PREVALENCE OF MALNUTRITION IN CHILDREN BELOW FIVE YEARS AT ISHAKA ADVENTIST HOSPITAL

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DECLARATION

I Bogere Solomon hereby declare that this report is my original work. Everything in this research paper is as a result of my hard work through reading various literatures including my personal knowledge and interpretation of the contents of the topic in the field of research under the guidance of my supervisor.

I am therefore certain that no work of this kind has been produced or submitted; either in partial or full publication in any other university, college or institution for the award of a degree or diploma.

I therefore present it for the award of a Diploma in clinical medicine and community health at Kampala International University western campus.

………………………….   ……………………………………

Date   Sign

Researcher;

Bogere Solomon

APPROVAL

This is to certify that this report has been done under my supervision and has, to the best of my knowledge, not been presented anywhere else for another purpose. This research report has been developed under my supervision and I approve it for submission.

....

MBURUGU MARTIN

TEACHING ASS'T   Date

ACKNOWLEDGEMENT

I want to thank the almighty father for this far he has taken me through, in the course and academics.

My parents for the support through the school may God bless you.

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I would like to thank the entire staff of KIU-western campus and more so the faculty of allied health sciences who offered me relevant Knowledge and skills that I am proud of to this date.

DEDICATION

I dedicate this work to my dearest family; my siblings and more so to mention my mom, your support has been paramount, my friends especially Rosset Mercy Muwanguzi and Ritah Nassuna, thanks for truthfully being there for me and any other person who stood by me during the stay at KIU. Above all, hadn't it been God, I couldn't have been able to be what I am today.

LIST OF ABBREVIATIONS

BMI	Body Mass Index
CDC	Centre For Diseases Control
DALYs	Disability Adjusted Life Year
HAZ	Height For Age Z Score
HIB	Hemophilus Influenza B
LBW	Low Birth Weight
MDGS	Millennium Development Goals
MOH	Ministry Of Health
MUAC	Mid Upper Arm Circumference
NCD	Non Communicable Diseases
ORS	Oral Rehydration Salt
SAM	Sever Acute Malnutrition
SD	Standard Deviation
SES	Socio Economic Status
UBOS	Uganda Bureau Of Statistics
UDHS	Uganda Demographic and Health Survey
UNICEF	United Nations International Emergency Fund
WFA	Weight For Age
WFH	Weight For Height
WHO	World Health Organization

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ABSTRACT

Malnutrition is a broad term commonly used as an alternative to under nutrition but technically it also refers to over nutrition (UNICEF, 2012). People are malnourished if their diet does not provide adequate calories and protein for growth and maintenance or they are unable to fully

utilize the food they eat due to illness (under nutrition). They are also malnourished if they consume too many calories (over nutrition).

A descriptive cross sectional study was used for children under five years who were attending Ishaka Adventist Hospital.

A random sampling method was used among 150 children under five attending Ishaka Adventist Hospital

Results

Out of 150 children that were enrolled in the study, it was found that a total of 6(4%) were severely wasted ie MUAC <12.5cm, 13(8.7%) of them were moderately wasted ie MUAC between 12 and 13.5cm, 131(87.3%) of them were found to be normal ie with MUAC > 13.5cm.

From the study out of 150 children that were enrolled in the study, it was found that a total of 6(4%) were severely wasted, 13(8.7%) of them were moderately wasted, 131(87.3%) of them were found to be normal.

Conclusions.

On prevalence, the study concludes that Bushenyi in which Ishaka Adventist Hospital is located has a high malnutrition level given that from the study 12.7% and 14.7% were wasted and stunted respectively as compared to UBOS findings that indicate 6% and 1l% to be wasted and stunted respectively in Uganda.

The study also concludes that the children age of 1 to 2 years are the most affected by malnutrition followed by those between two to five years accessed on basis of wasting and stunted growth.

5.3 Recommendations

Mothers should be encouraged to breast feed their babies exclusively up to 6 months and breast feeding should go on up to at least 18 months.

CHAPTER ONE:

Introduction

Malnutrition is a broad term commonly used as an alternative to under nutrition but technically it also refers to over nutrition (UNICEF, 2012). People are malnourished if their diet does not provide adequate calories and protein for growth and maintenance or they are unable to fully utilize the food they eat due to illness (under nutrition). They are also malnourished if they consume too many calories (over nutrition).

Globally, it is estimated that there are nearly 60 million children with MAM and 20 million with SAM. About 9% of sub-Saharan African and 15% of south Asian children have moderate acute malnutrition and about 2% of children in developing countries have SAM (MOH, 2010; Yebyo*et al* 2013). The majority of those affected are found in South Asia and Sub Saharan Africa. Approximately 1-2 million children die every year from severe acute malnutrition. It is reported that SAM is the commonest reason for pediatric hospital admission in many poor countries. Twenty five to 30% of children with severe malnutrition die during hospital admissions (WHO and UNICEF, 2007).

Under nutrition among children remains a challenge till date, despiteidentification of the problem for more than a century. Efforts to prevent or control under-nutrition have not been very successful. Not much technical expertise is required toprevent most of the cases of under nutrition as they are due to lack of hygiene or lack ofsufficient and appropriate food. Despite having enough food to feed everyone on the faceof earth, many are left to die due to hunger (Save the children 2012). Proper nutrition is essential for the physicaland mental growth of the child. Healthy children of today will become health citizens oftomorrow.

Children are the most affected age group by under nutrition. 21.37% under fivechildren are under nourished in the world. South East Asia (42.48%) and Sub SaharanAfrica (24.57%) has the highest burden of under nutrition (The World Bank, 2011). Under nutrition is responsiblefor 2.2 million deaths and 21% disability adjusted life years (DALYs) for under fivechildren annually (Black RE et al.,2014). In fact most of these deaths are preventable. India is the 2nd mostpopulated country in the world with population of more than 1210 million. Children lessthan six constitute sizable

proportion of this population (158 million) (New Delhi, 2011). Unfortunately, this population is worst affected by under nutrition as 43% of under five children are under weight.

These children are at high risk of mortality and morbidity, and may carry adverse health and mental consequences in their lives. Most of them live in poor societies, and with impaired physical and mental capacities. They are bound to enter a vicious cycle of poverty and malnutrition for generations to come (WHO, 2015).

1.1 Problem Statement

Globally, it was estimated that one in every three preschool children is malnourished WHO &UNICEF 2011(WHO, 2014) estimated that 165 million children under-five years of age were underweight, 101 million were stunted and 52 million were wasted Childhood malnutrition is influenced by multidimensional factors, these factors vary from biological, behavioral and environmental (WHO,2012). New estimates in "Levels and Trends in Child Mortality 2014" show that in 2013, 6.3 million children under five died from mostly Paper ID: NOV161585 preventable causes, around 200 000 fewer than in 2012, but still equal to nearly 17 000 child deaths each day (WHO, 2014). The improvement of nutrition therefore, is the main prerequisite for the reduction of high infant and under five mortality rates, the assurance of physical growth, social and mental development of children as well as academic achievement A study of school-age children from Developing countries found the overall prevalence of stunting to range between 48-52% with an overall prevalence of underweight between 34-62% notes that among school-age children stunting and underweight are more prevalent than wasting Standing Committee on Nutrition. (2002, December) Protein-energy malnutrition (PEM) is not due to deficiency in a single nutrient, but is often a result of inadequate intake or poor utilization of the food. In addition frequent infections contribute to malnutrition. For a long period the focus was on lack of protein in the diet, however now it is generally accepted that the lack of energy in the food is a more important and common factor for development of PEM (FAO, 2010).Study in northern Sudan on PEM revealed that poor family income has been found as a risk factor for severe acute malnutrition (Coulter JB, 2008). In Uganda, malnutrition remains 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 2006, nearly four in ten Ugandan children under-five years of age (38 percent) are stunted (short for their age), six percent are wasted (thin for their height), and eleven percent are underweight (UBOS & Macro International Inc ,2007).

1.3 Purpose of the study

The purpose of this study was to determine prevalence and establish socio demographic factors associated with malnutrition among children under five years and also to review specific factors leading to malnutrition. In this study, contributing factors will be defined generally as all conditions that must be available for malnutrition to occur.

1.4 Objective of the study

The study was guided by the following objectives:

1.4.1 General objective

To determine the prevalence of malnutrition among children under five years at Ishaka Adventist hospital.

1.4.2 Specific Objectives

- ❖ To determine the prevalence of malnutrition among children under five years attending Ishaka Adventist hospital.
- ❖ To establish socio demographic factors associated with malnutrition among children under five years attending Ishaka Adventist hospital.
- ❖ To determine other factors that lead to malnutrition among children under five years attending Ishaka Adventist hospital.

1.5 Research questions

The study sought to answer the following questions:

i. What is the prevalence of malnutrition among children under five years attending Ishaka Adventist hospital?

ii. What are the socio demographic factors associated with malnutrition among children under five years attending Ishaka Adventist hospital?

iii. What are the other factors leading malnutrition among children under five years attending Ishaka Adventist hospital?

1.6 Significance of the study

The study sought to investigate the prevalence, socio demographic factors associated and factors leading to malnutrition and among children under five years attendingIshaka Adventist hospital. This study therefore, generated information on prevalence and socio demographic factors associated with malnutrition among children under five years. Such information can be used to inform local leaders, health care providers and the community at large to develop interventions aimed at reducing its occurrence through specific interventions.

Through recommendations from this study, suggestions to policy makers can be made for them to put in place better policies to see that the incidence and prevalence of malnutrition reduces.

This study will be conceived on the concept of prevention. Preventive measures practiced properly can in the long run reduce on the incidence of malnutrition among children under five.

1.7 Scope of the Study

The study on the prevalence and socio demographic factors associated with malnutrition among children under five years was carried at Ishaka Adventist Hospital located in Ishaka municipality Bushenyi district in western Uganda. The study was carried out between February and April 2017 where a descriptive cross sectional study design was employed. The data was collected using a structured interview questionnaire with both open ended and close ended questions.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This chapter reviewed literature on prevalence and on factors contributing tomalnutrition among children less than 5 years. The researcher explored the existing studies to provide informatio0n on the research topic. The literature review was guided by literature related to the objectives of this study. In developed countries like United States of America and European countries, incidences of under nutrition are very low. Malnutrition is more prevalent in developing counties because of various factors, as was discussed.

2.1The prevalence of malnutrition among children under five years

The prevalence of underweight was projected to decline from 26.5% in 1990 to 17.6% in 2015, a change of –34% worldwide (de Onis, *et al*., 2013). In developed countries, the prevalence was estimated to dwindle from 1.6% to 0.9%, a change of –41%. In developing regions in total, the prevalence was forecasted to decline from 30.2% to 19.3%,a change of –36%. Unfortunately, the prevalence of underweight in Africa was forecasted to increase from 24.0% to 26.8%, a change of plus 12%.

Meanwhile, the prevalence was estimated to decrease from 35.1% to 18.5%, a change of –47% in Asia. In addition, the number of underweight children was projected to decline from 163.8 million in 1990 to 113.4 million in 2015, a change of −31% in the whole world (de Onis, *et al*., 2013). Numbers are projected to decrease in all sub-regions except the sub-regions of sub-Saharan, Eastern, Middle and Western Africa, which are expected to experience substantial increases in the number of underweight children (de Onis, *et al*., 2010).

The Ghana Health Service (GHS), has reported an increasing trend of malnutrition over the past five years. According to the agency's annual report, 2006, the malnutrition trends in children 0-11, 12–23 and 24–59 months have shown an increase over the period 2003-2006. The trend is high in mostly the three northern regions of Ghana. Ashanti region, recorded a low malnutrition rate among the 0-11 and 24–59 months groups. These were 1.8% and 2.3% respectively. The region recorded 3.3% among the 12–23 months age group.

According to UNICEF, (2008) stunting or low height-for-age is caused by long-term insufficient nutrient intake and frequent infections. This generally occurs before age two and its effects are largely irreversible. These effects include delayed motor development, impaired cognitive function and poor school performance. Nearly one third of children under five in the developing world are stunted yet there are certain countries where the prevalence exceeds this estimation. A study conducted in Malawi revealed that stunting prevalence was 50% (UNICEF, 2008).

However, in Ghana, the rates of children under five years are moderately and severely stunted to 22.4% and 7.4% respectively (UNICEF, 2008). Stunting begins at birth and

2.2 Socio demographic factors associated with malnutrition

2.2.1 Child related factors of under-five malnutrition

There are a number of demographic variables that researchers have found significant in influencing under-five malnutrition 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.

2.2.2 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 et al., 2007; Nguyen and Kam., 2008).

According to a study done in Kwara state Nigeria, Babatunde (2011), reported that there was a significant relationship between sex of a child and malnutrition, Male children were more likely to be malnourished than their female counterparts. This is probably due to increased attention paid to female children unlike the male children. Another study done in Botswana revealed that stunting, wasting and underweight were also significantly more prevalent among boys than girls (Salah and Nnyepi., 2006).

A study by Olwedo*et al.,(*2008) on the factors associated with malnutrition in internally displaced persons' camps of Northern Uganda indicated that a male child was nearly two times more likely to suffer from acute malnutrition compared to a female child (Adjusted odds Ratio of 1.56 at 95% C.I 1.15-2.13 with p-value=0.004**).Inthis situation, it could be important to note that specific ages; children's nutritional status is sensitive to feeding, weaning practices, care, and exposure to infection. A cumulative indicator of growth retardation (height-for-age) in children is positively

associated with age. A study done in Ethiopia has also shown an increase in malnutrition with increase in age of the child (Yimer, 2007). The findings are similar in Nakaseke and Nakasongola districts where children aged 37-48 months were five times more likely to be underweight than their counterparts aged less than 12 months.

A study conducted by Nguyen and Kam in Vietnam found out that the risk of malnutrition increases with age of a child. Children in the youngest age group 0-11 months had significantly lower risk of being stunted, underweight and wasted than children in the older age groups (Nguyen and Kam., 2008). The low risk to malnutrition may be due to the protective effect of breastfeeding since almost all children are breastfed throughout the first year of life. Higher rates of malnutrition after the 12 months are linked to inappropriate food supplementation during the weaning period. According to (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. It is expected that parents give less attention to older children when they give birth to a new child who needs much attention and care. Similar findings have been reported in different countries for instance in Kwara state of Nigeria (Babatunde, 2011). The findings are plausible considering that many of the younger children are still being breastfed and chronic malnutrition sets in only after weaning (Babatunde and Qaim, 2010).

2.2.3 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 (Sommerfelt*et al.,2010)*. In a study carried out among 6939 children underfive 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 and Hayat., 2016). 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 underfive children. During the study in Nakaseke and Nakasongola districts of Uganda, it was found quite easy to get actual information concerning birth order because the respondents found it easy to recall after all, they could easily tell by looking at their children.

2.2.4 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 were1.32 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.,Nuruzzaman and Goni, 2011). The study indicated that preceding birth intervals and child stunting were statistically significant ($p<0.05$). Preceding birth intervals of 18-35 months had a marginally positive significance on stunting whereas the interval of more than 48 months shows a negative relationship on stunting.

According to UBOS and Macro International Inc (2014), 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. Child birth intervals were statistically insignificant in the study conducted in Nakaseke and Nakasongola districts.

2.2.5 Mothers age at birth

Mothers age at birth has been associated with malnutrition among under-five year old children for example it was found out in Bangladesh that children whose mothers were less than 20 years at the time of birth were 1.22 times more likely to be stunted, wasted and underweight compared to children whose mothers were 20 years and above at birth (Nure., Nuruzzaman and Goni, 2011).Bachou (20012) in the Ugandan settings identified some common risk factors for protein energy malnutrition, that is severely malnourished infants mostly from young mothers had low weight at birth with less access to breast feeding that is essential for the infants protein intake. Thirty four percent (34%) of children received supplementary food by three months and some mothers stopped breast feeding earlier.

A number of studies have reported that mothers age at birth is one of the most important determinants of malnutrition among underfive 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, underfive malnutrition is higher also among children whose mothers give birth when they are older especially after 35 years. This is attributed to the fact that giving birth at an older age is associated with a higher likelihood of giving birth to babies with a low birth weight (Shrimptonetal., 2011). However, it is important to note that children of the younger mothers are traditionally cared for by

their grandmothers in Turkey and this was associated with low levels of malnutrition among children of younger mothers less than 24 years (Ergin*et al*., 2015).

2.2.6 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 focussed on maternal education, marital status and maternal occupation. Some other variables like place of residence and region were not applicable since the study was conducted in rural areas of Nakaseke and Nakasongola districts both found in Central Uganda.

2.2.7 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 practises and particularly under-five child nutrition (Babatunde and Qaim, 2010; Olwedo*et al.,* 2013; Webb and Block., 2014). These studies have pointed out the fact most women with low education spend more time in gardens and feed their children on less nutritious foods. Women who spend more time in gardening get limited time to attend to their children and prepare for them nutritious meals unlike their educated counterparts who normally focus on good child nutrition practices even when they are absent from home most of the time. Education helps mothers gain additional knowledge about the adequate intake of food for their children in terms of correct quantity, quality and frequency. It also determines her income and this helps her access proper nutrition for the child as well as health services.

In some countries, malnutrition levels are fairly similar among children whose mothers attended primary or secondary school while elsewhere there is a greater similarity with children whose mothers attended primary school or had no formal schooling. Median levels of malnutrition across all countries range from 36 percent for children whose mothers had some primary education to 16 percent for children of mothers with secondary or higher education.

2.2.8 Marital Status

On the study about mothers' marital status and under-five child nutrition, findings in Ethiopia reveal that child's malnutrition is significantly associated with marital status. It was found out that

under-five child malnutrition is higher among unmarried rural and divorced/separated women compared to married ones (Teller, 2010). 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*et al.,* 2016).

2.2.9 Mothers occupation

Previous studies have found out that mother's occupation is one of the determinants of under-five malnutrition in most developing countries. A study in Vietnam revealed that children from mothers who were labourers 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 and Kam, 2010). 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 malnutrition. It is also common for mothers to fail to provide complementary feeds including protein foods since most of them cannot afford them (Olwedo*etal.,*2008). Such findings are true especially among peasant farmers in Nakaseke and Nakasongola districts who spend most of their time in gardens leaving the under-five children under the care of other siblings or housemaids who are sometimes too young or illiterate on proper under-five nutrition practises.

Mother's occupation is one of the indicators for access to adequate food supplies, use of health services, availability of improved water sources, and sanitation facilities which are prime determinants of child nutritional status (UNICEF, 1210).

2.3Other factors leading of malnutrition

Malnutrition is caused by a multitude of the factors. Causes of malnutrition can bedivided broadly in to medical, social, economical and political. This is one of the most studied subjects in public health. UNICEF classified these causes into the hierarchy and provided frame work for better understanding.

This classification is very useful in creating hierarchical model for under nutrition. Irrespective of basic and underlying causes there are only 2 immediate causes of malnutrition such as diseases and inadequate dietary intake are important determinants of nutritional status ofa child are described briefly in coming sections (UNICEF, 2008)

2.3.1 **Maternal factors**

Intrauterine period is most important developmental period in child's life where it grows from single cell embryo to fully developed child. First 3 months are the most important period in child development. Lack of proper nutrition during this period may lead to lifelong disability. Classic example is of neural tube deficit attributable to foliatedeficiency Lack of proper nutrition during pregnancy is one of the important causes for low birth weight. Multitude of factors affects this pathway of maternal nutrition to birth weight.

2.**3.2 Antenatal Coverage**

Various studies found association between antenatal care and low birth weight.

Compared to 5 or more Antenatal care visits, under visitors (1-5 times) and non visitors

(no ANC) had Odds Ratio (OR) of 9.18 (6.65-12.68) and 5.46 (3.90 – 7.65) respectively of having low birth weight baby ((BMC Public Health. 2007).

However, quality of ANC is also important than just number of visits. Study used

2 proxy measures for quality of ANC, tetanus toxoid injections and guidance on where to go for pregnancy related complications. Study found lower OR of having small sized babies in (Hague, 2008).

2.3.3**Pre pregnancy weight**

Pre pregnancy weight represents overall nutritional status of mother. It is associated with higher level of low birth weight. Study in Maharashtra found that pre pregnancy weight < 45 kg was associated with high chance of Low Birth Weight (LBW)

(OR= 4.41, 2.30-8.46) compared to pre pregnancy weight > 45 kg(Deshpande, 2011).

Another prospective cohort study from Pune found relative risk for LBW 1.3 in pre pregnancy weight < 40 kg compared to reference group (40-45 kg) (Hirve, 2008).

2.3.5 Child factors

2.3.5.1Low birth weight

Low birth weight is under nutrition (underweight) at age 0. In her paper (SouthAsian Enigma) Monica Das Gupta has identified three major factors responsible for higher level of under nutrition in Indian population compared to African subcontinent namely, low birth weight, women empowerment and hygiene & sanitation. Higher incidence of Low birth weight in India (28%) compared to 16% in African setup makes nearly one third children begin their lives with disadvantage as such.

2.3.5.2 Exclusive breast feeding

Exclusive breast feeding has protective effect, if provided for appropriate duration. Beyond certain point continuing breast feeding may be risk for under nutrition itself. Weaning should be started at appropriate age. Cut off point for this consideration isan issue of debate. Wafie found significant less weight gain in breastfed children of 6 to

12 months compared to completely weaned children of same age group(Fawzi WW, 2012).

2.3.5.3 Immunization and nutritional status among under five children

Immunization or vaccination is known to significantly protect a child from many childhood killerdiseases such as measles, respiratory tract infections, whopping cough, poliomyelitis, and cholera among others (Abedi, &Srivastava, 2012; Santos, et al., 2013).

According to Abedi, and Srivastava (2012), childhood vaccination may protect children's nutritional status and lead to improved child growth in developing countries where most child killer diseases are preventable with vaccination. Abedi, and Srivastava observed that of 402 studied children, 176 (43.8%) were fully immunized, 168 (41.8%) and 58 (14.4%) were partially immunized and unimmunized, respectively. The authors observed that fully immunized children had better nutrition status. For example, significant association was found with immunization status of the children in relation to underweight. The study indicated that majority of children were malnourished and most of them were unimmunized. Abedi and Srivastava also revealed that immunization status of urban children was better than rural children. Das and Hossain (2008) in Bangladesh studied of 6005 children aged 12-59 months noted that those children who did not receive any vaccines, over one-fifth and two-fifths were found severely and moderately undernourished. Furthermore, the proportion of underweight was found significantly higher among partially immunized children (60.0%) than that of fully immunized children (52.0%).Similarly, Ray (2000) in Siliguri, India found a significantly higher prevalence of malnutrition children amongst partially immunized and non-immunized children (81.3% and 88.2%) in comparison to fully immunized children (62.1%). This implies that partially and non-immunized children were at higher risk of malnutrition as they were not protected against the vaccine preventable diseases. Santos, et al. (2013) study of 600 under five children revealed that 560 (93.3%) had received primary immunization, while 40 (6.7%) children were partially immunized.

Accordingly, prevalence of malnutrition was significantly higher in children who were partially immunized compared to fully immunized ones. With high prevalence of underweight (119; 53.6%), stunting (120; 54.1%) and wasting (38; 17.1%), (Santos, et al., 2013) revealed that stunting, wasting and acute respiratory infections were significantly lower in fully vaccinated children than in partially vaccinated ones. Thus, frequent vaccination protects the child against infections. Incomplete vaccination leads to worm infestation, an important predisposing factor for childhood malnutrition (Bhavsar, et al., 2012; Sengupta, et al., 2010). Sengupta and colleagues also observed that underweight, stunting and wasting were significantly higher in the incomplete immunized children than the completely immunized under five children. Therefore, the protective potentials of immunization cannot be under estimated and must be implemented to the benefits the children.

2.3.6 Infections: these may reduce appetite, increase energy and nutrient utilization (e.g. to fight infection) and limit the ability to absorb or retain nutrients (e.g. as a consequence of diarrhea and/or intestinal parasites) (WHO,2011).

CHAPTER THREE
METHODOLOGY

3.0 Introduction

This chapter describes the study area focusing on Geographical location, population structure and many other aspects including Study design, sample size determination, sampling method, selection criteria, data Collection, data analysis, data presentation, data quality control, study limitation and Ethical consideration.

3.1 Study area

The Study was done in Ishaka Adventist Hospital which is located in Ishaka town, Bushenyi District, in Uganda. Bushenyi District is approximately 337 kilometer by road, southwest of Kampala, the capital city of Uganda. The district is estimated as of the year 2014 UBOS report to have a population size of 235,621 people.

Bushenyi District lies between 00 N and 00 46' S of the equator and 290 41' East and 300 30' East of Greenwich. Its headquarters are located 340 km from Kampala in the South Western part of Uganda. It neighbors the districts of Rubirizi in the North, Buhweju and Sheema in the North East, Sheema in the East, Mitooma in the South West and Sheema in the South. The district has a land area of 3'949 square kilometers and lying between 910 – 2,500 meters above sea level and the main physical features within the district include natural tropical forests of Karinzu and Imaramagambo covering an area of 784 square km. Arable land covers 2,215 square km, open water bodies cover 372 square km and wetlands covering 183 square km.

Bushenyi District has a population as projected in 2010 of 117,000 and 124,000 male and female respectively totaling to 241,000 people. The population distribution in rural and urban is projected to stand at 89 per cent rural and 11 per cent urban. Importantly though, the urban population is projected to be almost 1:1 male to female ratio. The population density stands at 282 people per square km with a household size of 6.

3.2 Study design

A descriptive cross sectional study was used for children under five years who are attending Ishaka Adventist Hospital. Children weight for age and mid-upper arm circumference will be measured.

3.3 Sample Size determination

The sample size was determined using Fishers *et al*, 2003 formula .

$$n = \frac{z^2pq}{d^2}$$

Where

n= minimum sample size

d = margin of error

z=standard normal deviation corresponding to 1.96

p= prevalence of diarrhea.

q=1-p

Therefore taking

p = 26/100 (UDHS, 2006).

z = 1.96

q=1-p = 0.74

d= 5% or 0.05

$$n = \frac{1.96^2 X 0.26 X 0.74}{0.05^2}$$

= 296

Note, because of limited resources exactly a half of value of n was used in the study. Thus the sample size used was 150.

n=150 mothers with children presenting with gastroenteritis.

3.4 Study population

The study included all children under five attending Ishaka Adventist Hospital

3.5 The sampling method

A random sampling method was used among 150 children under five attending Ishaka Adventist Hospital

3.6 Inclusion and exclusion criteria

The study included all parents with children under five year of age, all children under five year age of intended population whose caretakers accepted to give consent, parents and caretakers of children under five year age attending Ishaka Adventist Hospital. Children above five years of age,

those who had emergence medical conditions, parents and caretakers of children who did not give consent, will be excluded.

3.7 Data collection method

The data was collected using both open and close ended structured questionnaire about socio-demographic and other characteristics (appendix i), the data was collected by the principle investigator himself and three research assistants. The questionnaires were filled by the child's mother / attendant. The variables of interest included age, sex, education, occupation, marital status, income and occupation. Others were hygiene and sanitation practices, water related factors exposure to infective pathogens was captured by the questionnaire. Measurements of weight for age and mid upper arm circumference were made and recorded to determine prevalence of malnutrition.

3.8 Data Analysis and presentation

The data collected from the study was computed using Microsoft excels. The analysis was made in line with the study objectives so as to achieve the purpose of the study and was presented inform of tables, pie-charts, bar-graph, and narratives depending on the data analyzed.

3.9 Expected study limitations

Language barrier because since the questionnaire was in English and some of the respondents were not conversant with the language however interpreters assisted in the process.

3.10 Data quality control

To ensure quality control, the researcher prior to the exercise conducted one day training for three research assistance who there-after were set for field testing of the study tools at Comboni hospital. A total of six questionnaires were distributed for the pre-test. The research assistants were supervised closely by the principle invigilator himself.

3.11 Ethical Consideration

The study was carried out after the approval of the proposal by the university.

An Introductory Letter from the Administrator school of Allied health sciences was obtained.

The researcher obtained permission from the administration Ishaka Adventist Hospital.

Autonomy wasobserved.

Confidentiality was maintained all through the research process and the interviews were conducted in reasonable privacy by use of codes that will only be known by responsible parties other than use of names, and ensuring not to disclose their information to third parties without their consent.

CHAPTER FOUR:

STUDY FINDINGS

4.0 Introduction

This chapter presents the Results, Analysis and interpretations of findings of the study according to the specific study objectives. Findings and results are presented in form of bar graphs, pie charts, tables and figures.

Study findings.

From the study conducted, the following results were obtained from a sample of 150 respondents who were enrolled in the study.

PART I: Socio-demographic characteristics of the participants.

From the study, regarding children's age, majority 63 (42%) were below one year, 47 (31.3%) were between 1 and 2 years and 40 (26.6%) were between 2 and 5 years. Regarding the sex of the children, majority 81 (54%) of children who participated in the study were female children and 69 (46%) were male children. Majority 43 (28.7%) of the children were forth born, 38(25.3%) were second born, 37 (24.6%) were third born, 32 (21.3%) were first born. Regarding mother's occupation, majority 79 (52.7%) were housewives, 38 (25.3%) were businesswomen, 17 (11.3%) were students, 16 (10.7%) were employed mothers. Regarding mothers marital status, majority 134 (89.3%) of the mothers were married, 19 (12.7%) were divorced. Regarding education level, majority 97 (64.7%) had gone to school at least up-to primary level, 23 (15.3%) had never gone to school and only 30 (20%) had studied beyond primary level.

Factor	Category	Frequency	Percentage
	Below 1 year	63	42
	1 to 2 years	47	31.3
Age of the child	2 to 5 yeas	40	26.6
	Total	**150**	**100**

Sex of the child	Male	69	46
	Female	81	54
	Total	**150**	**100**
Birth order of the child	First	32	21.3
	Second	38	25.3
	Third	37	24.6
	Forth and above	43	28.7
	Total	**150**	**100**
Mothers occupation	Housewife	79	52.7
	Student	17	11.3
	Business woman	38	25.3
	Employed	16	10.7
	Total	**150**	**100**
Marital status of mother	Married	134	89.3
	Divorced	19	12.7
	Widowed	5	3.3
	Total	**150**	**100**
Education level of the mother	Non educated	23	15.3
	Primary level	97	64.7
	Post primary	30	20
	Total	**150**	**100**

PART II: Prevalence of malnutrition in children under five years.

From the study, two forms of malnutrition were identified i.e. wasting and underweight of which were further categorized as severe, moderately malnourished.

Out of 150 children that were enrolled in the study, it was found that a total of 6(4%) were severely wasted ie MUAC <12.5cm, 13(8.7%) of them were moderately wasted ie MUAC between 12 and 13.5cm, 131(87.3%) of them were found to be normal ie with MUAC > 13.5cm.

On the other hand, 8(5.3%) of the 150 children had severe low weight for age ie<60% standard weight, 14 (9.3%) were having moderate low weight for age ie standard weight between 60 and 80% and 128(85.3%) of the children were having normal weight for age i.e. standard weight above 80%. Generally, the total numbers of 14 (9.3 %) children were severely malnourished, 27 (18%)were moderately malnourished giving an average percentage of 13.7% of malnutrition.Also, the total number of children that were wasted was 19, and that of those who were having low weight was 22. (Table 4.1).

Table 4.1 Showing prevalence of malnutrition among children under five years

VARIABLE	CATEGORY	FREQUENCY	PERCENTAGE
Wasting	Severe wasting(MUAC<12.5 cm)	6	4
	Moderate wasting (MUAC 12-13.5 cm)	13	8.7
	Normal (MUAC>13.5 cm)	131	87.3
	Total	**150**	**100**
Under weight	Severe (standard weight<60%)	8	5.3

	Moderate underweight (standard weight 60-80%)	14	9.3
	Normal weight (standard >80%)	128	85.3
	Total	**150**	**100**

PART III: Socio-demographic factors associated with malnutrition among children under five years

The socio-demographic factors associated with malnutrition that were studied included Childs age, child's sex, child's birth order, mother's occupation, marital status and education level.

From a total of 19 children that were found to be wasted, 2 (10.5%) were below one year of age, 13 (68.4%) of them were between 1 and 2 years while 4 (21.1%) were between 2 and 5 years. On the other hand from a total of 22 children that were having low weight for age, majority 16 (72.7%) were between 1 and 2 years, 3 (13.1%) of them were below 1 year and also3 (13.6%) were between 2 and 5 years.

Also to note is that majority of the children that were wasted 12 (63.2%) were male children while 7(36.8%) were female children. And also 13 (59.1%) children that had low weight for age were male children while 9 (40.9%) were female children.

Out of 19 children that were wasted, 7 (36.8%) were third born followed by 5 (26.3%) who were more than third born and then 4 (21.1%) were second born and then 3 (15.8%) who were first born. On the other hand out of 22 children, most of them that had low weight for age 10 (45.5%) were more than third born followed by 6 (27.3%) who were third born 4(18.2%) were first born and only 2 (9.1%) were second born.

Regarding mother's occupation, out of 19 children that were wasted, majority 7 (36.8%) of them their mothers were business women followed by 5 (26.3%) whose mothers were employed, 4 (21.1%) of the children's mothers were students and 3 (15.8%) were housewives. Also of 22

children that had low weight, most 11 (50%) their mothers were business women followed by 5 (22.7%) whose mothers were employed, those whose mothers were house wives and students were 3 (13.6%).

Surprisingly, majority of the children that were wasted 12 (63.2%) belonged to married women and 17 (77.3%) of them who had low weight also belonged to married women.

Out of 19 children 10 (52.6%) of the children were wasted, and out of 22, 13 (59.1%) of those that had low weight for age their mothers were non educated.

Table 4.3 Showing comparison of socio-demographic factors and prevalence of malnutrition

FACTOR	WASTING N= 19		UNDERWEIGHT N=22	
1. Age of the child	Frequency	Percentage	Frequency	Percentage
Below 1 year	2	10.5	3	13.6
1 to 2 years	13	68.4	16	72.7
2 to 5 years	4	21.1	3	13.6
2. Sex of the child				
Male	12	63.2	13	59.1
Female	7	36.8	9	40.9
3. Birth order				
First born	3	15.8	4	18.2
Second born	4	21.1	2	9.1

|				
Third born	7	36.8	6	27.3
More than third born	5	26.3	10	45.5
4. Mothers occupation				
House wife	3	15.8	3	13.6
Student	4	21.1	3	13.6
Business woman	7	36.8	11	50
Employed	5	26.3	5	22.7
5. Marital status of the mother				
Married	12	63.2	17	77.3
Divorced	4	21.1	3	13.6
Widowed	3	15.8	2	9.1
6. Education level of the mother				
Non-educated	10	52.6	13	59.1
Primary level	6	31.6	4	18.2
Post primary level	3	15.8	5	22.7

4.3 Other factors that lead to malnutrition among children under five years attending Ishaka Adventist hospital.

Part A: Maternal factors

Maternal factors associated with malnutrition that were studied included ANC coverage, maternal health condition during pregnancy, maternal age at birth and maternal weight at birth.

Out of 41 children that were found to be either having wasting or low weight for age, majority of them (30), their mothers fully attended ANC services and only 11 of them had not attended ANC services. Also, 32 mothers of children who were either wasted or had low weight for age had good maternal health throughout the course of pregnancy whereas 9 of them report to have had generally bad maternal condition associated with sickness of infections. Regarding maternal age, 27 of the mothers of malnourished children reported to have had above 20 years before conception and 14 reported to have had below 20 years before conception. Regarding maternal weight at birth, 36 of the mothers of children reported to have had above 40 kg at birth and 5 of them reported to have had above 40 kg of weight at birth.
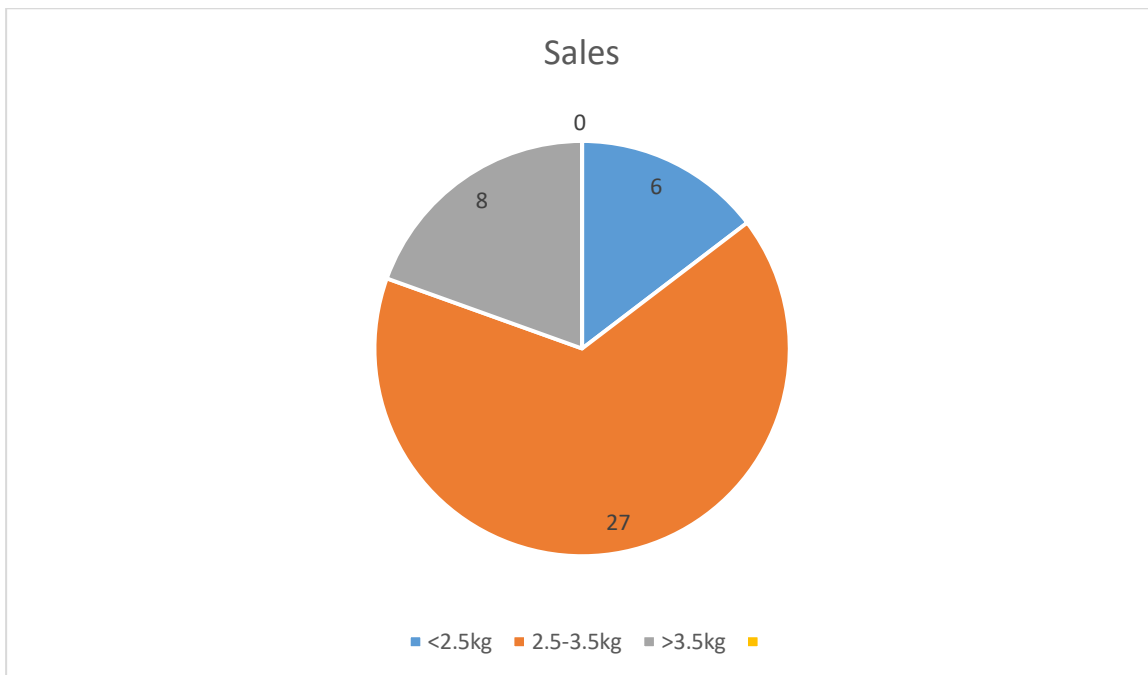
Figure 4.1 showing some of the maternal factors associated with malnutrition n=41
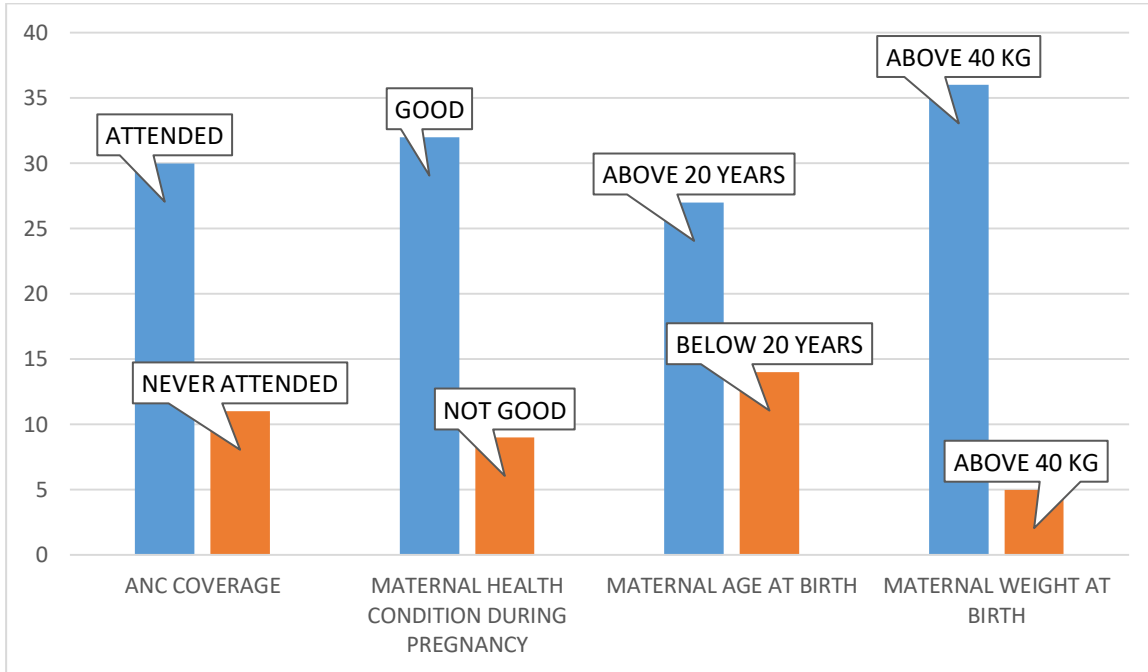
**Part B: Child factors**

Birth weight and malnutrition

Figure 4.2 Showing the prevalence of malnutrition with birth weight n=41

From the study conducted out of the 41 children who were malnourished, 27 children had been born with a 2.5 to 3.5kg weight, 6 children had been born with weight less than 2.5 kg while 8 children were born with weight above 3.5 kg

Immunization status

Figure 4.3 showing the prevalence of malnutrition with immunization
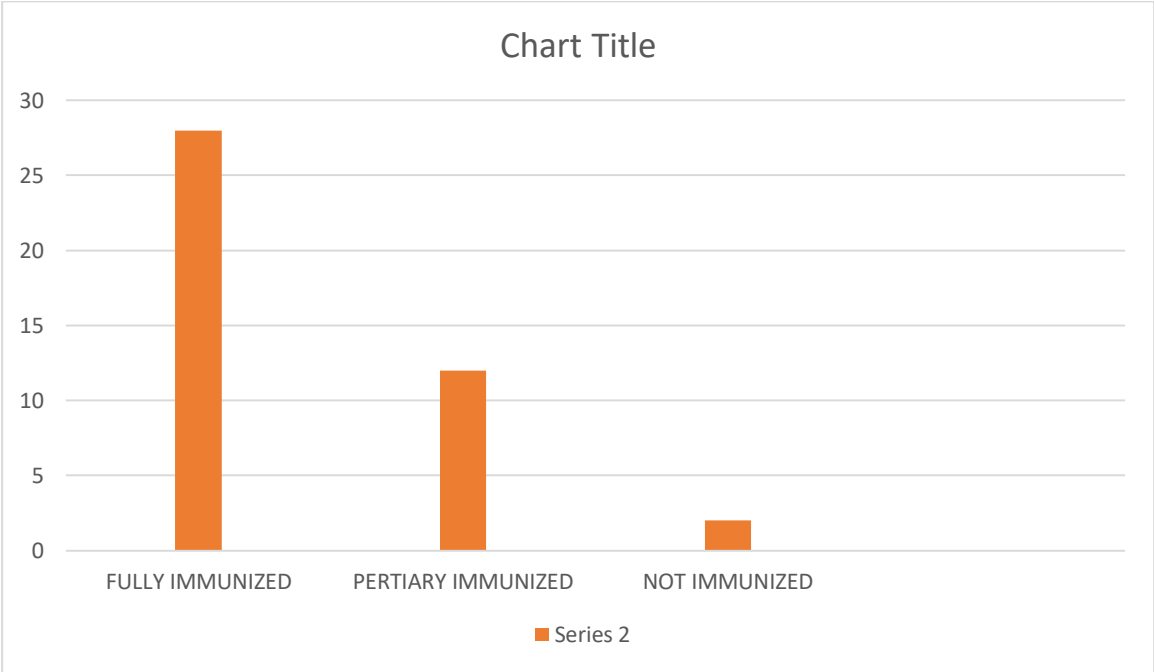
Out of 41 children of which some were either wasted or had low weight for age, 28 of them were reported to be fully immunized whereas 12 of them were partially immunized and 2 had never been immunized.

Breastfeeding

Figure 4.4 Showing Prevalence of malnutrition with breastfeeding status
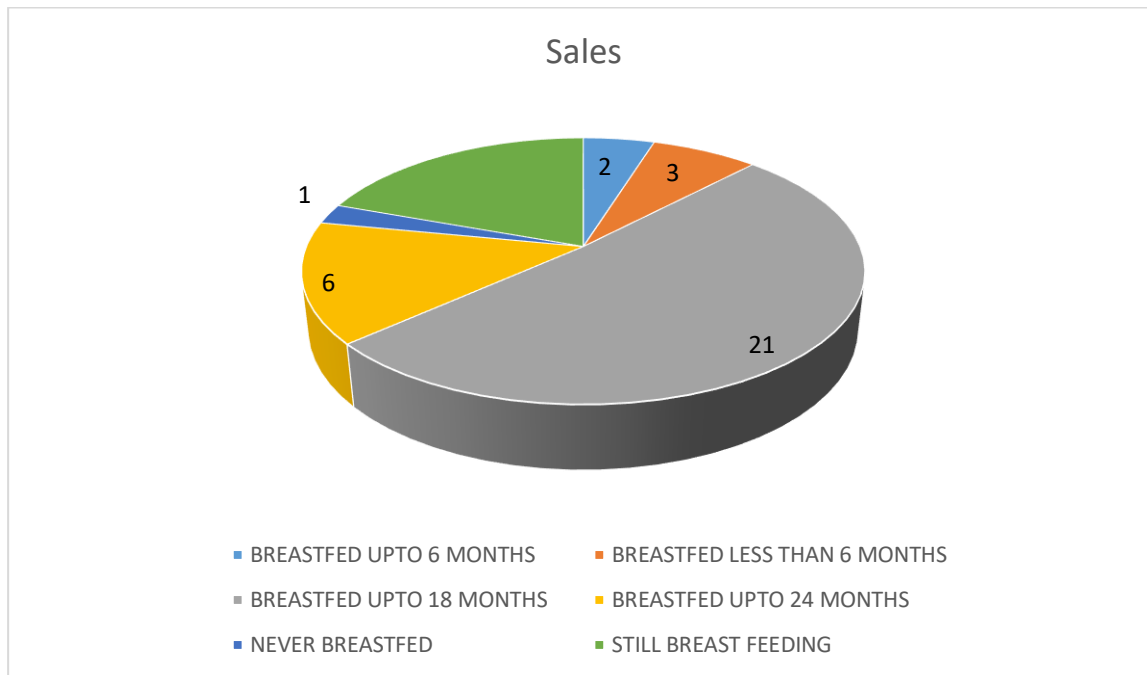
From the study conducted out of 41 children who were malnourished, 3 children had been breastfeed for less than 6 months, 21 the majority had been breast fed up to 18 months, 2 children had been breast fed up to 6 months, 6 children had been breastfed up to 24 months, only one had never been breast fed

Infection and disease status

Table 4.4 Showing prevalence of malnutrition with infection and disease

CATEGORY	FREQUENCY	PERCENTAGE
Recent or current disease or infection	**28**	**68.3**
No recent or current disease or infection	**13**	**31.7**

From the study conducted out of the 41 children who were malnourished, 28(68.3%) had had a recent or were currently having an infection while 13 (31.7%) were without any recent infection.

CHAPTER FIVE

5.0 Introduction

This chapter presents the summery of the findings, discussions, conclusion and recommendations of the study findings that were presented in the previous chapter. These were basically presented according to the specific objectives.

5.1 Discussion

5.1.1 Prevalence of malnutrition among children under five years

From the study out of 150 children that were enrolled in the study, it was found that a total of 6(4%) were severely wasted, 13(8.7%) of them were moderately wasted, 131(87.3%) of them were found to be normal.

On the other hand, 8(5.3%) of the 150 children had severe low weight for age, 14 (9.3%) were having moderate low weight for age and 128(85.3%) of the children were having normal weight for age. This indicates that a total of 19 (12.7%) were malnourished basing on wasting as a measure for malnutrition this is relatively higher as compared to other studies for example a study by (UBOS & Macro international, 2007) who stated that 6% of the children in Uganda are wasted (thin for age). And that a total of 22 (14.7%) children had low weight for their age. This value of low weight for age in current study is higher than that revealed in a study by (UBOS, 2007) who stated that 11% of children in Uganda are underweight.

Generally, the total number of 14 (9.3 %) children were severely malnourished, 27 (18%) were moderately malnourished giving an average percentage of 13.7% of malnutrition. Also, the total number of children that were wasted was 19, and that of those who were having low weight was 22.This is however,contrally to the similar study done by (MOH, 2010) who in their study stated thatglobally, it is estimated that there are nearly 60 million children with MAM and 20 million with SAM. About 9% of sub-Saharan African and 15% of south Asian children have moderate acute malnutrition and about 2% of children in developing countries have SAM (MOH, 2010; Yebyo*et al* 2013).

5.1.2 Socio-demographic factors associated with malnutrition among children under five years. From a total of 19 children that were found to be wasted, 2 (10.5%) were below one year of age, 13 (68.4%) of them were between 1 and 2 years while 4 (21.1%) were between 2 and 5 years ,

the high percentage of between 1 and 2 years is associated with poor weaning practices like early weaning and introducing foods with less proteins to the baby. This age is also associated with hyperactivity of babies and children can eat a lot of various things, this predisposes them to diarrohea diseases that are highly associated with malnutrition.

On the other hand from a total of 22 children that were having low weight for age, majority 16 (72.7%) were between 1 and two years, the low weight for age is an indicator of gradual stunted growth an indicator that the child's nutritional demands are not met usually due to inadequate food quantity. This is usually because the parents sell most of the food stuffs in need of money and leave less food for children.

In general 19(12.7%)of all the children who were enrolled in the study were found to be wasted while 22(14.7%) were found to be stunted. This is an indicator that though Bushenyi if a food producing district, there is still high level of malnutrition in the area.

5.1.3 Other factors associated with malnutrition among children under five years.
From the study conducted out of 41 children who were malnourished, 3 children had been breastfeed for less than 6 months, 21 the majority had been breast fed up to 18 months, 2 children had been breast fed up to 6 months, 6 children had been breastfed up to 24 months, only. This shows that early weaning of children predisposes them to malnutrition. However this study slightly differs from a recommendation by Uganda MOH which advised that children breast feed up to 18 months had low chances of being malnourished and yet from the study the highest number of children here had been breast fed up to 18 months.

Also to note is that from the study conducted out of the 41 children who were malnourished, 28(68.3%) had had a recent or were currently having an infection while 13 (31.7%) were without any recent infection. This is an indicator that infections contribute to malnourished because the make a child fail to have appetite thus poor feeding practices. Some other infections like worm infestations directly suck digested food directly and deprive children of nutrients from the body

5.2 Conclusions.

On prevalence, the study concludes that Bushenyi in which Ishaka Adventist Hospital is located has a high malnutrition level given that from the study 12.7% and 14.7% were wasted and stunted

respectively as compared to UBOS findings that indicate 6% and 1l% to be wasted and stunted respectively in Uganda.

The study also concludes that the children age of 1 to 2 years are the most affected by malnutrition followed by those between two to five years accessed on basis of wasting and stunted growth.

Also to note is that malnutrition is associated with a number of factors including child infections, poor breast feeding practices, unimmunized children, and failure to attend antenatal care by the mother during pregnancy. And other associated factors like mothers' educational level, mothers' occupation among others. This indicates that malnutrition is not only associated with feeding practices of the child but a lot of associated factors as indicated above.

5.3 Recommendations

Mothers should be encouraged to breast feed their babies exclusively up to 6 months and breast feeding should go on up to at least 18 months.

Mothers should be encouraged to take their child for immunization, since unimmunized child are susceptible to diseases that are one of contributing factors for malnutrition.

Mothers should be taught on how to monitor their baby growth using a growth monitoring chart, such that incase the child starts to lose weight, and the mother can seek health advice in time.

The health should guide mothers who deliver from health centers and hospitals on different ways of good child feeding

Mothers should be encouraged to always pick nutritional supplements from health centre for their children for example vitamin A, zinc among others.

The government should organize workshops together with community leaders to teach people not to sell all their agricultural produce for money leaving their children malnourished.

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APPENDICES

APPENDIX I: RESEARCH BUDGET

Item	Unit price	Amount
Stationary	10,000/=	10,000/=
Internet services	30,000/=	30,000/=
Typing and printing	40,000/=	40,000/=
Airtime	20,000/=	20,000/=
Transport	50,000/=	50,000/=
Total		**150,000/=**

APPENDIX II: Proposed Research Work plan

ACTIVITY	JAN 2017	FEB 2017	MAR 2017	APR 2017	MAY 2017	JUN 2017
Identification of research topic and approval of it.	■					
Assignment of supervisor and writing the proposal		■				
Continuation of proposal writing, submitting to faculty for examination.			■	■		
Data collection, data analysis, report writing and submitting it to faculty and defending it.					■	■

APPENDIX III: STUDY QUESTIONNAIRE
PART A: Informed Consent

Study: Prevalence of malnutrition among children under five years attending IshakaAdventist hospital.

Introduction

My name is Bogere Solomon; I am a student of Kampala International University western campus doing a diploma in clinical medicine and community health. I am here to do a study of prevalence of malnutrition among children under five years attending Ishaka Adventist Hospital.

Purpose of the study

This study will help us to determine the extent of the burden of malnutrition among childrenunder five years.

Study design/Procedure

This is a cross-sectional study and we are recruiting participants for this study from this health centre through systematic random sampling of the parents of children as they come for management. That means that anybody can be selected depending on their assigned number. An interviewer administered questionnaire will be used to collect information from the participants.

Risks

There are no anticipated risks in this study Voluntary Participation

This study is absolutely voluntary and participants can decide to decline participation or can abandon it half way if they feel uncomfortable with it.

Confidentiality

The information obtained will be treated with confidentiality and will not be shared with any other unauthorized people. In addition, participant's names will not be taken.

PART A: Demographic and socio-economic characteristics

Primary caregiver in this household

1. Mother

2. Father

3. Aunt

4. Other Relative

Age of the mother at pregnancy

1. Below 20 years
2. 21 to 25 years
3. 27 to 34 years
4. Above 35 years

Religion

1. Christian

2. Muslim

3.Others

Mother's Level of education

1. None

2. Secondary

3. Primary

4. Tertiary

Marital Status

1. Single

2. Separated / Divorced

3. Married

4. Widow

Currently what do you do for a living? (Occupation)

1. Housewife

2. Student

3. Business man/woman

4. Employed

5. Other9. Mother`s occupation

Age of the child

Below 1 year

1 to 2 years

to 5 years

Sex of the index child

1. Male

2. Female

Birth order of the child

1. First

2. Second

3. Third

4. Fourth & above

Birth interval

Birth interval between the child and older sibling (if any)_____ (years)

PART C: FACTORS LEADING TO MALNUTRTION

MATERNAL

Was there any serious illness during pregnancy?

Yes………….   No……………..

How many times did the mother attend antenatal clinic during pregnancy?

Time

Times

Times

Times

What was the weight of the mother before conception?

<45kg

45-55kg

56-60kg

>60kg

CHILD

What was the weight of the child at birth?

<2kg

2.5-3.5kg

>3.5kg

What is the child's immunization status?

Fully immunized

Partially immunized

Not immunized

SECTION D: QUESTIONNAIRE FOR THE MOTHERS

Instruction: Mark [√] or state where needed the box corresponding to your choice concerning each statement below:

How many children do you have? …………………………..

How many of them are under five years? ……………………….

How many people do you feed in your household?....................................

Did you ever breastfeed this child/children

a. Yes   [ ]

b. No   [ ]

Is the child still breastfeeding?

a. Yes   [ ]

b. No   [ ]

Which of the following do you practice? Please Tick (√) as many as applicable

a. Exclusive breastfeeding?(6 months) [ ]

b. Breastfeed the child for 18 months   [ ]

c. Breastfeed the child for 24 months   [ ]

d. Never breastfeed the child [ ]

18. When did you start giving the child complementary diet?

a. Before 6 months   [ ]

b. At 6 months   [ ]

c. 7 – 12 months   [ ]

d.   After 12 months   [ ]

What type of food do you give to your child? Please tick as many as applicable

a. cereals (eg: corn, wheat, millet, and oats)   [ ]

b. vegetables (eg: cabbage, garden eggs, okro)   [ ]

c. fruits (eg: orange, mango, pawpaw, banana)   [ ]

d. roots and tubers (eg: yam, cassava, cocoyam, potato)   [ ]

e. legumes/meat, fish, egg   [ ]

Have you received any education on the following?

Breastfeeding   yes [ ]   no [ ]

Healthy eating   yes [ ]   no [ ]

Complementary feeding   yes [ ]   no [   ]

What is the immunization status of your child?

a. No routine immunization   [ ]

b. Partially immunized   [ ]

c. Fully immunized   [ ]

Did your child experience diarrhea in the last 2 weeks?

a. Yes   [ ]

b. No   [   ]

APPENDIX IV: Map of Bushenyi district