less than 10,000

$$nf = \frac{n}{1 + n /N}$$

Where nf= desired sample size for population less than 10,000

n= calculated sample size for population greater than 10,000

N= Target population.

$$nf= \frac{384}{1+384/206}$$

nf=134

This gave appropriate sample size, but for simplicity, because of time and financial constraints, the researcher used a sample size of 100 participants.

3.5 Sampling procedure.

Kampala international university teaching hospital Bushenyi Ishaka municipality was selected because of its convenience to the researcher in terms of accessibility and it receives many referrals from many healthy centers in the district. Simple random sampling method was used and 100 people were interviewed.

3.6 study variables.

This section presents the specifications of the variables that were taken during the study.

i. Child malnutrition was determined if child was

Stunted underweight or wasted. Children who lied below -2sd were considered undernourished.

ii. Age of child

iii. Birth order

iv. Birth interval

v. Maternal age at birth

vi. Maternal level of education

vii. Marital status of care takers

viii. Maternal occupation

3.7 Data collection methods

Questionnaires were used for data collection .Questionnaires were prepared in English and verbally translated into the local language during interview time

Diagnosis of under-nutrition was based on weight for height or length, weight for age and height for age.

3.8 Data analysis

All data collected was edited, coded and errors corrected. It was then analyzed electronically using Microsoft excel.

3.9 Quality control

The questionnaires were cross-checked at the end of every day for completeness and correct filling of questionnaires was ensured. Efforts were made to translate the questions into the local language of the respondents for easy understanding of questions so as to generate accurate responses.

3.10 Ethical considerations.

A letter of introduction was acquired from the school of Allied Health sciences and was presented to KIU-TH administrator to grant me permission to conduct the study. Respondents were requested for their verbal consent prior to interview and confidentiality was maintained throughout the research process. Respondents were given equal chances, treatment and rights at all time of the study.

3.11 Study limitations

Time was the greatest limitation considering the fact that the researcher had a lot of class work and ward placement but the researcher was able to use the limited time carrying out the study.

Financial problems were also a limiting factor. The researcher used a sample size 100 participants in order to overcome this limitation. The sample size was small to give accurate results but the researcher was able to take accurate measurement in order to make nearly accurate results.

CHARPTER FOUR

PRESENTATION AND INTERPRETATION OF RESULTS

4.1 Introduction

Findings of the study are presented in this chapter

4.2 Prevalence of under nutrition among children under five years attending KIU TH Bushenyi district.

In the study, 27% of children under five were under weight, 25% are wasted, and 47% were stunted as shown in the table 4.1

Table: 4.1 Prevalence of under nutrition among children attending KIU TH Bushenyi district.

Under nutrition index	Over all status (%)
Stunting	47
Wasting	25
Under weight	27

4.2 social demographic characteristics of children and their care takers

These are presented as child and maternal factors

4.2.1 Child factor.

In the study, half of the study population was females and half were males by coincidence. More than half of children were 12 months and below (54%), 36% were between 13 and 36 months and the rest (10%) were 37 to 59 months. 73% of children in the study were of birth order 1 and 2(first born and second born), 23% were of birth order 3-4 and 4% were of birth order 5 and above.as shown in the table 4. 2

Table: 4. 2 child factor

Child factor	Frequency	Percentage
Sex		
Male	50	50
Female	50	50
Age in months		
<13	54	54
13-36	36	36
37-59	10	10
Birth order		
1-2	73	73
3-4	23	23
5+	4	4
Birth interval in years		
1-2	62	62
3-4	28	28
5-6	10	10

4.2.2 Maternal factor

The majority of mothers in the study were aged 20-29 years (48%), 39% reached primary school, 87% married, 54% peasant , 80% had family size of <6 people and 48% had estimated monthly income of <150000 Uganda shillings as presented in table 4.3 below.

Table: 4. 3 maternal factors

Maternal factor	Frequency	Percentage
Mothers age at birth in years		
<20	**18**	**18**
20-29	**48**	**48**
30-39	**26**	**26**
40-49	**8**	**8**
Education level		
Non formal	**6**	**6**
Primary	**39**	**39**
Secondary	**36**	**36**
College/ university	**19**	**19**
Marital status		
Single	**10**	**10**
Married	**87**	**87**
Divorced	**2**	**2**
Widow	**1**	**1**
Maternal occupation		
Peasant	**54**	**54**
Employed	**26**	**26**
Business	**20**	**20**
Family size		
=<6	**80**	**80**

>6	**20**	**20**
Income per month		
<150000	**48**	**48**
<300000	**30**	**30**
>300000	**22**	**22**

4.3 Relationships between child and maternal factors with under nutrition among children below five years attending KIU TH Bushenyi district.

Results are presented in table4. 4 and 4.5 respectively

4.3.1 Relationship between child factor and under nutrition among children under five years old attending KIU TH Bushenyi District.

Relationship between under nutrition and child factors are presented in table 4 below

Table: 4. 4: Relationship between child factors and under nutrition among children under five years attending KIU TH Bushenyi District.

Variables	**Total number N=100**	**Stunting**		**Wasting**		**Under weight**	
		N	**%**	**N**	**%**	**N**	**%**
Sex							
Male	**50**	**27**	**54**	**9**	**18**	**11**	**22**
Female	**50**	**20**	**40**	**16**	**32**	**16**	**32**
Age (months)							
<13	**54**	**23**	**42.6**	**16**	**29.6**	**12**	**22.2**
13-36	**36**	**19**	**52.8**	**9**	**25**	**13**	**36.1**
37-59	**10**	**5**	**50**	**0**	**0**	**2**	**20**
Birth order							
1	**45**	**22**	**48.9**	**10**	**22.2**	**15**	**33.3**

2	**28**	**16**	**57.1**	**6**	**21.4**	**5**	**17.9**
3	**13**	**5**	**38.5**	**3**	**23**	**2**	**15.4**
4	**10**	**1**	**10**	**5**	**50**	**4**	**40**
5	**4**	**3**	**75**	**1**	**25**	**1**	**25**
Birth interval (years)							
1-2	**50**	**30**	**60**	**18**	**36**	**21**	**42**
3-4	**42**	**15**	**35.7**	**6**	**14.5**	**6**	**14.3**
5-6	**8**	**2**	**25**	**1**	**12.5**	**0**	**0**
Breast feeding							
<6 months	**25**	**20**	**80**	**10**	**40**	**11**	**44**
6 months	**60**	**23**	**38.3**	**12**	**20**	**14**	**23.3**
>6 months	**15**	**4**	**26.7**	**3**	**20**	**2**	**13.3**
Meal per day							
<5	**32**	**23**	**71.9**	**12**	**37.5**	**15**	**46.9**
5	**17**	**2**	**11.8**	**4**	**23.5**	**3**	**17.6**
>5	**51**	**22**	**43.1**	**9**	**17.6**	**9**	**17.6**

4.3.2 Relationship between maternal factors and under nutrition among children under five years attending KIU TH Bushenyi district.

The relationship between maternal and under nutrition among children aged below 5 years attending KIU TH Bushenyi district are presented in table4. 5 below

Table: 4. 5: relationship between maternal factor and under nutrition among children under five years attending KIU TH Bushenyi District

Variables	Total 100	Stunting (n)	%	Underweight (n)	%	Wasting (n)	%
Age of mother at birth (years)							
<20	15	10	66.7	7	46.7	4	16
20-29	33	19	57.6	10	30.3	15	60
30-39	40	17	42.5	10	25	6	15
40-49	12	1	14.3	0	0	0	0
Mothers education level							
Non formal	6	3	50	3	50	0	0
Primary	39	21	53.8	16	41	16	41
Secondary	36	18	50	8	22.2	7	19.4
Collage/ university	19	5	26.3	0	0	2	10.5
Marital status							

Single	**10**	**3**	**30**	**2**	**20**	**2**	**20**
Married	**87**	**43**	**49.4**	**24**	**27.6**	**23**	**26.4**
Divorced	**2**	**0**	**0**	**0**	**0**	**0**	**0**
Widow	**1**	**1**	**100**	**1**	**100**	**0**	**0**
Mothers occupation							
Peasant	**54**	**25**	**46.3**	**18**	**33.3**	**19**	**35**
Employed	**26**	**11**	**42.3**	**2**	**7.7**	**4**	**15.4**
Business	**20**	**11**	**55**	**7**	**35**	**2**	**10**
Family size							
=<6	**80**	**36**	**48.8**	**21**	**26.3**	**36**	**21.3**
>6	**20**	**8**	**40**	**6**	**30**	**8**	**40**
Income per month							
<150000	**48**	**30**	**65.2**	**18**	**37.5**	**17**	**35.4**
<300000	**30**	**10**	**33.3**	**6**	**20**	**5**	**16.7**
>300000	**22**	**7**	**31.8**	**3**	**13.6**	**3**	**13.6**

4.4 Factors that lead to under nutrition among children under five years attending KIU TH Bushenyi district.

4.4.1 Independent variable against stunting

These are presented in the table4. 6 below

Table: 4. 6 Independent variable against stunting among children under-five years attending KIU TH Bushenyi District.

Variable	Stunting
Child factor	
Sex	**Male**
Age (in month)	**13-36**
Birth order	**1st and 2nd**
Birth interval (in years)	**1 to 2**
Breast feeding	**< 6 months**
Meals per day	**< 5 meals**
Maternal factor	
Mothers age at birth (in years)	**< 20**
Educational level	**Non formal and primary**
Marital status	**Widow and married**
Occupation	**Business and peasants**
Family size	**< 6**
Estimated monthly income	**< 150000**

4.4.2 Independent variable against Underweight among children under five years attending KIU TH Bushenyi District

These are presented in table 4.7

Table: 4. 7 independent variables against underweight among children under five years attending KIU TH Bushenyi District.

Variable	Under weight
Child factor	
Sex	**Female**
Age (in months)	**13-36**
Birth order	**1 and 4**
Birth interval (in years)	**<2**
Breast feeding	**<6 months**
Meals per day	**<5**
Maternal factor	
Mothers age at birth	**<20**
Educational level	**Non formal and primary**
Marital status	**Widow and the married**
Occupation	**Business and peasants**
Family size	**< 6**
Estimated monthly income	**< 150000**

4.4.3 Independent variable against Wasting

These are presented in table 4.8 below.

Table: 4.8 independent variables against wasting among children under five years attending KIU TH Bushenyi District.

Variable	**Wasting**
Child factor	
Sex	**Female**
Age (in months)	**<13**
Birth order	**4thand5th**
Birth interval	**<2**
Breast feeding	**<6 months**
Meals per day	**< 5 meals**
Maternal factor	
Mothers age at birth (in years)	**20-29**
Educational level	**Primary**
Marital status	**Married**
Occupation	**Peasant**
Family size	**>6**
Estimated monthly income	**< 150000**

CHAPTER 5

DISCUSSION, CONCLUSION AND RECOMMENDATIONS

5.1 Discussion of results

5.1.1 Prevalence of under nutrition among children below five years attending KIU TH Bushenyi district.

Prevalence of stunting, underweight, and wasting in the study were 47%, 27%, and 25% respectively. This indicates that there is a high level of malnutrition as judged by the WHO criteria.

Stunting in the study was 47% which is much close to the western region prevalence of 47.8%(JK Kikafunda, 2014) , and almost similar to the prevalence of stunting in bushenyi district 46% (JK Kikafunda, 2014) . This is because KIU TH is within those regions and people in these regions have similar problems. However it's higher than the prevalence of stunting in Bushenyi district at 42% UDHS, 2011 and much higher than the current national prevalence of stunting at 29% (*Uganda demographic and health survey*, 2016). This is because the study was carried out in a hospital were the majority of the participants had some under lying diseases and also bushenyi is a known burden to the country in terms of under nutrition.

In the study, prevalence of underweight was 27% which was much higher than the national prevalence (11%) according to UDHS 2016 and even higher than the highest prevalence in the country (26%) in Karamoja region (*Uganda demographic and health survey*, 2016). The difference may be due to the fact that diseases predispose to under nutrition and the majority of the participants were admitted to pediatric ward and also bushenyi is among the top burden districts in the country in terms of malnutrition.

The prevalence of wasting reported in the study was 25% which was much higher than the national prevalence of 4% according to UDHS 2016 and higher than the known highest prevalence in the country (10%) in Karamoja and west Nile (*Uganda demographic and health survey*, 2016) and it is also higher than the prevalence of wasting in Kenya at7% (KNBS). This big difference is because the study was carried out on sick children and diseases are known to cause under nutrition in children due to diarrhea and loss of appetite.

5.2 predisposing factors to under nutrition among children below 5 year attending KIU TH Bushenyi district.

5.2.1 Child factors

The results from the study show that child's age, birth order, birth interval, breast feeding have an influence on the child's nutritional status.

Children between 13 and 36months old were more undernourished than those below 13 months and above 37 months old. This is in line with UBOS and macros international 2007 were 13% of children aged 0 to 8 months malnourished and 45%of children aged between 13and 23 months were malnourished. This may be because of poor weaning practices.

Malnutrition was common among children whose mothers delivered when the youngest child is less than 2 years. This is in line with Nure,nuruzzaman and goni,2011. It is the same with UBOS and macro international inc 2007, where malnutrition is highest if the birth interval is less than 24 months (41%). This may be because these children are less cared for and less breast feed(less than 6months) when the mother is preparing for the new baby and also less fed. The supplementary feeds they use do not meet the AFASS criteria and also lack essential nutrients. In the study under nutrition was common in children who were breast feed for less than 6 months and those who had <5 meals per day.

5.2.2 Maternal factor

In the study the majority of undernourished children were from mothers who did not go to school and those who ended in primary school. This is in line with UDHS 2016 which showed that 37% of stunted children were from mothers who did not go to school and 30% from those who ended in primary school. This is because these mothers lack knowledge about health skills related to nutrition, hygiene, preventive care and disease treatment. They may also be poor and unable to purchase food for their children.

Children from married mothers were malnourished than those from single mothers and also the child from the only widowed mother was malnourished making it 100% however this could not be relied on because it needs a large number of children from widows to know the actual prevalence of under nutrition in children from widowed mothers. This result is contrally to the study carried out by Appol and Krekling 2005 where married mothers were positively associated with good

nutrition. This result may be because the majority of children who participated in the study where from married mothers (87%). This may also be because of large family size leading to high cost of living where these parents may not get enough food to sustain the family. On the other hand married mothers have to care for both children and the husband there fore she may end up keeping nutritious foods to the husband neglecting children.

The majority of under nourished children were from peasant and business women. This is in line with the study carried out in Vietnam by Nguyen and kam, 2008 which revealed that children from mothers who were laborers or farmers had a greater prevalence of stunting, underweight and wasting than those from mothers who were employed. This is because peasants in bushenyi grow most matooke which lack most nutrients and these farmers lack money to buy supplementary foods for their children. Secondly food they grow may not be enough to sustain their family during dry season .business mothers lack time to care for their children and end up leaving them with other elder children who may neglect feeding them in the right way. These mothers sell nutritious foods in search for money leaving less to sustain the family.

Most of the under nourished children were from mothers aged less than 20 years. This may be because these mothers get unplanned pregnancies and also lack knowledge on how to feed their babies.

5.3Conclusions

In the study, the prevalence of stunting, underweight, wasting among children under- five years attending KIU TH are 47%, 27%and 25% respectively.

Factors leading to under nutrition among children under five years attending KIU TH are;

Age 1-3 years, Birth interval of 1-2 years ,Breast feeding for less than 6 months ,Maternal age of less than 20 years, Maternal level of education (mother who did not go to school and those who stopped in primary school), Marital status (the married and the widow), Occupation,(peasant and business)

5.4Recomendation

Health education about nutrition, exclusive breast feeding and family planning

The government should encourage girl child education

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APPENDICES

APPENDIX I: DATA COLLECTION QUESTIONNAIRE

Dear Sir/Madam

My name is MUWAYA STEPHAN, a student at Kampala International University –Western Campus pursuing a diploma in clinical medicine and community health. I am carrying out a study on prevalence of under nutrition among children under-five years attending KIU-TH, Bushenyi District. The purpose of this study is to attain more information about the current nutrition status of the children under five years attending KIU-TH.

I hope that you will feel free to discuss with me about the topic given above. You are not under obligation to participate in the study, but it is my desire that you do.

Part I: child's demographic Information

1. Identity number …….....

2. Age: ……

3. Gender a) Male …… b) Female ……

4. Residence……

Part II: child's History of current illness

5. Fever 1. (Yes) ……2. (No)……..

6. Cough 1. (Yes)……2 (No)……..

7. Diarrhea 1. (Yes)……2. (No)……

8. Failure to gain weight 1. (Yes) …….. 2. (No) …….

9. Generalized body swelling 1. (Yes)… 2. (No)……

10. Weight loss 1. (Yes)……2. (No)…….

11. Oral thrush 1. (Yes)……2. (No)……

12. History of known chronic diseases

a) PTB 1.Yes……2. No……..
b) AIDS 1.Yes……..2. No……..
c) Congenital heart diseases 1.Yes…….2. No…..
d) Sickle cell disease 1.Yes……2.No…..
e) Others (specify) ……

Part III: child's immunization history

13. Was the child immunized according to his/her age 1. Yes……2. No…..

14. If no which immunization was missed? ……..

Part IV: child's breast feeding and weaning history

15. How long do you exclusively breast feed?

a) 4 months ☐

b) 6 months ☐

c) Others specify ☐

16. At what age do you introduce other foods?

a) Less than 6 months ☐

b) 6 months ☐

c) More than 6 months ☐

17. Which food do you start with after stopping breast feeding? ……..

18. Twenty four hours dietary recall ……..

19. Number of meals per day

a) Less than Five ☐

b) Five ☐

c) more than Five ☐

Part V: Parents' or guardians' social history

20. Parent or guardian's occupation.

a) Peasants ☐

b) Employed ☐

c) Business ☐

21. Parents level of education

a) Non-formal ☐

b) Primary ☐

c) Secondary ☐

d) College/university ☐

22. Estimated family income per month in Ugandan shillings

(optional)……..

23. Parents' marital status

a) Single ☐

b) Married ☐

c) Divorced ☐

d) Widowed ☐

e) Student ☐

24 Size of the family…….

Part VI: clinical findings on examination

25. Weight……..Kg

26. Length/height …… (cm)

27. MUAC (mm)……

28. Z score……

29. Edema in lower limbs

a) Yes ☐

b) No ☐

30. Nutrition status:

a) Underweight ☐

b) Wasted ☐

c) Stunted ☐

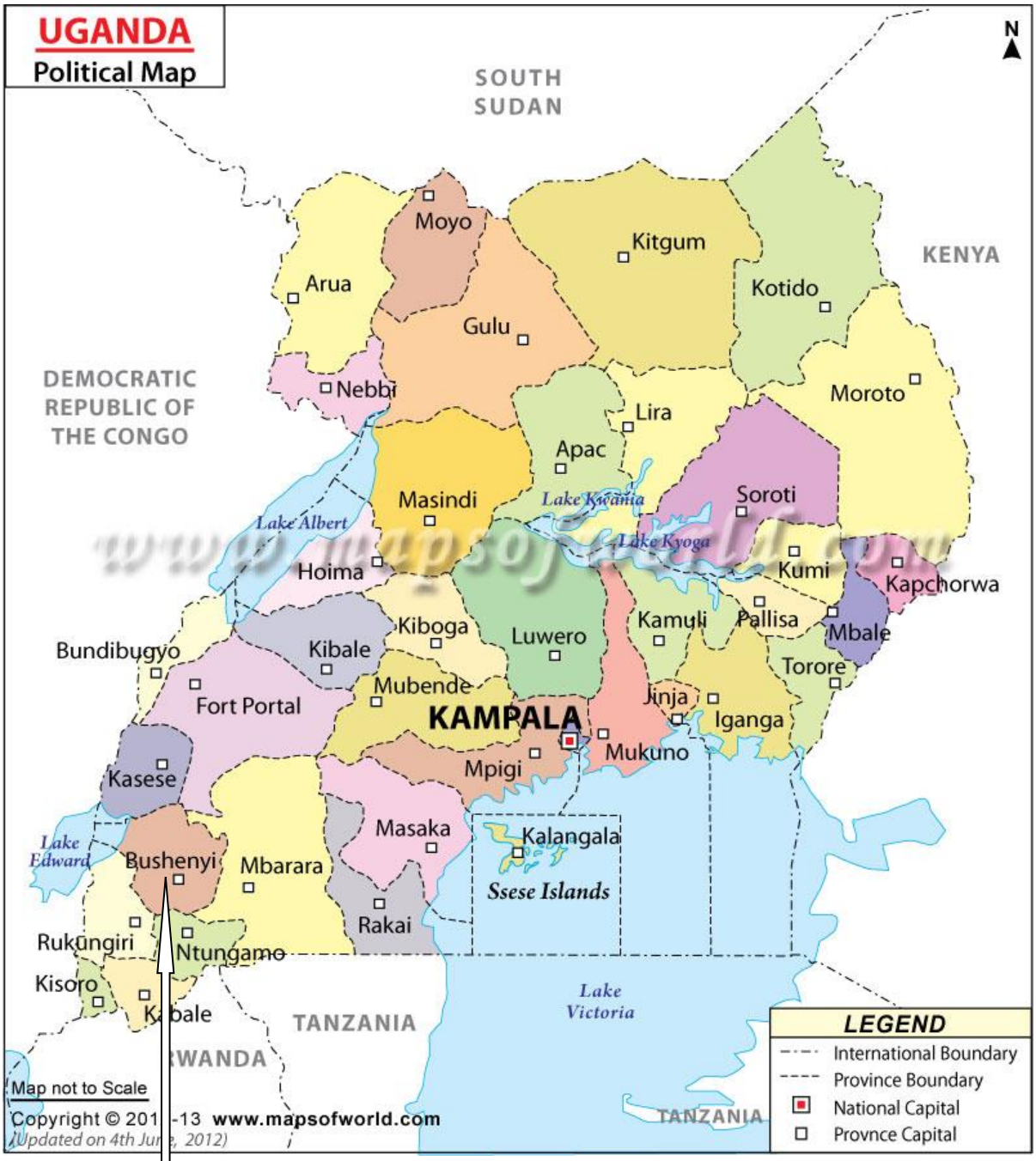
31. Degree of malnutrition

a) Moderate ☐

b) Severe ☐

THANKS FOR YOUR POSITIVE RESPONSE

APPENDIX II: MAP OF UGANDA



Bushenyi district

APPENDIX III: A MAP SHOWING STUDY AREA

APPENDIX IV: INTRODUCTION LETTER

KAMPALA INTERNATIONAL UNIVERSITY
EXPLORING THE HEIGHTS TEACHING HOSPITAL

School of Allied Health Sciences (SAHS) Ishaka,
P.O.BOX 71 Bushenyi,
Tel: 0703786082/0773786082
Email:christinekyobuhaire@gmail.com

OFFICE OF THE ADMINISTRATOR –SAHS

18th April 2017

The Executive Director KIUTH

Dear Professor,

SUBJECT: DATA COLLECTION

Academic research project is an Academic requirement of every student pursuing a 3 year Diploma in Clinical Medicine & Community Health (DCM) of Kampala International University- Western Campus (KIU-WC). DCM program is housed in the School of Allied Health Sciences (SAHS).

The students have so far obtained skills in Proposal writing especially chapter one, Three & Questionnaire design. The student's topic has been approved by SAHS Research Unit and is therefore permitted to go for data collection alongside full proposal & dissertation writing. As you may discover the student is in the process of full proposal development. However, the student MUST present to you his questionnaire and his research specific objectives that he wishes to address. We as academic staff of Allied Health Sciences are extremely grateful for your support in training the young generation of Health Professionals. I therefore humbly request you to receive and allow the student **MUWAYA STEPHEN** Reg.No. **DCM/0055/143/DU** in your hospital to carry out his research. His topic is hereby attached. Again we are very grateful for your matchless support and cooperation.

Topic: **PREVALENCE OF UNDER NUTRITION AMONG CHILDREN UNDER FIVE YEARS ATTENDING KIUTH IN BUSHENYI DISTRICT WESTERN UGANDA.**

Sincerely yours,

KAMPALA INTERNATIONAL UNIVERSITY 18 APR 2017 W.CAMPUS DEAN, SCHOOL OF ALLIED HEALTH SCIENCES

Christine Kyobuhaire, Administrator- SAHS

Approved

K.I.U TEACHING HOSPITAL 18 APR 2017 W.CAMPUS EXECUTIVE DIRECTOR DEAN FCM&D

CC: Dean SAHS
CC: Associate Dean SAHS
CC: Coordinator, Research Unit- SAHS
CC: H.O.D Dept. Public Health
CC: H.O.D Laboratory Sciences
CC: Coordinators; TLC & DEC

"Exploring the Heights"