THE DETERMINANTS OF NUTRITIONAL STATUS AMONG YOUNG PREGNANT MOTHERS ATTENDING SELECTED PUBLIC HEALTH FACILITIES IN IGANGA

PATIENCE ARNETIA LUNKUSE

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A DISSERTATION SUBMITTED TO THE FACULTY OF PUBLIC HEALTH, NURSING AND MIDWIFERY IN PARTIAL FULFILLMENT FOR THE REQUIREMENTS OF THE AWARD OF THE DEGREE OF MASTER OF PUBLIC HEALTH OF UGANDA CHRISTIAN UNIVERSITY

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DECLARATION

I **ARNETIA PATIENCE LUNKUSE** affirm that this thesis titled **"The Determinants of Nutritional Status among Young mothers attending selected public health facilities in Iganga"** is my own. It has been strictly written in pursuance of a Master of Public Health, of Uganda Christian University.

Signed:  Date: 28th June 2025

APPROVAL

This research thesis titled “The determinants of nutritional status among young pregnant mothers attending selected public health facilities in Iganga” has been developed under my supervision. I therefore, give my approval for its submission for examination.

Shallon ATUHAIRE 20/09/2025

Research Supervisor

DEDICATION

I dedicate this work to my mother and family, who financially and emotionally supported me throughout the research period.

I also dedicate this work to my fellow students for the support rendered to me, may Almighty God reward you abundantly.

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My sincere gratitude goes to my supervisor Shallon Atuhaire (PhD) for her tireless and valuable guidance and academic intellect throughout this research.

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ACRONYMS AND ABBREVIATIONS

ANC: Antenatal Care

DDS: Dietary Diversity Score

FGDs: Focus Group Discussions

HBM: Health Belief Model

IRB: Institutional Review Board

MUAC: Mid-Upper Arm Circumference

SDH: Social Determinants of Health

SEM: Social-Ecological Model

SES: Socio-Economic Status

SPSS: Statistical Package for the Social Sciences

UNAP: Uganda Nutrition Action Plan

UNCST: Uganda National Council for Science and Technology

WHO: World Health Organization

DEFINITIONS OF KEY TERMS

Child health: This refers to the overall well-being of children, encompassing physical, mental, emotional, and social health, including protection from diseases, proper nutrition, and safe environments during growth and development.

Malnutrition: This is a condition that occurs when a person's diet does not provide adequate nutrients (undernutrition) or includes too many unhealthy foods (overnutrition), leading to health problems such as stunted growth, weakened immunity, or obesity.

Maternal health: This refers to the health of women during pregnancy, childbirth, and the postnatal period, focusing on ensuring safe delivery, access to healthcare, proper nutrition, and protection from complications or diseases.

Nutritional status: This is a measure of the body's health as influenced by the intake and utilization of nutrients, often assessed through indicators like body weight, height, body mass index (BMI), and blood nutrient levels.

Young pregnant women: Refers to females, typically in their teenage years or early twenties, who are expecting a child. This group is often considered at higher health risk due to factors like ongoing physical development, limited access to healthcare, and socioeconomic challenges.

ABSTRACT

Background: Inadequate nutritional status among young expectant mothers in rural settings like Iganga are critical issues for public health which has negative impact on maternal and child health. This study aimed to identify the determinants influencing the nutritional status of young pregnant mothers aged 24 years and below who are attending selected public health facilities in Iganga, Uganda.

Methods: This was a decretive cross sectional mixed study. A semi structured questionnaire was used to collect data from 273 young pregnant women who were sampled using a simple random sampling method. Qualitative data was collected from health workers, village leaders and a small number of young pregnant women. Principles of saturation were followed for qualitative component. Quantitative data was analyzed using SPSS and thematic analysis was done for the qualitative component.

Results: 26.7% of the participants had poor nutrition status. The significant factors at multivariate analysis were practices done when planning to conceive such as fitness (AOR=0.3, 95% CI [0.08-0.83], p=0.023), number of children (AOR=0.7, 95% CI [0.36-1.38], p=0.002), level of education (AOR=0.5, 95% CI [0.23-105], p=0.000), skipping meals (AOR=1.2, 95% CI [0.67-1.98], p=0.004) and use of herbal products due to cultural taboos (AOR=0.7, 95% CI [0.39-1.28], p=0.051). From qualitative data, the identified factors were; relying on certain types of foods due to poverty, inadequate food, eating on certain kind of foods that lack nutrition values, feeling sick to cook and being neglected by their husbands.

Conclusion: This study found a high prevalence of poor nutrition status among young pregnant women. The significant factors included smoking practices, having many children, skipping meals, level of education, use of herbal medicine, poverty and lack of support from husbands.

Recommendations: Husbands and family members should provide adequate support to pregnant women such as assistance in provision of funds and house chores when weak.

CHAPTER ONE
INTRODUCTION

1.0 Introduction

Nutritional status is checking health state of a person focusing on diet, weight, height (body mass index) and body chemistry (Khan et al., 2023). Nutritional status can be assed using clinical indicators which include; body mass index (BMI0, weight and rate at which an individual losses weight unintentionally (Mehrez et al., 2023). Nutritional status can be measured or defines by considering consumption of nutritious foods obtained and the need for nutritious foods which should pave way for uptake of nutrients to maintain storages and substitute for lost nutrients (Fernández-Lázaro & Seco-Calvo, 2023). Due to various predictors of nutrition needs for each individual, it is vital to conform to guidelines for ones dietary requirements (Rani & Das, 2023).

Uptake of nutrition requirements by a mother determines the state of wellbeing of a mother and that of her new born thus has it has important effect on long term and sort term maternal (Monfared, 2024). It is vital to maintain required nutrients when a mother is pregnant for proper fetal development which enables to reduces risks of adverse events that may happen during pregnancy which includes giving birth before term, low weight at birth and passing away of new born (Marshall et al., 2022). Despites of effort to ensure effective nutrition status among pregnant mothers worldwide, maternal malnutrition is still a big public health challenges in many nations especially developing ones where Uganda belong which has an estimate of more than 20% of women in their reproductive age experience undernutrition (Sserwanja et al., 2020).

Lack of nutrition needs of the body for an expectant mother predisposes her to various adverse events such as obstetric problems that include diabetes during pregnancy, high blood pressure in pregnancy, high chances of acquiring infections due low body defense (Miele et al., 2021). In Uganda, inadequate nutrition status of expectant mothers leads to low birth weight and giving birth before term thus contributing to increased development problems in children and neonatal mortality (Musinguzi et al., 2024). Inadequate nutrition among mothers causes generation to generation poverty and poor health status of families (Bienertova-Vasku, 2021).

In rural communities of Uganda, many young expectant mothers continue to suffer from deficiency of nutritious foods despite provision of health education campaigns on the importance of adopting good nutritional status among pregnant women. Predictors to inadequate good nutrition practices

include low level of education, inadequate access to antenatal care and inadequate health care services (Tugume et al., 2024). However, there was inadequate research on assessing the determinants of nutritional status among young pregnant mothers in rural settings like Iganga, and this has made it hard to set up strategies to address nutritional needs among pregnant women. Therefore, considering the significance of maternal nutrition for both mother and her infant, this study explored the determinants of nutritional status among young pregnant mothers attending selected public health facilities in Iganga. Identifying these determinants was essential to developing effective public health strategies that could improve maternal and child health outcomes in rural areas of Uganda.

1.1 Background.

1.1.1 Historical Perspective. Pregnant mothers, nutritional status has been of major emphasis by public health research for decades because of effects on mothers and their infant outcomes (Mohamed et al., 2022). From historical view , poor nutrition among pregnant women has been put forward as an influencing factor to poor outcomes of pregnancy such as birth before term, low weight at birth, high maternal and child mortality (Berhe et al., 2021). The world stated putting focus on nutrition status of pregnant women during early days of 20^{th} century and during this time there was high rates of deficiencies of nutrition among pregnant mothers recorded in both developed and developing nations which forced establishment of strategic nutrition programs focused to improve child health and maternal health (Olajide et al., 2024). During this time various nutritional organizations including the World Health Organization (WHO) started programs aimed at provision of nutritious supplements, fortified foods and health education programs aimed at promoting good dietary practices among pregnant mothers (Kaur et al., 2022).

Worldwide, data obtained from 12 nations reported that acute malnutrition affected 5.5 million breastfeeding and expectant adolescent girls and women which increased to 6.9 million from 2020 indicating that 25% of women in reproductive age experienced lack of food and nutrition needs as reported by United Nations Emergency Children's Fund (UNICEF) (Plan, 2021).

The most affected continents with inadequate nutrition needs among women of reproductive age are South Asia and sub-Saharan Africa where by 2 in 3 women are suffering from low weigh for age and 3 in 5 are anemic (Jiang et al., 2022). Women from the poorest households have two chances experience underweight than those from rich households (Darling et al., 2020).

In Ethiopia, statistics indicated that maternal undernutrition was between 21.8% and 43.1%, and this was highest among women from rural areas, the contributed factors were being young, low levels of educational, poor socio-economic status, big family size, insufficient income, lack of decision making power among women, inadequate foods in homes, lack of adequate knowledge on nutrition needs, place of residence, inadequate diversity of diet, lack of pit latrines and unwanted pregnancies (Wakwoya et al., 2022).

In Uganda, a study carried out between 2015 and 2018 which involved 4,848,873 pregnant and breastfeeding mothers who were assessed for wasting showed that, 268,636 representing 5.5% with 6.8% median prevalence. This was high in Northern Uganda, with Central and Western Uganda having the lowest prevalence (Kyamwine et al., 2021).

1.1.2 Theoretical Perspective

This research about determinants of nutrition status among pregnant women from Iganga based on various theories relevant to public health which enabled understanding factors which influence nutrition among mothers. Example of theories for this research were Health Belief Model and the Social determinants of Health.

Social Determinants of Health (SDH) Framework

The SDH model talks about economic, social and environment factors that has an influence of health outcomes of an individual (Melo et al., 2020). The World Health Organization states that the SDH include income level, level of education, employment status, social support, and healthcare service access which has influence on nutritional status of a mother (WHO, 2024). This model was vital for this study about nutritional status of pregnant women because it helped to identify the health outcomes rather than focusing of individual behavior but ensuring consideration of structure and social factors.

Focusing on Iganga, this model was used to examine how poor socio economic status, inadequate health care services, and limited education lead to poor maternal nutritional status among pregnant women. It is known that young pregnant women from rural settings face challenges of low levels of income, limited access to antenatal care services, and are at times affected by inadequate food due to inadequate resources needed (UBOS, 2021). This meant that SDH were related to each other and could create a system of poor health in communities which were hard to eliminate

without setting focused community health programs (Park et al., 2020). Using this model, this study identified variety of social- economic determinants of nutritional status of pregnant women in Iganga which allowed comprehensive understanding of major factors that affected these women which enabled policy makers to set policies and interventions to address these factors.

Health Belief Model (HBM)

This theory was developed in 1950s by Hockbaum, Rosenstock and Kegels who were social psychologists. This theory explains and predicts health behaviors of people looking at their attitudes and beliefs (Anuar et al., 2020). This theory explains that health behaviors are influenced by five key elements which include; the perceived susceptibility, perceived severity, perceived benefits, perceived barriers and course of actions need. In line to maternal nutrition, the health Belief model elaborated why pregnant women in Iganga would or would not involve themselves in behaviors that would encourage adequate nutrition practices during pregnancy. For instance, pregnant women perceived themselves to be susceptible to adverse events during pregnancy that could stem from poor nutrition practices and thought that these could be severe thus more likely to engage in recommended diet after realizing the benefits of good nutrition which outweighed the battle necks such as costs of nutritious foods, and cultural beliefs about certain foods (Beressa et al., 2024). This theory also put forward course of actions such as getting counselling from health care workers and nutritional programs that could lead to change of behaviors (Diddana et al., 2018). In Iganga, due to the fact that most women were from rural settling with much respect of their cultural values, however some of these cultural practices prohibited uptake of certain types of foods by pregnant women. Therefore, understanding these cultural practices helped to design the strategies that could be used to improve nutritional status among pregnant women. Using the HBM in this study enabled the researcher to examine how pregnant women perceive the risks and benefits associated with nutritional behaviors and how these were designed by socio economic and cultural factors. This model enabled identification of important beliefs and attitudes that required to be addressed to promote good nutritional practices among pregnant women.

Application of Theories to the Study

By using the two theories outlined above that is to say the Health Belief Model and Social Determinants of Health, this enabled designing a strong foundation to understand determinants of nutritional status among pregnant women in Iganga as the Social Determinants of Health focused

on social economic factors that influenced nutrition among pregnant women. The HBM was based on an individual beliefs and attitudes that had an impact on their health. Use of both theories ensured comprehensive ways on how social economic and individual factors influenced nutritional status of pregnant women. This enabled setting up strategies that would be used to improve maternal nutrition in Iganga.

1.1.3 Conceptual Perspective

In rural communities where Iganga district is located in Eastern region of Uganda, young pregnant women are usually faced with high level of poverty and inadequate health care services. Pregnant women more especially those aged 24 years and lower were highly affected by malnutrition influenced by culture, physiological and socio economic factors (Sserwanja et al., 2020). These women were affected by inadequate sources of finance and inadequate knowledge to ensure uptake of a balanced diet which is vital for the well-being of mothers and their unborn babies (Marshall et al., 2022). Young pregnant women also encountered cultural practices that restricted some foods during pregnancy by prioritizing nutritional needs of other members of family thus inhibiting pregnant women to access essential nutritious foods (Rosen et al., 2018). The concept perspective of this research study looked at various determinants that influenced nutrition among pregnant women and this focused on demographic and socio economic determinants. All these were illustrated in a conceptual frame work.

1.1.4 Contextual Perspective

Unavailability of strategies designed to address the unique needs of young pregnant women at local levels in rural settings hinders the effectiveness of these needs at national level (Tuhebwe et al., 2021). Having gaps in implementation of policies for example inadequate health education of maternal nutrition during antenatal care contribute to challenges faced by pregnant women in Iganga District. Communities in Iganga have strong networks and social ties that act as barriers or facilitators to improvement of maternal nutrition. Health workers at community level together with local leaders play a significant role in promotion of positive health behaviors which include uptake of required nutrients during pregnancy (Unpublished data). However, at some extent norms within communities, and health practices and nutrition may resist change especially when they conflict with traditional beliefs and practices.

In order to promote effective behavior change and improving nutritional status among pregnant women, there was need to involve local leaders, community health workers and family members at community level (Pelto et al., 2013). This context shade light on factors which influenced nutritional status among young pregnant women in Iganga. This study provided a comprehensive understanding of the determinants of nutrition among mothers through consideration of geography, culture, economy, health care systems, policy and community level. These approaches enabled formation of appropriate and targeted interventions that effectively addressed challenges faced by young pregnant women in rural areas. This perspective acted as guideline for designing and implementing the study which ensured appropriate data collection methods that were in line with local setting leading to have findings that were relevant at both local and national level.

1.2 Statement of the Problem

Inadequate nutritional status among young expectant mothers in rural settings like Iganga were critical issues for public health which had negative impact on maternal and child health. Despite the efforts to ensure good nutrition status among pregnant women globally, malnutrition among pregnant women was still high affecting women more especially aged 24 years and below due to a combination of multifaceted factors stemming from cultural, socioeconomic and health care facility (Uganda Bureau of Statistics [UBOS], 2021). In Iganga more than 40% of young pregnant women encountered battle necks with nutrition needs which contributed to adverse outcomes such as preterm births, low birth weight, maternal morbidity and mortality (Kansiime et al., 2019).

According to Uganda Demographic and Health Survey (2021), there was high rates of malnutrition in rural areas as compared to urban areas and this was caused by a number of factors which included inadequate nutrition education, poor social economic status, lack of access to quality health care, and practices related to culture which affected dietary choices negatively (UBOS, 2021). Socio economic determinants that contributed to high rates of malnutrition among young pregnant mothers included; low level of education, low level of income, and lack of decision making in terms of health and nutrition needs leading to lack of access to essential health care services and nutritious foods (Amugsi et al., 2020; Smith & Haddad, 2015). Cultural factors included food taboos, gender inequalities which restricts uptake of nutritious foods among women during pregnancy (Pelto, Armar-Klemesu, & Siekmann, 2013).

On the other hand, the health care system in Iganga was affected with limited resource, inadequate counselling about nutrition needs during pregnancy and poor access to ANC services leading to poor maternal nutrition (Nankumbi & Muliira, 2015). Gaps in provision of health care services associated with lack of effectiveness in implementation of nutrition policies national wide at local levels had persistently led to high rates of malnutrition among young pregnant women (Kavle & Landry, 2018; Ministry of Health, Uganda, 2011).

Despite all these concerns, there was no research carried out specifically to assess the determinants of nutritional status among young pregnant mothers in rural areas like Iganga. The studies carried out regarding nutritional status among pregnant women had been majorly focused in urban areas living behind rural areas (Ruel & Alderman, 2013). Lack of research about nutritional status among pregnant women in rural setting led to lack of interventions to address challenges faced by young pregnant women regarding nutrition. Therefore, this study identified the determinants influencing the nutritional status of young pregnant mothers aged 24 years attending selected public health facilities in Iganga district. Failure to conduct this study would lead to failure to achieve the Sustainable Development Goal 3 (Good Health and Well-being) together with National Development Plan of vison 2040 which focuses to increase household incomes and improve Quality of Life of Ugandans.

1.3 Purpose of the Study

The main aim of this study was to identify the determinants influencing the nutritional status of young pregnant mothers aged 24 years and below who are attending selected public health facilities in Iganga, Uganda.

1.4 Objectives of the Study

I. To assess the nutritional status of young pregnant mothers attending selected public health facilities in Iganga district Uganda.
II. To identify determinants influencing the nutritional status of young pregnant mothers aged 24 years and below who are attending selected public health facilities in Iganga, Uganda.

1.5 Research Questions.

1. What is the nutritional status of young pregnant mothers attending selected public health facilities in Iganga district Uganda?

2. What are the determinants influencing the nutritional status of young pregnant mothers aged 24 years and below who are attending selected public health facilities in Iganga, Uganda?

1.6 Scope of the Study

This included geographical scope, population scope, content scope, and time scope.

1.6.1 Geographical Scope

The geographical location for this research was Iganga district found in eastern part of Uganda. This area had many women who were affected by malnutrition and risk factors to this were challenges due to culture, health system and economic background.

1.6.2 Population Scope

The researcher included pregnant women with in age range of 24 years and below who were seeking antenatal care from various public hospitals in Iganga which were selected for this study. This age group was chosen because young mothers were often at a higher risk of malnutrition due to socio-economic vulnerability, limited access to health services, and inadequate nutritional knowledge.

1.6.3 Content Scope

This research study assessed the determinants of nutritional status among young pregnant mothers in Iganga. It included nutritional assessment using anthropometric measurements and assessment of dietary practices. It also assessed socio-economic variables including employment status, income, education, household food security. The content also included demographic variables which include age, marital status, and parity.

1.6.4 Time Scope

This study was done within 6 months beginning with the month of October 2024 and included proposal writing, actual conduct of the study and report writing. This timeframe was selected to allow for adequate planning and execution of the study.

1.7 Significance of the Study

To the mothers

This study had a direct impact on young pregnant mothers in Iganga through empowering these women with knowledge and resources to improve their dietary practices. Improved nutrition during pregnancy led to better maternal and child health outcomes.

To policy makers

Findings from this study would inform formation of public health policies to address the issue of nutritional needs among pregnant mothers. Data obtained was used to make national policies which included Uganda Nutrition Action Plan (UNAP) and maternal health programs, to better meet the needs of young pregnant mothers in rural areas.

To academicians

The study findings would be used by future researchers on maternal nutrition in Uganda. By documenting the determinants of nutritional status among young pregnant mothers, this research highlighted areas that required further investigation, such as the long-term effects of maternal malnutrition on child health and development, and the effectiveness of specific interventions in different rural contexts. It also contributed to building a more comprehensive evidence base that researchers drew on for comparative studies, meta-analyses, and policy development.

1.8 Conceptual framework

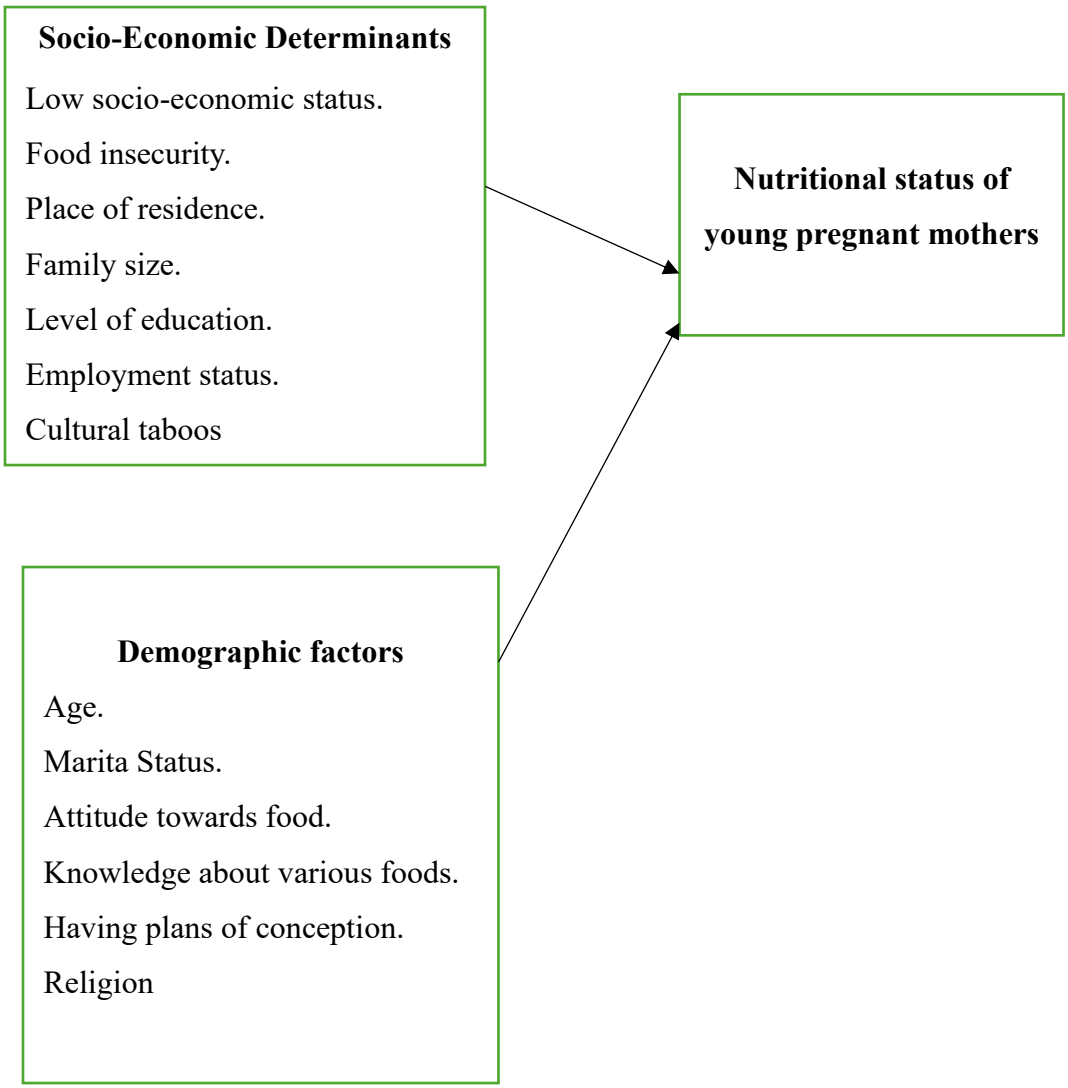

Figure 1: Researcher designed from the following sources (Keats et al., 2021) and (Mufida et al., 2024).

Figure 2: Determinants of Nutritional Status among Young mothers attending selected public health facilities in Iganga.

From Figure 1 above, the dependent variable was the nutritional status of young pregnant mothers and this was influenced by the independent variables which included; socio-economic, demographic, and health-related factors.

Low socioeconomic status: Mothers with low socioeconomic status often failed to meet dietary guidelines and requirements for healthy nutrition. Pregnant women faced several barriers to

healthy eating, including physical and social barriers, practical constraints such as lack of access to healthy foods, and time limitations.

Food insecurity: Women who resided in households with high edible crop production had high chances of having good nutrition status as compared to those without adequate food.

Place of residence: Women in rural areas were less likely to have good nutrition status compared to those in town and this was due to having various food items from different parts of town than in the village.

Family size: Having a big family led to skipping meals due to having large families with inadequate food supply.

Religion: Certain religious groups restricted women to take some food items leading to poor nutrition status.

Level of education: Women with formal education had higher odds of good dietary practice than those without formal education.

Employment status: Women who were employed in busy places often lacked time for meals and sometimes miss their meals due to being too busy.

Cultural taboos: Certain cultural taboos or beliefs such as avoiding certain foods led to poor nutrition status among pregnant women.

The Demographic, factors are;

Age: Young women had higher chances of appropriate nutrition status than adults.

Marita Status: Married women had high chances of good nutrition status than single.

Attitude towards food: Women who had positive attitude towards eating were more likely to have good nutrition status than those with poor attitude.

Knowledge about various foods.

Having plans of conception: Women planning to have a child try to optimize their preconception health by adopting a healthier diet.

CHAPTER TWO
REVIEW OF RELATED LITERATURE

2.0 Introduction

The literature was about determinants of nutritional status among young pregnant mothers. The review included findings from different studies related to the topic regarding determinants of maternal nutrition that was to say demographic, socio economic and cultural factors. This review started with theoretical review followed by literature review.

2.1 Theoretical Review

This majorly looked at two theories which included the Social Determinants of Health (SDH) and Health Belief Model (HBM) on determinants of nutritional status among pregnant women. The two theories elaborated on how social economic, social cultural and individual factors shaped health care seeking behaviors in regard to maternal nutrition.

2.2.1 Social Determinants of Health (SDH) Framework

These are dominants not related with medical context but originate from the society of an individual such as birth areas, growing areas, age that have an impact on daily life of an individual (Bhat et al., 2023).

Researchers have reported that factors such as fear of adverse events during pregnancy influence the social determinants of health among pregnant women include fear of adverse events during pregnancy (Kino et al., 2021). Social determinants of health contribute to inequalities and disparities in health which may pose adverse effects on pregnant women (Wind, 2021). Social determinant of health affects women differently at various levels such as personal level, and level of the society. Factors at individual level include, level of education, income disparities, health care insurance among others (Downey & Thompson-Lastad, 2023). Social determinant of health that at community level include; socio economic status of the community, environmental pollution among others.

2.2.3 Health Belief Model (HBM)

The Health Belief Model (HBM) is another theoretical framework relevant to this study. This theory was developed by psychologist Hochbaum,Rosenstock and Kegels in 1950s and it aimed at

explaining the health behaviors as well as prediction of these behaviors based on a person's beliefs and perceptions towards health (Devi et al., 2022). This theoretical model can be used as guidelines for disease prevention and health promotion programs (Green et al., 2020).

This theory puts up ideology that humans participate in health promotion activities if they feel like they are at risks of poor health outcomes also known as perceived susceptibility. Beliefs that the poor health outcome may be serious known as perceived severity. Thinking that when specific actions are taken it would reduce the risks or mitigate the severity of the problem known as perceived benefits (Anuar et al., 2020).

In aspects of nutrition among pregnant mothers this theory suggests that expectant mothers may adopt health feeding practices if they feel like they are at a high risk of poor pregnancy outcomes such as preterm delivery and low birth weight related to poor nutrition uptake during pregnancy and understanding that uptake of nutritious foods could reduce the risk (Beressa et al., 2024). However, challenges such as lack of access to nutritious foods, cultural beliefs and costs of nutritious foods hinder the perceived benefits limiting behavior change (Jhaveri et al., 2023).

This theory is important in understanding how one's perceptions and beliefs influence nutritional behaviors. In this study, the HBM theory will enable identification of attitudes, beliefs and perceptions of an individual which determine decision making about nutrition among pregnant women.

2.4 Review of Related Literature

This literature review will provide information from studies in line with maternal nutrition determinants covering areas of demographic, socio economic and cultural determinants.

2.4.1 Nutritional status of young pregnant mothers

Maternal Nutrition is an important aspect of the society where by millions of women are affected on global scale in developing and non-developed countries (Hasan et al., 2022). WHO revealed that malnutrition among mothers contributes to approximately 20% death worldwide (Keats et al., 2021). Expectant mothers who experiences inadequate nutrition status are highly subjected to complication such as anemia, pre-eclampsia, hemorrhage, and infections, which contributes to adverse pregnancy events like low weight at birth, birth before term, and death of infants during perinatal period (Mufida et al., 2024).

Globally, 20 million babies are born underweight each year and inadequate nutrition of mothers contribute to 800000 death of new born babies annually (Manimtim & Salaveria-Imperial, 2022). A systematic review that involved 544 articles from the African continent revealed that generally inadequate dietary practices and inadequate uptake of nutrients among expectant mothers is due to factors related to culture, social economic, individual environment, and social economic status (de Diego-Cordero et al., 2021).

A cross-sectional study which recruited 1003 pregnant Women from United States of America found that many expectant mothers were not getting adequate important nutrients while others were getting too much and 48% had low magnesium,46% had low Vitamin D,43% had low Vitamin E and 36% had low Iron intake (Bailey et al., 2019).

A systemic review carried out in Sub-Saharan African countries showed that expectant mothers are at risk of inadequate nutrition needs as a result of poverty, food insecurity, inadequate healthcare facilities, frequent infections and frequent pregnancies (Walle et al., 2020). A systematic review conducted to evaluate the status and intake of iron, vitamin A, iodine, folate and zinc in women of reproductive age (≥15–49 years) and pregnant women in Ethiopia, Kenya, Nigeria and South Africa revealed that 13%, 50% and 82% of expectant mothers experienced poor iron consumption, vitamin A and zinc respectively (Harika et al., 2017).

In east Africa, data reviewed from 42,721 married non-pregnant women aged 15 to 49 years old interviewed in Demographic and Health Surveys (DHS) from five east Africa countries (2011–2016) showed that the undernutrition among mothers was 35% (Jones et al., 2020). From an interview based descriptive qualitative study among 12 pregnant Maasai women in Tanzania, findings revealed that expectant women who consumed food rich in protein during no rain season were three only with the highest number reported feeding on maize and related products such as porridge (Lennox et al., 2017).

In Uganda undernutrition among expectant mothers was on rise and data obtained from a study carried out backwards from hospital quarterly records showed that Karamoja region and Lango regions had the highest rise of poor intake of nutrients between 2015 to 2018 at more than 15%. Acholi region had the highest malnutrition group and Kampala was in between 5-9% of malnourished pregnant mothers (Kyamwine et al., 2021).

2.4.2 Socio-Economic Determinants of Maternal Nutrition

According to an interview based study conducted in Netherlands on nutrition practices showed that expectant women who were poor did no fulfill the guidelines for good diet. Pregnant mothers encountered several challenges for healthy eating, including physical and social bottle necks, practical constraints such as lack of access to healthy foods and time limitation (Super et al., 2021).

A study carried out from community in Ethiopia from 448 pregnant women showed that women had adequate foods in their homes such as vegetables among other types of foods had 2.0 times chances exercise diet required than those who did not. This indicated that having food security promoted good nutrition practices (Fite et al., 2022).

A study carried out in Kyrgyzstan which involved 423 women aged 18–49 showed that there was poor consumption of fruits and vegetables among pregnant women, where by 21.7% who consumed them from rural residents and 8.6% were from towns. This was hindered by fruits being available only in seasons and being at high costs during off seasons which was not affordable for women who belonged to poor families (Otunchieva et al., 2022).

A study in Eritrea from 226 pregnant women showed that pregnant mothers skipped some meals with 43.8% skipping lunch and 24.2% skipping breakfast. It was reported that dinner was the most commonly skipped meal, and this was because of having large families with inadequate food supply (Teweldemedhin et al., 2021).

A study carried out in Ethiopia which involved 422 participants showed that 1.9% had poor food consumption, 16.6% had borderline food intake and 81.5% had acceptable food consumption score. Factors such as place residence, religion like belonging to Orthodox were associated with food consumption score (Ambaw et al., 2021). Similarly, a study in Ethiopia which involved among 351 study participants, showed that women who had attained school were had 2.7 chances of having good dietary practice than those who had not attained any education. The study also reported that participants who earned above 57 US dollars per month and between 28.5 to 57 US dollars had 3 and 2 chances of having appropriate dietary practice compared to those who earned below 28.5 US dollars (Yalewdeg et al., 2020).

A community-based cross-sectional study carried out among 712 pregnant women in Ethiopia by Mulugeta et al., (2019) reported that almost all respondents reported women who worked than usual hindered them to prepared nutritious foods during pregnancy due excessive workload.

2.4.3 Demographic factors affecting nutritional status among women

In a descriptive cross-sectional study which involved 77 % women aged between 20 and 35 years, with 51.72% having secondary or tertiary education showed that pregnant women who were single had 4.2 chances of having inadequate nutrition than married women (Alanyo et al., 2022).

A pilot study conducted in rural United States (US) which involved 27 women showed women who ate three and more times in a day had 86% chances of not being undernourished compared to those ate once in a day (Kerver et al., 2023).

In Ethiopia, a cross-Sectional study which involved 351 study participants revealed that 90% had appropriate dietary practices and this was due to having positive attitude towards good nutrition (Yalewdeg et al., 2020). In addition, a study carried out among 712 pregnant women in Ethiopia by Demilew et al., (2020), reported that Women who exhibited positive towards nutritious foods had 1.7 times chances of adopting appropriate dietary practice than women with poor attitude.

A study carried out among 712 pregnant women in Ethiopia showed that 19.9% had appropriate dietary practices and this poor practice was due to insufficient knowledge on maternal diet. Women with some knowledge were 1.8 times and women with high knowledge level were 3.2 times more likely to adopt appropriate dietary practices than women with low knowledge, (Demilew et al., 2020).

A comparative study which adopted a cross sectional research design which involved 379 expectant women from urban and rural of Ghana showed that maternal age was significantly associated with maternal nutrition status. Mothers aged between 15 and 24 years had higher chances of having poor nutrition practices thus become anemic than mothers aged between 25 and 34 years and those aged between 35 and 49 years (Ayensu et al., 2020).

A survey which was population based that involved women of reproductive age in Australia that recruited 965 women showed that desire to have a child in future influenced maternal nutritional status. It was indicated that 80% of women who wanted to have a child tried to adopt health diet.

78% adopted routine health checkup, 78% reduced on alcohol consumption, 73% ensured weight reduction to assume fitness and 70% reduced on smoking behaviors (Hammarberg et al., 2020).

A mixed-methods approach study which recruited 224 women on quantitative approach and 94 women for focused group discussion for qualitative data from South Africa showed that 37% reported that cultural taboos had an impact on their feeding practices. Foods such as meat, fish, eggs, potatoes, pumpkin, fruits and butternut rich in essential nutrients were restricted during pregnancy and reasons for avoiding the majority of foods were fear of complications during pregnancy, labour and risks of having small children thus instead women resorted to using herbal medicines (Chakona & Shackleton, 2019).

A cross-sectional study which involved 11 pregnant women in Aceh on nutrition among pregnant mothers, findings revealed that lack of nutrition care before becoming pregnant led to inadequate knowledge on nutrition leading to poor nutrition practices. This was influenced by cultural beliefs such as cultural taboos and inadequate sources of information about nutrition practices (Ahmad et al., 2020)

A focused group discussion study which involved 40 women and 5 birth attendants who gave their services at traditional level in Kenya revealed according to some cultures, pregnant mothers are supposed to avoid certain foods such as fish, fruits, eggs, highly rich in essential nutrients like proteins and carbohydrates to have a successful delivery (Ombere et al., 2021).

Similarly, a study in Ethiopia, reported that food taboos was practiced by 27% of pregnant women which restricted them from nutritious foods. 37% of pregnant mothers had beliefs that, their babies would be born with something attached on their head if they ate banana during pregnancy, 32% thought that eating pimento would burns the fetus, 24.3% thought that eating cabbage would disturb the fetus and 44.3% believed that sugarcane increased the seminal fluids (Kibr, 2021).

Gaps in Existing Literature

Despite the extensive research on maternal nutrition, several gaps remain, particularly concerning young pregnant mothers in rural settings like Iganga. Most studies have focused on broader maternal populations or urban contexts, overlooking the unique challenges faced by younger mothers in rural areas. Studies carried out to identify the determinants of nutritional status among young pregnant women looking at cultural, health care and socio economic factors are limited.

Only few have looked at how determinants such as health system, socio economic and cultural factors interact to influence nutrition among mothers. This gap indicates the need to carry out a study on determinants of maternal nutrition in rural areas.

2.5 Research Gap

From the given studies, it is indicated that there are research gaps that needs to be addressed regarding maternal nutrition among pregnant women in rural areas such as Iganda district in Eastern Uganda. Therefore, the need to carry out this research to identify the determinats of maternal nutrition.

CHAPTER THREE
METHODOLOGY

3.1 Introduction

This chapter explained the methods that were used during the study. These were the research design, study area, study population, selection criteria, sample size estimation, sampling method, study collection tools, data collection procedures, data management and analysis, quality control, ethical considerations, study limitations and dissemination of results.

3.2 Research Design

This study employed analytical cross sectional design. The study used both qualitative and quantitative in nature and data was collected at a single point in time. A cross-sectional study design involved collecting data from a sample of the target population at a specific point in time (Wang & Cheng, 2020). This research study was considered mixed methods which used both quantitative and qualitative techniques (Matović & Ovesni, 2023). This approach was appropriate for exploring research questions that needed deep understanding of a phenomena as well as collecting numerical data from the study participants.

3.3 Study Population

This study targeted young pregnant mothers aged 24 years and below attending selected public health facilities in Iganga District, Eastern Uganda. This population was chosen because many young women in rural areas were victims of malnutrition influenced by socio economic, cultural and health care system related factors. Therefore, targeting pregnant women aged 24 years and below enabled to capture data regarding maternal nutritional status among young pregnant mothers.

3.3.1 Inclusion Criteria

Participants were selected following this selection criterion;

- Young pregnant mothers aged between 18 and 24 years.
- Those who attending antenatal care services at the selected public health facilities in Iganga District.
- Those who provided informed consent to participate in the study.

- Those who were able to communicate in either the local language (Lusoga) or English

3.3.2 Exclusion Criteria

Participants were excluded from the study if they:

- Older than 24 years.
- Were not attending antenatal care services at the selected public health facilities.
- Had a known or documented medical condition (e.g., severe mental illness) that could hinder one's ability to provide a written informed consent.
- Those who declined to consent or withdrew from the study.

3.4 Sample Size Determination

To determine the sample size of this study, the researcher based on both quantitative and qualitative methods. The sample represented a large sample size so that results were statistically significant and representative of the target study population which was young pregnant women aged 24 years and below from selected public health facilities in Iganga District eastern Uganda.

3.4.1 Sample Size for Quantitative Component

Following quantitative approach, the sample size was calculated using the Cochran formula to determine the sample size commonly used in studies involving proportions in large populations (Cochran, 1977). The study sample size was calculated as below;

$$n = \frac{Z2 \cdot p \cdot (1 - p)}{e2}$$

Where:

n = required sample size

Z = Z-value (standard normal deviate) corresponding to the desired confidence level (usually 1.96 for a 95% confidence level)

p = estimated proportion of the population with the characteristic of interest (e.g., malnutrition prevalence among young pregnant mothers)

e = margin of error (tolerable error, typically set at 5% or 0.05)

Based on previous studies, the estimated prevalence of malnutrition among pregnant women in rural Uganda was approximately 20% (Kansiime et al., 2019; Sserwanja et al., 2020). This study considered, p = 0.20 and e = 0.05.

Substituting these values into the Cochran formula:

$$n = \frac{1.96^2 \cdot 0.20 \cdot (1 - 0.20)}{0.05^2}$$

$$n = \frac{3.8416 \cdot 0.20 \cdot 0.80}{0.0025}$$

$$n = \frac{0.6147}{0.0025}$$

$$= 246$$

Therefore 246 young women would provide data about quantitative data.

Considering a non-response rate of 10%; or incomplete data; the sample size was;

$$n \text{ adjusted} = \frac{246}{1 - 0.10}$$

$$= 273$$

Therefore, the final sample size was 273 young pregnant women.

3.4.2 Sample Size for Qualitative Component

For the qualitative data; the study sample size was calculated based on the principle of data saturation, which was the point at which no new information or themes were observed in the data (Braun & Clarke, 2021). Given the exploratory nature of the qualitative research, data was collected through in-depth interviews and focused group discussions (FGDs) with young pregnant mothers, healthcare providers, and community leaders.

In-Depth Interviews: 10 young pregnant mothers were interviewed to capture a range of experiences, perceptions, and beliefs related to maternal nutrition. Additional interviews were conducted with healthcare providers (approximately 5 nurses and midwives) and community leaders (approximately 5) to gather diverse perspectives on the factors influencing maternal nutrition.

Focus Group Discussions (FGDs): A total of 3 to 5 FGDs was conducted with groups of young pregnant mothers, each consisting of 6 to 10 participants. This approach facilitated discussions on common challenges, cultural practices, and community dynamics that affect maternal nutrition. The number of FGDs was adjusted based on data saturation.

The qualitative sample size was flexible, allowing for the addition of participants until data saturation was reached and no new themes or insights emerged from the data.

3.4.3 Justification for Sample Size

Quantitative Component: The sample size of 273 young pregnant mothers is sufficient to detect statistically significant relationships between the variables of interest (e.g., socio-economic status, demographic characteristics, cultural practices, health-related factors) and maternal nutritional status. A sample size of 273 respondents made results significant statistically thus generalized to the entire population.

Qualitative Component: To capture qualitative data related to nutrition among pregnant women the researcher used the principles of saturation and information power. This was done by including key informants such as health care providers, community health teams and young mothers which enabled the researcher to obtain in-depth information about the study.

Combined Mixed-Methods Approach: Using mixed methods enabled the researcher to obtain quantitative data and in-depth information from qualitative side about nutrition among young pregnant mothers in Iganga district. This enabled triangulation thus ensuring obtaining valid and reliable results (Fetters, Curry, & Creswell, 2013).

3.5 Sampling Technique

The researcher use both probability and non-probability sampling methods. This enabled obtaining comprehensive data determinants to maternal nutrition status among young pregnant women from

various public health facilities in Iganga District. Using both probability and non-probability techniques enabled collection of both qualitative and quantitative data.

3.5.1 Sampling Technique for Quantitative Component

The researcher used a stratified sampling method to obtain quantitative data. This allowed each groups (strata) to have an equal chance of being selected for the study which allowed generalization of the research findings (Etikan & Bala, 2017).

Stratification Process:

The researcher made various strata basing on variables such as age, socio economic status and parity. This ensured that each group was a representative of the sample.

Random Sampling within Strata:

Once the researcher finished making up the subgroups, she then used a simple random sampling technique to enroll the respondents. This gave each individual a chance to be selected for the study thus selection bias was eliminated (Acharya et al., 2013).

Sample Allocation

The researcher allocated the study participants using proportions in each subgroup according to the population of each stratum in relation to the total population of young pregnant women attending the chosen health care facilities. For example, if 40% of the population contained first time mothers and 60% were women with previous pregnancies, the sample was proportionally distributed.

3.5.2 Sampling Technique for Qualitative Component

The researcher used a purposive sampling method to select participants for qualitative data. This enabled the researcher to select respondents who were knowledgeable about the study thus exploring in depth data regarding determinants of maternal nutrition status among young pregnant women (Palinkas et al., 2015).

Selection of Participants:

A purposive sampling technique was used to select study participants who participated in in depth interviews and this was according to antenatal care experience, parity, socio economic status and

age thus a wide range of data was captured concerning maternal nutrition status. This sampling technique also involved selection of participants who involved in focus group discussion.

Key Informants:

The researcher used health care providers and village leaders as key informants and these were selected using a purposive sampling method. These were chosen based on their knowledge and experience regarding maternal nutrition status.

Sample Size Flexibility:

The researcher ensured flexibility of the sample size for qualitative component to allow changes according to the principles of saturation. At some points the researcher recruited more participants until no new themes were generated from the study (Guest, Bunce, & Johnson, 2006).

3.5.3 Justification for the Sampling Techniques

Stratified Random Sampling for Quantitative Data:

This sampling method was chosen because it ensured adequate representation of each sub group thus making it easy to understand variations in maternal nutrition status from different groups based on demographic data and socio economic status. This sampling technique minimized on bias thus improving the data accuracy, and production of reliable results (Acharya et al., 2013).

Purposive Sampling for Qualitative Data:

This type of sampling was preferred because it gave an opportunity for the researcher select participants who were knowledge, and experienced based on the objectives of the study. This enabled obtaining of in depth information from individuals with relevant data about maternal nutrition status participate in the study (Palinkas et al., 2015).

Integration of Probability and Non-Probability Sampling:

Use of both stratified and purposive sampling methods agreed with the study design which was a mixed study. Thus this ensured collection of both qualitative data adding credibility to the research findings (Creswell & Clark, 2017).

3.6 Measurement of Variables

The study included both dependent and independent variables. These variables were measured to examine the determining factors to nutrition status among young pregnant women from chosen public health care centers in Iganga district. Below are the details of measurements of study variables.

3.6.1 Dependent Variable

Table 1: Measurements of Variables

Variable	How it will be measured	Source
Nutritional status	Anthropometric Measurements such as Body mass index, Middle Upper Arm Circumference, and Dietary Assessment.	(Musa et al., 2022)
Socio-Economic Factors	**Household Income:** Measured in Uganda currency in shs per month. Participants will be asked to report their household's average monthly income. This variable was categorized into low income (< UGX 200,000), medium income (UGX 200,000 - 500,000), and high income (> UGX 500,000).	(UBOS, 2021).
	Educational Level: Measured as the highest level of education attained by the participant. Categories included no formal education, primary education, secondary education, and tertiary education.	(UNESCO, 2019).
	Employment Status: Measured by asking participants whether they are	(ILO, 2020).

	employed, unemployed, or involved in informal work. This was categorized as "employed," "self-employed," or "unemployed"	
	Household Food Security: Assessed using the Household Food Insecurity Access Scale (HFIAS), which measures perceptions of food insecurity over the past 30 days, categorized as food secure, mildly food insecure, moderately food insecure, or severely food insecure	(Coates et al., 2007).
Demographic Factors	**Age:** Measured in completed years. This variable will be categorized as "≤18 years" and "19-24 years."	(Kansiime et al., 2019).
	Marital Status: Measured as single, married, divorced/separated, or widowed.	
	Parity: Measured by the number of previous pregnancies. This was categorized as "primiparous" (first-time mothers) or "multiparous" (mothers with previous pregnancies).	
	Cultural Beliefs and Practices: Assessed using a semi-structured questionnaire that includes questions on local beliefs about food consumption during pregnancy, food taboos, and restrictions. Responses were categorized into "supportive" or	(Simkhada et al., 2018).

	"non-supportive" of good nutritional practices. **Decision-Making Autonomy:** Measured using a validated scale that assesses the level of autonomy a woman has in making decisions about her health and diet, categorized into "high autonomy," "moderate autonomy," and "low autonomy"	

3.6.3 Data Collection Tools

The following tools were used to measure the variables:

Structured Questionnaires: To collect data on socio-economic, and demographic factors.

Anthropometric Equipment: Calibrated digital weighing scales and stadiometers were used to measure weight and height, and non-stretchable measuring tapes were used to measure MUAC.

Dietary Assessment Tools: A 24-hour dietary recall form were used to collect information on dietary intake to compute the Dietary Diversity Score (DDS).

3.6.4 Reliability and Validity of Measurement Tools

Reliability: The researcher used valid and standard tools such as HFIAS, MUAC tape, and dietary diversity scores to measure maternal nutrition status thus consistent and accurate data were collected from the study participants. These tools were pretested to check if they were valid and reliable to collected data thus were necessary adjustments were made.

Validity: Data collection tools were selected after showing that they were valid to collect data from areas similar to the study area. Trained research assistants collected Anthropometric measurements using calibrated equipment which ensured accuracy of findings (Kennedy et al., 2011; WHO, 2016).

3.6.5 Ethical Considerations

Ethical Approval

After final writing of the research proposal with guidance from the supervisor, an ethical approval letter was got from UCU research and ethics committee (rec number UCUREC-2025-830). During this process, the committee reviewed the research protocol, consent forms, data collection instruments, and procedures used during data collection thus ensuring that the study adhered to the international research standards involving human subjects (WHO, 2011).

All research team members affirmed that they did not have any conflict of interest in the study. Any conflict of interest that arose was handled following ethical guidelines thus making the study transparent and maintaining the study process integrity (CIOMS, 2016).

Informed Consent: Respondents were requested to provide written informed consent prior to participation in the study. For those below 18 years of age consent was obtained from their care givers (Parents and Guardians) together with assent from them. The informed consent was obtained by the research and research assistants.

Confidentiality: The researcher ensured that all the collected data was kept confidential by securely storing it and without use of anything that would be used to identify the study participants.

Voluntary Participation: There was voluntary participation in the study and respondents were informed that they were free to withdraw from the study anytime they wished to do so without any penalty.

By following ethical guidelines, the researcher obtained quality data which was valid and reliable to provide an understanding the determinants of maternal nutrition status among young pregnant women from Iganga district.

3.7 Data Management and analysis

To ensure accuracy, integrity and security of data collected from this research, there was need for effective data management. Therefore, the data management process was done as outlined below.

3.7.1 Quantitative data Management and Analysis

Data Entry: Anthropometric measurements, structured questionnaires, 24 hourly dietary recall forms were used to collect quantitative data. The collected data which was then entered into a

computer using Microsoft excel program to make a data set. Data was protected electronically using a password only known by the principal investigator.

Double Data Entry: The researcher also entered data twice to minimize errors that could arise during data entry. This was done by using two different people. After the two data sets were compared to identify discrepancies by comparing with original paper based forms (Creswell & Clark, 2017).

Data Cleaning: The dataset was reviewed regularly to identify and correct any inconsistencies or missing values. Outliers and implausible values were investigated and addressed to ensure data quality and reliability (Field, 2018).

Bivariate analysis was used to determine the crude odds ratio for the study variables at p value <0.2. Factors which were significant were subjected to multivariate analysis using advanced odds ratio and were measures at p –value <0.05 to determine the significant factors (Montoro & Galvez-Sánchez, 2022). Multiple regression analysis was conducted to control for potential confounding variables (Montoro & Galvez-Sánchez, 2022)

3.7.2 Qualitative data Management and Analysis

Transcription: Audio recordings from in-depth interviews (IDIs) and focus group discussions (FGDs) were transcribed verbatim by trained transcribers who were fluent in both Lusoga and English. All transcripts were reviewed for accuracy and completeness by the research team.

Data Storage: Transcripts, audio recordings, and field notes were stored securely in both physical and electronic formats. Hard copies were stored in a locked cabinet, while digital files were stored on a password-protected computer and backed up regularly to an external hard drive to prevent data loss (Morrow, 2020).

Data Coding and Analysis: Qualitative data was organized using qualitative data analysis software (such as NVivo) to facilitate systematic coding and thematic analysis. Themes and patterns related to determinants of maternal nutrition status were identified by coding data line by line (Guest, MacQueen, & Namey, 2012).

3.8 Quality assurance (Validity and Reliability)

Validity

Validity denotes degree of any tool to measure what it is envisioned to measure. Content validity is the point to which a practical measurement reproduces an exact domain of content. This was used to check all items in the tools to ensure that all the questions are valid. To ensure validity, all the data collection tools were evaluated by several experts separately. These scored every question as either relevant or irrelevant. These experts were requested to rate tool and an edge was 0.7, then the tool was acceptable.

Reliability of data collection tool

Research reliability means the degree to which a research method results into unchanging and dependable results. A sure measure was well-thought-out of as being reliable if it was used in further studies and was able to yield comparable results. To determine the reliability of the questionnaire, SPSS software version 23.0 was used where cronbach's alpha coefficients was generated, the minimum being 0.7 for reliability to be declared. The questionnaire was then corrected based on the findings to ensure that it captured what it intended to capture. Pretest was also done in Mayuge district and necessary modifications were made.

3.9 Dissemination Plan

Community Sensitization:

Prior to data collection, the researcher had a meeting with local leaders, management of health facilities and other members of the community where by she explained the purpose of the study, data collection methods and benefits of the study. This enabled her get support from community during the research process (Hofmann et al., 2017).

Feedback to Participants:

Immediately after the research process, the researcher provided feedback from the study where by findings were shared with the study participants, community leaders and health authorities. Any participant who requested for the study results were provided with the summary of findings in any format accessible to them (Mack et al., 2011).

CHAPTER FOUR: RESULTS

4.0 Introduction

This chapter presented the findings of the study from a sample size of 273 young pregnant women on determinants influencing the nutritional status of young pregnant mothers aged 24 years and below who are attending selected public health facilities in Iganga, Uganda.

4.1 Demographic characteristics of the respondents

Table 2: Demographic characteristics of the respondents

n=273

Variable	Category	Frequency (f)	Percentage (%)
Age	18-20	121	44.3
	21-24	152	55.7
Religion	Catholics	56	20.5
	Born again	55	20.1
	Anglican	48	17.6
	Muslim	66	24.2
	Pagan	48	17.6
Marital status	Single	45	16.5
	Married	123	45.1
	Cohabiting	61	22.3
	Divorced	44	16.1

Table 2 shows that more than a half 52(55.7%) of the respondents were aged between 21 and 24 years, 66(24.2%) were Muslims, and 123(45.1%) were married.

4.2 Nutritional status of young pregnant mothers attending selected public health facilities in Iganga district Uganda.

Figure 3: Level of nutritional status of young pregnant mothers attending selected public health facilities in Iganga district Uganda

n=273

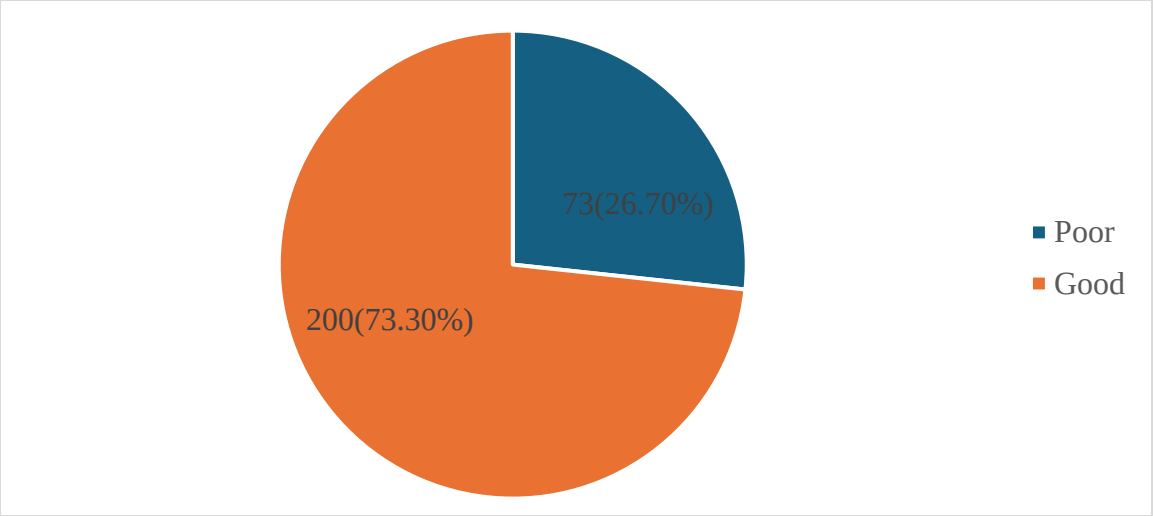

Figure 3 shows that majority 200(73.3%) of the respondents had good nutrition status while the minority 73(26.7%) had poor nutrition status.

Figure 4: Meals eaten daily

n=273

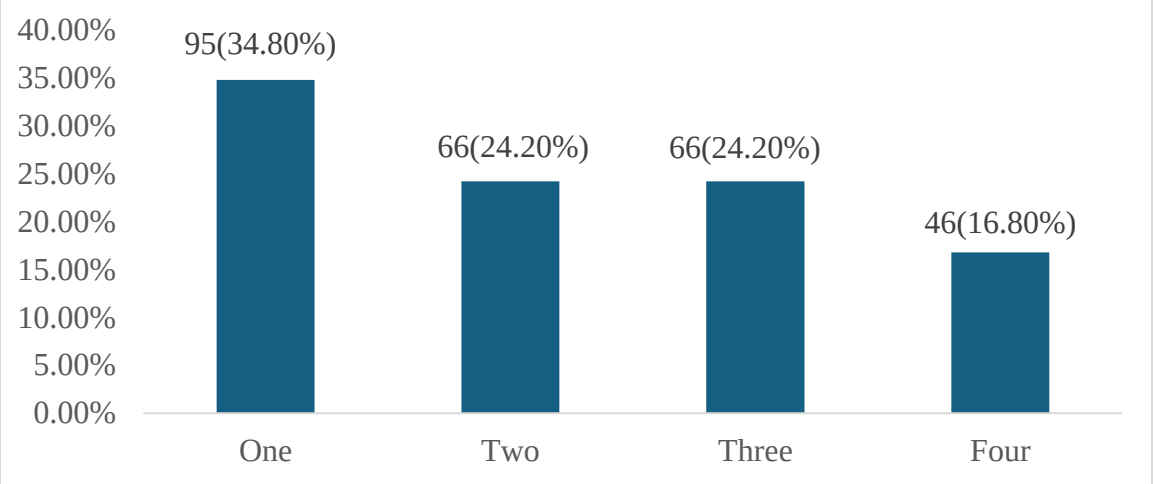

Figure four shows that most 95(34.8%) of the respondents ate only one meal per day whereas the least 46(16.8%) ate four meals per day.

Figure 5: Food access and consume most during pregnancy

n=273

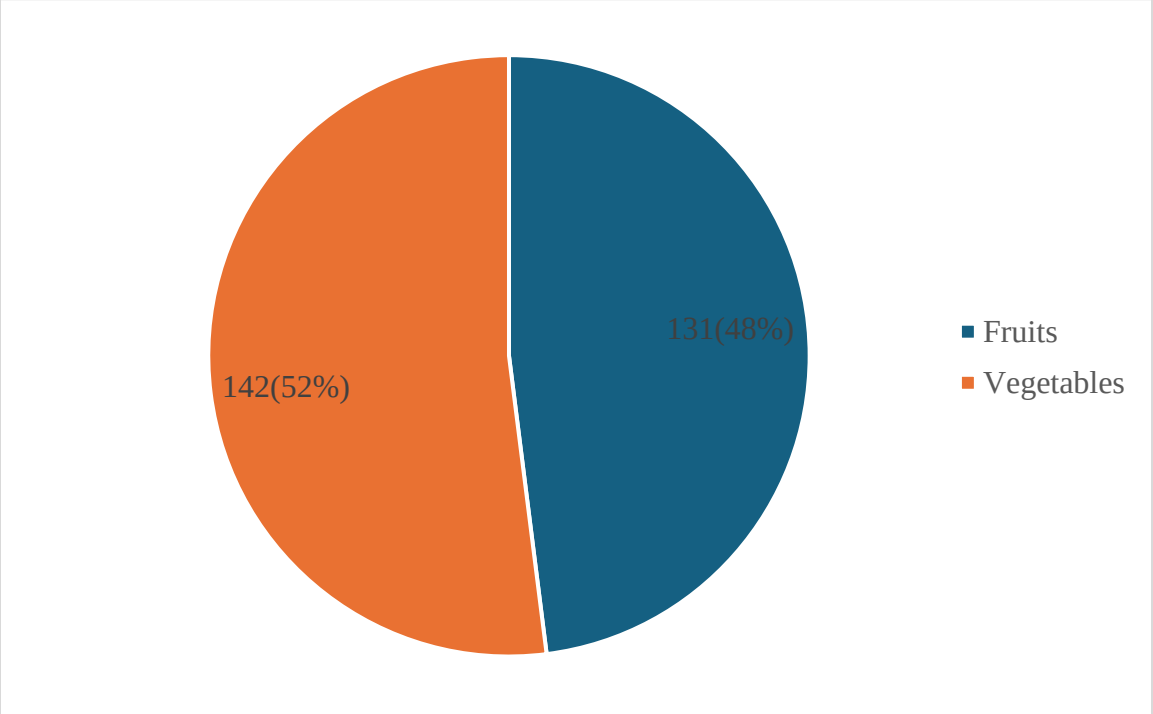

Figure 5 shows that more than a half 142(52%) of the respondents would easily access and consume vegetables most during pregnancy.

4.3 Demographic factors affecting nutritional status among women

Table 3: Univariate analysis of demographic factors affecting nutritional status among women

n=273

Variable	Category	Frequency (f)	Percentage (%)
Beliefs regarding effective nutrition practices	It is good	98	35.9
	It is not necessary	93	34.1
	It leads to big babies	82	30.0
Causes of poor nutrition practices	Low level of knowledge on maternal diet	102	37.4
	Moderate knowledge on diet	92	33.7
	High knowledge on diet	79	28.9
Knew the recommended food required for pregnant mothers	Yes	146	53.5
	No	127	46.5
Examples of known recommended food required for pregnant mothers	Eggs	37	25.3
	Greens	36	24.7
	Meat	33	22.6
	Fish	40	27.4
Effective nutrition practices while planning to conceive	Adopting a healthy diet	55	20.1
	Seeing a doctor for a health check-up	64	23.4
	Reducing alcohol consumption	60	22.0
	Getting fitter	55	20.1
	Reducing smoking	39	14.3

Table 3 shows that 98(35.9%) believed that effective nutrition practices are good, 307(37.4%) thought that low level of knowledge on maternal diet can cause poor nutrition practices, 146(53.5%) knew the recommended food required for pregnant mothers and the most known recommended food was fish, 40(27.4%). 64(23.4%) reduced smoking to ensure effective nutrition practices while planning to conceive.

Table 4: Bivariate analysis of demographic factors affecting nutritional status among women

Variable	Nutritional status		COR	95% CI (Lower-Upper)	P-Value
	Good	Poor			
Age					
18-20	35	86	0.5	0.19-1.41	0.195
21-24	38	114	1		Ref
Religion					
Catholics	12	44	0.9	0.15-5.36	0.910
Born again	14	41	1.2	0.23-5.85	0.862
Anglican	13	35	0.8	0.14-4.74	0.822
Muslim	23	43	0.3	0.05-1.33	0.105
Pagan	11	37	1		Ref
Marital status					
Single	17	28	9.4	1.53-7.56	0.015*
Married	31	92	7.9	1.79-5.65	0.076
Cohabiting	12	49	5.8	1.09-3.74	0.060
Divorced	13	31	1		Ref
Beliefs regarding effective nutrition practices					
It is good	24	74	0.8	0.24-2.82	0.759
It is not necessary	26	67	0.8	0.23-2.53	0.649
It leads to big babies	23	59	1		Ref
Causes of poor nutrition practices					
Low level of knowledge on maternal diet	34	68	0.4	0.11-1.21 0.62-7.49	0.099
Moderate knowledge on diet	19	73	2.2		0.225
High knowledge on diet	20	59	Ref		Ref
Knew the recommended food required for pregnant mothers					
Yes	40	106	1.7	0.63-4.60	0.297
No	33	94	1		Ref
Effective nutrition practices while planning to conceive					
Adopting a healthy diet	18	37	0.3	0.06-1.83	0.209
Seeing a doctor for a health check-up	24	40	0.1	0.03-0.80	0.027
Reducing alcohol consumption	15	45	1.6	0.31-8.65	0.560
Getting fitter	5	50	1.4	2.50-4.87	0.004*
Reducing smoking	11	28	1		Ref

At bivariate analysis level, marital status was significantly associated with nutrition status. Single women were 9.4 times (COR=9.4, 95% CI [1.53-7.56], p=0.015) more likely to have poor nutrition status than divorced. Those who practiced fitness while planning to conceive were 1.4 times

(COR=1.4, 95% CI [2.50-4.87], p=0.004) more likely to have poor nutrition status as compared to those who reduced smoking.

4.3 Socioeconomic factors influencing effective nutritional status among pregnant mothers

Table 5: Univariate analysis of socioeconomic factors influencing effective nutrition practices among pregnant mothers

n=273

Variable	Category	Frequency (f)	Percentage (%)
Number of children	1-2	99	36.3
	3-4	95	34.8
	5 and above	79	28.9
Place of residence	Rural	184	67.4
	Urban	89	32.6
Level of education	Non formal	73	26.7
	Primary	71	26.0
	Secondary	69	25.3
	Tertiary	60	22.0
Causes of failure to meet dietary products during pregnancy	Lack of money to buy food	100	36.6
	Lack of access to different variety of food	87	31.9
	Lack of time	86	31.5
Causes of skipping some meals	Large families	134	49.1
	Inadequate food supply	139	50.9
Employment status	Employed	117	42.9
	Not employed	156	57.1
Culture beliefs/taboos on some foods during pregnancy	Yes	147	53.8
	No	126	46.2
Cultural prohibited food during pregnancy	Eggs	51	34.7
	Meat	35	23.8
	Fish	61	41.5
Reasons for culture to deny the above foods during pregnancy	Leads to poor baby growths	90	33.0
	Leads to difficulties in labor	81	29.7
	May lead to the delivery of a misfortune	102	37.4
Use some herbal products recommended by culture during pregnancy	Yes	147	53.8
	No	126	46.2

Table 5 shows that 99(36.3%) had 1 to 2 children, 184(67.4%) were rural residents, 73(26.7%) had not attended school, 100(36.6%) stated that lack of money to buy food makes them fail to meet their dietary products during pregnancy, 139(50.9%) stated that inadequate food supply caused

them to skip some meals, 156(57.1%) were not employed, 147(53.8%) had cultural beliefs/taboos on some foods during pregnancy, and most common not recommended food by culture was cultural belief was fish, 61(41.5%), 102(37.4%) reported that their culture denies the mentioned foods because of the beliefs that it may lead to the delivery of a misfortune, 147(53.8%) used some herbal products recommended by their culture during pregnancy.

Table 6: Bivariate analysis of socioeconomic factors influencing effective nutritional status among pregnant mothers

n=273

Variable	Nutritional status		COR	95% CI (Lower-Upper)	P-value
	Good	Poor			
Number of children					
1-2	27	72	1		Ref
3-4	22	73	4.6	1.12-8.99	0.034*
5 and above	24	55	1.5	0.40-5.51	0.553
Place of residence					
Rural	49	135	1.3	0.43-3.74	0.666
Urban	24	65	1		Ref
Level of education					
Non formal	17	56	1.1	2.51-9.45	0.002*
Primary	32	39	0.7	0.17-3.31	0.701
Secondary	1	68	1.7	4.76-5.01	0.070
Tertiary	23	37	1		Ref
Causes of failure to meet dietary products during pregnancy					
Lack of money to buy food	29	71	2.2	0.49-9.85	0.305
Lack of access to different variety of food	29	58	1.7	0.33-9.22	0.510
Lack of time	15	71	1		Ref
Causes of skipping some meals					
Large families	38	96	0.3	0.07-0.90	0.033*
Inadequate food supply	35	104	1		Ref
Employment status					
Employed	29	88	2.8	0.78-9.99	0.116
Not employed	44	112	1		Ref
Culture beliefs/taboos on some foods during pregnancy					
Yes	41	41	1.4	0.54-3.69	0.482
No	32	32	1		Ref
Use some herbal products recommended by culture during pregnancy					

Yes	38	109	4.5	1.34-5.64	0.015*
No	35	91	Ref		Ref

At bivariate analysis level, number of children was associated with nutrition status. Women who had 3 to 4 children were 4.6 times (COR=4.6, 95% CI [1.12-8.99], p=0.034) more likely to have poor nutrition status than those who had 1 to 2 children. Women with no formal education were 1.1 times (COR=1.1, 95% CI [2.51-9.45], p=0.002) more likely to have poor nutrition status than those with tertiary level of education. Those who skipped meals because of large families were 0.3 times (COR=0.3, 95% CI [0.07-0.90], p=0.033) less likely to have poor nutrition status as compared to those who skipped meals because of inadequate food supply. Women who used herbal products during pregnancy were 4.5 times (COR=4.5, 95% CI [1.34-5.64], p=0.015) more likely to have poor nutrition status as compared to those who did not.

Table 7: Multivariate analysis of factors influencing effective nutritional status among pregnant mothers

Variable	Nutritional status		AOR	95% CI (Lower-Upper)	P-value
	Good	Poor			
Marital status					
Single	17	28	1.9	0.75-4.86	0.173
Married	31	92	0.9	0.39-1.90	0.710
Cohabiting	12	49	0.7	0.27-1.75	0.429
Divorced	13	31	1		Ref
Effective nutrition practices while planning to conceive					
Adopting a healthy diet	18	37	1.3	0.52-3.27	0.568
Seeing a doctor for a health check-up	24	40	1.7	0.72-4.23	0.216
Reducing alcohol consumption	15	45	0.9	0.37-2.33	0.869
Getting fitter	5	50	0.3	0.08-0.83	0.023*
Reducing smoking	11	28	1		Ref
Number of children					
1-2	27	72	1		Ref
3-4	22	73	0.9	0.45-1.67	0.667
5 and above	24	55	0.7	0.06-0.38	0.002*
Level of education					
Non formal	17	56	0.5	0.23-0.56	0.000*
Primary	32	39	1.3	0.64-2.60	0.482
Secondary	1	68	0.1	0.01-0.17	0.067

Tertiary	23	37	1		Ref
Causes of skipping some meals					
Large families	38	96	1.2	0.67-0.98	0.004*
Inadequate food supply	35	104	1		Ref
Use some herbal products recommended by culture during pregnancy					
Yes	38	109	0.7	0.39-1.28	0.051*
No	35	91	1		Ref

At multivariate analysis, only five factors were statistically significant. Women who practiced fitness while planning to conceive were 0.3 times (AOR=0.3, 95% CI [0.08-0.83], p=0.023) less likely to have poor nutrition status as compared to those who reduced smoking. Women with 5 and more children were 0.7 times (AOR=0.7, 95% CI [0.06-0.38], p=0.002) more likely to have poor nutrition as compared to those who had 1 to 2 children. Women who had no formal education were 0.5 times (AOR=0.5, 95% CI [0.23-0.56], p=0.000) more likely to have poor nutrition status as compared to those who had tertiary level of education. Women who skipped meals because of large families were 1.2 times (AOR=1.2, 95% CI [0.67-0.98], p=0.004) more likely to have poor nutrition status than those who had inadequate food supply. Women who used herbal products were 0.7 times (AOR=0.7, 95% CI [0.39-1.28], p=0.051) more likely to have poor nutrition status than those who were not.

4.4 Qualitative findings on factors influencing effective nutritional status among pregnant mothers

Table 8: Categories and number of interviews

Methods	Health Care Workers and Village Leaders	Number of interviews	Total Number of Participants
Key informant interviews	Health Workers and Village leaders	2 individual per health facility	10
In depth interview	Young pregnant Women	2 Women per health facility	10

Table 9: Thematic analysis

Themes	Sub-themes
Theme 1: Poverty	Pregnant mothers faced challenges of poverty which led to skipping meals, relying on certain types of foods.
Theme 2: Knowledge	Some young pregnant women avoid foods such as eggs, fish etc, fearing that it might harm the baby
Theme 3: Food taboos and beliefs	Sometimes families are poor and food is not enough, others still follow old traditions like stopping girls from eating eggs or fish. Many people believe that eating too much makes the baby too big which causes problems during delivery, so girls avoid food out of fear.

Key informants' interviews with health workers and village leaders

Key informant reported various factors influencing effective nutritional status among pregnant mothers including; such as skipping meals, relying on certain types of foods due to poverty and inadequate food. Health workers reported that most young pregnant women lacked adequate knowledge about nutritional needs during pregnancy and balanced diet. Both health Workers and

Village leaders reported that cultural practices often discourage young pregnant women to eat certain types of nutritious foods.

'Most young mothers come with signs of undernutrition, with many admitting they skip meals or rely on Posho and Beans because that is what they can afford'. (Midwife. N).

'Poverty is a big issue. Many girls stay with their parents or their in-laws who control the food. Sometimes they do not know what a balanced diet is or think that eating certain foods will make the baby too big'. (Midwife.P).

'Sometimes families are poor and food is not enough, others still follow old traditions like stopping girls from eating eggs or fish'. (Ibanda Eribabu LCI chairperson Nakavule).

'Many people believe that eating too much makes the baby too big which causes problems during delivery, so girls avoid food out of fear'. (Hajji Mpiya Hussein LCI chairperson Walugogo).

'Most young pregnant women do not attend antenatal care as required, thus they miss out important nutrition education' (Nurse, J).

Though young pregnant women being knowing what to eat, some cannot afford the food due to poverty' (Nantatya M, Iganga Municipal LC 3).

Some young pregnant women avoid foods such as eggs, fish etc, fearing that it might harm the baby. (Ssebide M, Chairman LC1).

In depth interviews with young pregnant women

Pregnant women described their various nutrition behaviors and influencing factors such as eating on certain kind of foods that lack nutrition values, feeling sick to cook and being neglected by their husbands.

'I mostly eat cassava, posho and beans, sometimes greens. I rarely eat meat or take milk because they are expensive'. (19-year-old Jane, 1st pregnant).

'Sometimes, I feel too sick to cook, other times there is no food at home, my husband left and I live with my mother who struggles too'. (22 year Amina, 2nd pregnancy).

'I eat only what is available and sometimes we only have one meal in a day' 20 year Faridah, 2nd pregnancy.

'My husband thinks that having nutritious foods is important, he instead spends money in others things'. (19-year-old Patience, 1st pregnancy).

The clinic is far away from home, so I cannot go there every day. This makes me miss some important nutrition education'. (21 years old cathy, 3rd pregnancy).

At times am tired from work. I just eat quickly and go to sleep. (22-year-old Judith, 2nd pregnancy).

CHAPTER FIVE: DISCUSSION

5.0 Introduction

The study aimed to assess the determinants influencing the nutritional status of young pregnant mothers aged 24 years and below who are attending selected public health facilities in Iganga, Uganda.

5.1 Discussion

5.1.1 Nutritional status of young pregnant mothers attending selected public health facilities in Iganga district Uganda.

The study findings revealed that 26.7% of the participants had poor nutrition status. This could be due to factors such as inadequate food, large families among others. This finding is in line with Kyamwine et al., (2021) in Uganda who found that Karamoja region and Lango regions had the highest rise of poor intake of nutrients between 2015 to 2018 at more than 15%. Acholi region had the highest malnutrition group and Kampala was in between 5-9% of malnourished pregnant mothers. The similarities could be due to similarities in economic status as eastern region of Uganda has almost the same economic status as the northern region. However, our findings were lower than findings by Jones et al., (2020) in East Africa who showed that undernutrition among mothers was 35%. This could be due to differences in sample size of 42,721 compared to ours of 273.

5.1.2 Demographic factors affecting nutritional status among women

At multivariate analysis, women who practiced fitness while planning to conceive were 0.3 times (AOR=0.3, 95% CI [0.08-0.83], p=0.023) less likely to have poor nutrition status as compared to those who reduced smoking. This indicated that practicing inadequate fitness practices contributed to poor nutrition status. This is because of lack of activeness of the body leading to poor metabolism. This study is in agreement with Hammarberg et al., (2020) in Australia that recruited 965 women who showed that desire to have a child in future influenced maternal nutritional status as 73% of women ensured weight reduction to assume fitness had good nutrition status.

5.1.3 Socioeconomic factors influencing effective nutritional status among pregnant mothers

The study showed that women with 5 and more children were 0.7 times (AOR=0.7, 95% CI [0.06-0.38], p=0.002) more likely to have poor nutrition as compared to those who had 1 to 2 children. This indicated that large families contributed to poor nutrition status. This is because of inadequate

food to feed large families. This finding is in line with Teweldemedhin et al., (2021) in Eritrea from 226 pregnant women who showed having large families with inadequate food supply contributed to poor nutrition status among pregnant women.

Furthermore, women who had no formal education were 0.5 times (AOR=0.5, 95% CI [0.23-0.56], p=0.000) more likely to have poor nutrition status as compared to those who had tertiary level of education. This indicated that low level of education contributed to poor nutrition. This is because of inadequate knowledge regarding the required food needed to improve nutrition. This finding is similar to Yalewdeg et al., (2020) in Ethiopia who reported that women who had attained school were had 2.7 chances of having good dietary practice than those who had not attained any education.

The study findings showed that women who skipped meals because of large families were 1.2 times (AOR=1.2, 95% CI [0.67-0.98], p=0.004) more likely to have poor nutrition status than those who had inadequate food supply. This indicated that skipping meals contributed to poor nutrition status. Skipping meals could be due to factors such as being busy, poor appetite among others. This finding is in agreement with Teweldemedhin et al., (2021) in Eritrea who found that pregnant mothers skipped some meals with 43.8% skipping lunch and 24.2% skipping breakfast which led to poor nutrition status. Similarly, the study agrees with Kerver et al., (2023) in rural United States (US) who showed women who ate three and more times in a day had 86% chances of not being undernourished compared to those ate once in a day.

The study findings showed that women who used herbal products were 0.7 times (AOR=0.7, 95% CI [0.39-1.28], p=0.051) more likely to have poor nutrition status than those who were not. This implied that use of herbal medicine contributed to poor nutrition status. This is because of not taking the required as advised by health care providers instead relying on herbal products that may not have any value to improve nutrition status of an individual. This finding is in Chakona & Shackleton, (2019) in South Africa who reported resorting to herbal medicine among pregnant women due to cultural taboos such as denial of foods such as meat, fish, eggs, potatoes, pumpkin, fruits and butternut rich in essential nutrients due to reasons such as fear of complications during pregnancy, labour and risks of having small children thus instead women contributed to poor nutrition status among pregnant women.

Data obtained from key informants showed that relying on certain types of foods due to poverty and inadequate food also contributed to poor nutrition status among pregnant women. This is because of inadequate money to buy the required food during pregnancy. This indicated that there is need to improve on the economic status of the people to eliminate poverty. This finding is in line with Super et al., (2021) in Netherlands who found that expectant women who were poor did no fulfill the guidelines for good diet. Pregnant mothers encountered several challenges for healthy eating, including physical and social bottle necks, practical constraints such as lack of access to healthy foods and time limitation.

> *'Most young mothers come with signs of undernutrition, with many admitting they skip meals or rely on Posho and Beans because that is what they can afford'. (Midwife. N).*

> *'Poverty is a big issue. Many girls stay with their parents or their in-laws who control the food. Sometimes they do not know what a balanced diet is or think that eating certain foods will make the baby too big'. (Midwife.P).*

The data obtained from in-depth interview also showed that factors such as eating on certain kind of foods that lack nutrition values, feeling sick to cook and being neglected by their husbands contributed to poor nutrition status among pregnant women. This is probably because of inadequate support. This indicated that pregnant women needs support from husbands and family members to improve on their nutrition status. This finding is similar to Lennox et al., (2017) in Tanzania who found that from an interview based descriptive qualitative study among 12 pregnant Maasai women in Tanzania, findings revealed that expectant women who consumed food rich in protein during no rain season were three only with the highest number reported feeding on maize and related products such as porridge. The similarity could be due to both studies carried out in East Africa.

> *'Sometimes, I feel too sick to cook, other times there is no food at home, my husband left and I live with my mother who struggles too'. (22 year Amina, 2nd pregnancy).*

> *'I eat only what is available and sometimes we only have one meal in a day' 20 year Faridah, 2nd pregnancy.*

5.2 Limitations of the study

There were risks for recall bias as study participants were forgetting, gave false reports or giving incorrect estimated diet after being asked to recall their dietary intake in the past 24 hours. This would affect accuracy of dietary diversity scores. The researcher minimized this bias by training research assistants on how to probe respondents to provide accurate information.

The study participants feared to give information that was sensitive to their culture which affected the accuracy of data collected in regard to culture and behavior. To avoid this, data was conducted with in private places which ensured confidentiality of information.

There was a risk of non-response or withdrawal from participants during the study, which could reduce the sample size and potentially introduced bias. This was minimized by building rapport with participants, providing clear explanations of the study's importance, and offering flexible scheduling options for interviews. Follow-ups and reminders were also used to encourage continued participation.

CHAPTER SIX: CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusion

- This study found a high prevalence of poor nutrition status among young pregnant women at 26.7%.
- The significant demographic factor included smoking practices.
- The socio economic factors included; having many children, skipping meals, level of education, use of herbal medicine, poverty and lack of support from husbands.

6.2 Recommendations

The study participants should avoid smoking practices

The government should ensure that the economic status of families is improved to eradicate poverty.

Health workers should ensure comprehensive health education to young pregnant women about importance of good nutrition status and the required food to improve on their knowledge especially to those with low level of education.

Pregnant women should avoid use of herbal products in expense of neglecting good nutritious foods due to cultural taboos.

Husbands and family members should provide adequate support to pregnant women such as assistance in provision of funds and house chores when weak.

Areas for further research.

There is need to carry out studies assessing young women's knowledge regarding nutritious foods needed during pregnancy.

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APPENDICES

APPENDIX I: CONSENT FORM

Topic: Determinants influencing the nutritional status of young pregnant mothers aged 24 years and below who are attending selected public health facilities in Iganga, Uganda.

Researcher: ARNETIA PATIENCE LUNKUSE from Uganda Christian University

Introduction:

You are requested to participate in a research study conducted by ARNETIA PATIENCE LUNKUSE a student from Uganda Christian University. The aim of this study is to assess the Determinants influencing the nutritional status of young pregnant mothers aged 24 years and below who are attending selected public health facilities in Iganga, Uganda. Prior to engage in this study, it is important for you to understand the aim of the study, the procedures involved, and any risks and benefits. This form provides information about the study. Please read it carefully and feel free to ask any questions you may have before agreeing to participate.

Purpose of the Study:

The purpose of this study is to assess the Determinants influencing the nutritional status of young pregnant mothers aged 24 years and below who are attending selected public health facilities in Iganga, Uganda. The study findings may help to improve nutrition status among pregnant women.

Procedures:

This research process may take 20 to 30 minutes. You will be required to fill the questionnaire provided if you consent to participate in this study.

Voluntary Participation:

Your participation in this study is entirely voluntary. You may choose not to participate or to withdraw from the study at any time without any penalty or loss of benefits to which you are otherwise entitled.

Risks and Discomforts:

There are no significant risks anticipated from participating in this study. However, some questions may make you feel uncomfortable or emotional. If you experience any discomfort, you may skip those questions or stop participating at any time. Counseling support will be available if needed.

Benefits:

While there may be no direct benefit to you for participating, your responses will help provide valuable insights into the nutrition status of mothers which may improve the quality of life of mothers.

Confidentiality:

Your responses will be kept confidential. All data collected will be stored securely, and only the research team will have access to it. Your Name or any identifying information will not be used in any reports or publications resulting from this study.

Compensation:

There is no financial compensation for participating in this study. However, your participation is greatly appreciated.

Contact Information:

If you have any questions about the study, you can contact the principal investigator, ARNETIA PATIENCE LUNKUSE at 0705446052. If you have any concerns about your rights as a participant in this study, you can contact the Ethics Committee or Institutional Review Board at …….

Consent:

By signing below, you acknowledge that you have read and understood the information provided above. You voluntarily agree to participate in this study. You will be given a copy of this consent form for your records.

Signature:_____

Date: _____

Researcher's Name: ARNETIA PATIENCE LUNKUSE

Signature:_____

Date: _____

Thank you for your participation in this study. Your input is valuable and will contribute to the improvement of care for patients with opioid use disorder.

APPENDIX II: QUESTIONNAIRE

Instructions.

1) Do not write your name on this questionnaire
2) Circle the appropriate answer(s) or write your answer in the space provided

Section A: Demographic factors

1. What is your age?
    a) 18-20
    b) 21-24
2. What is your religion?
    a) Catholics
    b) Born again
    c) Anglican
    d) Muslim
    e) Others specify
3. What is your marital status?
    a) Single
    b) Married
    c) Cohabiting
    d) Divorced
4. What is your belief regarding effective nutrition practices?
    a) It is good
    b) It is not necessary
    c) It leads to big babies

5. What do you think can cause poor nutrition practices?
    a) Low level of knowledge on maternal diet
    b) Moderate knowledge on diet
    c) High knowledge on diet
6. Do you know the recommended food required for pregnant mothers?
    a) Yes
    b) No
7. If YES as in above, what are they?

    ……

    ……

    ……
8. What can you do to ensure effective nutrition practices while planning to conceive?
    a) Adopting a healthy diet
    b) Seeing a doctor for a health check-up
    c) Reducing alcohol consumption
    d) Getting fitter
    e) Reducing smoking

Section B: Socioeconomic factors influencing effective nutrition practices among pregnant mothers

9. How many children do you have?
    a) 1-2
    b) 3-4
    c) 5 and above
10. What is your place of residence?
    a) Rural
    b) Urban
11. What is your level of education?
    a) Non formal
    b) Primary
    c) Secondary
    d) Tertiary
12. What makes you fail to meet your dietary products during pregnancy?
    a) Lack of money to buy food
    b) Lack of access to different variety of food
    c) Lack of time
13. What do you think can cause you to skip some meals?
    a) Large families
    b) Inadequate food supply

14. What is your employment status?

    a) Employed

    b) Not employed

15. Does your culture have beliefs/taboos on some foods during pregnancy?

    a) Yes

    b) No

16. If YES, which foods are you not recommended to feed on during pregnancy according to your culture?

    a) Meat products

    b) Fish

    c) Eggs

    d) Beans

17. What could be the reasons for your culture to deny the above foods during pregnancy?

    a) Leads to poor baby growths

    b) Leads to difficulties in labor

    c) May lead to the delivery of a misfortune

18. Do you use some herbal products recommended by your culture during pregnancy?

    a) Yes

    b) No

Section C: Nutritional status of young pregnant mothers attending selected public health facilities in Iganga district Uganda.

19. How many meals do you usually have daily?

    a) One

    b) Two

    c) Three

    d) Four

20. Which type of foods do you access and consume most during pregnancy?

    a) Fruits

    b) Vegetables

21. MUAC results…….

Thank you for your participation

APPENDIX III: REC APPROVAL LETTER.

UGANDA CHRISTIAN UNIVERSITY
A Centre of Excellence in the Heart of Africa

Office of the Vice Chancellor
Research Ethics Committee UG-026

05th May, 2025

ARNETIA PATIENCE LUNKUSE
Uganda Christian University
0705446052
Email: parnetia@gmail.com

UG-REC-026 APPROVAL NOTICE

To: Arnetia Patience Lunkuse, Principal Investigator

Re: UCU-REC Application titled: *The Determinants Of Nutritional Status Among Young Pregnant Mothers Attending Selected Public Health Facilities In Iganga.*

Application Number: **UCUREC-2025-830**

Version: 4.1

UGANDA CHRISTIAN UNIVERSITY APPROVED 05 MAY 2026 RESEARCH ETHICS COMMITTEE

Type: [ ] **INITIAL REVIEW**
[ ] Protocol Amendment
[ ] Letter of Amendment (LOA)
[ ] Continuing Review
[ ] Material Transfer Agreement
[ ] Other, Specify:

I am pleased to inform you that the **UG-REC-026;** UCUREC approved the above referenced application.

Approval of the research is for the period from **05th May, 2025,** to **05th May, 2026**
This research is considered minimal risk category.
As Principal Investigator of the research, you are responsible for fulfilling the following requirements of approval:

1. All co-investigators must be kept informed of the status of the research.
2. Changes, amendments, and additions to the protocol or the consent form must be submitted to the REC for re-review and approval prior to the activation of the changes. The REC application number assigned to the research should be cited in any correspondence.
3. Reports of unanticipated problems involving risks to participants or other must be submitted to the REC. New information that becomes available which could change the risk: benefit ratio must be submitted promptly for REC review.

P.O. Box 4, Mukono, Uganda, Plot 67-173, Bishop Tucker Road, Mukono Hill
Tel: +256 (0) 312 350 885 Fax: +256 (0) 4142 90 800 Email: rec@ucu.ac.ug Web: www.ucu.ac.ug

4. Only approved consent forms are to be used in the enrollment of participants. All consent forms signed by subjects and/or witnesses should be retained on file. The REC may conduct audits of all study records, and consent documentation may be part of such audits.
5. Regulations require review of an approved study not less than once per 12-month period. **Therefore, a continuing review application must be submitted to the REC eight weeks prior to the above expiration date of 05th May, 2026 in order to continue the study beyond the approved period.** Failure to submit a continuing review application in a timely fashion may result in suspension or termination of the study, at which point new participants may not be enrolled and currently enrolled participants must be taken off the study.
6. The REC application number assigned to the research should be cited in any correspondence with the REC of record.
7. Your research details have been shared with the Executive secretary of Uganda National Council for Science and Technology (UNCST) and you are **not** required to get clearance since you are a Master's Degree research. Refer to UNCST Research registration and clearance Policy and guidelines (July 2016) in Uganda section 6(e).

The following is the list of all documents approved in this application by **UG-REC _026:**

	Document Title	Language	Version	Version Date
1.	Protocol	English	1.0	2025-03-17
2.	Questionnaire	English	1.0	2025-03-17
3.	Informed consent form	English	1.0	2025-03-17

Signed and Stamped

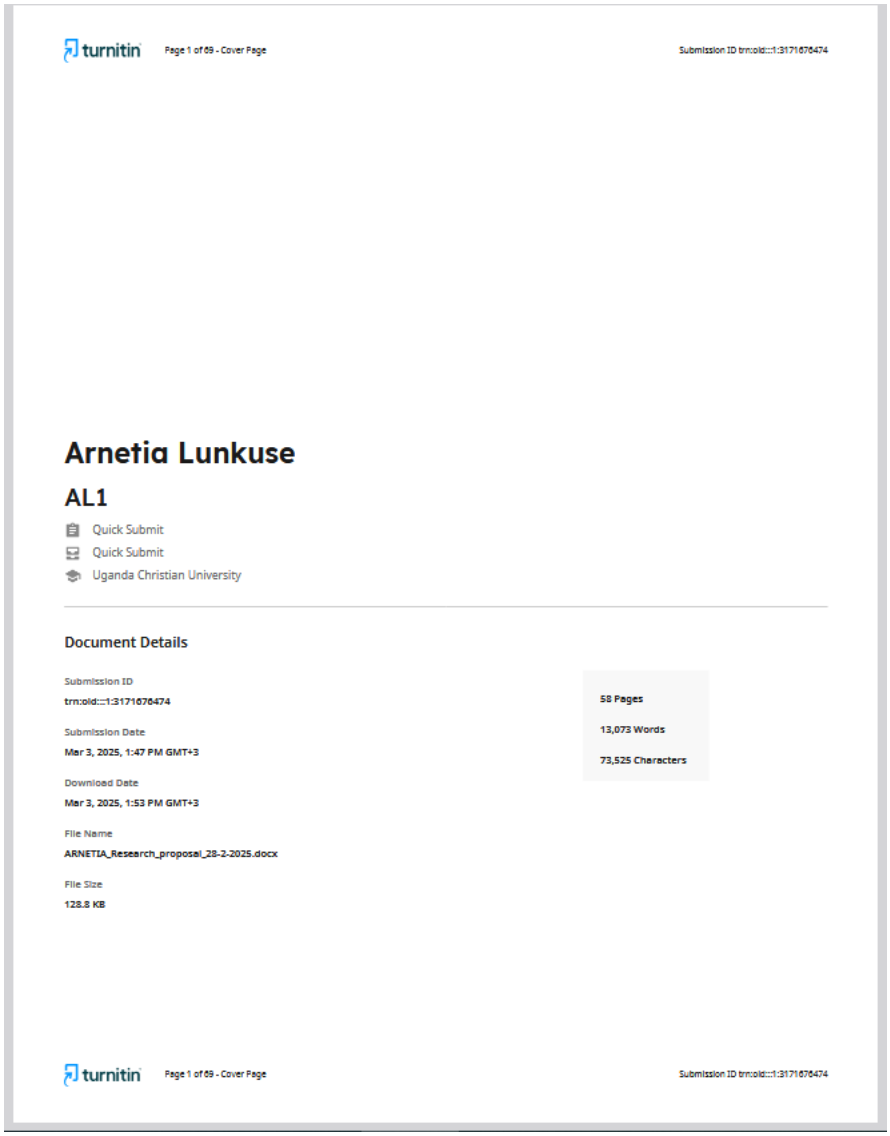
Prof. Peter Waiswa.
UCUREC Chairperson,
pwaiswa@musph.ac.ug

UGANDA CHRISTIAN UNIVERSITY
APPROVED
"INTI"
05 MAY 2026
RESEARCH ETHICS COMMITTEE

Research and Ethics

P.O. Box 4, Mukono, Uganda, Plot 67-173, Bishop Tucker Road, Mukono Hill
Tel: +256 (0) 312 350 885 Fax: +256 (0) 4142 90 800 Email: rec@ucu.ac.ug Web: www.ucu.ac.ug

APPENDIX IV: PLAGIARISM CERTIFICATE



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Arnetia Lunkuse

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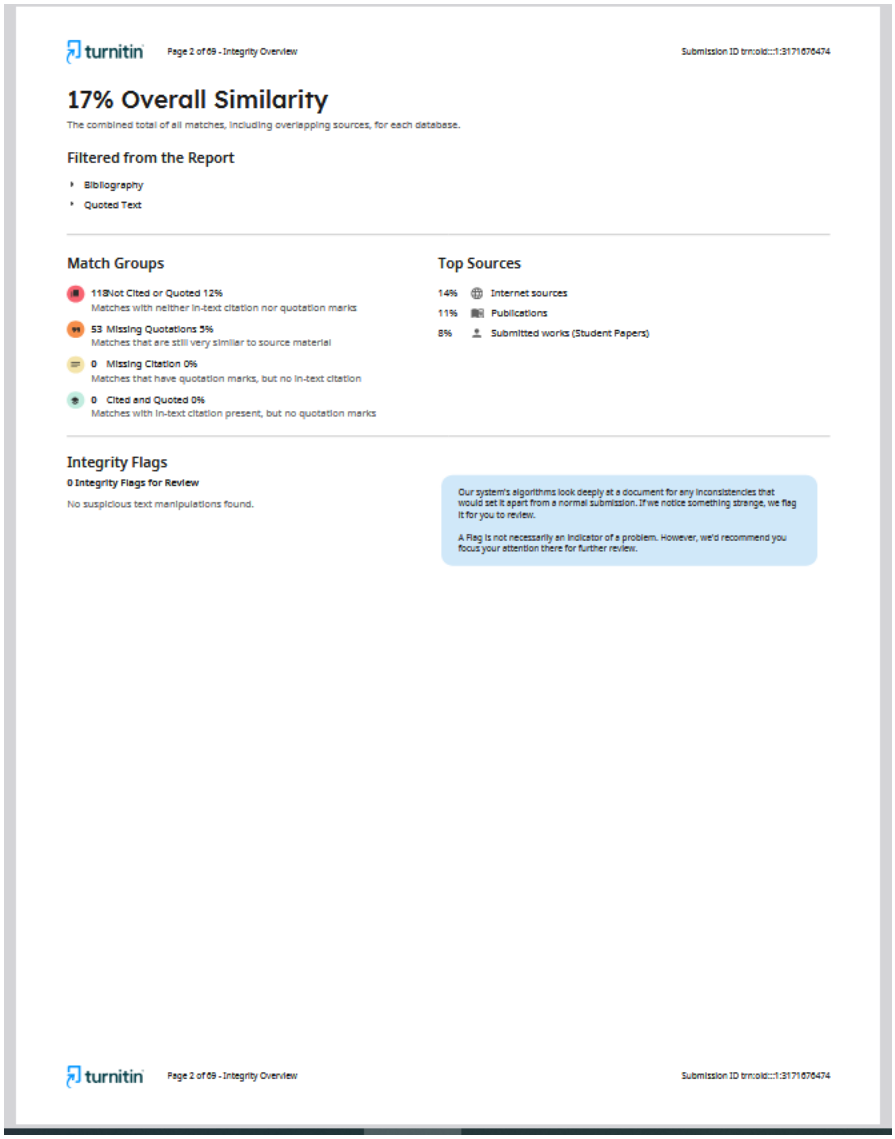

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UGANDA CHRISTIAN UNIVERSITY

SCHOOL OF RESEARCH & POSTGRADUATE STUDIES

DISSERTATION CORRECTION COMPLIANCE REPORT BY THE CANDIDATE (POST VIVA FORM)

Date: ***29/09/2025***

Name of Candidate: **ARNETIA PATIENCE LUNKUSE** **Reg. No:** RM23M21/003

Title of Dissertation: **THE DETERMINANTS OF NUTRITIONAL STATUS AMONG YOUNG PREGNANT MOTHERS ATTENDING SELECTED PUBLIC HEALTH FACILITIES IN IGANGA**

EXTERNAL EXAMINER'S REMARKS

Examiner's Remark	Page No.	Correction Made / Action Taken	Indicator	Remarks
Add operational definitions before the abstract.	p. i–ii	Added an operational definitions section before the abstract.	Section present before abstract.	Corrected.
Clarify source of qualitative data.	p. 27	Indicated in methodology that qualitative data came from key informant interviews and focus groups.	Methods section updated.	Corrected.
Tailor recommendations to the study area.	p. 73–74	Revised recommendations to focus on Iganga public health facilities context.	Recommendations aligned to findings.	Corrected.
Correct inconsistencies in statistical results (CIs,	p. 49–55	Consulted statistician, corrected errors in results tables.	Results now consistent.	Corrected.

Examiner's Remark	Page No.	Correction Made / Action Taken	Indicator	Remarks
p-values).				
Correct prevalence of poor nutrition (34% not 26%).	p. 49	Updated prevalence figure.	Results section corrected.	Corrected.

INTERNAL EXAMINER'S REMARKS

Examiner's Remark	Page No.	Correction Made / Action Taken	Indicator	Remarks
Revise objectives (reduce to two, frame as research questions).	p. 4	Reformulated objectives into two research questions.	Objectives now reflect examiners' advice.	Corrected.
Clarify inclusion criteria (age range).	p. 26	Stated age range: 15–24 years.	Inclusion criteria updated.	Corrected.
Specify sample and key informants.	p. 27–28	Listed mothers, healthcare providers, community leaders.	Methods section updated.	Corrected.
Indicate study sites (specific health facilities).	p. 25	Added names of facilities in Iganga.	Sites now listed.	Corrected.
Provide REC number for ethical approval.	p. 31	Inserted REC approval number.	Ethical clearance section updated.	Corrected.
Define poor nutrition operationally.	p. 11	Gave definitions for undernutrition and overnutrition.	Operational definitions updated.	Corrected.
Describe recruitment and consent procedures.	p. 27	Detailed participant enrollment process.	Procedures section updated.	Corrected.
Outline measures for data quality.	p. 29	Included training, pretesting, and review steps.	Methods updated.	Corrected.
Present qualitative results under themes.	p. 58–60	Organized results into thematic areas: poverty, knowledge gaps, etc.	Thematic presentation visible.	Corrected.
Discussion should focus on significant variables.	p. 65–69	Revised to highlight significant determinants, linked to qualitative themes.	Discussion section aligned.	Corrected.
Write conclusions in bullet form.	p. 72	Converted conclusions into clear bullet points.	Bullet points visible.	Corrected.
Recommendations to be based only on findings.	p. 73	Edited recommendations to directly reflect results.	Recommendations aligned.	Corrected.

Examiner's Remark	Page No.	Correction Made / Action Taken	Indicator	Remarks
Correct grammar, spelling, and typographic errors.	Throughout	Edited full dissertation for clarity and accuracy.	No major errors remain.	Corrected.

VIVA PANEL CORRECTIONS

VIVA Panel Comment	Page No.	Correction Made / Action Taken	Indicator	Remarks
Include a table summarizing results; clarify why some factors were left out.	p. 49–50	Added a summary table of results; explained inclusion/exclusion of factors.	Results table present.	Corrected.
Clarify prevalence of malnutrition among young mothers; specify undernutrition vs overnutrition.	p. 49	Defined malnutrition prevalence and differentiated undernutrition/overnutrition.	Results now state both clearly.	Corrected.
Provide definition of malnutrition used in study.	p. 11	Added operational definition of malnutrition in terms of BMI.	Operational definitions updated.	Corrected.
Clearly state study focused on undernutrition; specify BMI cutoff values.	p. 26	Indicated undernutrition as focus; stated BMI cutoff value used.	Methods section updated.	Corrected.
Show how BMI before pregnancy was assessed or acknowledge limitation.	p. 70	Stated inability to track pre-pregnancy BMI as a limitation.	Limitation section updated.	Corrected.
Justify sample size of 270 mothers and describe study population.	p. 26–27	Explained sample size determination and characteristics of study population.	Methods updated.	Corrected.
Clarify type of facilities where participants were recruited.	p. 25	Specified public health facilities in Iganga.	Study sites listed.	Corrected.
Explain why non-malnourished population included.	p. 70	Noted inclusion to allow comparative analysis; acknowledged as study limitation.	Limitation explained.	Corrected.
Qualitative interviews require	p. 28	Added description of survey guides used for qualitative	Methods updated.	Corrected.

VIVA Panel Comment	Page No.	Correction Made / Action Taken	Indicator	Remarks
survey guides.		interviews.		
Clarify that parity is not family size; define terms properly.	p. 12	Corrected definitions; distinguished parity from family size.	Terms defined clearly.	Corrected.
Indicate which concepts of Health Belief Model guided the study.	p. 20–21	Identified key HBM concepts (perceived susceptibility, perceived barriers, etc.).	Conceptual framework updated.	Corrected.
Suggestion to include objective on perception in order to use HBM.	p. 4	Added clarification in objectives and framework discussion.	Objectives/framework aligned.	Corrected.

ARNETIA PATIENCE LUNKUSE

Candidate's Name & Signature

SHALLON ATUHAIRE (PhD)

Supervisor's Name &Signature