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**FACTORS ASSOCIATED WITH MALNUTRITION AMONG NEWLY DIAGNOSED
ADULT TUBERCULOSIS PATIENTS**

CASE STUDY: KAMWENGE DISTRICT

A dissertation presented to

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Making a Difference

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DEDICATION

I dedicate this piece of work to my dear wife Eseza, and children Japheth, Joan and Janice

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LIST OF ABBREVIATIONS

AOR	:	Adjusted Odds Ratio
COR	:	Crude Odds Ration
FY	:	Financial Year
HC	:	Health Centre
HIV	:	Human Immune Virus
HMIS	:	Health Management Information System
PNFP	:	Private-not-for-profit
SPSS	:	Statistical Package for Social Scientists
TB	:	Tuberculosis
UDHS	:	Uganda Demographic and Health Survey
USAID	:	United States Agency for International Development
WHO	:	World Health Organization

ABSTRACT

Background: *Malnutrition is a major contributor to increased morbidity and mortality, decreased function and quality of life, increased frequency and length of hospital stay, and higher health care costs. The burden of malnutrition is higher among TB patients. It is a strong risk factor for progression from latent tuberculosis to active form of the disease, just as TB can lead to or worsen pre-existing malnutrition by decreasing appetite, and by increased catabolism.*

Objective: *This study was set out to ascertain the burden and explore the factors associated with malnutrition in the newly diagnosed TB patients in Kamwenge District. The study determined the incidence and factors associated with, and experiences regarding malnutrition among newly diagnosed TB patients in Kamwenge District.*

Methodology: *The study was cross sectional in nature. It applied both quantitative and qualitative methods. Data collection was done by researcher-administered interviews, and was conducted at ten public health facilities and two private-not-for-profit health facilities in Kamwenge District. One hundred fifty eight newly diagnosed TB patients participated in the study. Sampling was done purposively at the participating health facilities, and data was analysed through descriptive, analytical and phenomenological techniques.*

Results: *Almost all, 144(91.1%) of the study participants were malnourished. On logistic linear regression and multivariate analysis, the only factors that significantly influenced malnutrition among newly diagnosed TB patients were: challenges accessing food for home consumption and positive HIV serostatus. Patients reported negative experiences related to physiological challenges, social challenges, and effects of treatment. However, some of them reported positive experiences such as good handling by health workers, access to treatment, and improved health.*

Conclusion and Implication for Public Health Practice: *Newly diagnosed TB patients have a high rate of malnutrition (>91%) and this is strongly related to challenges in accessing food and positive HIV sero status. Further, malnutrition in TB diseases is associated with negative experiences related to physiological and social challenges caused by the disease, and the negative effects of treatment/drugs. These findings underscore the need for public health practitioners, policy makers and promoters to actively strive for improvements in prioritization and service delivery to ensure early diagnosis and treatment of malnutrition among persons newly diagnosed with tuberculosis.*

Recommendations: *Ministry of health and district health departments should ensure that health facilities are well stocked with all relevant medicines and other supplies for combating malnutrition among newly diagnosed TB patients, considering that majority of them are malnourished. They should also advocate for improved availability of food at household level as challenges in accessing food was implicated in malnutrition among newly diagnosed TB patients.*

Key words: TB, Malnutrition, HIV, physiological and social challenges, effects of treatment.

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

Both Tuberculosis (TB) and malnutrition remain major global health problems, independently or interdependently (WHO, 2018). According to the World Health Organisation (WHO), TB is one of the top 10 causes of death worldwide. In 2017, 10 million people fell ill with TB, and 1.6 million died from the disease (WHO, 2018). Globally, malnutrition is a major cause of ill-health and death. In 2014, approximately 462 million adults worldwide were malnourished. In 2016, an estimated 155 million children under the age of 5 years were suffering from stunting, around 45% of deaths globally are linked to malnutrition. These mostly occur in low- and middle-income countries (Ghattas, 2014). Unfortunately, the progress to tackle all forms of malnutrition remains unacceptably slow. There has been some progress in tackling malnutrition, but still more than 400 million people are malnourished globally, with more than 90% of them occurring in developing countries (Ghattas, 2014)

The latest assessment shows that just under 50% of countries are on course to meet at least one of nine global nutrition targets. However, no country is on target to meet all of the nine targets that are being tracked. This leaves most of the countries with data off-track as countries continue to struggle with multiple forms of malnutrition (Center for Disease Control and Prevention, 2018). According to WHO (2018), 88% of developing countries experience more than one form of malnutrition, with 29% of them having high levels of all three forms of malnutrition. Unfortunately, in the cases of TB, malnutrition becomes more pronounced, complicating both the treatment and outcomes of TB treatment (Jenkins, 2016). Malnutrition was implicated in more than a third of the TB deaths in 2016 and 2017, thus

making the TB/malnutrition burden a global public health problem, just like TB/HIV combination (Black, et al., 2018).

The burden of malnutrition in TB disease is not well defined in most sub-Saharan African countries and the other high TB burden countries of India, China, Indonesia, the Philippines, Pakistan, Bangladesh, and others, yet these are places with more than 99% of the death burden due to TB (Jenkins, 2016). In Uganda, the Uganda Demographic and Health Survey (UDHS) report (2016) indicate that 19% of the Ugandan population was malnourished. The burden of malnutrition in tuberculosis patients has not been well documented in Uganda because few studies have been done on this subject. However, a study by Nambi (2015) reported the prevalence of malnutrition to be 46.0% among TB patients. Nonetheless, in the study area in Kamwenge District, the incidence of malnutrition among newly diagnosed TB patients was 77.8% in Financial Year (FY) 2017/2018 (Kamwenge District Health Management Information System [HMIS] reports, FY 2017/2018). This study was aimed at ascertaining the burden and exploring the factors associated with malnutrition in newly diagnosed TB patients.

1.2 Background to the study area

This study was carried out in Kamwenge District, which is located in Western Uganda. The district is surrounded by three other districts in the Toro sub-region, and these include Kabarole to the North West, Kyegegwa to the East, and Kyenjojo to the North. It is also bordered by Ibanda District to the South, Kiruhura District to the North East. The district headquarters lies approximately 300 kilometres (190 mi), by road, west of Uganda's capital, Kampala. The district is majorly rural, comprising of people of low socio-economic standards who mainly practice subsistence farming and rearing of animals. There is a total of 33 health facilities in Kamwenge District, two of them being public Health Centre (HC)

IVs. There are 8 public HC IIIs and 2 private-not-for-profit (PNFP) HC IIIs. The rest are 19 public HC IIs and 2 PNFP HC IIs.

There are several privately owned clinics and drugs shops (Kamwenge District Health Management Information System [HMIS], 2018). Specifically, the current study was conducted at the ten public health facilities (Bwizi HC III, Rwamwanja III, Rukunyu HC IV, Biguli HC III, Bigodi HC III, Kamwenge HC III, Nyabbani HC III, Ntara HC IV, Kicheche HC III, Mahyoro HC III) and two PNFP facilities (Padre Pio HC III, and Kabuga HC III) which provide TB diagnosis services.

1.3 Problem Statement

Malnutrition is a major contributor to increased morbidity and mortality, decreased function and quality of life, increased frequency and length of hospital stay, and higher health care costs. The burden of malnutrition is higher among TB patients. It is a strong risk factor for progression from latent tuberculosis to active form of the disease, just as TB can lead to or worsen pre-existing malnutrition by decreasing appetite, and by increased catabolism. Globally, malnutrition was implicated in more than a third of the TB deaths in 2016 and 2017 (Black, et al., 2018). In Uganda, there are few published studies on malnutrition in TB patients, but in Kamwenge District, the burden of malnutrition in TB patients is high. According to the Kamwenge District HMIS reports for FY 2017/2018, there were 276 new cases of TB (newly diagnosed). However, 217 of them (78.6%) had malnutrition. This is however, higher than the incidences of malnutrition among TB patients reported in FY 2015/2016 (56.2%) and FY 2016/2017 (62.9%).

However, records from all the public and private health facilities in the district indicate an increasing trend of malnutrition among newly diagnosed TB patients. Such patients have been reported to respond poorly to TB treatment, and malnutrition was implicated in 82% of the TB associated deaths in the district (Kamwenge District HMIS report, FY 2017/2018).

However, there has been no efforts by the district to explore the factors that predispose to malnutrition among newly diagnosed TB patients. This study therefore sought to explore the factors associated with malnutrition in newly diagnosed TB patients.

1.4 Research Questions

- i. W
What is the incidence of malnutrition among newly diagnosed TB patients in Kamwenge District?
- ii. W
What are the factors that are associated with malnutrition in newly diagnosed TB patients in Kamwenge District?
- iii. W
What are the experiences of malnourished patients newly diagnosed with TB?

1.5 Study Objectives

The study had both general and specific objectives

1.5.1 Broad Objective

To ascertain the burden and explore the factors associated with malnutrition in the newly diagnosed TB patients in Kamwenge District.

1.5.2 Specific Objectives

- i. To determine the incidence of malnutrition among newly diagnosed TB patients in Kamwenge District
- ii. To determine the factors that are associated with malnutrition in newly diagnosed TB patients in Kamwenge District
- iii. To elucidate the experiences of malnourished patients newly diagnosed with TB

1.6 Justification for the Study

There is available documented evidence of the existence of malnutrition among newly diagnosed TB patients in Kamwenge District. However, there is no documented evidence about the burden and factors that are associated with this health problem, neither is there evidence of a study conducted to identify such factors. Hence, this study will explore the burden and factors that predispose to malnutrition among newly diagnosed patients in the District.

1.7 Significance the Study

The findings of this study are expected to be of benefit to various stakeholders at different levels of decision making, policy planning and implementation, including but not limited to.

Policy Makers: The findings of the study are relevant in guiding policy formulation and drafting guidelines on prevention and management of malnutrition among persons infected with TB.

Kamwenge District Leadership: Ascertaining the burden and factors that are associated with malnutrition among persons infected with TB is essential in addressing the factors that predispose to this burden.

Further, the findings are helpful in guiding the district leadership (political and technical) to mobilize community members especially those who are suspected of suffering from TB to benefit from nutrition interventions in the district.

The findings of the study are also hoped to be of benefit in addressing sociodemographic, economic and medical factors that predispose to malnutrition among newly diagnosed patients in the District.

TB Patients

The information generated by the study is hoped to be beneficial for designing key messages for suspected TB patients to appreciate the need participating in nutrition interventions in the district in the bid to reduce the risks malnutrition in TB disease.

Development Partners

The findings and recommendations of this study are hoped to be useful in providing information for proper planning, resource mobilization and allocation by development partners and other players for supporting intervention in preventing and managing malnutrition in TB patients.

Researchers/Scholars

Cognizant of the limited research available about malnutrition in TB patients, the current study is well placed to add to the volume of research and documented evidence which other researchers and scholars could find relevant for spearheading knowledge in the field of malnutrition and TB.

1.8 Conceptual Framework

This study was guided by the Laura et al. (1972) framework for determining and predicting the risk factors of nutrition status outcomes. According to this framework and model, a number of factors have been suggested to directly or indirectly contribute to a disease phenomenon (in this case malnutrition among TB patients). These factors include sociodemographic and economic factors among others. The sociodemographic and economic factors may affect directly or indirectly on all other groups of risk factors with the exception of sex and age. These include environmental factors (such as type of house, house structure, type of latrine, sources of water), knowledge, food habits, beliefs, disease

conditions, and others. These variables, in turn, may affect the nutritional status of individuals. Figure 1 indicates the interaction between the different factors and how they lead to malnutrition (undernutrition), and how they eventually lead to mortality if not well addressed.

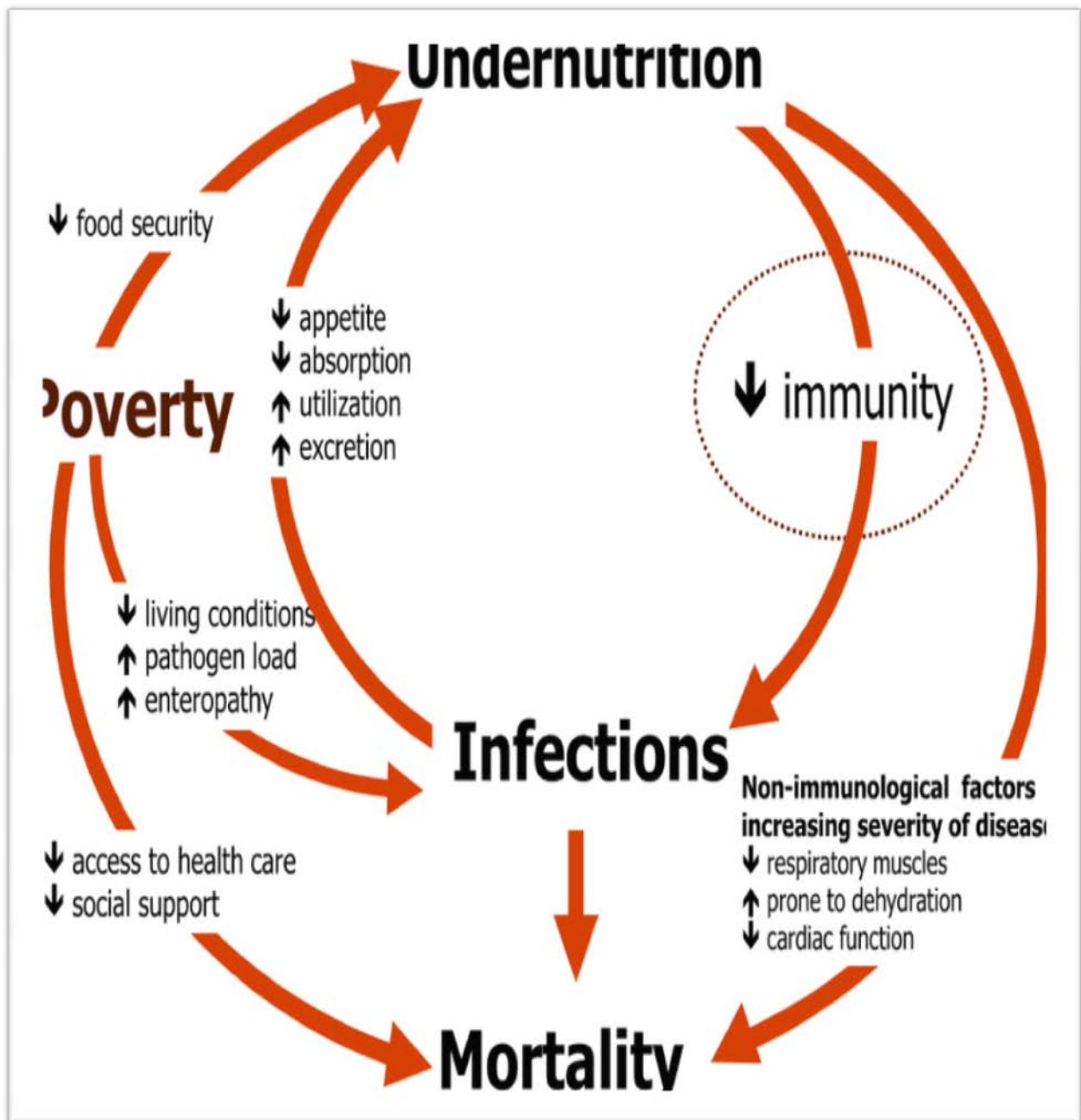


Figure 1: Conceptual Model of Burden and Factors Associated with Malnutrition; adopted from theoretical model for the study of nutritional status: An ecosystem approach by Laura et al. (1972)

From figure 1, malnutrition (undernutrition) results from a number of factors, including socioeconomic factors such as poverty and food security challenges, infections that cause medical conditions/diseases (like HIV, and others), and environmental factors, such as living conditions and exposure to high pathogen loads and enteropathy. These factors lower the body's immunity and therefore predispose to malnutrition or TB itself. Further, malnutrition can be the result of lack of social support, poor access to healthcare, decreased appetite and absorption (as can result from infection with TB), and increases nutrient utilization and excretion (as can result from infection with TB). These factors not only contribute to malnutrition, but can also lead to death, just like the non-immunological factors such as increasing severity of disease.

Figure 2 shows how the different variables selected in this study interact to contribute to the independent variable (malnutrition):

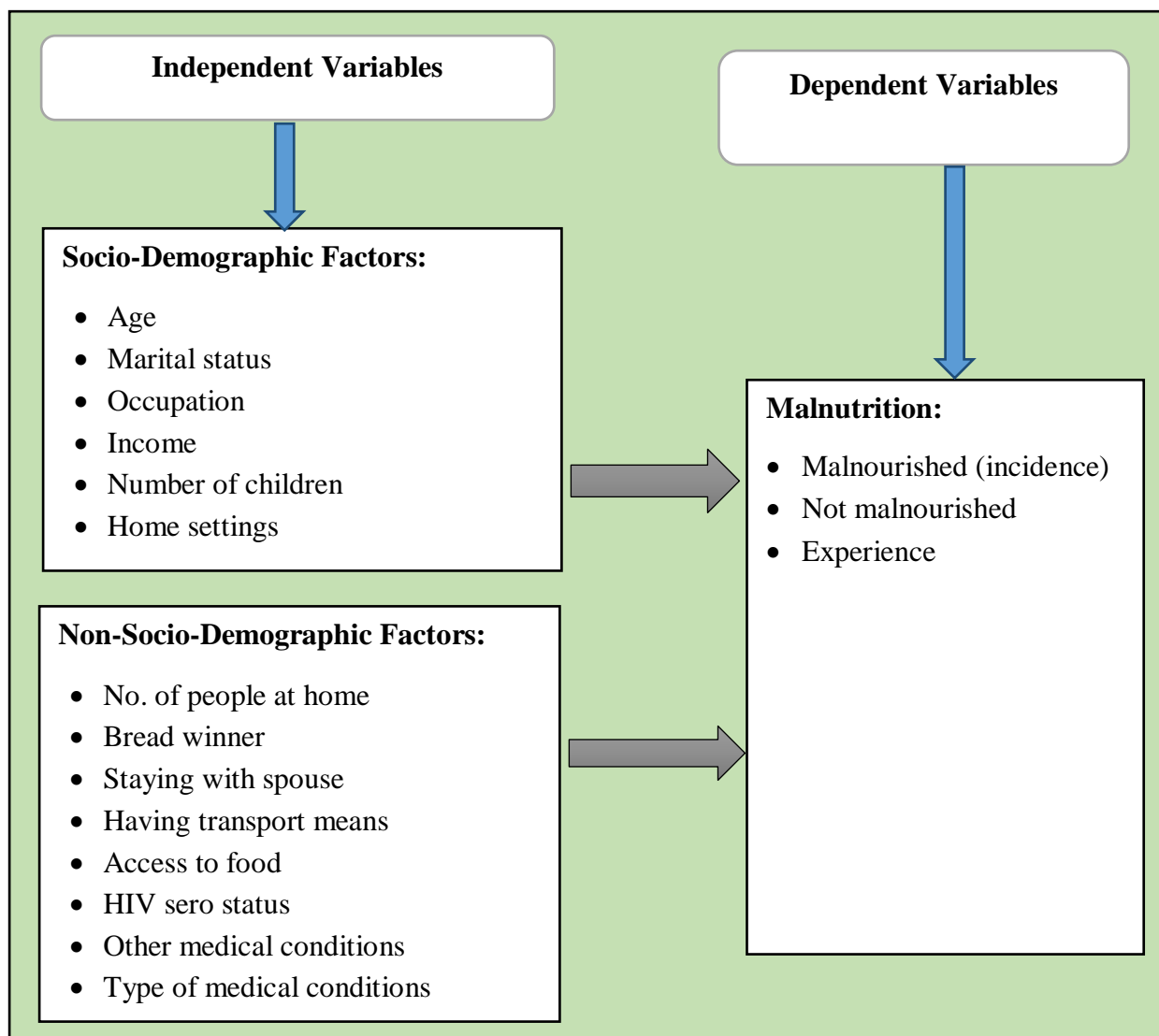


Figure 2: Conceptual Diagram of the Variables Under Investigation

1.9 Scope of the Study

1.9.1 Content Scope

The study explored the factors that are associated with malnutrition among newly diagnosed patients in Kamwenge District. Both socioeconomic and non-socioeconomic factors were studied, and the extent to which they contribute to or influence malnutrition among persons newly diagnosed with TB. Patients' demographic characteristics such as sex, age, educational level, marital status, religion, tribe, occupation, incomes, source of food, family sizes, meals per day, and food restrictions were also assessed, as well as non-socioeconomic

factors such as prevailing medical conditions and their durations, housing/living conditions, source of water, and others were also assessed.

1.9.2 Geographical Scope

This study was carried out in Kamwenge District, which is located in Western Uganda. Kamwenge District is part of the Kingdom of Toro, one of the ancient traditional monarchies in Uganda. Specifically, the current study was conducted at the ten public health facilities (Bwizi HC III, Rwamwanja III, Rukunyu HC IV, Bunoga III, Bigodi HC III, Kamwenge HC III, Nyabbani HC III, Ntara HC IV, Kicheche HC III, and Mahyoro HC III) and two PNEF facilities (Padre Pio HC III, and Kabuga HC III) which conduct TB diagnosis services. These were considered for this study because they are the places where TB diagnosis and treatment, plus malnutrition diagnosis is done for TB patients.

1.9.3 Time Scope

The study was conducted over a two year period which was used to draft the research proposal, data collection period, data analysis and report writing, thesis defence and submission of final research dissertation.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter presents a review of literature according to other researchers and scholars in line with the burden and factors associated with malnutrition in the newly diagnosed TB patients. Literature is reviewed and analysed according to:

- ❖ Incidence of malnutrition among newly diagnosed TB patients
- ❖ Factors associated with malnutrition in newly diagnosed TB patients
- ❖ Experiences of malnourished patients newly diagnosed with TB

2.2 Incidence of Malnutrition Among Newly Diagnosed TB Patients

There are a number of adult tuberculosis (TB) patients suffering from malnutrition in the world especially in developing countries (USAID, 2011). Globally, it is estimated that about one quarter of newly diagnosed TB patients have malnutrition (WHO, 2013). A study conducted at Yirgalem Hospital in Sidama, Ethiopia found a high prevalence of malnutrition (77.9 %), among TB patients (Madebo and Bernt, 2010). Although this study was mainly focused on the effect of malnutrition on the outcome of tuberculosis, the findings of 77.9% indicates a high incidence of malnutrition among newly diagnosed TB patients since the study comprised of both new and old TB cases.

Another study in Gondar (Kassu et al., 2006) also showed a high incidence (65.4%) of malnutrition among TB patients, though at a slightly low magnitude (65.4 %). However, just like the Madebo and Bernt (2010) study, the Kassu et al. (2006) study primarily investigated the incidence levels among both TB patients, both old and newly diagnosed. Nonetheless, the incidence in the Kassu et al. (2006) study was lower (65.4%) than that in the Madebo

and Bernt (2010) study which was conducted four years later. The difference however, can be attributed to differences in study settings.

However, the above two studies (Kassu et al., 2006; Madebo and Bernt, 2010) were limited to few health facilities, were undertaken at hospital level, did not solely address the issue of malnutrition in adult TB patients and were conducted long ago (thirteen and nine years later). Hence, the current study was planned to particularly assess the incidence of malnutrition in newly diagnosed TB patients in health facilities in a whole district and involving both public and private health facilities including those of lower level status provided they carry out TB and malnutrition diagnosis. Nonetheless, even most recent study (Somnath et al. 2018) have reported high levels of incidence of malnutrition among TB patients, including those who are newly diagnosed with TB disease.

According to the study by Somnath, et al. (2018) which assessed the nutritional status of newly diagnosed tuberculosis patients in a tertiary care hospital of Tripura, India, it was found that 66% of the newly diagnosed TB patients in the study had malnutrition (BMI <18.5kg/m²). However, malnutrition levels were higher among females (71%) than males, and the mean BMI was 17.9Kg/m².

In another recent study in Ethiopia, Berihun, et al. (2016) assessed the prevalence and associated factors of undernutrition among adult tuberculosis patients in some selected public health facilities of Addis Ababa. The study reported the prevalence of undernutrition among TB patients to be 39.7 % (23.6 % mild, 8.6 % moderate and 7.2 % severe undernutrition). However, this study targeted mainly adult patients and consisted mainly those who had been with TB for some time as compared with those who had just been diagnosed. This finding of the prevalence of undernutrition among adult TB patients (39.7 %) indicates a higher prevalence than a study conducted in Peru (21 %) (Krapp et al.,

2008), but it is lower when compared with another study done in Gulbarga, India (62.2 %) (Amrutha et al., 2013). The difference in results between these two studies may be due to the socio-economic difference between the two countries and the study in India used a different method of data collection. In other African countries the prevalence of undernutrition among TB patients is also high.

A study in Ghana (Dodor, 2008) revealed that the prevalence of undernutrition among TB patients to be 51 %, which is higher than the findings of the studies by Krapp et al. (2008) and Berihun et al. (2016). This could be due to the fact that the study in Ghana was conducted among patients who have been followed in hospital level where they are expected to be undernourished. Moreover, the BMI of the participants was taken at the time of diagnosis before starting anti-TB medications when patients have not recovered from their illness and were at the state of critical undernourishment which could overestimate the expected figure.

A study conducted in other African countries such as Malawi 57 % and Uganda 62 % also found a high prevalence (Zachariah et al, 2002; Shah et al., 2010). This higher prevalence of undernutrition in those studies compared to the current study could be attributed to the difference in socio-cultural situation, life style, feeding pattern and economic status of the countries. Other Ethiopian based studies have also shown a higher result. A study conducted in Gondar, 65.4 % (Kassu et al., 2006) and Sidama, 77.9 % (Madebo and Bernt, 2010) revealed higher prevalence of undernutrition among adult tuberculosis patients compared to this study. This may be attributed to the difference in study context (urban dweller TB patients) and in socio-economic status of the society in those areas. Besides, those studies were conducted a long time ago when the economic status of the country was relatively low which had an impact on the nutritional status of the society in general TB patients in particular.

In a study in Uganda, Nambi (2015) assessed the prevalence and factors associated with malnutrition among adult Tuberculosis patients attending the national referral tuberculosis program clinic at Mulago Hospital. A total of 415 newly diagnosed tuberculosis patients aged 18 years and above who attended the national referral tuberculosis program clinic at Mulago hospital during the study period, willing and able to give informed consent were included in the study. According to the study, the prevalence of malnutrition reported 46.0% (191 patients) 95% CI (41.3%, 50.8%).

2.3 Factors associated with malnutrition in newly diagnosed TB patients

Malnutrition in TB is associated with various socioeconomic factors such as poverty (Leung et al., 2014), poor housing (Dheeraj et al., 2004 and Kennedy et al., 2006) and economic deprivation (Van-Lettow et al., 2004; Harries et al., 2008) which lead to poor nutritional status and impaired immune function (Dheeraj et al., 2004; Van-Lettow et al., 2004; Kennedy et al., 2006; and Harries et al., 2008). Nutrition is important for health and functioning of all systems of the body including the immune system. This is because malnutrition weakens the immune system and thus the ability of the individual to fight infection like TB and their ability to control disease progression was compromised (Zachariah et al., 2006). Among the known risk factors for active tuberculosis (malnutrition, HIV infection, diabetes, cancer), malnutrition has the highest population attributable fraction of 27 % (Semba et al., 2010).

According to the study in Uganda by Nambi (2015) to assess the prevalence and factors associated with malnutrition among adult Tuberculosis patients attending the national referral tuberculosis program clinic at Mulago Hospital, it was reported that there was a significant association between malnutrition in TB patients with the patient's HIV status. HIV positive (PR=1.54, 95% CI 1.214, and 1.949), those with unknown HIV status (PR=2.05, 95% CI 1.41, and 2.98) had higher rates of malnutrition. The other factors that

were strongly associated with malnutrition in TB patients were number of meals a day and poor knowledge about proper nutrition (Nambi, 2015).

According to this study (Nambi, 2015), most of the respondents 324(90 %) had awareness about TB. Among the study participants, 259(71.9 %) had pulmonary tuberculosis and 232(64.4 %) were on anti-TB treatment for less than or equal to four weeks. More than half of the respondents 215(58.9 %) were ambulatory by their functional status. Of all participants in this study 59(16.4 %) had eating problem and 80(22.2 %) stated that they felt sadness or depression. Among the participants, 89(24.7 %) of them have had chronic illness, of which 74(83.1 %) were HIV positive. After controlling the other variables, only functional status and dietary counselling was found to be significantly associated with undernutrition. Patients with ambulatory functional status were 2.6 times more likely to develop undernutrition compared to those who have working functional status (AOR = 2.57; 95 % CI = 1.42, 4.68). Patients who had not received dietary counselling were 1.8 times more likely to be undernourished compared with those who had received dietary counselling (AOR = 1.79; 95 % CI = 1.03,3.12) (Nambi, 2015).

According to the study by Madebo and Bernt (2010) in Ethiopia, many patients with TB in Ethiopia were reported to have low functional status when first seen at TB treatment unit. Functional status of the patients was related to their underlying medical condition in which patients with deteriorated functional status could have a compromised health status. This condition was seen to result from reduced intake of food which in turn resulted in malnutrition. This fact was in line with the findings of this study in which those patients with ambulatory functional status were more likely to be undernourished compared to those who had working functional status (Madebo and Bernt, 2010).

Further, in this study (Madebo and Bernt, 2010), patients who did not receive dietary counselling were more likely to be undernourished compared with those who received

dietary counselling. This was because TB patients who had received dietary counselling became more knowledgeable about the dietary issues and they could apply the advices to take adequate quantity and quality of variety of foods. Due to this reason those patients who received dietary counselling tend to be well nourished. In another study (Semba et al., 2010), infection with HIV was significantly associated with malnutrition. Even though TB and HIV infections are both independently associated with undernutrition, co infection with HIV was reported to exacerbate the extent of causing malnutrition (Semba et al., 2010).

Conversely, according to the study by Kassu et al. (2006) in Gondar, the prevalence of malnutrition in adult TB patients co-infected with HIV was 71.6 %, which is higher when compared with the finding of the study 25.9% prevalence among those who didn't have HIV infection. This could be due to the fact that the study in Gondar included high number of TB/HIV co-infected patients who were more exposed to undernutrition because of double burden.

A study conducted in Ghana (Dodor, 2008) showed that income, educational status and family size were factors associated with malnutrition among TB patients. Similarly, in this study (Dodor, 2008), tuberculosis was associated with feeding problems which directly affects the amount of food intake by the patient, just like Paton et al. (2004) reported that eating problems, mainly loss of appetite, nausea and vomiting had significant association with malnutrition among TB patients.

2.4 Experiences of malnourished patients newly diagnosed with TB

Malnutrition among recently diagnosed TB patients possess a serious public health problem (WHO, 2013). The relationship between malnutrition and active tuberculosis infection is bidirectional. Having active tuberculosis leads to loss of weight and being underweight is known risk factor for developing tuberculosis either through the reactivation of latent tuberculosis or the development of progressive primary disease upon infection. Therefore,

malnutrition complicates the health situation of TB patients (Shah et al., 2010). However, beyond the social and economic burdens caused by malnutrition among TB patients, the individual with the double burden of these two days experiences a lot of pain, difficulty, discomfort and distress as a result of the disease and as a result of the social complications which come with the disease, like rejection from the society where the individual stays (Ezekiel et al., 2010; Leung et al., 2014).

According to Dheeraj et al. (2004), tuberculosis causes a great distress to the patients. This distress is attributable to the nature of the disease (TB) as well as the burden caused by poor appetite and poor nutrition status. This is supported by Zachariah et al. (2002) who reported that distress is common among TB patients with malnutrition and is one of the risk factors associated with early death among these patients. These findings are also consistent with Amrutha et al. (2013) who reported TB patients with malnutrition as experiencing distress, depression, and discomfort as a result of frequent bouts of pain, treatment, social exclusion, and inability to feed well.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

This chapter presents the methods, techniques and tools that were applied in the study. It specifically describes the study design, study area, study population, inclusion and exclusion criteria, sample size determination, sampling procedure, research instruments, data collection procedures, data quality control measures, data analysis, ethical considerations, limitations of the study, and dissemination of study results

3.2 Study Design

The study used cross-sectional analytical designs using both qualitative and quantitative approaches. The study was cross sectional because only a portion of the study population was sampled to represent the rest and data collection was carried out at a defined time. This was done because of the researcher's limited time and finances for carrying out the study. It was descriptive because study findings are to be presented by describing occurrence of the study phenomenon and also by using frequencies and percentages. The study was analytical because attempts are to be made to apply data analysis statistical methods to determine the level of **significance of the different factors and malnutrition in newly diagnosed TB patients.**

3.3 Study Area

This study was carried out in Kamwenge District, which is located in Western Uganda. Like most other Ugandan districts, it is named after its 'chief town', Kamwenge, where the district headquarters are located. Kamwenge District is part of the Kingdom of Toro, one of the ancient traditional monarchies in Uganda. The kingdom is coterminous with Toro sub-region, home to an estimated 2 million inhabitants in 2016, according to the national

population and housing census (2016). The district is surrounded by three other districts in the Toro sub-region, and these include Kabarole to the North West, Kyegegwa to the East, and Kyenjojo to the North. It is also bordered by Ibanda District to the South, Kiruhura District to the North East. The district headquarters lies approximately 300 kilometres (190 mi), by road, west of Uganda's capital, Kampala.

The district is majorly rural, comprising of people of low socio-economic standards who mainly practice subsistence farming and rearing of animals. There is a total of 33 health facilities in Kamwenge District, two of them being public Health Centre (HC) IVs. There are 8 public HC IIIs and 2 private-not-for-profit (PNFP) HC IIIs. The rest are 19 public HC IIs and 2 PNFP HC IIs. There are several privately owned clinics and drugs shops (Kamwenge District Health Management Information System [HMIS], 2018). Specifically, the current study was conducted at the ten public health facilities (Bwizi HC III, Rwamwanja III, Rukunyu HC IV, Bunoga III, Bigodi HC III, Kamwenge HC III, Nyabbani HC III, Ntara HC IV, Kicheche HC III, and Mahyoro HC III) and two PNFP facilities (Padre Pio HC III, and Kabuga HC III) which conduct TB diagnosis services. These were considered for this study because they are the places where TB diagnosis and treatment, plus malnutrition diagnosis is done for TB patients.

3.4 Study Population

The study population comprised of persons who are newly diagnosed with TB infection.

3.5 Study Unit

3.5.1 Inclusion Criteria

Participants were included in the after fulfilling the following conditions:

-

B

being a resident of Kamwenge District for at least 6 months prior to the study

- C
consenting in writing to participate in the study
- A
person who was newly diagnosed with TB for the first time

3.5.2 Exclusion Criteria

Those who were not in position to offer information needed in the study were excluded.

3.6 Sample Size Determination

This sample size was determined using the Krejcie and Morgan formula for finite populations (Krejcie & Morgan, 1970).

$$S = \frac{X^2NP(1-P)}{d^2(N-1) + X^2P(1-P)}$$

Where:

S = Required Sample size

X = Z value (e.g. 1.96 for 95% confidence level)

N = Population Size

P = Population proportion (expressed as decimal) (assumed to be 0.5 (50%))

d = Degree of accuracy (5%), expressed as a proportion (.05); It is margin of error

According to Kamwenge District HMIS for FY 2017/2018, there were 276 new cases of TB (newly diagnosed). Therefore, N is 276.

Hence,

$$S = \frac{1.96^2 * 276 * 0.5(1-0.5)}{[0.05^2 * (276-1) + 1.96^2 * 0.5(1-0.5)]}$$

$$S = 161$$

However, during the data collection exercise, only 158 patients were newly diagnosed with TB during. Hence, only these (158) participated in the study. Therefore, the response rate was $158/161 * 100\% = 98.1\%$.

3.7 Sampling Procedure

Sampling was done at the twelve health facilities (HC IIIs and IVs) where TB diagnosis and screening for malnutrition is done among newly diagnosed TB patients. This was done during the data collection period and all newly diagnosed TB patients was considered in the study. Sampling was done during the data collection period of June and July 2019. Among those who were diagnosed with TB, and assessment was done to identify those with malnutrition so as to get the incidence of malnutrition and thereafter the patient's experiences and factors associated with malnutrition in newly diagnosed TB patients.

Study Variables

The study considered both independent and dependent variables. The independent variable were the influencer or determinant variables and are the ones assumed to be associated with malnutrition in newly diagnosed TB patients. The dependent variables on the other hand were the outcomes variables or the results of the independent variables. The other variables were the intervening variables. These were considered to be the background characteristics or demographic factors of respondents. The different variables are summarised in table 1 below:

Table 1: Summary of Study Variables

Independent Variables	Dependent Variables
Background characteristics (age, sex, education level, religion)	
Other factors (marital status, occupation, income,	Observations (body weight, height,

address, number of children, HIV status, source of food, transport means, disease/medical conditions, etc)	MUAC score, temperature, pulse, blood pressure, and respiratory rate)
	Patient experiences with malnutrition and TB

3.8 Data Collection Tools and Procedures

Different tools were used during data collection. These included tools for assessing the factors associated with malnutrition and one for exploring patient experiences. Assessing the factors associated with malnutrition was done using a structured questionnaire. The questionnaire had both open and closed-ended questions and had questions guided by the variables indicated in the conceptual framework. Patient experiences were tracked through an audio-recorded interview using a semi-structured interview guide.

3.9 Data Collection Procedure

It was done in three phases. First, data on incidence was obtained by getting all persons being diagnosed with TB and those being diagnosed with malnutrition. The incidence of malnutrition among newly diagnosed TB patients was determined by dividing the newly diagnosed TB patients with malnutrition by the total number of those being diagnosed by TB (new cases) and then multiplying the answer by 100%. They were then subjected to interviews to explore their experiences and the factors associated with malnutrition in newly diagnosed TB patients.

Data on factors associated with malnutrition in newly diagnosed TB patients was collected through researcher-administered questionnaires in which the interviewer was asking the questions while recording the responses. This was because majority of the respondents were not comfortable reading and writing in English language. Hence, the interviewer was asking

the questions in the local language and recording the responses on the interview tool. The interviews were conducted right after TB diagnosis and was done by the respective clinician at the health facility. Hence, the research assistants in this study was the thirteen clinicians at the respective facilities (one per facility) participating in the study.

Data on experiences with malnutrition among newly diagnosed TB patients was obtained through in-depth interviews of one person per study site. Hence, 12 in-depth interviews were conducted, and it was done using an interview guide.

3.10 Data Quality Control Measures

Quality control measures included measures for ensuring validity and reliability of research instruments, as well as the training of research assistants. This was done before data collection exercise.

Validity

To measure validity, the study questionnaire was given to the research supervisor to assess the suitability of all questions in obtaining relevant data for the study.

Reliability

For this study, reliability was ensured by standardizing the questionnaire through pre-testing it. The questionnaire and interview guide were pre-tested on 10 newly diagnosed TB patients with malnutrition at the nearby Kyabenda HC III in the same district. This was aimed at finding out whether the questions were understandable and un-ambiguous, so as to help in obtaining the relevant data from clients.

Training of Research Assistants

The research assistants in the study comprised the clinicians who were conducting malnutrition diagnosis among the newly infected TB patients. To ensure they understood

their role in the data collection process, the research assistants were subjected to a one-day training which was conducted by the principal researcher. The training emphasized how to identify and select the study respondents and how to conduct the interviews using the questionnaire.

3.11 Data Entry, Analysis and Presentation

After collection, quantitative data was sorted and edited, and then entered into the computerized statistical package for social scientists (SPSS) version 20. Different statistical methods were used, namely, descriptive and inferential statistical methods. Analysis was done by use of descriptive statistics of frequency and percentages. Univariate and bivariate analysis was done for the different factors that are associated with malnutrition among newly diagnosed TB patients. Thereafter, factors that shall showed association at bivariate analysis were subjected to multivariate analysis. The significant level for all statistical analyses was set at $p \leq 0.05$. Data on experiences was analyzed qualitatively by content thematic analysis basing on emerging themes.

3.12 Ethical Considerations

After approval of the study proposal, an introductory letter was obtained from the University administration. This was presented to the district health officer of Kamwenge District for the researcher to obtain permission for carrying out the study. Written clearance was also be obtained for the participating health facilities. Further, written informed consent was obtained from the respondents before enrolling them into the study. This was after explaining to them the objectives of the study and responding to their expectations. They were assured of confidentiality of their opinions and responses, the reason why their name not be required. They were assured that participating in the study would not at all affect the services they were to receive from the health facility, and that participation was at free will,

without any compulsion. They were also informed of their right to withdraw from the study at any stage if they wished so.

3.13 Limitations of the Study

There were some limitations with the study. One of such limitations was that the study targeted patients for the selected period of data collection. However, this might not be a representative sample since there might be seasonal variations in TB and malnutrition diagnosis trends in the district which could be changing from time to time.

3.14 Plan to disseminate results

Approved findings from the study will be disseminated as follows:

- i. A
written report was submitted to Uganda Martyrs' University
- ii. C
copies of the report was shared with Kamwenge District Health Office
- iii. F
urther, study findings shall be shared during presentations at scientific conferences, at Kamwenge District Health Team and Health Management Team meetings, and with partners who might be interested in supporting interventions for preventing malnutrition in TB patients.

CHAPTER FOUR

RESULTS

4.1 Introduction

This study was conducted among 158 newly diagnosed TB patients at ten public and two PNFT health facilities in Kamwenge District, to ascertain the burden and explore the factors associated with malnutrition in the newly diagnosed TB patients in Kamwenge District. Specifically, the study determined the incidence of malnutrition, associated factors, and experiences of malnutrition among newly diagnosed TB patients. Table 2 shows participants per health facility.

Table 2: Number of Newly Diagnosed TB Patients Per Health Facility

Health Facility	Frequency (n = 158)	Percent (%)
Biguli HC III	21	13.3
Mahyoro HC III	20	12.7
Rukunyu HC IV	19	12
Rwamwanja HC III	19	12
Bigodi HC III	15	9.5
Kabuga HC III	18	11.4
Ntara HC IV	11	7
Nyabbani HC III	5	3.2
Kicheche HC III	4	2.5
Kamwenge HC III	10	6.3
Padre Pio HC III	10	6.3
Bwizi HC III	6	3.8
Total	158	100

According to the summary of results in table 2 above, majority of study participants, 21(13.3%) were at Biguli HC III and the least, 4(2.5%) were from Kicheche HC III.

4.2 Socio-Demographic Characteristics of Respondents

The relevant socio-demographic characteristics considered in this study were: age, gender, education level, religion, and others.

Table 3: Socio-Demographic Characteristics of Respondents

Characteristic	Frequency (n=158)	Percent (%)
Age (Years)		
Less than 18	5	3.2
18 – 25	70	44.3
26 – 30	50	31.6
31 – 40	26	16.5
Older than 40	7	4.4
Gender		
Male	80	50.6
Female	78	49.4
Education Level		
None	16	10.1
Primary	68	43
Secondary	66	41.8
Tertiary	8	5.1
Religious Affiliation		
Roman Catholic	72	45.6
Protestant/Anglican	43	27.2
Muslim	27	17.1
Others	16	10.1
Marital Status		
Married	127	80.4
Not married	31	19.6
Occupation		
None	51	32.3
Peasant	89	56.3
Salaried employment	18	11.4
Income		
Less than 50,000	28	17.7
50,000 – 100,000	60	38
More than 100,000	21	13.3
None	49	31
Number of children		
4 or less	112	70.9
5 or more	46	29.1
Home Setting		
Village settings	122	77.2
Urban setting	36	22.8

According to the summary of results in table 3 above, majority of study participants, 70(44.3%) were aged 18-25 years, and the least, 5(3.2%) were those less than 18 years age. Slightly more than a half, 80(50.6%) were male. Majority, 68(43.0%) were of primary education level, and the least, 8(5.1%) were those of tertiary education level. According to religious affiliation, majority, 71(45.6%) belonged to the Roman Catholic religion, and the least, 16(10.1%) belonged to the religious groups of Pentecostal, Seventh Day Adventist, and traditional religious groups. Further, majority, 127(80.4%) were married. Slightly more than a half, 89(56.3%) were peasants, and the least, 18(11.4%) had salaried employment. Majority, 60(38.0%) were earning 50,000 – 100,000/- and the least, 28(17.7%) were earning less than 50,000/-. Majority, 112(70.9%) had 4 or less number of children, and majority, 122(77.2%) were staying in village settings.

4.3 Non Socio-Demographic Characteristics of Respondents

The study considered a number of non socio-demographic factors that are likely to be associated with malnutrition among newly diagnosed TB patients. Tables 5 below shows the summary of findings in line with non socio-demographic characteristics of respondents.

According to the summary of results in table 4below, majority of study participants, 102(64.5%) had 5 or more people in their homes. For majority of them, 82(51.9%) the breadwinner at their homes was a different person. Most of them, 122(77.2%) were staying with their spouses. Majority of them, 89(56.3%) didn't not have means of transport to the health facility, and more than three quarters half of them, 120(75.9%) had challenges accessing food for home consumption. Further, more than three quarters of them, 124(78.5%) of them were HIV positive. Some of them, 20(12.7%) had malaria, but majority of them, 138(87.3%) didn't have any other medical conditions.

Table 4: Non Socio-Demographic Characteristics of Respondents

Factor	Frequency (n = 158)	Percent (%)
Number of People at Home		
4 or less	56	35.4
5 or more	102	64.5
Bread Winner at Home		
Self	76	48.1
Another person	82	51.9
Stays with spouse		
Yes	122	77.2
No	14	8.9
Not Applicable	22	13.9
Has Transport Means to Health Facility For Treatment		
Yes	69	43.7
No	89	56.3
Has Challenges Accessing Food		
Yes	120	75.9
No	38	24.1
HIV Sero Status		
Positive	124	78.5
Negative	34	21.5
Has other medical conditions		
Yes	20	12.7
No	138	87.3
Type of medical condition		
Malaria	20	12.7
No medical condition	138	87.3

4.4 Incidence of malnutrition among newly diagnosed TB patients in Kamwenge District

The nutritional status of study participants was assessed by taking their MUAC measurements using the MUAC tape. The study found that almost all respondents, 144(91.1%) were malnourished as they had a MUAC value of ≤ 23 cm. Only 14(8.9%) of them had a MUAC value greater than 23cm and were therefore not malnourished (Figure 2).

4.5 Factors Associated with Malnutrition in Newly Diagnosed TB Patients

To achieve this, the investigated socio-demographic and non socio-demographic factors were subjected to Pearson Chi square (χ^2) tests so as to identify the factors that were significantly associated with malnutrition in newly diagnosed TB patients. Thereafter, Logistic linear regression and cross tabulation was used in the final model to identify the level of influence of the factors associated with the choice of delivery place. Tables below 5 and 6 show the summary of findings.

Basing on Chi-square (χ^2) analysis, the only socio-demographic factors that were significantly associated with malnutrition in newly diagnosed TB patients were gender (p=0.000), marital status (p=0.030), occupation (p=0.000), income (p=0.000), and home setting (p=0.000). However, on subjecting to bivariate analysis based on Crude Odds Ratios (COR), none of the socio-demographic factors was significantly associated with malnutrition among newly diagnosed TB patients (Table 5).

Table 5: Bivariate Analysis of Socio-Demographic Factors Associated with Malnutrition in Newly Diagnosed TB Patients

Factor	Nutrition Status		χ^2	df	COR	95% CI		p-value
	Malnourished Freq. (%)	Not malnourished Freq. (%)				L	B	
Age (in years)								
≤25	67(46.53)	8(57.14)	0.577	1	1.657	(0.226-1.462)		0.229
>25	77(53.47)	6(42.86)						
Gender								
Male	73(50.69)	7(50.00)	0.002	1	0.973	(0.325-2.914)		0.066
Female	71(49.31)	7(50.00)						
Education Level								
None	13(9.0)	3(21.4)	2.156	1	2.214	(0.472-1.969)		1.009
Has some education	90(91.00)	11(78.6)						
Religion								
Roman Catholic	63(43.75)	9(64.29)	2.169	1	1.876	(0.678-2.175)		1.420
Other Religions	81(56.25)	5(35.71)						
Marital status								
Married	115(79.86)	12(85.71)	0.277	1	1.513	(0.321-7.138)		0.030
Not married	29(20.14)	2(14.29)						
Occupation								
None	47(32.64)	4(28.57)	0.097	1	2.196	(1.214-2.109)		0.114
Has occupation	97(67.36)	10(71.43)						
Income								
Has some income	99(68.75)	10(71.43)	0.043	1	1.361	(0.338-3.818)		0.072
Has no income	45(31.25)	4(28.57)						
No. of Children								
≤4	101(70.14)	11(78.57)	0.440	1	1.252	(0.764-2.109)		0.126
5 or more	43(29.86)	3(21.43)						
Home setting								
Village	111(77.08)	11(78.57)	0.160	1	0.917	(0.242-3.484)		0.061
Urban	33(22.92)	3(21.43)						

***p < 0.05**

Table 6: Bivariate Analysis of Non Socio-Demographic Factors Associated with Malnutrition in Newly Diagnosed TB Patients

Factor	Nutrition Status		χ^2	df	COR	95% CI L B	p-value
	Malnourished Freq. (%)	Not malnourished Freq. (%)					
No. of people at home							
≤4	49(34.03)	7(50.00)	1.423	1	1.671	(0.778-1.428)	0.810
5 or more	95(65.97)	7(50.00)					
Bread winner							
Self	68(47.22)	8(57.14)	0.503	1	3.134	(1.001-1.628)	0.184
Another person	76(52.78)	6(42.86)					
Stays with spouse							
Yes	109(75.69)	13(92.86)	2.136	1	2.356	(0.769-2.009)	1.272
No	35(24.31)	1(7.14)					
Has transport means							
Yes	61(42.36)	8(57.14)	1.133	1	1.783	(0.817-1.889)	0.612
No	83(57.64)	6(42.86)					
Has challenges accessing food							
Yes	109(78.47)	11(78.57)	0.058	1	2.771	(0.311-4.461)*	0.000*
No	35(21.53)	3(21.43)					
HIV sero status							
Positive	113(78.47)	13(92.86)	0.000	1	4.006	(0.264-3.830)*	0.000*
Negative	31(21.53)	3(7.14)					
Has other medical conditions							
Yes	18(12.50)	2(14.29)	0.037	1	1.167	(0.241-5.643)	0.059
No	126(87.50)	12(85.71)					
Type of medical condition							
Malaria	18(12.5)	2(14.29)	0.037	1	2.341	(1.121-2.991)	0.052
None	126(87.50)	12(85.71)					

***p < 0.05**

According to study results in Table 6 above, Basing on Chi-square (χ^2) analysis, the only non socio-demographic factors that were significantly associated with malnutrition in newly diagnosed TB patients were challenges accessing food (p=0.000), HIV sero status (p=0.000), having other medical conditions (p=0.000), and type of medical condition (p=0.000). Further, on subjecting to bivariate analysis based on COR, challenges accessing food for home consumption (COR = 1.771, 95% CI = 0.311 - 4.461, p = 0.008) and HIV sero status (COR = 3.006, 95% CI = 0.264 - 3.830, p = 0.003) were the only non socio-

demographic factors that were significantly associated with malnutrition among newly diagnosed TB patients were: (Table 7). This is an implication that having challenges accessing food and positive HIV sero status were about three and four times respectively associated with malnutrition among newly diagnosed TB patients.

4.6 Multivariate Analysis of Factors Influencing Malnutrition in Newly Diagnosed TB Patients

The significant variables after Logistic linear regression were further subjected to multivariate analysis to get the Adjusted Odds Ratios (AOR) and corresponding 95% CI.

Table 7: Multivariate Analysis of Factors Influencing Malnutrition in Newly Diagnosed TB Patients

Factor	Nutrition Status		COR (CI; 95%)	AOR (CI; 95%)
	Malnourished Freq. (%)	Not Malnourished Freq. (%)		
Gender				
Has challenges accessing food				
Yes	9(75.69)	1(78.57)	2.771(0.311-4.461)** 1	1.849(0.224-3.218)*
No	3(24.31)	3(21.43)		
HIV sero status				
Positive	3(78.47)	3(92.86)	4.006(0.264-3.830)** 1	1.993(0.261-3.782)*
Negative	3(21.53)	3(7.14)		







*p < 0.05 **p < 0.01 RC = 1

According to study results in Table 7 above, basing on multivariate analysis, the only factors that were significantly associated with malnutrition among newly diagnosed TB patients on bivariate analysis were also found to be significant even at multivariate analysis, as follows: challenges accessing food for home consumption (AOR = 1.849, 95% CI = 0.224-3.218, p = 0.02) and HIV sero status (AOR = 1.993, 95% CI = 0.261-3.782, p = 0.001). This is in an implication that having challenges accessing food and positive HIV sero status were both about two times associated with malnutrition among newly diagnosed TB patients.

4.7 Experiences of malnourished patients newly diagnosed with TB

Objective four of the study was to examine the experiences of malnourished patients newly diagnosed with TB. To this, participants were asked to describe what life had been like as a result of having TB disease and malnutrition. They were requested to give both positive and negative experiences. Eleven of them shared their experiences. However, from analysis of findings, there were more negative than positive experiences associated with malnutrition among patients with newly diagnosed TB disease. In summary, their experiences are categorized into two theme, as indicated in Table 9 below:

Table 8: Themes and Categories that Emerged from Experiences of Participants

Theme	Categories
Positive Experience	 Handling by Health Workers Good
	 Treatment Access
	 Health Improved
Negative Experience	 challenges Physiologic
	 challenges Social
	 treatment Effects

Theme One: Positive Experiences

Some participants reported some positive experiences. This theme emerged from three categories, namely: good handling by health workers, access to treatment, and improved health.

Category 1: Good Handling by Health Workers

Some participants reported positive experiences as a result of the way they are handled by health workers when they go to receive treatment. This is evidenced from their quotes:

“Health workers have handled me well” (Respondents 3, 4 and 6)

“Health workers have taken good care of me” (Respondents 1 and 7)

Category 2: Access to Treatment

Some participants reported positive experiences in line with ease of access to treatment.

This is evidenced from the quote:

“I have been able to get the treatment at the health centre” (Respondents 2, 4, 5, 7, 9, 10 and 11)

Category 3: Improved Health

Some participants reported improvement in health, as can be observed in their quotes below:

“My health has improved due to treatment” (Respondents 1, 2, 4 and 6)

Theme Two: Negative Experiences

Most participants reported negative experiences in regard to malnutrition among newly diagnosed TB patients. This theme emerged from three categories, namely: physiological challenges, social challenges, and effects of treatment

Category 1: Physiological Challenges

Some participants reported physiological challenges such as loss of appetite and body weakness as a result of the disease(s). This is evidenced from their quotes:

“I have lost appetite for food” (Respondents 2, 4, 6 and 8)

“I have general body weakness” (Respondents 3, 5,8, 9 and 11)

“I have lost weight.....” (Seven participants)

Category 2: Social Challenges

Some participants experienced social challenges, as can be observed in their quotes below:

“my wife wants to leave me because she fears that I will transmit TB to her” (Respondent 1)

“I don’t get adequate support from my family.....” (Respondents 2, 6 and 7)

“the community isolates me because they fear that I will transmit TB to them...” (Respondents 1)

“....my wife wants to leave me because she fears that I will transmit TB to her” Respondents 3 and 6)

“I can’t cater for family’ needs” (Respondents 1, 3, 4, 6, 7 and 8)

“I am not able to meet needs like food, clothing, and money to for transport to the health facility.....” (Respondent 8)

“I separated with my wife because of the disease” (Respondent 7)

“Life has been bad due to sickness” (Respondents 1, 3, 4, 6, 7, 8 and 9)

Category 3:Effects of treatment

Some participants experienced challenges related to the medicines they were taking, as can be observed in their quotes below:

“I am taking a lot of drugs, which is a challenging.....” (Respondents 3, 4, 7 and 9)

“The drugs make me weak” (Respondents 2, 3, 5, 7, 8 and 9)

Summary of Key Findings

The study studied a number of factors that were considered to be associated with malnutrition among newly diagnosed adult tuberculosis patients in in Kamwenge District. However, on multivariate analysis, only two factors were found to have strong influence on malnutrition among newly diagnosed TB patients as follows, and these were: challenges accessing food for home consumption (AOR = 1.849, 95% CI = 0.224-3.218, p = 0.02) and HIV sero status (AOR= 1.993, 95% CI = 0.261-3.782, p = 0.001). This is in an implication that having challenges accessing food and positive HIV sero status were both about two

times associated with malnutrition among newly diagnosed TB patients. Further, the study found that newly diagnosed TB patients had negative experiences related to physiological challenges, social challenges, and effects of treatment. Nonetheless, some of them reported positive experiences such as good handling by health workers, access to treatment, and improved health.

CHAPTER FIVE

DISCUSSION, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter presents the discussion, summary, conclusion, and recommendations from the major findings of the study.

5.2 Discussion

5.2.1 Incidence of Malnutrition

According to the study results, almost all, 144(91.1%) of the study participants were malnourished. This was probably because the TB diseases affected their food intake thereby affecting their nutrition status. However, this is not unique as the USAID (2011) also reported that some adult TB patients suffer from malnutrition globally, but more so in developing countries. However, the 91.1% rate in the current study is much higher than the 77.9% rate in reported by Madebo and Bernt (2010) and the 25% rate global incidence reported by WHO (2013). Nonetheless, the higher incidence in the current study can probably be attributed to the high level of malnutrition in Uganda, which probably makes it easier for TB patients to become malnourished.

It can also probably be related to the fact that the Madebo and Bernt (2010) involved both newly diagnosed TB patients and those on treatment, and due to the fact that both the Madebo and Bernt (2010) and WHO (2013) studies were conducted in different study settings and involving large sample sizes. The differences in sample study settings and sizes could have contributed to the differences in findings.

5.2.2 Factors Associated with Malnutrition

According to study results, basing on logistic linear regression the only factors that significantly influenced malnutrition among newly diagnosed TB patients were: challenges accessing food for home consumption (COR = 1.771, 95% CI = 0.311 - 4.461, p = 0.008) and HIV sero status (COR = 3.006, 95% CI = 0.264 - 3.830, p = 0.003). Similarly, when subjected to a multivariate analysis, both challenges accessing food for home consumption (AOR = 1.849, 95% CI = 0.224-3.218, p = 0.02) and HIV sero status (AOR = 1.993, 95% CI = 0.261-3.782, p = 0.001) were both about two times associated with malnutrition among newly diagnosed TB patients. These findings are supported by Semba et al. (2010) who reported on logistic linear regression analysis that factors such as gender, marital status, occupation, income, home setting, and other medical conditions were not found to significantly influence malnutrition among TB patients, and only poor access to food and HIV sero status showed significant relationship with malnutrition among TB patients. However, the above study findings differ from the study in Ghana by Dodor (2008) which showed income, educational status and family size, and a number of other similar factors to have strong influence in causing malnutrition among TB patients.

5.2.3 Experiences with Malnutrition

In the current study newly diagnosed TB patients with malnutrition reported experiences such as physiological challenges, social challenges, and effects of treatment. Probably this was because TB causes serious body changes, which contributes to physiological challenges. Further, it could be due to stigma attached to TB disease, thereby causing the social challenges, and also the treatment requiring the person to take several tablets over a long period of time, hence the negative experience associated with effects of treatment. However, similar experience has been reported by other studies. For example, Ezekiel et al. (2010) and Leung et al. (2014) reported that TB patients with malnutrition experience

social, physiological and disease-related challenges such as pain, difficulties, discomfort and distress, as well as isolation from the societies where they stay.

Further, Dheeraj et al. (2004), Zachariah et al. (2002) and Amrutha et al. (2013) indicated that TB patients with malnutrition experience distress, depression, and discomfort as a result of frequent bouts of pain, treatment, social exclusion, and inability to feed well. However, in the current study, some participants reported positive experiences such as good handling by health workers, access to treatment, and improved health. Probably this can be attributed to improvements in health care provision, as has been indicated by the report by WHO (2018). The improvement in healthcare provision could probably have contributed to these patients good healthcare worker handling and increased access to treatment, which could have led to improvement in their health.

5.3 Conclusion

According to the study, the incidence of malnutrition among newly diagnosed TB patients in Kamwenge District is very high at 91%, an indication that newly diagnosed TB patients in this district are at a very high risk of malnutrition. However, this is strongly influenced by one socioeconomic factor of having challenges in accessing food, and one medical factor of being co-infected with the Human Immune Virus. Sero status. Further, newly diagnosed TB patients in Kamwenge District have negative experiences related to physiological and social challenges caused by the disease, and the negative effects of treatment/drugs. Albeit this however, some of them have positive experiences such as good handling by health workers, access to treatment, and improved health as they take their medicines aimed at combating TB and the other co-morbidities.

5.4 Recommendations

Basing on the study findings, the researcher hereby makes the following recommendations to improve the plight of newly diagnosed TB patients with malnutrition:

Health Department, Kamwenge District

1. Should ensure that the health facilities in the district are well stocked with all relevant medicines and other supplies for combating malnutrition among newly diagnosed TB patients, considering that majority of them are malnourished.
2. Should ensure that the health facilities in the district are well equipped to combat HIV because it is strongly associated with malnutrition among newly diagnosed TB patients.
3. Should advocate for improved availability of food at household level as challenges in accessing food was implicated in malnutrition among newly diagnosed TB patients.

Political Leadership, Kamwenge District

1. Should mobilize communities to participate in activities for combating TB, HIV and malnutrition in TB disease.
2. Should mobilize communities to engage in food production to increase access to food, especially among newly diagnosed TB patients
3. Should mobilize communities and participate in sensitization activities aimed at improving support for patients with TB, especially in combating stigma associated with TB.

Health Workers

1. Should play an active role in sensitizing communities about improving support for patients with TB, especially in combating stigma associated with TB.
2. Should ensure to provide counseling support to newly diagnosed TB patients with malnutrition especially concerning the burden associated with taking their TB

treatment and in regard to the physiological burdens that are associated with malnutrition in TB.

Ministry of Health

1. Should improve the supply of medicines and other items required for proper management of HIV which is associated with TB

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APPENDICES

APPENDIX I: RESPONDENT CONSENT FORM

Background

My name is AKANKWASA HENRY, a Master's student from Uganda Martyrs' University, hereby carrying out a study to ascertain the burden and explore the factors associated with malnutrition in the newly diagnosed TB patients in Kamwenge District. The aim of this study is to help the researcher fulfil the requirements for the award of a Masters' Degree.

Confidentiality

The information you provide was treated with strict confidentiality, your name not be recorded anywhere, and your specific identifier not appear in the report that was generated. Questionnaires is anonymous, and data is securely kept.

Voluntary participation

Taking part in this study is entirely voluntary. If you decide not to take part, no accusation was made against you at all. If you agree to take part in this study, you was contributing to the national effort of prevention of malnutrition in newly diagnosed adult TB patients. It is therefore important that you participate although you are free to decline. If you agree to participate, you was asked to sign this consent form.

DECLARATION AND SIGNATURE

I hereby **ACCEPT** to take part in this study on **“FACTORS ASSOCIATED WITH MALNUTRITION AMONG NEWLY DIAGNOSED ADULT TUBERCULOSIS PATIENTS IN KAMWENGE DISTRICT”**

Thumbprint/Signature of respondent

Date.....

Signature of interviewer.....Date.....

Contact information

If you have any questions regarding this study, call the Principal Investigator; AKANKWASA HENRY on Tel: 0772327529/0751066948. If you have any issues pertaining to your rights and participation in the study please contact the Chairperson of the Institutional Review Board, University Martyrs' University, Or the Uganda National Council of Science and Technology, on plot 6 Kimera Road, Ntinda, Kampala, Tel 0414 705 500.

APPENDIX II: STUDY QUESTIONNAIRE

**Research Title: FACTORS ASSOCIATED WITH MALNUTRITION AMONG
NEWLY DIAGNOSED ADULT TUBERCULOSIS PATIENTS IN KAMWENGE
DISTRICT**

S/N	Question	Response	Response Code
Section A: Background Characteristics			
[1]	How old are you (in complete years)	Less than 18 (1) 18 – 25 (2) 26 – 30 (3) 31 – 40 (4) Older than 40 (5)	
[2]	Gender	Male (1) Female (2)	
[3]	What is your highest level of formal education?	None (1) Primary (2) 'O' Level (3) 'A' Level (4) Tertiary (5)	
[4]	What is your religion?	Roman Catholic (1) Protestant/Anglican (2) Muslim (3) Other (specify)	
Section A: Factors associated with malnutrition in newly diagnosed TB patients			
[5]	What is your marital status?	Married (1) Never married (single) (2) Divorced/Separated (3)	

		Widowed (4)	
[6]	What is your occupation?	Peasants(1) Salaried employment (2)	
[7]	What is your average income per month (in Uganda Shillings)?	Less than 50,000 (1) 50,000 – 100,000 (2) More than 100,000 (3) None (4)	
[8]	How many children do you have?	4 or less (1) 5 or more (2)	
[9]	Where do you stay?	Village settings (1) Urban setting (2)	
[10]	How many people are in your household?	4 or less (1) 5 or more (2)	
[11]	Who is bread winner at home?	Self (1) Spouse (2) Another person (specify)	
[12]	Are you staying with your spouse?	Yes (1) No (2)	
[13]	Has means of transport to the health facility for treatment	Yes () No ()	
[14]	Do you have challenges in accessing food for human consumption?	Yes (1) No (2)	
[15]	If yes in [14] above, please explain why or how?		
[16]	What is your HIV status?	Positive (1) Negative (2)	
[17]	Do you have any other disease or medical condition?	Yes (1)	

		No (2)	
[18]	If your answer is yes in [17] above, which disease/medical condition is that?		

Thanks For Your Time and For Participating In The Study

APPENDIX III: OBSERVATION CHECKLIST

Checklist for MUAC Results

No.	MUAC score	Comment

APPENDIX IV: INTERVIEW GUIDE

Dear respondent, I am AKANKWASA HENRY, a Master's student from Uganda Martyrs' University, hereby carrying out a study to ascertain the burden and explore the factors associated with malnutrition in the newly diagnosed TB patients in Kamwenge District. Thank you for accepting to participate in this study. I have already interacted with you, asking some questions regarding the factors that could be associated with malnutrition in newly diagnosed TB patients. In this second part of the interview, I would like you to share your experiences in regard to malnourished in newly diagnosed TB disease.

Section A: Background Information

Gender: _____

Age: _____

Education level: _____

Section B: Experiences of malnourished patients newly diagnosed with TB

Guiding questions:

Please describe what life has been like as a result of having TB disease and malnutrition?*(Are there some positive experiences you can talk about? If yes, please describe them. What are some of the negative or bad experiences you have had as a result of your malnutrition condition in newly diagnosed TB disease?)*

**APPENDIX V: MAP OF UGANDA SHOWING LOCATION OF
KAMWENGEDISTRICT**



Location of Kamwenge District

APPENDIX VI: AUTHORIZATION LETTER

Uganda
Martyrs
University



Making a difference

Faculty of Health Sciences
Email: health@umu.ac.ug
13th May, 2019

The Responsible Officer

RE: INTRODUCING MR. AKANKWASA HENRY

This is to introduce to you MR. AKANKWASA HENRY Reg. No. 2017-M272-20005 who is a postgraduate student in the Faculty of Health Sciences at Uganda Martyrs University. He is pursuing a programme leading to the award of Master of Public Health- Population and Reproductive Health. He is currently on research for his dissertation on the topic:

“FACTORS ASSOCIATED WITH MALNUTRITION AMONG NEWLY DIAGNOSED ADULT TUBERCULOSIS (TB) PATIENTS IN KAMWENGE DISTRICT”

The topic and protocol have been approved by the relevant university authorities.

Any assistance rendered to him in this respect will be highly appreciated by the university.

Yours sincerely,

Dr. Juliet Ndirizza
Dean,
Faculty of Health Sciences,
Uganda Martyrs University

Team Kamwenge
Award this Researcher all the necessary support.
 District Health Office
KAMWENGE
24/5/2019