

**FACTORS CONTRIBUTING TO MALNUTRITION AMONG PREGNANT WOMEN  
ATTENDING ANTENATAL CLINIC IN MITYANA HOSPITAL,  
MITYANA DISTRICT**

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## **DECLARATION**

I Zawedde Florence, hereby declare that this research work on Factors influencing malnutrition among pregnant women attending ANC clinic at Mityana hospital, Mityana district is my own original work and it has never been presented at any institution for the same or any other academic award.

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DATE: .....

**APPROVAL**

This research work on Factors influencing malnutrition among pregnant women attending ANC clinic at Mityana hospital, Mityana district has been under my guidance and supervision and is submitted with my approval.

SIGNATURE: .....

SUPERVISOR'S NAME: AFAYO ROBERT

DATE: .....

## **DEDICATION**

I dedicate this dissertation to; my beloved mother, Ms. Dolothy Nakyanzi; my husband, Mr. Kityo Ben; my sons, Benja and Brian; plus my supervisor, Mr. Afayo Robert who has done a tremendous contribution towards my research work.

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## **OPERATIONAL DEFINITIONS**

### **Malnutrition**

Malnutrition refers to the situation where by an individual feeds on unbalanced diet in which some are in excess, lacking or in wrong proportion.

This can be determined by measuring one's body mass index where by <18.5 means Underweight, 18.5 – 24.9 –Healthy, 25 – 29.9 – Overweight and 30 means Obese.

### **Antenatal clinic**

This is a place where expectant/ pregnant women go to receive medical checkups, screening, diagnosis and treatment of various conditions plus health education and advice in preparation for safe delivery.

### **Trimester.**

This is a three month division of a pregnancy. The first three months( 1-3 months) being termed as 1<sup>st</sup> trimester, the second three months (4-6 months) meaning the 2<sup>nd</sup> trimester and the last three months( 7-9 months) called the 3<sup>rd</sup> trimester.

### **Lactation**

This is a process of feeding the baby after birth through breast milk.

### **Parity**

This means the number of times a woman has given birth to a viable child (24 or 28 weeks of gestation) regardless of whether the born child is alive or stillbirth.

## **ABBREVIATIONS AND ACRONYMS**

AIDS	-	Acquired Immune Deficiency Syndrome
ANC	-	Antenatal Care
BMI	-	Body Mass Index
DHO	-	District Health Officer
HIV	-	Human Immune Virus
IFA	-	Iron Folic Acid
ITN	-	Insecticide Treated Nets
LBW	-	Low Birth Weight
LLIN	-	Long Lasting Insecticide Nets
PEM	-	Protein Energy Malnutrition
RDA	-	Recommended daily allowances
STIs	-	Sexually Transmitted Infections
TT	-	Tetanus Toxoid
UDHS	-	Uganda Demographic Health Survey
UNICEF	-	United Nations International Children's Emergency Fund
US	-	United States
WHO	-	World Health Organization

## ABSTRACT

### **Introduction:**

Malnutrition is still highly prevalent among pregnant women in Uganda with 12% of them being undernourished 64% of pregnant women and 53% of lactating women being anemic and 18.6% of pregnant women and 17.3% of lactating mothers having Vitamin A deficiency.

Many of the 200 million women who become pregnant each year, most of them in developing countries suffer from ongoing nutritional deficiencies, repeated infections and the long term cumulative consequences of under nutrition during their own childhood.(UNICEF, 2009)

### **General objective:**

The study assessed the factors contributing to malnutrition among pregnant women attending antenatal clinic in Mityana hospital, Mityana district.

### **Research methodology:**

The study employed a cross-sectional research design to collect data on factors contributing to malnutrition in pregnant mothers. A Convenient sampling method was adopted to recruit 325 mothers into this study. Structured questionnaire was used to collect data and data was analyzed using SPSS16 version.

### **Results:**

The study revealed that, of the 325 pregnant mothers interviewed, 45.38% (147/325) were found to be malnourished. Lack of balanced diet [OR=3.2 (CI=1.54-6.88) P=0.002 ], Parity more than 4 [OR=2.22 (CI=1.06-4.64) P=0.035 ], Having food taboos [OR=0.17 (CI=0.05-0.52) P=0.002], Age more than 30 years [OR=26.4(CI=6.07-114.9) P=0.001],Christians [OR=0.29 (CI=0.13-0.66) P=0.003]and monthly income more than Ush.100,000 [OR=2.72(CI=1.04-7.08)P=0.04], we found to the contributing factors to malnutrition among pregnant mothers in Mityana district.

### **Conclusion:**

The study found out that the prevalence of malnutrition was moderately high. Age more than 30 years, Christian faith religion, monthly income of more than Ush. 100,000, lack of a balanced diet, parity more than 4 and having food taboos were found to be the major independent variables contributing to malnutrition among pregnant women attending ANC in Mityana hospital, Mityana district.

### **Recommendation:**

Therefore, Community based nutrition and maternal health programs should be established to tackle the problem of malnutrition and poor knowledge and attitudes on maternal health in the community.

## CHAPTER ONE: INTRODUCTION

### 1.0 Background

More than half a million women die every year due to pregnancy related causes. Almost 4 million neonatal deaths are also registered of the majority of 200 million women who conceive every year, many are living in developing countries, suffer from ongoing nutritional deficiencies, repeated illnesses and long term cumulative consequences of under nutrition during their childhood. UNICEF (2009)

Malnutrition means consuming inadequate nourishing foods or taking in a particular type of food which has little or no nutritive value. It can be mild, moderate or severe malnutrition (Pelleter et al 1994). The extent and distribution of malnutrition in a given population depends on many factors ; the household economic status, knowledge and attitude, level of education and employment, literacy, child spacing, cultural and religious food customs, existence and effectiveness of nutrition programs and availability and quality of health services.

About 35% of adult women worldwide are estimated to be overweight (BMI  $25\text{kg/m}^2$ ), a third of whom (297 million) are obese (BMI  $30\text{kg/m}^2$ ) WHO 2011's data. In the European Region, the Eastern Mediterranean Region and the Region of the Americas this number exceeds 50%. Obesity in pregnancy is connected to maternal complications ranging from effects on fertility to effects on delivery and during the postpartum period, as well as many complications also affecting the unborn and newborn (Arendaset al.2008). According to Pooblan and colleagues (2008), the risk of caesarean delivery is increased by 50% in overweight women and is more than double for obese women compared to women who have a normal BMI. Many socio-demographic and lifestyle factors have been associated with the use of dietary supplements which contribute to obesity. The most typical female supplement user seems to be a well-educated woman whose diet is already close to the nutrition recommendations without supplement use (Paturiet al.2008).

In addition, greater age has also been associated with higher supplement use (Yuet al.2010). However, age and education did not differentiate among supplement users and non-users during pregnancy in a study on Finnish women (Erkkola et al 2008), whereas in Norwegian pregnant women of higher level of education (Nilsen et al.2010) and among British women higher age were associated positively with supplement use during pregnancy (Mathews et al.2010).

Conversely, low BMI and/ or short stature( height less than 145cm) are found to be common among women in low-social countries, with the highest rates formerly observed in southern and south eastern Asia, followed by sub Saharan Africa with critical rates ( 40%) in Bangladesh and Eritrea, and a serious rate (20-39%) prevalence in Chad, Cambodia, India, Ethiopia, Mali, Nepal, Madagascar and Yemen (WHO 2011), Other countries their prevalence is less (10-19%). In Bangladesh, India, and Nepal, more than 10% of women are shorter than 145cm. One of the factors contributing to short stature is lack of nutritional knowledge, dietary restriction and food taboos. According to Gillett (2009), the major problem with food taboos is preventing a pregnant mother from accessing a well-balanced diet in the belief that transgression of those taboos may harm the mother and baby. Consequently, any miscarriage, complications during childbirth or baby being born with certain abnormalities are often believed to be caused by the mother, who may have eaten certain foods not allowed in pregnancy. Several studies have shown that educational intervention not only increases knowledge about a proper diet in pregnancy (Rao, et al., 2008), but also are positively correlated with good eating habits (Kim, et al., 2009). In addition, Liu, et al. (2009) observed that educational intervention enables women to change unhealthy practices and consequently decreases prevalence of postpartum complications.

Also data from WHO 2011 suggests that almost 468 million women aged between 15 -49 years (30% of all women) are thought to be anemic and at least half of them are as a result of iron deficiency. Majority are Africans (48- 57%) and south eastern Asians are of the greater numbers( 182 million women of reproductive age and 18 million expectant mothers). The prevalence of anemia in teenagers (15–19 years) can be even higher and exceeds 60% in Ghana, Mali and Senegal.

Similarly 12% of the same age category were reported to be thin (BMI less than  $18.5\text{kg/m}^2$ ), 9% are mildly thin and 3% are moderately or severely thin. About one in every five women (19%)are overweight or obese. 38% of children aged 6 to 59 months and 36% of women aged 15 to 49 years were reported to have vitamin A deficiency (UDHS 2011). Therefore malnutrition which is associated with a lower physical capacity and increased susceptibility to infections, needs to be tackled before women become pregnant in order to reduce the risks of poor maternal health and low birth weight babies.

Though maternal nutrition during pregnancy is so important in reducing maternal and infant mortality which are targeted in achieving the millennium development goal, very few studies have been done on factors contributing to malnutrition among pregnant women in Mityana. As a result, there is lack of comprehensive information regarding nutritional knowledge and factors associated with this condition. Therefore the purpose of this study is to identify factors that contribute to malnutrition among pregnant women in a bid to cover the knowledge and information gap.

### **1.1 Problem statement**

Malnutrition is still highly prevalent with 12% of women being undernourished or thin (BMI less than 18.5), 64% of pregnant women and 53% of lactating women being anemic and 18.6% of pregnant women and 17.3% of lactating mothers having Vitamin A deficiency (demographic and health survey 2008). Poor nutrition amongst women reduces physical development thus leading to miscarriages, low birth weight or worse still, still births, perinatal deaths and irreversible brain damage to the unborn child. As a result this hurts development in terms of education and productivity. Therefore drastic measures need to be taken into account in-order to address this problem. Hence the purpose of this study was to identify factors contributing to malnutrition among pregnant women attending ANC in a bid to address this issue.

WHO guidelines together with MOH recommends at least 4 ANC visits to every pregnant and the 1<sup>st</sup> visit should be made within the 1<sup>st</sup> trimester. However, only 48% of women in Uganda make these visits (UDHS 2011). The major objective of ANC visits is to detect anemia, infections and other health problems associated with pregnancy including malnutrition. In addition, the government of Uganda has tried to combat maternal malnutrition through introduction of the minimum health care package which also supports promotion of ANC, supplementation with iron and folic acid, treatment and control of helminths infestations, diet diversification in-order to increase dietary iron intake.

In-spite of these efforts, majority of the mothers still don't have access to these services or even information. This is evidenced by the fact that only 1 in 3 mothers receive postpartum vitamin A supplementation, only 47% of mothers attend 4 or more ANC visits, less than 1% of mothers follow the recommended dose of 90 + IFA (Iron Folic Acid) supplementation and only 60% of pregnant women take their iron supplements (Demographic and health survey 2008).

## **1.2 General Objective**

The study assessed the factors contributing to malnutrition among pregnant women attending antenatal clinic in Mityana hospital, Mityana district.

## **1.3 Specific Objectives**

The study was guided by the following objectives;

- i) To identify the prevalence of malnutrition among pregnant women attending antenatal clinic in Mityana hospital, Mityana district.
- ii) To determine the demographic factors contributing to malnutrition among pregnant women attending antenatal clinic in Mityana hospital, Mityana district.
- iii) To identify socio-economic factors contributing to malnutrition among pregnant women attending antenatal clinic in Mityana hospital, Mityana district
- iv) To identify the personal related factors contributing to malnutrition among pregnant women attending antenatal clinic in Mityana hospital, Mityana district.

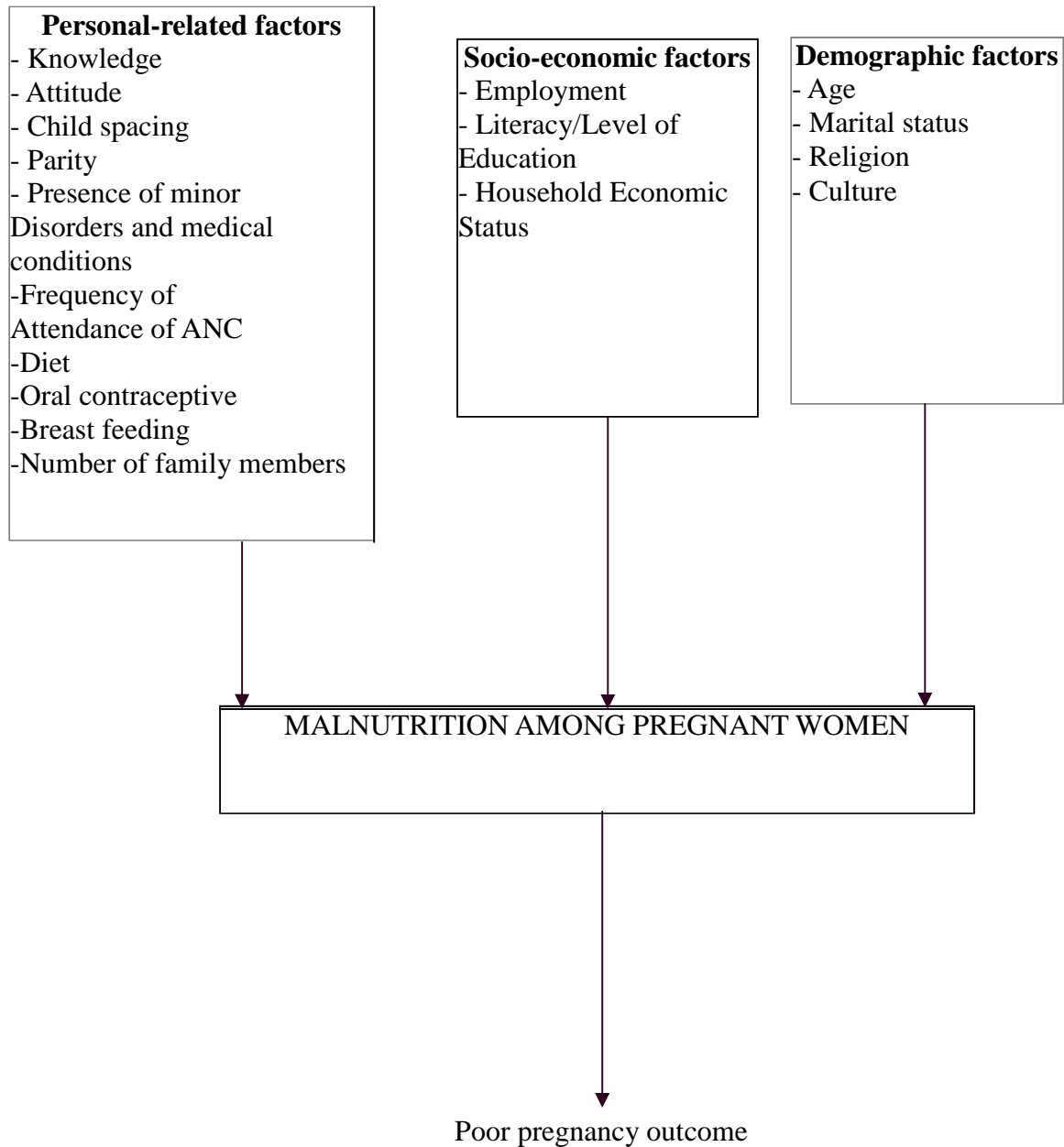
## **1.4 Research questions**

This study answered the following questions;

- i) What is the prevalence of malnutrition among pregnant women attending antenatal clinic in Mityana hospital, Mityana district?
- ii) What are the demographic factors contributing to malnutrition among pregnant women attending antenatal clinic in Mityana hospital, Mityana district?
- iii) What are the socio-economic factors contributing to malnutrition among pregnant women attending antenatal clinic in Mityana hospital, Mityana district?
- iv) What are the personal related factors contributing to malnutrition among pregnant women attending antenatal clinic in Mityana hospital, Mityana district?



## 1.5 Conceptual Framework



The conceptual framework for factors contributing to malnutrition among pregnant women attending Antenatal clinic in Mityana hospital, Mityana district

### Description of the conceptual framework

In the above conceptual framework, the independent variables included personal-related factors (Knowledge, attitude, child spacing, parity, presence of minor disorders, frequency of

ANC attendance, diet, oral contraceptives, breastfeeding, number of family members, gestational age of enrollment at ANC), Socio-economic factors (Employment, literacy/level of education, household), and Demographic factors (Age, marital status, religion and culture) which all affect the dependent variable being malnutrition among pregnant women which all lead to poor pregnancy outcomes.

### **1.6 Justification of the study**

The information gathered may help the authorities create policies for improving maternal malnutrition in Mityana. The information generated may add to the knowledge already on the already existing pool of data on the prevalence of malnutrition among women in Mityana. This may help women have good pregnancy outcomes hence good health and healthy babies. Even though, maternal nutrition during pregnancy is crucial in reducing maternal mortality and infant mortality which are the target areas in achieving millennium development goals, very few studies have been conducted on factors associated with malnutrition among pregnant women. As a result, there is lack of comprehensive information regarding nutritional knowledge and factors associated with this condition.

Therefore the aim of the study was to assess the nutritional status of pregnant women in order to identify women who have nutrient deficiencies during pregnancies indicated by low BMIs, inadequate gestational weight gain and pattern of food intake. This will help to identify the trimester at which pregnant women are nutritionally at risk, so that programs could be geared towards pregnant women found in that particular trimesters and improve maternal health as a whole.

## **CHAPTER TWO: LITERATURE REVIEW**

### **2.0 Introduction**

In this chapter, literature related to the study is critically reviewed in-order to place linkage among the variables used in the research. This chapter is sectioned according to the major themes of the study. All the section therein is focused on the conceptual understanding of the factors contributing to malnutrition among pregnant women at Mityana hospital.

### **2.1 Prevalence of Malnutrition among pregnant women.**

Malnutrition is still a major health concern in both the developed and developing countries. Maternal mortality and morbidity, intra uterine growth retardation and low birth weight are commonly caused by poor nutrition and infections during pregnancy. This is evidenced about 5 to 20% of African women being malnourished (low BMI) as a result of chronic hunger. (Lartey A 2008).

In Bangladesh, India in three selected villages of Sirajganj, Kishoreganj and Tangail districts in July 2014, across section study was conducted where 56 pregnant and 46 postpartum women were recruited from community clinics by purposive sampling technique (Salim. F et al 2014). The study found out that, of the 56 subjects studied a significant number of 24 (23.5%) of the pregnant women were found to be underweight by calculating the BMI. Among the possible reasons that were stated was knowledge about malnutrition in pregnancy and lack of food in terms of types and amount and types to be taken during pregnancy.

Another cross sectional study done on a sample of 130 pregnant women in Algeria aged 19 – 45 years attending antenatal clinics discovered that 78.46% (more than half) of the 130 pregnant women were found to be malnourished (39.23% are overweight and 39.23% were obese) and only 21.54% had a healthy BMI. (S. Taleb; et al 2011). This was due to the sedentary lifestyle and poor dieting for example 8% of pregnant women in the study reported snacking all day.

According to other survey studies done on malnutrition in pregnant women in the Gulf region, it was discovered that overweight and obesity were the main problems in these women. It was estimated that 54 - 70% of pregnant women in this region were overweight or obese. In other words only 3 to 13% were found to be underweight hence a double burden of malnutrition. (Abdulrahman .M 2007).

Some of the factors that was found to be associated with malnutrition included frequent child bearing and multiple pregnancies which causes several health and nutritional problems among pregnant women (Abdulrahman .M 2007). Statistics showed that the fertility rate of the gulf mothers is relatively high (ranging from 4.6 per 1000 women aged 15 -44 years in Bahrain to 7.1 in both Oman and Saudi Arabia).

In addition, unsound food habits during pregnancy which may affect the weight of the fetus. Few pregnant women consumed more fresh fruit during pregnancy and this affects their diet. In Kuwait, Prakash et al discovered that the intake of calcium, iron and vitamin C by pregnant mothers was below 75% of US recommended daily allowances (RDA), while among breastfeeding mothers, all nutrients (except protein) were below the RDA. Traditional beliefs was also found to another risk related to nutrition during pregnancy. For example, in some areas in the Gulf, mothers decrease their intake during pregnancy believing that extra food will cause an over large baby, while others believe that they should eat for two.

Majority of pregnant women believe that taking iron supplements may make the fetus big and results into difficult delivery or even abortion. Finally the other factor was lifestyle where by many pregnant mothers in the GCC are not employed and very few of them exercise. These factors contribute to malnutrition (overweight and obese).

Also sedentary lifestyle, having housemaids, cars, televisions, sophisticated home appliances decrease physical activity of women and together with taking fatty foods increase the weight of women during pregnancy.

A cross-sectional study (magnitude and determinants of malnutrition among pregnant women in eastern Ethiopia) done on 1731 pregnant women selected by a cluster random sampling method discovered that on average, 19.06% of respondents were malnourished, while 23.3% were underweight (body mass index < 19.8 kg m<sup>-2</sup>). Women in the 2<sup>nd</sup> and 3<sup>rd</sup> trimester had a 66% and almost two fold increased risk of malnutrition as compared to those in the 1<sup>st</sup> trimester, respectively. Women with improved eating habits had a 53% lower risk of malnutrition compared to those who never improved. The risk of malnutrition was 39% lower in subjects who got prenatal dietary advice than in those who never got one. Therefore it was concluded that Malnutrition affects at least 1/5 women in the study, calling for priority attention (Haji Kedir 2014).

Another cross sectional study carried out in Khartoum, Sudan to examine the prevalence of underweight, obesity and to identify contemporary socio-demographic predictors in

malnutrition among 1690 pregnant women, revealed that 94 (5.5%) were underweight (BMI of 19.9 Kg/m<sup>2</sup>), 603 (35.6%) were overweight (BMI of 25 - 29.9 Kg/m<sup>2</sup>) and 328 (19.4%) were obese (BMI of 30 Kg/m<sup>2</sup>) (Duria A Rayis; et al 2010). Age 27 years , secondary level education and parity was found to have a high prevalence.

Similarly, parity and social economic status in Tanzania and marital status and employment in Chilly was found to be positively associated with obesity. Villamor and colleagues (2007) Furthermore, the cultural perception towards weight and body image may be different in some settings e.g. obesity could be perceived as a sign of prosperity as opposed to the stigma that exists in some developing communities.

However Obesity was inversely related to HIV; HIV infection has become more prevalent and must now be considered as a possible etiological factor for malnutrition among pregnant women in Sub-Saharan Africa. Malnutrition in HIV/AIDS can be a result of HIV infection, opportunistic infections and/or highly active antiretroviral therapy. In one study conducted by Makerere University among HIV-infected pregnant women receiving antiretroviral therapy, it was discovered that about 15% of the women lost weight over the course of their pregnancies (Cornell chronicle journal 2012). A matched case-control study conducted in Nigeria found that HIV-positive women were significantly more likely to have intrauterine growth restriction, preterm labour than HIV-negative women (Olagbuji BN et al 2010).

## **2.2 Socio-economic factors contributing to malnutrition among pregnant women**

### **2.2.1 Employment**

Women's employment increases her economic status in their homes, this in particular improves her nutrition status and household nutrition. Employment may increase women's status and power, and may bolster a woman's preference to spend her earnings on health and nutrition. However, employed women without control over their income and decision making authority within the household are deprived of economic and social power and the ability to take actions that will benefit their own well-being.

According to a survey carried out in Ethiopia where 13,057 pregnant women were studied, it was discovered that unemployed pregnant women were more likely to be affected by under nutrition than those working in agriculture, but the pregnant women in non-manual/professional jobs were less likely to be affected by chronic under nutrition (Bitew et al 2010). This is in agreement with survey studies carried out in Africa which have indicated that, at similar levels of income, households in which women have a greater control over their income are more likely to be food secure (Kennedy and Haddad, 2009).

### **2.2.2 Level of education**

Studies on autonomy and empowerment of women suggest that, education of a woman promotes her empowerment and influences participation in decision making in matters concerning nutrition and access to health services. (Emina et al. 2009). Women who receive even a minimal education are generally more knowledgeable than those who have no education of how to use available resources for the improvement of their own nutritional status together with their families.

In Nigeria, a cross section study was conducted in different antenatal clinics (Government hospitals and private clinics), where a total of 1,387 pregnant mothers participated, 910 in Owerri urban area and 477 in the rural area surrounding Owerri (Okwu GN et al 2007). It was found out that the effect of education level on the prevalence of PEM showed that those with no formal education and primary education had significantly lower BMI and higher percentages of PEM than those of other groups. Hence it was concluded that the less educated pregnant women are, the higher risk of getting PEM. However another study carried out in Nigeria disputed this showing a negative correlation between level of education and maternal nutrition status. Therefore education is one of the most important resources that enable women to provide appropriate care for themselves and unborn child, which is an important determinant of healthy pregnancies. On that note, increasing the level of education among women decreases incidence of malnutrition among women plus their unborn children.

### **2.2.3 Household economic status.**

In many, nutrition is influenced by income and economic growth. Rich people have the capacity to buy more diverse foods including fruits and vegetables rich in essential vitamins, minerals and other nutrients plus animal products rich in proteins. (Population reference bureau 2012). Poorer populations often lack access to the right variety of foods and the right amount of foods, leading to inadequate nutrition. For the poorer populations, economic growth can boost household incomes, resulting in more spending on food, health, and education, and better individual health and nutrition. In addition, when national economies are growing, governments have more to spend on social programs and infrastructure necessary for health systems to function, thus increasing the overall health and nutritional status of the nation. Conversely poor people especially in developed countries like the USA are at high risk of obesity because healthy food is often more expensive, whereas refined

grains, added sugars, and fats are generally inexpensive and readily available in low-income communities (Drewnowski, 2010; Monsivais & Drewnowski, 2009).

Households with limited resources often try to stretch their food budgets by purchasing cheap, energy-dense foods that are filling that is, they try to maximize their calories per dollar in order to stave off hunger (DiSantis et al., 2013; Drewnowski, 2009). While less expensive, energy-dense foods typically have lower nutritional quality and, because of over consumption of calories, have been linked to obesity (Hartline-Grafton et al., 2009).

A cross-sectional design and path analytic methods was used in a clinic-based in USA on a sample of 118 low-income women in their first trimester of pregnancy. Women completed questionnaires and received training on estimating food portion sizes. Three 24-hour dietary recalls were collected over 2 weeks. Overall dietary quality on low income pregnant women was assessed using the Dietary Quality Index (Eileen R. Fowles et al 2011). The results showed that pregnant women in low-income households are more likely to eat poor diets than their wealthier counterparts due in part to an inadequate understanding of nutritional requirements and limited ability to purchase healthy foods, predisposing them to pregnancy complication.

### **2.2.3 Food taboos**

In periods of growth and development like in pregnancy, there is increased nutrition demand. It is estimated that recommended intakes of 14 of the 21 essential micro-nutrients increase during pregnancy (Allen 2008). In one study among 1274 pregnant women aged 18–45 years from the UK, it was found that for every 10 mg increase in dietary iron intake, fetal birth weight was predicted to increase by 70g (Jessica A Grieger 2015). On that note, if women don't take initiative to feed well, under nutrition can have drastic and wide ranging effects on them and their children, if not managed optimally. And when it does occur in severe form, usually as a result of food shortage, very high level of morbidity and mortality are recorded (Picot et al 2012).

According to a cross sectional comparative study on dietary intake carried out among 720 pregnant women in Ogun state Nigeria, it was discovered that 16.1% of women in rural and 19.4% in urban areas believed in food taboos that restricted them from consuming certain foods which included beans, eggs, fish, plantain all these contributed to maternal malnutrition.

Similar findings were discovered in Burkina Faso, Ghana where women reported having food taboos (Huybregts et al., 2009; Koryo-Dabrah et al., 2012; Madiforo, 2010). This prevents women from benefiting from the nutrients that are in these foods and in turn affect their health and that of the unborn child. Imposing of dietary taboos on some sections of the society, mainly women and children may be in some cases dictated by men's egoistic motives to preserve exclusive rights to a certain food (Meyer-Rochow 2009).

Several factors have been associated with adherence to food taboos including prim gravidity; teenage pregnancy; lack of formal education; low household income, signifying low socio-economic status and a low body mass index (Oni and Tukur, 2012). According to Gillett (2009), the major problem with food taboos is preventing a pregnant mother from accessing a well-balanced diet in the belief that transgression of those taboos may harm the mother and baby. Consequently, any miscarriage, complications during childbirth or baby being born with certain abnormalities are often believed to be caused by the mother, who may have eaten certain foods not allowed in pregnancy. A study by Gibbs (2010) in the Wosera area in Papua New Guinea on the disabled and their families indicated that more than 7% of disabilities, in particular sight loss and limb malformations, are believed to be caused by broken food taboos.

Also diets and staple foods in Sub-Saharan Africa are often deficient in macro-nutrients and micro nutrients leading to multi-nutrient malnutrition and micro nutrient deficiencies. These are often complicated by a high burden of preventable infectious diseases and helminthes infestations, with dire consequences among children and pregnant women (Abrahams et al 2011). The World Health Organization advocates for community-specific interventions, aimed at improving the nutrient intake of pregnant women and the girl child, with a view to optimize their nutritional status (WHO 2012).

## **2.4 Demographic factors contributing to malnutrition among pregnant women**

### **2.4.1 Age**

A cross sectional study carried out in antenatal clinics in Nigeria where a total of 1,387 pregnant women took part, 910 in Owerri urban area and 477 in the rural area surrounding Owerri (Okwu GN et al 2007). It was discovered that the effect of age on the prevalence of PEM in pregnant women showed that the age groups, below 20 years and 20-24 years, presented the higher prevalence of PEM of 25% and 11.74% respectively. Their mean BMIs



were significantly lower than those of the other age group. The probable reason is that these women are still young and their bodies still developing hence they need a-lot of nutrients. The 24 years and below age group is apparently the group at greater risk for PEM especially in the rural areas. The age effect although not seen in the urban area was quite prominent in the rural areas. This is in contrast with a study carried out in Bangladesh, India which showed a significant deterioration of women's nutritional status in relation to age where women aged 35 years and above were more malnourished compared with younger women.

Another clinical trial aimed at investigating the effects of age and parity (number of children had by mother) associated with protein energy malnutrition (PEM) on some biochemical indices in pregnant women in Enugu metropolis of Nigeria. Serum total protein, albumin, urea, total cholesterol, creatinine and calcium were evaluated in three groups of female subjects as part of an investigation on the biochemical changes associated with protein energy malnutrition (PEM) in pregnant women.

The first group were 52 pregnant women with low total protein (<52g/l), the second group were 50 pregnant women with normal total protein (>52g/l) while the third group were 50 non- pregnant, non-lactating, apparently healthy women with normal total protein (>63kg). All the subjects were resident in Enugu metropolis and aged between 20 to 40 years.

The results of all parameters measured for mothers in different age groups divided according to their level of serum total protein. There was no significant difference in the means of the serum total protein of mothers of different age ranges and other parameters measured ( $p>0.05$ ). Therefore age may not affect the level of serum total protein of a mother and also other parameters measured. A test of correlation showed that age of mother did not correlate significantly with serum total protein. However age of mother correlated positively and significantly with parity only ( $r = + 0.545$ ) ( $p<0.05$ ) and no other parameter measured ( $p>0.05$  in each case). This agrees with the study of Okwu et al , which showed that the lower age groups (below 20 years and 20-24 years) presented higher prevalence of PEM than other age groups, with the effect more prominent in rural areas than in urban areas.

According to a study carried out in Ethiopia by the demographic and health research (2010), it was revealed that the prevalence of chronic energy deficiency (under nutrition) by age showed that women aged 15-19 and 40-49 were most affected, with prevalence of 38.4% in 2000 and 33.0% in 2005 among women age 15-19, and prevalence of 34.9% in 2000 and 30.9% in 2005 among women age 40-49.

### **2.4.2 Marital Status**

According to a household survey carried out in Ethiopia by Demographic and health research (2010), never-married pregnant women were found to be the most affected by under-nutrition, followed by divorced/separated/widowed women. Among never-married pregnant women, 35.7% in 2000 and 28.7% in 2005 were chronically undernourished.

Among both rural and urban women for both surveys, those married or living together were the least affected by chronic energy deficiency. Among the reasons given is the fact that unmarried adolescent women are often at the bottom of the food chain, with little or no decision-making power in the household about food distribution, could lead to food security issues and may contribute to their poor nutritional status.

Moreover, women aged 15-19 need adequate nutrients to support fast physical, mental and emotional growth. Unawareness of adolescent women about their own health and nutritional status could be another reason associated with their poor nutritional status.

### **2.4.3 Culture and religion**

According to a descriptive survey study design conducted to assess the knowledge and attitude of dietary practices among pregnant women attending Yerwa Clinic in Nigeria where a total of 294 pregnant women were selected using systematic random sampling technique. It was revealed that majority of the respondents 118 (40%) avoid some good diet during pregnancy because of cultural beliefs, while 18(20%) because of their religion (Kever R.T 2015).

Another cross-sectional study carried out in Nigeria, where a sample population of 200 child bearing mothers who registered with the Primary Health Centers were used, it was discovered that some causes of malnutrition involved cultural beliefs (Jacinta A et al, 2011). Many of the respondents agreed that cultural beliefs are one of the causes of malnutrition. In Nigeria, people may abstain from eating certain food items of high nutritive value simply because of their ethical or religious beliefs and taboos. Atinmo and Akinyele said that socio cultural factors are important factors in considering the quantity of food.

Usually the family head receives the largest portion of meals in the family resulting in children having the smallest portion but mothers do share their reserved meal for the children. It is a taboo amongst some rural communities to give snail to pregnant mothers or meat and

egg to children. Some people believed that when you give a child egg or meat, the child will start stealing. In some places, the forbidden meats are the major available sources of animal protein hence people suffer in the midst of plenty.

## **2.5 Personal related factors contributing to malnutrition among pregnant women**

### **2.5.1 Nutritional knowledge**

Several studies have shown that educational intervention not only increases knowledge about a proper diet in pregnancy (Rao, et al., 2008), but also are positively correlated with good eating habits (Kim, et al., 2009). In addition, Liu, et al. (2009) observed that educational intervention enables pregnant women to change unhealthy practices and consequently decrease on the prevalence of postpartum complications. It is therefore of paramount importance to include nutrition as one of the health education topics given to pregnant women during their antenatal checkups.

A cross-sectional descriptive institutional based study was conducted in Ethiopia to assess knowledge of pregnant women about maternal nutrition and factors associated with it during pregnancy on a sample of 422 pregnant women during January to June of the year 2013. It was revealed that nutrition knowledge was predictive of change in dietary habits and health advices encouraged expectant women to advance their food intake. This study revealed that out of 422 pregnant women more than half (57.8%) of the respondents did not know the meaning of food. This study result was in agreement with the study reported from America at El-Menshawy Hospital that about half of women didn't have enough knowledge regarding the meaning, the importance, and the constituents of a well balanced diet for the pregnant women. This study also pointed out that the nutritional knowledge of pregnant women about the importance of food during pregnancy as: (52.5%), (50.6%), (72.3%) and (71.8%) had the knowledge that food during pregnancy is important for bodies energy and heat, proper functioning of the body, growth and development of the fetus and fighting infection respectively in which the figure is slightly greater than the study conducted in Malawi, lilongwe, that most of the women (60%) said that eating from all food groups is good for a woman's health and for foetal growth and development.

Another quasi-experimental intervention was undertaken on a random sample of 100 pregnant women attending urban health centers in Ilam city, Iran to determine maternal nutritional health, before and during pregnancy, influences the health status of herself and her

developing fetus (Farnoush Fallah et al 2013). A nutritional education program containing two to four lessons was undertaken for small groups of between six to ten women. Nutritional knowledge was assessed before intervention (pretest) and followed by two posttests within three weeks interval.

This study sought to answer the question of whether nutrition education can influence a positive change to improve levels of nutritional knowledge of pregnant women. The study therefore showed significant improvements in awareness level of pregnant women who received at least two educational sessions on healthy nutrition in which it was significantly increased from 3% before intervention to 31% after the nutritional education intervention ( $P < 0.001$ ). These results are similar to those found by Verbeke (2007) who found that education on nutrition and food consumption can resolve safety issues in the population.

### **2.5.2 Attitude**

Regarding attitudes, pregnant women may believe there are no advantages in attending ANC in the first 3 months of pregnancy 37, because ANC is viewed primarily as curative, rather than preventive (MA Mbule et al 2013). Neema reported that pregnant women do not have confidence in the health system because of inadequate services and medicines, which in part contributes to the high usage (73%) of traditional indigenous medicine as an alternative to ANC in Uganda (MA Mbule et al 2013). Such attitudes and misconceptions contribute to the high prevalence of malnutrition among pregnant women. Thus, apart from availing all ANC services and medicines at health facilities, community based health education programs are needed to correct negative attitudes and misconceptions about ANC.

### **2.5.3 Child spacing**

Child spacing means the period between two consecutive pregnancies of the same mother. Because the nutritional burden on the mother between pregnancies depends on the extent of breastfeeding, the inter-pregnancy interval and the 'recuperative interval' (duration of the non-pregnant, non-lactating interval) could measure whether the mother has had a chance to recover from the pregnancy. Therefore, it is expected an increased risk for maternal anemia when the inter-pregnancy interval is very short.

According to a survey-based descriptive study conducted among 400 pregnant women to determine the prevalence of anemia and the influence of some factors associated with anemia

during pregnancy it was discovered that about 63 % of mothers had more than two years between repetitive pregnancies and 37% of women had a child spacing of less than two years (Noha morsy et al 2014).

Time interval between pregnancies strongly influences the outcome of the subsequent pregnancies. Short birth interval does not give the mother enough time to recuperate from the nutritional burden of the previous pregnancy, which may lead to poor pregnancy outcomes. Good pregnancy outcomes are expected when there is a gap of at least 18 – 23 months between the consecutive pregnancies.

#### **2.5.4 Parity**

According to a survey carried out among 13,057 women in Ethiopia it was discovered that women who had never had a child (Parity 0) and women with at least five children (Parity 5+) were at a higher risk of chronic energy deficiency than other women (Bitew et al 2010). This was supported by another clinical trial carried out in Nigeria (2010), where a group of women were analyzed with the first group, 52 pregnant women with low total protein (<52g/l), the second group were 50 pregnant women with normal protein (>52g/l) while the third group were 50 non-pregnant women, non-lactating, apparently healthy women with normal protein (>63kg) for study.

The pregnant women were different gestational stages of pregnancy, having different parity and attending the antenatal clinic of Parklane specialist hospital Enugu (Ikeyi A et al 2010). The results showed that parity (i.e. the number of children had by a mother) correlated negative ( $P < 0.05$ ) with serum total protein, total cholesterol, creatinine and calcium, this is in contrast with the results of the first study. This study suggested that serum total protein significantly decreased as number of children increased and vice versa. This implies that parity therefore, may be contributing factor to malnutrition. This agrees with the views of Mcganity et al that PEM manifests in many mothers because their nutritional status has not improved from their last birth and so they are not nutritionally prepared for the next pregnancy. In addition Lapidó suggested that many pregnancies in developing countries are unplanned, coupled with inadequate dietary intake due to dietary taboos associated with pregnancy, gender and other cultural beliefs.

However another cross sectional study carried out in Nigeria suggested different, where a total of 1,387 pregnant women took part in the study, 910 in Owerri urban area and 477 in the

rural area surrounding Owerri. The study covered antenatal clinics of government hospitals and private clinics in Owerri urban area and antenatal clinics of health centers in rural areas surrounding Owerri and covered a period of 11 months (Okwu GN et al 2007).

The study discovered that there was an increase with BMI in relation to the number of children one had (Parity). This effect was more pronounced in the urban areas than the rural areas. This can be explained by the fact that weight gain increases with increase in parity. Hence those with lower parity are likely to have lower BMIs. However, in the rural areas, this might not necessarily be the case since as has been pointed out the rural women live physically arduous lives and so the usual weight gain with increase in parity may not be observed.

### **2.5.5 Presence of Minor disorders and medical conditions**

A study of more than 81,000 pregnant women in the UK revealed that those who had nausea and vomiting during pregnancy that interfered with their life were 23% more likely to deliver their baby before 34 weeks in comparison with women who said their morning sickness did not substantially affect their lives (UK National Institutes of Health 2011). Poor nutrition and too little weight gain were considered to be the contributing factors to this risk.

Hyperemesis gravidarum affects about 1% of pregnant women, this usually disappears during the second half of pregnancy, and typically does not cause serious complications in the mother (UK National Institutes of Health 2011).

A survey in 2011 in the UK found that mothers in the study said they had lost at least 5% of their weight when they had hyperemesis gravidarum. The researchers speculated that stress and anxiety during pregnancy, as well as malnutrition, may affect the fetus' brain as it develops. Also, women with the condition may experience psychological or physical problems after their pregnancy that hinder their ability to bond with their child.

Also medical conditions like helminth infestations and sexually transmitted diseases like HIV/AIDS exacerbate the problem of malnutrition. Malnutrition in HIV/AIDS can be a result of HIV infection, opportunistic infections and/or highly active antiretroviral therapy. In a study conducted by Makerere University among HIV-infected women receiving antiretroviral therapy, it was discovered that 15% of the women lost weight over the course of their pregnancies as a result of malnutrition (Cornell chronicle journal 2012). In a Cote d'Ivoire study, it was highlighted that ART in pregnant women with advanced HIV disease substantially reduced mother-to-child transmission, but was associated with low birth weight

(LBW). A matched case-control study conducted in Nigeria found that HIV-positive women were significantly more likely to have intrauterine growth restriction and preterm labour than HIV-negative women (Olagbuji BN et al 2010).

### **2.5.6 Frequency of attendance of ANC**

Pregnancy is a crucial time to promote health behaviors, prevent still births and avoid some of the major causes of illness among newborns. Essential interventions during the pregnancy period are provided through the ANC package, including, TT immunization, identification and management of STIs, including HIV.

The usual recommendation nowadays is for booking (first antenatal visit) to take place in early pregnancy, prior to 14 weeks. The World Health Organization (WHO) recommends that pregnant women in developing countries should seek ANC within the first 4 months of pregnancy. A WHO Technical working Group recommended a minimum of four antenatal visits for a woman with a normal pregnancy (lancet, 2008).

According to a cross-sectional study carried out in Kisoro (Gloria 2010) where a sample of 100 pregnant women and mothers were, it was discovered that the age was identified as a factor in ANC late attendance, slightly more than half of the women in the study whose age was reported to be less than 30, and were on their third pregnancy were less likely to attend ANC visits. However this was in contrast to another cross sectional quantitative study carried out in Zambia where a group of 613 pregnant women attending ANC were studied, it was discovered that maternal age was not an associated factor with low or late attendance of ANC visits (Medical Journal of Zambia 2012).

This was in agreement with a study carried out in Sudan where it was also observed that there was no effect of maternal age on ANC utilization. However the study established that there was a tendency of initiating ANC late amongst women of high parity and gravidity. This could be as result of limited resources in the family and negative perceptions resulting from previous pregnancy experiences. It is also possible that multiparous women feel confident after previous experience and feel that starting ANC early is not necessary.

According to the same study as indicated above in Zambia (Medical journal of Zambia 2012), it was discovered that women with adequate knowledge about the benefits ANC were more likely to initiate ANC as compared to those without. The findings are similar to Tariku and others found out in their study that women who well informed about ANC were likely to book for ANC within the recommended time. Furthermore the study proved that women who

had the perception of no benefits were likely to start ANC visits late. Hence there needs to be a concerted effort in order to educate mothers about the benefits of ANC and the effects which in return also affect the unborn child.

The intension to get pregnant is another factor that affects ANC attendance. In contrast to women who planned their pregnancies, women who fell pregnant unintentionally were more likely to start their ANC late (Medical Journal of Zambia 2012). The findings are in line with the study done in New South Wales, Australia where it was indicated that younger women with unplanned pregnancy lacked information about ANC resulting in late attendance. It is believed that wanted pregnancies are more cared for by pregnant women and their spouses; this enables women to book for ANCs in time.

### **2.5.7 Diet**

A cross-sectional survey was employed for the study to assess dietary practices, nutritional status and associated factors among pregnant women in study area. Two-stage cluster sampling was used. 153 pregnant women aged 19-49 years were the subjects. Energy and nutrient intakes were calculated from one day weighed food records on a sub-sample (n = 77). Results of the study revealed that energy intake of study participants in 2nd and 3rd trimesters pregnancy were 2308 kcal for 2340 kcal and 1420.5 kcal for 2452 kcal (Dr Pragya Singh et al 2011 ). Vitamin A intake was 3 micro grams for 800 micro grams. Protein intake of the study respondents in 2nd and 3rd trimester pregnancy was 45.9 g and 31.5g for 71g. Majority (75.2 %) of study participants did not take additional meal during pregnancy. 69.3 % skipped one of their regular meals. Total of 9.2% of the study subjects were undernourished. Energy and most of the nutrients intakes of study participants were lower than recommended intakes. Dietary practices and nutritional status of study participants were not adequate to support their increased energy and nutrient requirement. Therefore filling the gap in knowledge of maternal under nutrition and generating information for intervention is important to maternal nutritional during pregnancy.

### **2.5.8 Oral contraceptive**

In study conducted by Milton, et al., (2010) in among the rural Bangladeshi women of reproductive age is still very high; a total of 2341 women aged between 20 and 45 years residing in the study area were interviewed. Information on socioeconomic variables, nutritional status, and pregnancy-related history was obtained using interviewer administered questionnaire. A total of 34% of the reproductive aged rural women suffer from malnutrition.



A multivariate analysis shows association between malnutrition and monthly household income, history of taking oral contraceptive, current pregnancy status, and history of breastfeeding. The final regression model shows a statistically significant decreasing trend in malnutrition status with increasing income (P for trend <.001).

In another study conducted by Haque, Mandal and Sultana (2015), the nutritional status and associated socioeconomic factors of 15-49 Years Garo Ethnic Women Residing in Northern Part of Bangladesh were examined. A multivariate analysis shows association between malnutrition and monthly household income, history of taking oral contraceptive, current pregnancy status, and history of breastfeeding.

### **2.5.9 Breast feeding**

Scientists have long been concerned about the relationship between maternal protein-energy malnutrition and breastfeeding. There is general agreement that lactation puts some nutritional stress on women, especially when it overlaps with more than one trimester of the next pregnancy (Merchant, Martorell & Haas, 1992). It is common that women lose weight during sustained lactation.

According to Barari (2011), breast feeding is the first and most important reason for postpartum malnutrition. Nursing mothers need to increase their energy intake by at least 1000 kilo calories every day. Without proper guidance or a nutrition chart, most women are unable to plan their diet adequately. This leads to dehydration, deficiency of vitamins and minerals and severe anemia in some cases, which we collectively term as post natal malnutrition. As breast feeding makes one hungry, they tend to eat whatever comes there way. Feel-good foods are usually not rich in vitamins and minerals and thus, it leads to post natal malnutrition. It is important to continue taking prenatal vitamins even after child birth. Prenatal vitamins like folic acid are water soluble and therefore flushed out from the body regularly. Deficiency of folic acid commonly causes severe anemia in post natal women. So even if you think you have had 'enough' prenatal vitamins, carry on taking them for at least 6 months after child birth (Barari, 2011).

### **2.5.10 Number of family members**

According to Mahanta, Roy, Dutta and Devi (2012) Pregnancy is a critical time in the course of life, having both health and social impacts for individuals, family, and society. Mahanta, et al., (2012) examined the prevalence of malnutrition among pregnant women in a rural area of Assam, India, using anthropometric and biochemical assessments. A cross-sectional study

with a sample of 285 women from all three trimesters was done and key socioeconomic factors that affect nutritional status were examined. The results found that 48% of the women were below normal for Body Mass Index (BMI), indicating a high level of malnutrition. The age of the mother and husband's occupation showed a strong positive correlation with BMI, while family size (number of family members) and income level showed a negative correlation. The results of the biochemical analysis showed that 62% of the women were anemic, and copper and zinc levels were 29% and 12% below normal levels, respectively.

## CHAPTER THREE: METHODOLOGY

### 3.0 Introduction

This chapter presents the methodology that was used during the study. It highlights the research design, sample size determination and sampling technique, the data collection tools, data management and analysis procedure, as well as steps that will be taken to ensure validity and reliability during the study.

### 3.1 Study design

The study employed a cross-sectional research design to assess factors that contribute to maternal malnutrition during pregnancy. This design entailed collecting data to make inferences about a population of interest at one point in time.

### 3.2 Source of data

Primary data obtained from pregnant mothers attending ANC at Mityana hospital.

### 3.3 Study area

The study was conducted in Mityana Hospital in Mityana district, in Uganda's central region. Mityana district gets its name Mityana town, the main municipal, administrative and commercial center of the district and the district headquarters are located there. Mityana Hospital is a district hospital that provides services for the sick or injured, especially those confined to bed. The hospital has a maternal and child health unit which is fully operational albeit the small space available for them. Services offered include general medical and surgical care, counseling and sensitization, family planning and antenatal care. According to the Mityana hospital report of May 2015, a total of 1086 expectant women sought ANC services and the maternity unit has a total of 50 beds. Also a total of 393 births were recorded for the month of May 2015.

### 3.4 Population

**Target population:** This included all pregnant women in Mityana district.

**Study population:** This entailed pregnant women at ANC in Mityana hospital who consented to participate in this study.

### 3.5 Sample size determination

To obtain the overall sample, the Fisher's (1999) formula was used;

$$n = \left[ \frac{z^2 p (1-p)}{d^2} \right] \times 2$$

Where n = sample size

z = the value of standard variety at a given confidence level

d = the level of statistical significance set

p = sample proportion

Therefore z = 1.96 (statistical constant)

d = 0.05

p = 0.12

$$n = \left[ \frac{(1.96)^2 \times (0.12) \times (1-0.12)}{(0.05)^2} \right] \times 2$$

$$= \left[ \frac{3.8416 \times 0.1056}{0.0025} \right] \times 2$$

$$= 3.8416 \times 42.24 \times 2$$

$$= 3.8416 \times 42.24 \times 2$$

$$= 324.538368$$

$$= 325$$

n = 325 respondents (Fisher, 1999)

Therefore, the sample size for this study was 325 pregnant women attending ANC at Mityana hospital.

### 3.6 Eligible criteria

#### 3.56.1 Inclusion criteria

Those pregnant women who consented to participate in this study were selected as the study participants.

#### 3.6.2 Exclusion criteria

Women with mental disorders, very ill and disabled were excluded. Also, mothers with bad obstetric history, diabetes or any other chronic disease.

### **3.7 Sample techniques**

Mityana hospital was purposely selected because it provides service to many pregnant mothers. After that, convenience sampling method was employed where by all pregnant women who turned up for ANC visits were briefed for the study and asked to take part in this study after consent until the required number is obtained.

### **3.8 Study Variables**

#### **3.8.1 Dependent variable**

The dependent variable was malnutrition among pregnant women attending ANC at Mityana hospital. Malnutrition was measured using BMI whereby a BMI of  $<18.5\text{Kg/m}^2$  meant underweight,  $18.5\text{-}24.9\text{Kg/m}^2$  was normal, and  $25\text{Kg/m}^2$  and above was obese.

#### **3.8.2 Independent variables**

Independent variables were individual factors, socio-economic factors and demographic factors that were assumed to be associated with maternal malnutrition.

The individual factors that were investigated in this study included; (knowledge, attitude, child spacing, parity, presence of minor disorders)

On the other hand socio-economic factors included: (Employment, literacy/level of education, household economic status) and finally demographic factors were (age, marital status, religion, culture). All these were presumed to affect and to lead to poor maternal malnutrition as the outcome.

### **3.9 Data collection method**

The researcher administered a semi-structured questionnaire to attain information from the study subjects. The semi-structured questionnaire was prepared in the English language and translated to Luganda for patients who didn't understand English. Consent was however sought from the respondents before the interview proceeded.

### **3.10 Data Quality Assurance**

Quality issues were addressed through the following measures to ensure that data generated is complete, reliable, accurate and above all reproducible using similar methods. These measures contributed towards both internal and external validity of the study.

The questionnaire was pretested at Kisugu health center IV. The pretest was done on 5% of the total sample size. The questionnaire was then assessed for its clarity, length and

completeness. The questionnaire was also translated in to the local language to facilitate understanding of the respondents. The weighing scales and tape measures were also tested to ensure proper functioning for data validity.

### **3.11 Data management**

The principle investigator supervised the data collection process and all data was cross checked for missing information before departing with the respondents. Data was stored and kept confidentially till field work was completed.

### **3.12 Descriptive analysis**

Categorical variables were summarized (analyzed) and presented in pie-charts, bar-graphs and frequency tables. Numerical variables with be summarized and presented in means, median, IQR, histogram and frequency polygon.

### **3.13 Data Analysis**

The data was checked, cleared and entered into Epi-info data sheet software and analysis was done using SPSS version (16.0). The descriptive analysis such as proportions, percentages, frequency distribution and measures of central tendency were calculated.

Bivariate Analysis was performed between malnutrition among pregnant women attending ante-natal clinic in Mityana Hospital (Dependent variable) and each of the potential factors associated with malnutrition (Independent variable).

Multivariate analysis was also performed using the logistic regression model. Factors that were significantly associated with malnutrition during pregnancy at bivariate analysis and those not significant but with previous evidence from literature review indicating possible association with malnutrition during pregnancy were considered in Multivariate logistic regression model.

### **3.14 Ethical issues**

1. Ethical clearance was sought from ethics committee at International Health Sciences University before the study proceeded.
2. District health officer, medical officer in-charge of the hospital and of ANC in-charge were all informed of the study and their consent was sought.
3. During the study period, a written informed consent was sought from all eligible participants before administering questionnaires and interviews held, for all illiterate participants, a thumb print was used. This was done after a detailed explanation of the

procedure of collecting the sample.

4. All information collected during the research was held confidential. Data was safely stored in a locked facility and only the researcher had access to the information.

## CHAPTER FOUR: RESULTS

### 4.0 Introduction

This chapter presents the results regarding the prevalence of malnutrition among pregnant women attending antenatal clinic in Mityana hospital- Mityana district. It further presents the association of demographic factors, social economic factors and personal related factors and malnutrition.

**Table 1: Demographic Characteristics of Pregnant mothers**

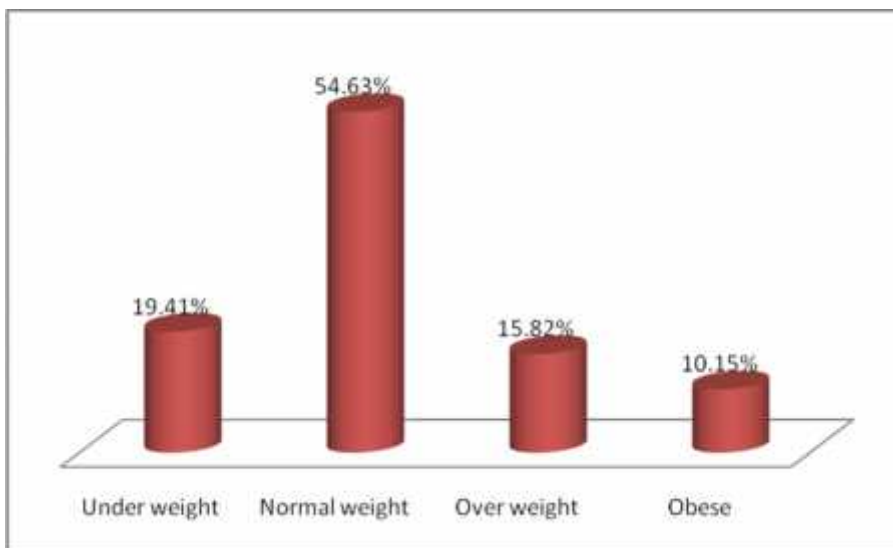
Variables	Category	N(325)	Percent (100%)
Age	<20 years	82	25.2
	20-25 years	140	43.1
	26-30 years	65	20.0
	>30 years	38	11.7
Marital status	Single	69	21.2
	Married	234	72.0
	Divorced	7	2.2
	Separated	15	4.6
Religion	Christian	230	70.8
	Moslem	78	24.0
	Others	17	5.2
Employment status	Yes	103	31.7
	No	222	68.3
Education level	No formal education	9	2.8
	Primary	115	35.4
	Secondary	153	47.1
	Tertiary	48	14.8
Monthly income	Sh. 100,000	263	80.9
	>Sh. 100,000	62	19.1



The results in the table above show that majority of the respondents were aged between 20-25 years 43.1% (140/325), were married 72.0% (234/325), Christians 70.8% (230/325, not employed 68.3% (222/325), had stopped in secondary as the highest education level 47.1% (153/325) and had a monthly income of lesser than or equal to Sh. 100,000 80.9% (263/325).

#### 4.1 The prevalence of Malnutrition among pregnant women

The first study objective sought to establish the prevalence of malnutrition among pregnant women attending antenatal clinic in Mityana hospital, Mityana district. This was measured using BMI whereby a BMI of  $<18.5\text{Kg/m}^2$  meant underweight,  $18.5\text{-}24.9\text{Kg/m}^2$  was normal, and  $25\text{Kg/m}^2$  and above was obese and results were as presented below;



**Figure 1: Distribution of Pregnant mothers according to their BMI**

Of the 325 pregnant mothers interviewed, 45.38% (147/325) were found to be malnourished as shown in figure 2.

#### 4.2 Demographic factors influencing Malnutrition among pregnant mothers

The second study objective sought to determine the demographic factors contributing to malnutrition among pregnant women attending antenatal clinic in Mityana hospital, Mityana district. Chi-square was used to determine the relationship and results were as presented below;

**Table 2: Demographic factors influencing Malnutrition among pregnant mothers.**

Variable	Malnourished	Normal	$\chi^2$	P-values
<b>Age (years)</b>				
<20	31(20.95)	51(28.81)	23.199	0.001
20-25	52(35.14)	88(49.72)		
26-30	35(23.65)	30(16.95)		
>30	30(20.27)	8(4.52)		
<b>Marital status</b>				
Single	27(18.37)	42(23.60)	17.078	0.001
Married	101(68.71)	133(74.72)		
Divorced	7(4.76)	0(0.00)		
Separated	12(8.16)	3(1.69)		
<b>Religion</b>				
Christian	101(69.18)	129(72.07)	10.19	0.006
Moslem	33(22.60)	48(26.82)		
Others	12(8.22)	2(1.12)		

The results in the table 2 indicate that age significantly influenced malnutrition ( $\chi^2 = 23.199$ ,  $p = 0.001$ ). The results show that the proportion of pregnant women who were aged between 20-25 years and were malnourished was 35.14% (52/148) as compared to those who were aged more than 30 years and were malnourished 20.27% (30/148).

There was also a significant relationship between marital status and malnutrition ( $\chi^2 = 17.078$ ,  $p = 0.001$ ). The proportion of pregnant women who were married and were malnourished was 68.71% (101/147) as compared to those who were divorced and were malnourished 4.76% (7/147).

Furthermore, the results indicate that religion significantly influenced malnutrition ( $\chi^2 = 10.19$ ,  $p = 0.006$ ). Pregnant women who were Christians and were malnourished was 69.18% (101/146) as compared to those who were affiliated to other religions and were malnourished 8.22% (12/146).

### 4.3 Socio-economic factors influencing Malnutrition among pregnant mothers

The third study objective sought to identify socio-economic factors contributing to

malnutrition among pregnant women attending antenatal clinic in Mityana hospital, Mityana district. Chi-square was used to establish the contribution and results were as presented below;

**Table 3: Socio-economic factors influencing Malnutrition among pregnant mothers**

Variable	Malnourished	Normal	$\chi^2$	P-values
<b>Employment status</b>				
Employed	51(34.46)	52(29.38)	0.849	0.357
Unemployed	97(65.54)	125(70.62)		
<b>Education level</b>				
No formal education	4(2.72)	5(2.81)	18.852	0.001
Primary	61(41.50)	54(30.34)		
Secondary	51(34.69)	102(57.30)		
Tertiary	31(21.09)	17(9.55)		
<b>Monthly income</b>				
Ush. 100,000	104(77.04)	159(83.68)	17.443	0.001
>Ush. 100,000	31(22.96)	31(16.32)		
<b>Social support</b>				
Low	98(66.67)	138(77.53)	4.691	0.30
Moderate	49(33.33)	40(22.47)		
<b>Food taboos</b>				
Yes	28(19.05)	4(2.25)	23.449	0.001
No	119(80.95)	174(97.75)		

The results in the table 3 indicate that education level significantly influenced malnutrition ( $\chi^2 = 18.852$ ,  $p = 0.001$ ). The proportion of pregnant women who had stopped in primary as the highest education level and were malnourished was 41.50% (61/147) as compared to those who had no formal education and were malnourished 2.72% (4/147).

This study also found out that monthly income was significantly associated with malnutrition ( $\chi^2 = 17.443$ ,  $p = 0.001$ ). Pregnant women who had a monthly income of lesser than or equal to Sh. 100,000 and were malnourished was 77.04% (101/135) as compared to those who had a monthly income of greater than Sh. 100,000 and were malnourished 22.96% (31/135).

Belief in food taboos during pregnancy significantly influenced malnutrition ( $\chi^2 = 23.449$ ,  $p$

= 0.001). The results show that the proportion of pregnant women who had food taboos that they believed in and were malnourished was 19.05% (28/147) as compared to those who had no food taboos that they believed in and were malnourished 80.95% (119/147).

#### **4.4 Personal factors influencing Malnutrition among pregnant mothers**

The fourth study objective sought to identify the personal related factors contributing to malnutrition among pregnant women attending antenatal clinic in Mityana hospital, Mityana district. Chi-square was used and results were as presented below;

**Table 4: Personal factors influencing Malnutrition among pregnant mothers**

Variable	Malnourished	Normal	$\chi^2$	p-values
Awareness of ANC				
Yes	144(80.90)	119(80.95)	0.0002	0.988
No	34(19.10)	28(19.05)		
ANC is important				
Yes	125(86.21)	180(100.00)	31.125	0.001
No	20(13.79)	0(0.00)		
Number ANC visits				
1-2 times	9(6.57)	4(2.13)	34.81	0.001
3 times	50(36.50)	44(23.40)		
4 times	78(56.93)	140(74.47)		
Swallow Iron tablets				
Yes	127(83.55)	167(92.78)	6.919	0.009
No	25(16.45)	13(7.22)		
Takes balanced diet				
Yes	56(36.84)	103(56.28)	12.587	0.001
No	96(63.16)	80(43.72)		
First pregnancy				
Yes	58(39.46)	91(51.12)	4.308	0.038
No	89(60.54)	87(48.88)		
Parity				
None	53(35.33)	78(44.57)	14.709	0.002
1-2	49(32.67)	64(36.57)		
3-4	29(19.33)	28(16.00)		
>4	19(12.67)	5(2.86)		
Family size				
1-4	101(68.24)	150(84.75)	12.873	0.001
6-10	47(31.76)	27(15.25)		
On contraceptives				
Yes	42(28.57)	42(23.60)	1.096	0.295
No	105(71.43)	136(76.40)		
Medical condition				
Nausea	85(46.96)	59(40.97)	1.215	0.545
Depression	37(20.44)	37(25.69)		
Others	59(32.60)	48(33.33)		
HIV status				
Positive	129(87.76)	169(94.94)	5.051	0.025
Negative	18(12.24)	9(5.06)		

Among the personal factors studied, we found out ANC is important ( $\chi^2 = 31.125$ ,  $p = 0.001$ ), Number of ANC visits ( $\chi^2 = 34.81$ ,  $p = 0.001$ ), Swallowing iron tablets ( $\chi^2 = 6.919$ ,  $p = 0.009$ ), Taking a balanced diet ( $\chi^2 = 12.587$ ,  $p = 0.001$ ), First pregnancy ( $\chi^2 = 4.308$ ,  $p = 0.038$ ), Parity ( $\chi^2 = 14.709$ ,  $p = 0.002$ ), Family size ( $\chi^2 = 12.873$ ,  $p = 0.001$ ) and HIV status ( $\chi^2 = 5.051$ ,

p=0.025) were statistically significantly associated with malnutrition among pregnant women as shown in table 4.

#### 4.5 Factors associated with malnutrition among pregnant mothers

To establish how much common or shared variance could be extracted from factors associated with malnutrition among pregnant mothers, a multivariate analysis was done and results were as show in table 5;

**Table 5: Factors associated with malnutrition among pregnant mothers at multivariate analysis**

Variable	Malnourished	Normal	OR(95%CI)	P-value
Takes balanced diet				
Yes	56(36.84)	103(56.28)	1	
No	96(63.16)	80(43.72)	3.2(1.54-6.88)	0.002
Parity				
1-2	49(32.67)	64(36.57)	1	
>4	19(12.67)	5(2.86)	2.22(1.06-4.64)	0.035
Food taboos				
Yes	28(19.05)	4(2.25)	1	
No	119(80.95)	174(97.75)	0.17(0.05-0.52)	0.002
Age (years)				
<20	31(20.95)	51(28.81)	1	
>30	30(20.27)	8(4.52)	26.4(6.07-114.9)	0.001
Religion				
Christian	101(69.18)	129(72.07)	1	
Moslem	33(22.60)	48(26.82)	0.29(0.13-0.66)	0.003
Monthly income				
Ush. 100,000	104(77.04)	159(83.68)	1	
>Ush. 100,000	31(22.96)	31(16.32)	2.72(1.04-7.08)	0.04

The results in the table 5 indicate that pregnant women who reported not to take a balanced diet while having meals were 3 times more likely to suffer from malnutrition than those who reported to take a balanced diet.

Pregnant women who had parity of greater than 4 were 2 times more likely to suffer from

malnutrition than those who had parity of 1-2.

The results further show that that pregnant women who were aged more than 30 years were 26 times more likely to suffer from malnutrition than those who were aged less than 20 years. Again pregnant women with monthly income more than Ush.100,000 were almost 3 times more likely from malnutrition than those whose monthly income were less than or equal to Ush. 100.000.

However, women who reported not to have any food taboos and those who were Moslem by Religion were less likely to suffer from malnutrition than those who had food taboos and Christian by Religion respectively.

## CHAPTER FIVE: DISCUSSION OF RESULTS

### 5.0 Introduction

This chapter contains discussion of results in relation to other relevant literature of the study.

### 5.1 The prevalence of Malnutrition among pregnant women

The study findings revealed that almost half of the pregnant women were malnourished.

The observed level of malnutrition could be as result of various factors ranging from policy issues to immediate household conditions to underlying community and cultural situations. Such may include, household food insecurity (mainly related to poor access to the range of foods needed for a diversified diet); and poor access to health care and a healthy environment where pregnant women do not live in a healthy environment with good access to toilets and other sanitation services, a reliable safe water supply, and effective health facilities and services, including nutrition services such as micronutrient supplementation and nutrition education.

These results are in line with another cross sectional study done in Eastern Ethiopia ( Haji Kedir 2014) which revealed that on average, 19.06% were malnourished, while 23.3% were under weight.

Also another study that was done in Bangladesh, India( Salim. F.et al 2014, found out that malnutrition (under weight) was 23.5% almost similar.

This was so because both studies used similar study design and all examined the independent variables.

However, there are people who found the prevalence of malnutrition to be higher than this study. For example, a study that was done in Algeria (S.Taleb; et al 2011) discovered that more than a half 78.46% were malnourished (39.23% were overweight and 39.23% were obese).

Another study was conducted in the Gulf region (Abdulrahman .M 2007) and it revealed that 54-70% of pregnant women were overweight and obese and 3-13% were underweight.

More so, another study was carried out in Khartoum, Sudan ( Duria A Rayis; et al 2010), it found out that 5.5% were underweight, 35.6% were overweight and 19.4% were obese giving a total of 60.5% of pregnant women being malnourished.

This deviation was as a result of differences in sample size as some had very few (130) and



others extremely big sample (1690) compared to my study which had a sample size of 325. Also the study setting was different and this could cause the variation.

The 45.38% prevalence of malnutrition among pregnant women has much implication whereby the underweight are more likely to get miscarriages, premature deliveries, low birth weight babies and postpartum hemorrhages. The overweight and obese women have higher chances of having very big fetuses which predispose them to caesarian sections with all their complications in fat women including delayed wound healing.

## **5.2 Demographic factors influencing Malnutrition among pregnant mothers.**

Malnutrition among pregnant women was found to be associated with age more than 30 years.

This was so because majority of these women aged more than 30 years and pregnant, their parity was also high, were not using family planning, could come for ANC late because they are used, their social economic status were either very low or very high and were ignorant about the balanced diet.

These findings were in line with another study which was done in Ethiopia by the demographic and health research (2010) which showed that age range of 15-19 and 40-49 years were more affected. These studies discovered almost similar findings because both used the same age categories.

However, another study done in Nigeria with Okwu et al ., (2007). It was discovered that the effect of age on the prevalence of Protein-energy malnutrition (PEM) in pregnant women mainly associated with age groups, below 20years and 20-24 years. His findings are not in line with mine because of the different study setting and the sample size being very high (1,387) compared to 325.

Malnutrition among the age of more than 30 years creates high chances of maternal morbidity and mortality due to other personal and social economic burden which always accompany them as compared to young ones.

Christian faith religion was also found to be associated with malnutrition among pregnant women. The reason being that the majority of the Christians interviewed were not taking the balanced diet and others had religious beliefs about family planning and certain foods.

These results are in agreement with another study that was done in Yerwa clinic in Nigeria with Kever R.T 2015 which found that 20% of pregnant women avoid good diet because of

their religion hence becoming malnourished. This imposes a very burden to the community because of them being the majority.

### **5.3 Socio-economic factors influencing Malnutrition among pregnant mothers**

Earning a monthly income of more than Ush.100,000 was discovered to be associated with malnutrition among pregnant women. This was so because these women of high economic status are employed and have busy jobs, so they end up not getting time to eat nutritious foods, they just depend on snacks hence becoming underweight and others think that having money means eating fatty things daily and taking alcohol which in the end make the overweight and obese.

The study findings are not in line with the study done in USA ( Eileen R.Fowles et al 2011) which revealed that pregnant women in low income household are more likely to eat poor diets as compared to wealthier counterparts.

This variation was as a result of differing in the study setting USA being a developed country, people are aware and so sensitive about diet as compared to the Ugandans who are still developing and learning about diet.

This creates a big challenge to the society as everyone is struggling to get a job and raise the economic status. Something must be done urgently.

Malnutrition was also found to be associated with pregnant women who have food taboos. This was because women with food taboos are restricted to eat certain diets which are very important during pregnancy to cover up the increased nutritional demand.

The study results was in line with Jessica A Grieger 2015 and Picot et al 2012 who found that during pregnancy, the nutritional demand raises and if women don't feed well, under nutrition can have drastic and wide ranging effects on them and their children.

Also the findings were in agreement with another study which was done in Ogun state Nigeria. It discovered that 16.1% of women in rural and 19.4% of women in urban areas believed in food taboos which contributed to their malnutrition. Similar findings were also found in Burkina Faso, Ghana. Whereby food taboos were also associated with maternal malnutrition.

#### **5.4 Personal factors influencing Malnutrition among pregnant mothers.**

Not taking a balanced diet was discovered to be associated with malnutrition among pregnant women. The reason being that, during pregnancy the nutritional demand increases in order to serve the growing fetus and the mother with all physiological changes that take place. So if a pregnant woman fails to take the balanced diet, her chances of becoming malnourished greatly increase.

The findings was line with another study which was done by Dr Pragya Singh et al 2011 and revealed that majority (75.2%) of participants were not taking additional meals to compensate for the increased demand and a total of 9.2% of the study subjects were undernourished.

This increases the chances of anemia hence getting postpartum hemorrhage following child birth.

Malnutrition among pregnant women was also associated with parity of more than 4. This was because, the more the woman produces, the higher the social economic demand due to the increased number of dependants hence food insecurity in the home.

The study results was in line with another study that was done in Ethiopia by Bitew et al 2010 which found out that women of atleast 5 children( parity 5+)were at high risk of chronic energy deficiency than other women. However, it also discovered that even those who had never had a child ( parity 0) were also at high risk.

This similarity and deviation was as a result of using the same categorical method and differences in the sample size and the study setting respectively. It was also in agreement with another study that was done in Nigeria (2010) which suggested that serum total protein significantly decreases as the number of children also increases.

However, another person in Nigeria ( Okwu GNet al 2007) found out that weight gain increases with increase in parity. This was more pronounced in the urban than the rural areas of Mityana.

This has many implications including poor pregnancy and delivery outcomes and chronic morbidity.

## **CHAPTER SIX: CONCLUSION AND RECOMMENDATIONS**

### **6.0 Introduction**

This chapter presents the drawn conclusions and the suggested recommendations based on the objectives and results.

### **6.1 Conclusion.**

This study was aimed to assess the factors contributing to malnutrition among pregnant women attending ANC in Mityana hospital, Mityana district.

It found out that the prevalence of malnutrition was slightly high as 45.38% were malnourished. Of these, 19.41%, 15.82% and 10.15% were underweight, overweight and obese respectively.

Under social demographic factors, Malnutrition was associated with women aged more than 30 years and those with Christian faith.

In social economic factors it was found that monthly income of more than Ush. 100,000 was associated with malnutrition.

The personal related factors indicated that, lack of a balanced diet, parity more than 4 and having food taboos was also associated with malnutrition.

### **6.2 Recommendations**

#### **6.2.1 Introduction.**

According to UDHS( 2011), one of the millennium development goals was to eradicate Poverty and hunger. Nutrition should be a priority at national and regional levels as it is important for human and social-economic development in the country.

#### **6.2.2 To the ministry of health.**

The Ministry of Health together with other policy makers running the health sector should introduce feeding programmes in antenatal clinics and health centers. This may help done through provision of food subsidies to pregnant women.

There is need for conducting nutrition surveillance needs to be done continuously and special attention should be given to vulnerable groups such as the pregnant women and the children under 5 years.

The government should also strengthen its livelihood and economic empowerment programs to cater for women by providing opportunities for them to get more access to education, paid

employment, assets such as land and credit facilities.

### **6.2.3 To Mityana district local government health department.**

The district should form Nutritional programmes which should be extended to the community. These programmes should teach the community about maternal nutrition.

The village health teams (VHTs) should also be strengthened to encourage all pregnant women seek ANC services

### **6.2.4 To Mityana hospital staff.**

Health workers should start providing counseling on dietary intake before and during pregnancy. This could be done through establishing nutrition education and efficient nutrition monitoring systems at all levels of antenatal care.

They should also emphasize the use of family planning, dangers of producing at an early or late age, benefits of attending ANC and taking the given routine drugs and also the implication of having many food taboos.

### **6.2.5 To the community members of Mityana district.**

The VHTs in Mityana community should encourage all pregnant women to attend ANC early in the first trimester as majority were found to be starting in 2<sup>nd</sup> and 3<sup>rd</sup> trimesters.

Local leaders should encourage people to do farming on top of the businesses in order to have food security in their homes.

Pregnant women should especially those who are employed and has a high social economic status should avoid taking sharks and fatty food as this was found to cause malnutrition in them.

## REFERENCES

- Fallah f, pourabbas a, delpisheh a, vei-sani y, shadnoush m., 2013. Effects of nutrition education on levels of nutritional awareness of pregnant women in western iran. *Int j endocrinol metab*: 2013; 11(3):175-178.
- Haji kedir, yemane berhane, alemayehu worku., 2014. *Magnitude and determinants of malnutrition among pregnant women in eastern ethiopia: evidence from rural, community-based setting*. Ethiopia: addis continental institute of public health, addis ababa.
- Rayis, et al., 2010. *Epidemiology of underweight and overweight-obesity among term pregnant sudanese women*. *Bmc research notes* 2010 3:327.
- Salim f, et al., 2015. *Nutritional status and knowledge about nutrition during pregnancy among pregnant and postpartum women*. India.
- Daba g, beyene f, fekadu h, garoma w., 2013. *Assessment of knowledge of pregnant mothers on maternal nutrition and associated factors in guto gida woreda, east wollega zone, ethiopia*. *J nutr food sci* 3: 235.
- Adebowale, s.a., adepoju o.t., okareh o.t. & fagbamigbe f.a., 2011. Social epidemiology of adverse nutritional status outcomes among women in nigeria: ndhs, 2008. *Pakistan journal of nutrition* 10, 888–898.
- Assefa n, berhane y, worku a., 2012. *Wealth status, mid upper arm circumference (muac) and antenatal care (anc) are determinants for low birth weight in kersa*. Ethiopia: plos one 7, e39957.
- Bitew f.h, telake d.s, 2010. *Undernutrition among women in ethiopia: rural-urban disparity*. Dhs working papers no. 77. Icf macro, calverton, mary- land, usa.
- Black r.e, allen l.h, bhutta z.a, caulfield l.e., de onis m, ezzati m, 2008. Maternal and child undernutrition: global and regional exposures and health consequences. *Lancet* 371, 243–260.
- Butte n.f., king j.c., 2005. *Energy requirements during pregnancy and lactation*. Public health

nutrition 8,1010–1027.

Balarajan y, villamor e, 2009. Nationally representative surveys show recent increases in the prevalence of overweight and obesity among women of reproductive age in bangladesh, nepal, and india. *J nutr* 2009,139:2139.

Erick m, mahan lk, escott stump s., 2008. *Nutrition during pregnancy and lactation. Krause's food and nutrition therapy*. 12th ed. Philadelphia: saunders.

Basher ms, kabir s, ahmed s, miah ma, kamal ms., prenatal nutrition among rural bangladeshi pregnant women. *Mymensingh med j*. 2011;20(4):548-57.

Eicher-miller ha, mason ac, abbott ar, mccabe gp, boushey cj., 2009. The effect of food stamp nutrition education on the food insecurity of low-income women participants. *J nutr educ behav*. 2009;41(3):161-8.

Bellahreche k, ouargli z., 2007. *Nutritional status of pregnant women attending pmi el meniaa (ghardaia) and ghriss (mascara), engineer status in nutrition and food technology*. Inataa, mentouri university of constantine: algeria.

Kabiru, t. Hafiz, a. And atiku, m. K., 2012. Epidemiology of underweight and overweight-obesity among term pregnant sudanese women. *Bayero journal of pure and applied sciences*. 5(2): 119 – 121

Ikeyi a. Alumanah e.o. and joshua p.e., 2010. Effects of age and parity associated with protein energy malnutrition (pem) on some biochemical parameters of some pregnant women in enugu metropolis of nigeria. *Research j. Science and tech*. 2010; 2(2): 23-28

Kever rt eta al., 2015. Knowledge and attitude of pregnant women towards dietary practices in yerwa clinic, maiduguri metropolitan council; borno state. *Journal of research in nursing and midwifery*. Vol. 4(1) pp. 12-19, january, 2015

Okwu, g. N., ukoha, a. Nwachukwu, n. And agha, n. C., 2007. Studies on the predisposing factors of protein energy malnutrition among pregnant women in a nigerian community. *Online journal of health and allied science*, 3:1.

Alice k, christina a, richard a., 2012. Dietary practices and nutrient intakes of pregnant women in accra, ghana. *Current research journal biological sciences* 4: 358-365

Mitra m, wan a, manan w, affizal a, mohd s., 2012. *Dietary knowledge and behaviors in a sample of malay pregnant women*: umt 11th international annual symposium on sustainability science and management 09th –11th july 2012, terengganu, malaysia

Global status report on noncommunicable diseases 2010. Geneva, world health organization, 2011.

Gina ma, higginbottom hv, forgeron j, gibbon d, malhi r, mamede f., 2011. *Food choices and practices during pregnancy of immigrant and aboriginal women*. Canada: biomed. Central. Pp. 205-211.

Ogunjuyigbe p, ojofietimil eo, sanusi ra, akinlo aa, liasu sa, owolabi oo., 2008. *Food aversion during pregnancy may cause poor pregnancy outcome in nigeria*.

Latifa mf, manal ha, nihai ss., 2012. Nutritional awareness of women during pregnancy. *J american sci* 8.

Naomi m., 2010. Investigating health and nutrition messages given to pregnant women at bwaila hospital in lilongwe; master thesis; food, nutrition and health.

Barari, a. (2011). Causes of post-natal malnutrition among women, published: tuesday, july 26, 2011, retrieved from <http://www.boldsky.com/pregnancy-parenting/postnatal/2011/causes-postnatal-malnutrition-women-26-0711.html>

Merchant, k. M., martorell, r. & haas, j.d. (1992) consequences for maternal nutrition of reproductive stress across consecutive pregnancies. *American journal of clinical nutrition*, 52, 616-620.

Mahanta., l. B., roy, t. D, dutta, r. G., & devi, a. (2012) nutritional status and the impact of socioeconomic factors on pregnant women in kamrup district of assam. *Ecology food nutrition*, 51(6), 463-480.



Opinion research corporation macro international, inc. (orc macro). 2006. Uganda demographic health survey 2006. Calverton, md: orc macro.

Milton, a. H., smith w, rahman b, ahmed b, shahidullah sm, hossain z, hasan z, sharmin s. 2010 prevalence and determinants of malnutrition among reproductive aged women of rural bangladesh. *Asia pac j public health*. 22(1), 110-117.

Haque mm, mandal s, sultana j (2015) nutritional status and associated socioeconomic factors of 15-49 years garo ethnic women residing in northern part of bangladesh: a cross sectional observational survey. *Journal of nutritional health and food engineering*, 2(5).

## APPENDIX 1: CONSENT FORM AND NON-DISCLOSURE AGREEMENT

**Title of the study:** Factors influencing malnutrition among pregnant women attending ANC visits at Mityana hospital, Mityana district.

**Introduction:** Thank you for taking time to talk to us. This consent form contains information about the above named research study. The study is being conducted by a Bachelor Nursing student from International Health Sciences University, Namuwongo.

**Reason for the study:** The study is being carried out in-order to find out the prevalence of malnutrition among women, a group that is at risk of such disorders and yet the negative effects of malnutrition not only affect the women but the children that they have and generations after that.

**Participation in the study:** You are being asked to take part in this study because pregnant women are at most high risk of being affected by malnutrition. We will need about 30-45 minutes of your time for this study. Your participation will not in any way affect your routine daily activities.

**Possible benefits:** The research outcomes are intended to inform the authorities and persons concerned about the condition its prevalence and effect so that appropriate plans are put in place in order to address this issue.

**Confidentiality:** If you decide to participate, your participation and all information you provide to us is completely confidential, and will not be shared with others. We will not write down your name. If the results of this study are published, you will not be identified nor named in any reports. No photos will be taken without your permission.

Signing this consent form signifies agreement to participate in the study. You can withdraw from the study at any time you feel like it with no penalties.

If you have any questions regarding your experience in this study please feel free to contact Florence Zawedde (Student), 0753186450.

Signature of the participant

Date

.....

.....

Signature of the interviewer

Date

.....

.....

## APPENDIX II: QUESTIONNAIRE

This questionnaire is going to be used solely to assess the nutritional status of pregnant women attending ANC and all information provided will be kept confidential. Please feel free to answer the questions. However you can opt out if you so desire at any time during the survey.

ID No: -----

Tick in the box as required.

### SECTION A: DEMOGRAPHIC FACTORS

1. Age:

1. < 20  2. 20 – 25  3. 26 – 30  4 > 30 years

2. Marital status:

1. Single  2. Married  3. Divorced  4. Separated

3. Religious Affiliation:

1. Christian  2. Muslim  3. Other

### SECTION B: SOCIO-ECONOMIC CHARACTERISTICS.

4. Are you employed?

1. Yes  2.No

5. Education attained:

1.No formal education      2.Primary      3.Secondary      4.Tertiary

6. Household -economic status (Income per month)

1. Less than 100,000       2.More than 100.000

7. How can you rate you social economic status?

1. Low       2. Moderate       3. High

8. Are there any cultural practices that inhibit you from having certain foods during pregnancy?

1. Yes       2.No

9. If YES, What are they?

.....  
.....

**SECTION E: The prevalence of Malnutrition among pregnant women.**

10. What is your BMI?

<18.5 –Underweight       18.5 – 24.9 -Healthy       25 – 29.9 – Overweigh         
30 Obese

11. What is your BMI?

1. < 18.5 Kg m<sup>-2</sup>

2. Kg m<sup>-2</sup>

**SECTION F: PERSONAL RELATED FACTORS**

**ATTITUDE**

12. Are you aware of any antenatal services available?

Yes  No

13. Do you think they are important to pregnant women?

Yes  No

14. IF YES, How

.....  
.....

15. How many times should a pregnant woman visit ANC?

1. 1-2 times  2. 2 – 3 times  3. 3. 4 times

16. In which trimester is ANC most important (Tick where applicable)

All trimester  1st trimester  2nd trimester  3rd trimester

17. How frequent do you attend Antenatal clinic services?

1. Weekly  2. After every 2 weeks  3. After 1 month   
4. After 2 months

18. Which foods do you think are good during pregnancy?

.....  
.....

19. Do you take your iron and Folic acid supplements?

1. Yes  2. No

### KNOWLEDGE

20. Do you know what a balanced diet is?

1. Yes  2. No

21. If yes what is a balanced diet

.....  
.....

22. Why do we need a balanced diet when pregnant ?

.....  
.....

23. What do you think are the effects of malnutrition?

Low birth weight  Generalized weakness  Repeated illness

Abortion or premature delivery

24. What are the benefits of taking nutritious foods during pregnancy?

Baby's weight will be normal  Baby's weight will be low  Baby will be   
overweight  Don't know

**PERSONAL RELATED FACTORS (CONT)**

25. Is this your first pregnancy?

1. Yes  2. No

26. Parity?

1. None  2. 1-2  3-4  4. > 4

27. What is the spacing of your children?

1. 1 year  2. 1 year  2 years  > 2 years

28. How old were you when you had your first child?

1. < 18  2. 19 – 30 years  31 – 35 years  5 > years

29. Number of family members

1. 1 – 5  2. 6 – 10  3. 11- 15

30. Have you ever been on oral contraceptives pills?

1. Yes  2. No

31. Do you consume the following food groups on a daily basis?

1. Vegetables and fruit (Potato, yam, orange, and banana)	Yes	<input type="checkbox"/>	<input type="checkbox"/>
2. Breads and cereals (Porridge, rice, cassava)	Yes	<input type="checkbox"/>	<input type="checkbox"/>
	No	<input type="checkbox"/>	
3. Milk and milk products (Milk, Yoghurt, cheese)	Yes	<input type="checkbox"/>	<input type="checkbox"/>
	No	<input type="checkbox"/>	
4. Lean meat, poultry, seafood, eggs, nuts, seeds and legumes	Yes	<input type="checkbox"/>	<input type="checkbox"/>



32. Did you experience any complications at the initial stages of your pregnancy?

1. Yes  2. No

33. If yes please Mention?

.....  
.....

34. Do you have any medical conditions that have affected your weight?

Nausea  Depression  Liver disease  Persistent diarrhea

Others

(Please Mention).....

35. What is HIV/Aids Status?

1. Negative  2. Positive

36. If Positive, has your status affected you during your pregnancy?

1. Yes  2. No

37. If Yes, How?

.....  
.....

38. Did you breastfeed the last baby you gave birth to?

1. Yes  2. No

39. At what gestational age did you first start your ANC visits?

1. 1st trimester

2. 2<sup>nd</sup> trimester

3. 3<sup>rd</sup> trimester

**END**

**APPENDIX III: INTRODUCTORY LETTER**



*making a difference in health care*

**Office of the Dean, School of Nursing**

Kampala, 16<sup>th</sup> September 2015

Senior Hospital Administrator  
Mityana Hospital



Student has been accepted to do her research in Mityana Hospital as per the request.  
SHA - For MS.

Dear Sir/Madam,

**RE: ASSISTANCE FOR RESEARCH**

Greetings from International Health Sciences University.

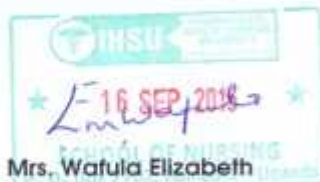
This is to introduce to you **Zawedde Florence** Registration No. **2012-BNS-TU-056** who is a student of our University. As part of the requirements for the award of a Bachelors degree in Nursing of our University, the student is required to carry out research in partial fulfillment of her award.

Her topic of research is: **Factors contributing to malnutrition among pregnant women attending antenatal clinic in Mityana Hospital – Mityana District**

This therefore is to kindly request you to render the student assistance as may be necessary for her research.

I, and indeed the entire University are grateful in advance for all assistance that will be accorded to our student.

Sincerely Yours,



**Mrs. Wafula Elizabeth**  
Dean

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