KIBOGORA POLYTECHNIC

FACULTY OF HEALTH SCIENCES

DEPARTMENT OF GENERAL NURSING

ASSESSMENT OF PREVALENCE AND ASSOCIATED RISK FACTORS OF MALNUTRITION AMONG UNDER-FIVE YEARS OLD CHILDREN IN MURAMBI CELL, RWAMAGANA DISTRICT.

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A Research Paper submitted in partial fulfillment of the requirements for the Bachelor's degree with honor in General Nursing in KIBOGORA Polytechnic.

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Kibogora, June 2023

DECLARATION by the Candidates

I… **MUGISHA NDANYUZWE Charles & MUHORAKEYE Saïdate**… hereby declare that this is my own original work and not a duplication of any similar academic work. It has therefore not been submitted to any other institution of higher learning. All materials cited in this paper which are not my own have been duly acknowledged.

MUGISHA NDANYUZWE Charles

Signed.....

Date.....

MUHORAKEYE Saïdate

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Date.....

Declaration by the Supervisor

I declare that this work has been submitted for examination with my approval as KP Supervisor

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ABSTRACT

Background: Malnutrition is a pathological state resulting from a relative or absolute deficiency or excess of one or more essential nutrients. According to World Health Organization, globally child malnutrition is major health issue with different public consequences especially for children survival, damaging the mental and physical development of children as well as the economic productivity of individual and even of societies. Malnutrition covers 50% of all child deaths and 11% of the total global disability. Rwanda has a prevalence of malnutrition among children under five years (~32.4%) and 33.9% in Rwamagana District where Murambi cell is located. As the Rwanda Demographic and Health Survey 2021-22 reported, the prevalence of malnutrition remains high, and there is still a need for more intensive interventions.

Aim of study: The aim of this study was to assess the prevalence of malnutrition, and the risk factors contributing to malnutrition among children under five years old in Murambi cell.

Methods: The current study is a cross sectional survey to assess the prevalence of malnutrition and identify risk factors contributing to malnutrition in children under five years.

In order to achieve these objectives, a non-probability convenient purposive sampling was used by assessing 94 children residing in Murambi Cell and interviewing their parents.

Results: This study reveals that the prevalence of malnutrition in Murambi cell is 34.5%. Significant risk factors associated with malnutrition among children under five were found namely child's age, maternal occupation, economic status of households, low birth weight, small number of daily meals taken, child illness, place of delivery, vaccination and source of drinking water, all above mentioned risk factors their p-value were less than 0.05.

Conclusion: The study concludes that prevalence of malnutrition in Murambi cell is 34.5%. Rwanda Demographic and Health Survey 2019-2020 says the country's malnutrition level is at 32.4 %. The study has also concluded that, in Murambi cell, the main associated factors with malnutrition among children under five years were maternal occupation, economic stutus of the households, education levels of the mother, child breastfeeding habits in the first six months, and marital status of the mother. Much effort from the Government of Rwanda and stakeholders should be focused on malnutrition reduction, nutrition programs addressing undernutrition among under-five years old children must continue and be expanded to include policies to prevent malnutrition.

DEDICATION

I, **MUGISHA NDANYUZWE Charles**, dedicate this work to my late mother NYIRARWAKA Thamar and RWIHANIZA Jonas. I also dedicate this work to Emmanuel, Richard, Frank, Aline and Jacques' families, thank you for your support, without your encouragement, I would not have achieved this.

DEDICATION

I, **MUHORAKEYE Saidate**, dedicate this work to my parents, my lovely husband and my children. I also dedicate this work to my close families thank you for your support, without your encouragement, I would not have achieved this.

ACKNOWLEDGEMENT

I, **MUGISHA NDANYUZWE Charles**, would like to thank God the Almighty for giving me time, strength and courage to do this work. I express my sincere thanks and gratitude to the Administration of KIBOGORA Polytechnic for providing me with knowledge and skills and to the Rotary Club of Preston Guild for support and encouragement in my career progression.

I also, wish to express my great appreciation and special gratitude to my supervisor TUYISENGE Francine for her great effort, guidance, and motivation throughout this study. Other special thanks to my father Rwihaniza Jonas and late mom Nyirwarwaka Thamar and big brothers for their invaluable support and encouragement throughout my study.

Finally, I express my thanks to all those who have contributed to the success of this work. May God bless you all.

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I, **MUHORAKEYE Saidate**, would like to thank God the Almighty for giving me time, strength and courage to do this work. I express my sincere thanks and gratitude to the Administration of KIBOGORA Polytechnic for providing me with knowledge and skills.

I also, wish to express special gratitude to my supervisor TUYISENGE Francine for her flexibility, input, and motivation throughout this study. Other special thanks to my husband and children who have stood with me, and for their invaluable support throughout my study.

I also want to express my thanks to all those who have contributed to the success of this work.

LIST OF TABLES

Table 1: Demographic characteristics of respondents 21
Table 2: Bivariate analysis: Malnutrition among under five Year's children and different sociodemographic factors. .....**Error! Bookmark not defined.**
Table 3::bivariate analysis: Association between factors and malnutrition among under five years' children..... 24

LIST OF FIGURES

Figure 1: Conceptual framework 13

LIST OF ACCRONYMS AND ABBREVIATIONS

BMI: Body Mass Index

CFSVANS: Comprehensive Food Security and Vulnerability Analysis and Nutrition Survey

MUAC: Middle Upper Arm Circumference

NISR: National institute of statistics of Rwanda

RDHS: Rwanda Demographic and Health survey

UN: United Nations

UNICEF: United Nations International Children's Emergency Fund

WHO: World Health Organization

MINAGRI: Ministry of Agriculture and Animal Resources

LIST OF APPENDENCES

Appendix 1: recommendation letter from kibogora polytechnic .....a
Appendix 2: check list to diagnose malnutrition in children ..... b

Appendix 3: consent form from parents of children c
Appendix 4: Questionnaire ..... d
Appendix 5: questionnaire in kinyarwanda` ..... f

TABLE OF CONTENTS

DECLARATION BY THE CANDIDATES I

DECLARATION BY THE SUPERVISOR I

ABSTRACT II

DEDICATION III

ACKNOWLEDGEMENT IV

LIST OF TABLES V

LIST OF FIGURES VI

CHAPTER ONE: GENERAL INTRODUCTION 1

1. INTRODUCTION 1
1.0 BACKGROUND OF THE STUDY 1
1.1 PROBLEM STATEMENT 3
1.2 PURPOSE OF THE STUDY 3
1.3 OBJECTIVES OF STUDY 4
1.4 RESEARCH QUESTIONS 4
1.5 SIGNIFICANCE OF THE STUDY 4
1.6 LIMITATIONS OF THE STUDY 5
1.7 SCOPE OF THE STUDY 5
1.8 ORGANIZATION OF THE STUDY 5

CHAPTER TWO: LITERATURE REVIEW 6

2.0 INTRODUCTION 6
2.1. DEFINITION OF KEY TERMS 6
2.1.2 PREVALENCE OF MALNUTRITION OF CHILDREN UNDER FIVE YEARS OLD 7

2.1.3 FACTORS CONTRIBUTING TO MALNUTRITION AMONG CHILDREN UNDER FIVE YEARS OLD 8

2.4.1 COMPLICATION OF MALNUTRITION 10
2.4.2. SITUATION OF MALNUTRITION IN RWANDA 10

CHAPTER THREE: RESEARCH METHODOLOGY 14

3.0 INTRODUCTION 14
3.1. RESEARCH APPROACH 14
3.1 RESEARCH DESIGN 14
3.2 RESEARCH SETTING 14
3.3 STUDY POPULATION 14
3.4 TARGET POPULATION 15
3.4.1 INCLUSION CRITERIA 15
3.4.2 EXCLUSION CRITERIA 15
3.6 SAMPLE SIZE 15
3.7. SAMPLING TECHNIQUE 15
3.8 DATA COLLECTION METHOD 17
3.9 VALIDITY AND RELIABILITY 17
3.10 DATA ANALYSIS PROCEDURES 18
3.11 ETHICAL CONSIDERATION 18

CHAPTER FOUR: RESEARCH FINDINGS AND DISCUSSION 19

4.0 INTRODUCTION 19
4.1 DEMOGRAPHIC CHARACTERISTICS OF RESPONDENTS 19
4.8 DISCUSSION OF FINDINGS 25

CHAPTER FIVE: CONCLUSIONS AND RECOMMENDATIONS 30

5.0 INTRODUCTION 30

5.3 RECOMMENDATIONS 31

5.4 SUGGESTIONS FOR FURTHER STUDY 32

REFERENCE 33

CHAPTER ONE: GENERAL INTRODUCTION

1. INTRODUCTION

This chapter contains the Background of the study, Statement of the problem, Objectives of the study, Research Questions, Significance of the study, Limitation of the study and Scope of the study and organization of the study.

1.0 BACKGROUND OF THE STUDY

Malnutrition among children is one of the most important causes of morbidity and mortality in the world, particularly in developing countries (Tigabu., S. Amsalu and T., 2008.) It is the most important risk factor for the burden of disease causing about 300,000 deaths per year directly or indirectly responsible for more than half of the all deaths in children (S. Amsalu and T. Tigabu, 2008.). Globally, approximately 60 million and 13 million of children are affected with moderate and severe acute malnutrition, respectively. Worldwide reports show that 21.9%, 13.4%, and 7.3% of under five years of age are stunted, underweight, and wasted, respectively. The WHO also estimated that about 5.4 million under-five chil- dren die each year with 2.7 million deaths occurred in Sub- Saharan African countries including Ethiopia (Chesire EJ, Oago ASS, Oteba LP, Echoka E. . , 2008).

The prevalence of stunting has decreased from 58% in 2000 to 44% in 2011 in Ethiopia. The prevalence of wasting is changed from 12% in 2000 to 10% in 2011. The prevalence of underweight has consistently decreased from 41% in 2000 to 29% in 2011. In Tanzania, a high prevalence of underweight (46.0%), stunting (41.9%) and wasting (24.7%) are observed in 2017. In addition, 33% of children are both stunted and underweight, 21% of chil- dren are underweight and wasted, and 12% of children are stunted and wasted. In Ethiopia, more than one- third of a child deaths are associated with malnutrition. Moreover, the proportion of malnutrition is higher among anemic children compared to those of non-ane- mic (Teji K, O'Connor TP, Belachew T, O'Brien NM. , 2016)

Reducing malnutrition among children under the age of five remains a huge challenge in developing countries of the World. An estimated 230 million under-five children are believed to

be chronically malnourished in developing countries (Van de Poel et. al., 2008). Similarly, about 54% of deaths among children of this age group are believed to be associated with malnutrition in developing countries (FAO, 2008). In Sub-Saharan Africa, 41% of under-five children are malnourished and deaths from malnutrition are increasing on daily basis in the region (FAO, 2008). Malnutrition is widespread in Nigeria, especially in the rural areas. This is partly due to inadequate food and nutrient supply. The 2003 Nigeria Demographic and Health Survey revealed that 38% of under-five children in Nigeria are stunted, 29% underweight and 9.2% wasted (Ajieroh, 2010). The 2004 Food Consumption and Nutrition Survey reported similar trends with 42% stunted, 25% underweight and 9% wasted (Ajieroh, 2010). These surveys indicated significant variation between the rural and urban areas with children from rural areas worse affected by malnutrition (C.Bruce, 2007).

Malnutrition among children is one of the most important causes of morbidity and mortality in the world, particularly in developing countries (S. Amsalu, 2010). It is the most important risk factor for the burden of disease causing about 300,000 deaths per year directly or indirectly responsible for more than half of the all deaths in children (M. Alemu, 2019). Globally, approximately 60 million and 13 million of children are affected with moderate and severe acute malnutrition, respectively (M.M. Islam, 2013). Worldwide reports show that 21.9%, 13.4%, and 7.3% of under five years of age are stunted, underweight, and wasted, respectively (M. De Onis, 2018). The WHO also estimated that about 5.4 million under-five children die each year with 2.7 million deaths occurred in Sub- Saharan African countries including Ethiopia (L. Hug, 2017).
Many studies reported the health and physical consequences of child malnutrition include delaying their physical growth and motor development, lower intellectual quotient (IQ), greater behavioral problems, deficient social skills, and susceptibility to contracting diseases. Child malnutrition may also lead to higher levels of chronic illnesses in adult life which may have intergenerational effects, as malnourished females are more likely to give birth to low-weight babies (K. Mengistu, 2013), (H. Darsene, 2017).

The most immediate determinants are inadequate dietary intake and disease which are themselves caused by a set of underlying factors: household food insecurity, poor maternal/child caring practices, and lack of access to basic health services including lack of safe water supply and unhealthy living environment such as open defecation. In turn, these underlying causes themselves

are influenced by economic, political, and sociocultural conditions; national and global contexts; capacity, resources, environmental conditions, and governance (W. Tsedeke, B. Tefera, and M. Debebe, , 2006)

1.1 PROBLEM STATEMENT

Although the problem of malnutrition is still wide in developing countries, in every form, presents significant threats to human health. In 2017, 22.9 per cent, or just under one in four children under age 5 worldwide had stunted growth. That said, overall trends are positive. Between 2000 and 2016, stunting prevalence globally declined from 32.7 per cent to 22.9 per cent, and the number of children affected fell from 198 million to 155 million. In 2016, about one in two stunted children lived in South Asia and one in three in sub-Saharan Africa (UN World, 2017).

In Rwanda, according to Alex MUCUMBITSI (2017) a nutrition officer at the maternal child and community health division at Rwanda Biomedical Centre, malnutrition has been going down over the years. The 2016/17 findings by Rwanda Demographic and Health Survey (RDHS) indicate that all forms of malnutrition have decreased in all the components of stunting, underweight, wasting and anemia. The Survey estimates that cases of underweight are at 9 per cent, stunting at 38 per cent while anemia is 37 per cent (N. ATIENO, 2017).

Children under five years as are still suffering with malnutrition in Murambi cell. As the Rwanda Demographic and Health Survey 2018-19 reported, Rwamagana district where Murambi cell is located, 36.7% of under five years old children have malnutrition, it’s a big number. That’s basically why we’re seeking to know the prevalence of malnutrition and the associated risk factors among under-five children in Murambi cell.

1.2 PURPOSE OF THE STUDY

The purpose of this study is to identify and determine the prevalence and the risk factors for the Malnutrition among children under 5 years old in MURAMBI cell in Rwanda.

1.3 OBJECTIVES OF STUDY

1.3.1 General Research Objectives

The main objective is to assess the prevalence of malnutrition and associated risk factors among under-five children in MURAMBI cell.

1.3.2 Specific Research Objectives

Specifically, the study will seek:

- To determine the prevalence of malnutrition among under-five children in Murambi Cell from 2018 to 2022.
- To identify the risk factors related to malnutrition among under-five children in Murambi Cell from 2018 to 2022.

1.4 RESEARCH QUESTIONS

The study had the following research questions:

- What is the prevalence of malnutrition among under-five children in Murambi cell from 2018-2022?
- What are the risk factors related to malnutrition among under-five children in Murambi cell from 2018-2022?

1.5 SIGNIFICANCE OF THE STUDY

In nursing education

Firstly, this study will provide information and help to improve knowledge and health services. It will also contribute in reducing children mortality rate especially in MURAMBI cell by providing information that will be used to reduce malnutrition of children under five years of age**.**

In nursing practice

This study will help nurses to know the key factor that cause malnutrition among children under five years in MURAMBI Cell and shade light on the key factors promoting malnutrition related to the parents and relatives of children, factors related to preparing balance diet, and adequate breast feeding in order to prevent malnutrition in children under five years. It will increase the knowledge and practices of parents in preventing malnutrition in using balanced diet and breast

feeding, and will lead to decreasing the number of children that have malnutrition which will facilitate health care improvement.

In nursing research

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

1.6 LIMITATIONS OF THE STUDY

Some of the parents of MURAMBI cell are illiterate, their inability to read or write is a challenge to the researcher in the collection of data. MURAMBI is a cell in Eastern Province, Rwanda. Some parents have low level of understanding, in collecting data from parents of children by addressing the limitations, the researcher will emphasize on the confidentiality, and no names will be disclosed. The collected information will be known only by the principal investigator and the research team.

1.7 SCOPE OF THE STUDY

The case study is targeting children under five years old and their parents, seeking to know the prevalence and risk factors leading to malnutrition in these children. Participants were parents of children under five years of MURAMBI cell. Geographically, MURAMBI cell is situated in the region of Muhazi Sector in RWAMAGANA district, of Eastern Province, Rwanda. Data was collected in 4 weeks in May and June, 2023.

1.8 ORGANIZATION OF THE STUDY

This research report consists of five chapter. Chapter One is introduction to the study and basically has the following sections: Background of the study, Statement of the problem, Objectives of the study, research questions, Significance of the study, Limitations of the study, Scope of the study and Organization of the study. It is followed by Chapter Two, the literature review. This Chapter has theoretical and empirical literature and conceptual framework. Chapter Three has the followings: Research design, Target population, Sample size and Sampling techniques, Research instrument, Data collection methods, Administration of data collection, Reliability and Validity, Data analysis procedure and Ethical consideration.

CHAPTER TWO: LITERATURE REVIEW

2.0 INTRODUCTION

Literature review is defined as a broad, comprehensive, in depth, systematic and critical review of scholarly publications, unpublished scholarly print materials, audiovisual materials and personal communications (Basavanthappa B. , 2006).

The review of literature relevant to this study is presented in the following sections: Introduction, definitions of key terms, the purpose of literature review, the extent of malnutrition, its contributing factors, causes and the distribution according to sex, age in the world and in Rwanda. Empirical literature, conceptual frame work, and research gap identification were also included.

2.1. DEFINITION OF KEY TERMS

Malnutrition: Is a pathological state resulting from a relatve or absolute deficiency or excess of one or more essential nutrients (Dar, B., 2017)

Undernutrition: An insufficient intake and/or inadequate absorption of energy, protein or micronutrients that in turn leads to nutritional deficiency (Endris N, Asefa H, Dube L., 2017)

Nutrition assessment: is the process of identifying characteristics known to be associated with nutrition problems (Saunders J, Smith T, Stroud M., 2015)

Prevalence: is the proportion of a population who have a specific characteristic in a given time period. (Cole, TJ, 2002)

Risk factors: are characteristics or attributes that increase the likelihood of a person developing a disease or health disorder. (Belaynew., 2015)

2.2 RESEARCH STRATEGIES

Literature was searched by using various databases including the Rwanda Biomedical Center online resources, National Institute of Statistic of Rwanda resources, National Child Development Agency resources, Rwanda Demographic and Health Survey reports, Google scholar and the internationally recognized website such as Centre for Disease Control and Prevention and World health Organization websites. A few resources were consulted from different libraries and the searching key words were prevalence, risk factors, children under five years old, malnutrition, and underweight.

2.1 THEORETICAL LITERATURE

2.1.1 THE PURPOSE OF LITERATURE REVIEW

Literature review helps the researcher determine what is known and what is not known about a subject, concepts or problem and so avoid duplication of study. It also helps determine the gaps, consistencies and inconsistencies in the literature about the subject (Papaioannou, D., Sutton, A., Booth, A., 2016)

Literature review aids the researcher to discover unanswered questions about a problem and so tries to answer the questions. The researcher discovers the strengths and weaknesses of the designs or methodology and instruments used in earlier studies. In nursing research, literature review helps the researcher promote the development of protocols and policies related to nursing practice and also uncover new practice interventions or gain support for changing a practice intervention. Literature review in this study focused on the prevalence and the associated risk factors of malnutrition among the under five children. Published and non-published literature were used.

2.1.2 PREVALENCE OF MALNUTRITION OF CHILDREN UNDER FIVE YEARS OLD

A Cross-Sectional Study was was conducted on 840 children aged 6–59 months from March 01–25, 2017 in pastoral communities of Afar Regional in Northeast Ethiopia. A structured-interviewer-administered questionnaire in a face-to-face manner was used to collect the data from mothers of children 6–59months of age. The study found the prevalence of wasting, stunting, and underweight was 16.2%, 43.1%, and 24.8%, respectively. EPI Data 3.1 and SPSS version 20.0 were used for data entry and analysis, respectively. Family size, prelacteal feeding, and diarrhoea in the past two weeks were associated with malnutrition. And sex of child, age of child, and immunization status of child were predictors for stunting (Abel G, et al, 2017)

In Nigeria, A cross-sectional study of pre-primary school children conducted from January to May 2016. The study was conducted using a using stratified sampling technique. Caregiver-administered questionnaire was used to obtain relevant information. Seven hundred and forty nine out of 782 recruited children were studied. The results found that six hundred and eighty-five (91.5%) children had normal nutritional status. The overall prevalence of malnutrition was 8.5%. Forty-four (5.9%) had a form of undernutrition while 22 (3%) had overnutrition. Eighteen children (2.4%) were wasted of which two (0.4%) were severely wasted. Twenty-six (3.5%) children were

stunted. Eleven (1.5%) children were overweight while another 11 (1.5%) were obese. Data analysis was done with SPSS version 20.0. The associations between nutritional status on one hand, and categorical variables such as age grouping, sex, socio-economic status, and maternal educationwere determined using chi square. P-value < 0.05 were reported as statistically significant (Jude CK, Chukwunedum AU, Egbuna KO., 2019).

In Nepal, a cross-sectional study conducted among 6 to 59 months children admitted to the Outpatient Therapeutic Care Centers (OTCC) from April to June 2018. The sample size after data cleaning and excluding incomplete data from the two districts considered was 398. The structured questionnaire was developed based on the study objectives. Out of 398 children, 5.8% were severely malnourished and the higher percentage of female children were malnourished. Multivariate analysis showed that severe acute malnutrition was significantly associated with family size (five or more members) (Adjusted Odds Ratio [AOR]: 3.96; 95% Confidence Interval [CI]: 1.23–12.71). Children from severely food insecure households (AOR: 4.04; 95% CI: 1.88–10.53) were four times more likely to be severely malnourished. p-value < 0.05 was considered as significant (Umesh G, Binod K., Ankush Kumar G.,Suman S., 2019)

In Ethiopia, a group of scientists carried out a study on the prevalence of malnutrition and associated factors among under five children using the 2016 Ethiopia Demographic and Health Survey data. The EDHS used a two-stage stratified sampling design to select households. The results found that the prevalence of stunting, wasting, and underweight were 38.3%, 10.1%, and 23.3%, respectively. About 19.47% of children were both stunted and underweighted, and only 3.87% of children had all the three conditions. The data was extracted, edited and analyzed by using SPSS Version 23.0. variables with P-values<0.05 in the multivariable logistic regression model were taken as statistically significant (Abay Kassa T., Ashenafi A. Woya, Garoma W., 2019).

2.1.3 FACTORS CONTRIBUTING TO MALNUTRITION AMONG CHILDREN UNDER FIVE YEARS OLD

A cross sectional study was conducted to find out socioeconomic, and health related factors on nutritional status among under five children in Bangladesh. The study used Bangladesh

Demographic and Health Survey 2016 data. Bivariate analysis, multivariate analysis was used to identify the determinants of under-five malnutrition. The analyses revealed that 19.6 percent of the children were severely stunted, 29.4 percent were moderately stunted and 51 percent were not stunted. The main contributing factors for under five malnutrition were found to be child's age, birth order, mother's education, father's education, family wealth index, sanitation facility, place of delivery, place of residence and division (Jahangir Alom, 2009).

A case control study was carried out in rural areas of Yavatmal district, India. A total of 737 cases (under-five acute malnutrition children) and an equal number of normal controls were included in the study. Data were collected using a structured questionnaire. The results found that that the odds of a child being in the malnutrition category increased significantly if the family: was below the poverty line, have more children in the family, have less rooms in the house, have a working mother, has a mother with a lower level of education, did not use any water purification measure, did not always ensure parents washed their hands before feeding a child, have a father with any addictive habit like tobacco or alcohol consumption, have the same food utilized more than once in a day, and have no age-appropriate vaccination.
Binary logistic regression was used for multivariate analysis using a hierarchical model (Ambadekar NN, Zodpey SP., 2016)

In South Africa, a case-control study of mothers of malnourished children who were interviewed to the determination of association between their children nutritional status during infancy and severely malnourished. the study findings indicated that boys who had been hospitalized with marasmus or kwashiorkor during their 2 first year of life were marasmus likely to come from poorly built, more overcrowded houses with fewer furnishing and appliances than those of controls. However, the association of problems in all such studies reflected and considered that environmental factor may act as a confounding factors as well as indicator of wealth. The data was extracted, edited and analyzed by using SPSS Version 23.0. (Rama, I.D., Khan H.S., 2016).

In Turkey, a descriptive cross-sectional study was conducted to investigate the prevalence and association with sociodemographic variables of malnutrition in 0-5 year’s old children in Bursa, Turkey. A total of 702 children are included in this cross-sectional study. Demographic features of

subject including age, gender, family characteristics and other data were obtained. Nutritional assessment was done using anthropometric indices including weight-for-age, height-for-age, weight-for-height, head circumference and body mass index-for-age. The results found out that the prevalence of underweight, stunting and wasting were 19.7, 17.7 and 16.2%, respectively. Socio-demographic variables that statistical significantly in association with malnutrition were low monthly family income, educational level and employment status of father, parental consanguinity, number of pregnancies, and regular intake of vitamin D and history of prematurity. Multivariate analysis detected following risk factors for these indices; low monthly family income, history of prematurity, unemployed father and the period between pregnancies (Baran Serdar Kizilyildiz, 2016).

2.4 OTHER RELEVENT LITERATURE REVIEW THAT SUPPORT OUR STUDY

2.4.1 COMPLICATION OF MALNUTRITION

By UNICEF, 2017, nearly half of all deaths in children under 5 are attributable to undernutrition. This translates into the unnecessary loss of about 3 million young lives a year (UNICEF, 2011). Undernutrition puts children at greater risk of dying from common infections, increases the frequency and severity of such infections, and contributes to delayed recovery (UNICEF, 2011). In addition, the interaction between undernutrition and infection can create a potentially lethal cycle of worsening illness and deteriorating nutritional status (UNICEF, 2017). Poor nutrition in the first 1,000 days of a child's life can also lead to stunted growth, which is irreversible and associated with impaired cognitive ability and reduced school and work performance (UNICEF, 2017).

2.4.2. SITUATION OF MALNUTRITION IN RWANDA

A Comprehensive Food Security and Vulnerability Analysis 2021 (CFSVA), conducted by MINAGRI, NISR, WFP, and other partners, particularly aimed to provide current information on food insecurity and malnutrition has indicated that 20.6 percent of the population in Rwanda is food insecure, of which 18.8 percent are moderately food insecure and 1.8 percent are severely food insecure. National stunting rates have significantly decreased from 34.9 percent in 2018 to 32.4 percent in 2021. Out of this 24.0 percent of children under 5 years of age are moderately stunted and 8.4 percent are severely stunted.

Acute malnutrition (or wasting) in children under 5 is 2.4 percent, with 1.8 percent experiencing moderate acute malnutrition (MAM) and 0.6 percent experiencing severe acute malnutrition (SAM). The prevalence of acute malnutrition has slightly increased by 0.4 percent compared to 2.0 percent in 2018.

According to CFSVA 2021, In Rwanda, food insecurity and malnutrition are mainly caused by limited consumption of nutritionally diverse foods. Only 19.5 percent of children aged between 6 to 23 months receive a minimum acceptable diet (an increase of 2.5 percent compared to 2018), 32.8 percent reach the minimum meal frequency and 42.3 percent obtain the minimum dietary diversity of four food groups consumed. For women aged 15- 49 years old, 32 percent meet the minimum dietary diversity for women (MDD-W) indicating that they have consumed at least 5 out of the 10 specified food groups in the last 24 hours, before the survey.

After birth, stunting increases with age, particularly after the first year: children aged 12-23 months are more likely to be stunted than children aged 6-11 months emphasizing the importance of appropriate weaning practices. Underweight prevalence is relatively stable over the five years of early childhood, while wasting levels decrease slightly after the first two years of age.

The 2019-20 Rwanda DHS measures children's nutritional status by comparing height and weight measurements against an international reference standard. One in three children under five are stunted. Stunting is an indication of chronic undernutrition. Stunting varies by province, from 21% in the City of Kigali to 41% in North province. Stunting decreases as mother's education and household wealth increase. In Rwanda, 1% of children under five are wasted. Wasting is an indication of acute malnutrition. Eight percent of children under five are underweight, and 6% of children under five are overweight.

According to CFSVA 2021, nationally the COVID-19 pandemic was reported as the main shock, however, it mainly affected households living in the City of Kigali and in urban areas. Households living outside the City of Kigali were more affected by natural disasters and hazards. Irregular rains or drought are some of the natural hazards reported in the Eastern and Southern Provinces.

In 2021, 44 percent of households reported experiencing a shock or unusual situation during the last 12 months which affected the household's ability to provide for itself, to eat in the manner it is accustomed to or affected the household's assets. The City of Kigali was by far the most affected by a shock (71 percent of households) followed by the Western (54%) and Southern Provinces (46%). The COVID-19 pandemic was reported as the main shock, mainly affecting Kigali City (76% of households) and urban areas. This shock resulted in revenue losses and a decrease of assets mainly for skilled laborers, traders, and daily laborers. The data shows less impact from COVID-19 for agriculturalists. The second main shock reported was irregular rains/drought and landslides affecting mainly the rural areas (NISR, 2021).

In the framework of the National Strategy for Transformation (2017-2024), the Government of Rwanda has built a social protection system that aims to uplift the living standards for vulnerable and poor families and improve social welfare. Rwanda's social protection is structured around four pillars: (i) Social Security schemes that are designed to achieve consumption smoothing and ensure a minimum standard of living throughout an individual's life, (ii) Emergency Assistance which is temporary or incidental (one-off) cash or in-kind assistance that addresses short-term or temporary risks or deprivations, (iii) Social Care Services that provide protection, psycho-social support, referrals and promote social inclusion for the most vulnerable, (iv) Facilitated linkages to complementary livelihood support services delivered by other institutions in the social protection cell.

The flagship social protection program includes the "Vision 2020 Umurenge Program" (VUP). Other initiatives include Community-Based Health Insurance (CBHI) and in- kind social care services, social protection services provided through the Genocide Survivors Support and Assistance Fund (FARG), the Rwanda Demobilization and Reintegration Commission (RDRC).

Apart from this, a range of other programs and services are implemented by other cells and contribute to poverty reduction and malnutrition. Rwanda's health cell has established several key nutrition support programs including Fortified Blended Food distribution; the One Cup of Milk per Child Program; and milk distribution to acute and severely malnourished children. The agricultural cell has also specific programs like the Girinka program, agricultural inputs support, livestock and crops insurance among others. The disaster management cell provides short-term assistance to shock- and disaster-affected households.

Figure 1: Conceptual framework

Miles and Huberman (2001) defined a conceptual framework as a visual or written product, one that "explains, either graphically or in narrative form, the main things to be studied the key factors, concepts, or variables and the presumed relationships among them."

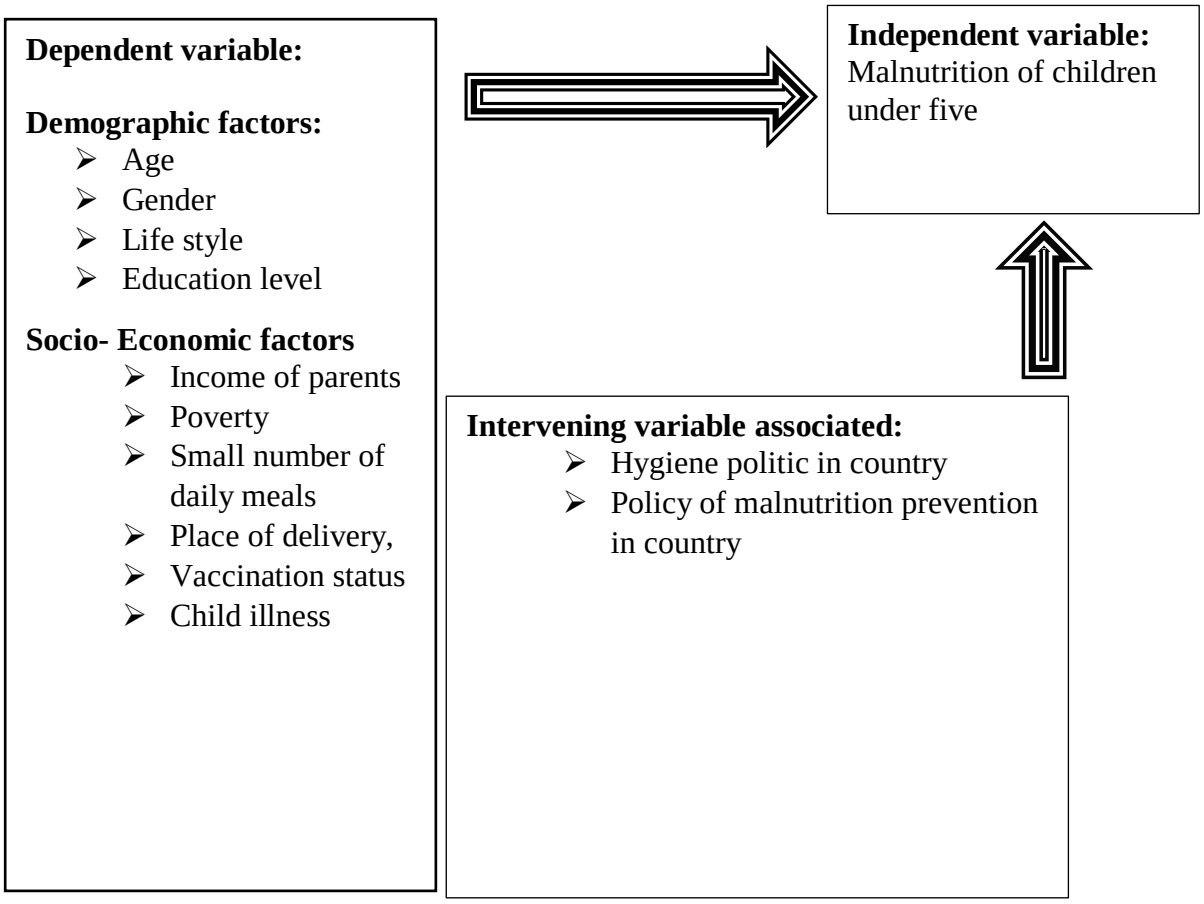

Figure: Conceptual framework adapted from UNICEF conceptual framework 2015 *(UNICEF, 2015)***.**

The figure above indicates conceptual framework have independent, dependent variable and intervening variable associated. The independent variable is malnutrition of children under five. Dependent variable concerns with demographic factors such as age, gender, life style, education level while economic factors consist of income of parents, and poverty in this figure.

CHAPTER THREE: RESEARCH METHODOLOGY

3.0 INTRODUCTION

This chapter is composed by the research design, target population, sample size and sampling techniques, research instrument, data collection methods, administration of data collection, reliability and validity, data analysis procedure and ethical consideration.

3.1. RESEARCH APPROACH

The researcher used a cross sectional survey on children who attended the hospital during data collection period of one week. Quantitative research method is used to describe variables and examine relationships among variables. Therefore, a quantitative approach was used in this study in order to determine factors that contribute to malnutrition basing on number of children affected.

3.1 RESEARCH DESIGN

A research design is an overall plan of the research study (Dempsy, 2001). It includes the research structure, and strategies of investigating or answering the research question (Basavanthappa, 2007). In this study, a non-experimental descriptive cross-sectional study was used, and correlation research designs to find out the relationship between variables were used.

3.2 RESEARCH SETTING

MURAMBI cell is in Rwamagana district. Rwamagana is a district in Eastern Province, Rwanda. Its capital is Rwamagana town. Rwamagana cell have 484,953 habitants in those number of populations 23.8% (9698) are children under five years.

3.3 STUDY POPULATION

A study population refers to a total category of persons or objects that meet the criteria for the study established by the researcher, any set of persons, objects or measurements having observable characteristics in common (Basavanthappa, 2007). The study population consists of the target population and the accessible population. In this study, the study population were the care takers of the under five children in MURAMBI cell. The population will be care takers (mothers and fathers) of under-five years children who suffer malnutrition.

3.4 TARGET POPULATION

A target population is the population which the researcher is interested in and wishes to generate the results of the study (Polit H. and Hungler T., 2001). The target population for this study were the care takers of children who suffer malnutrition. According to the National Early Childhood Development program, there are 123 households in Murambi cell. The researcher consulted one parent per family.

3.4.1 INCLUSION CRITERIA

Inclusion sampling criteria are those characteristics that a subject or element must possess in order to be part of the target population (Burns and Grove, 2009). In this study, parents who have children under five years living in the community of MURAMBI cell and have children with malnutrition.

3.4.2 EXCLUSION CRITERIA

Exclusion sampling criteria are those characteristics that can cause a person to be excluded from the target population (Burns M. & Grove H., 2009). In this study, parents who were present in Murambi cell but were not willing to sign the consent form, parents of health children and parents who had children who were in critical conditions were excluded in the study.

3.6 SAMPLE SIZE

Sample size determination is the act of choosing the number of observations or replicates to include in a statistical sample (Polit H. and Hungler T., 2001). The sample size is an important feature of any empirical study in which the goal is to make inferences about a population from a sample.

3.7. SAMPLING TECHNIQUE

The target population for this study is consisted of all caregivers/mothers of the children who met criteria considered by National Early Childhood Development Program (NECDP) in its study conducted in Rwamagana District, where Murambi cell is situated. The sample was chosen using Taro YAMANE method to set the sample size and the Rwanda Population and Housing Census done in 2022. Data were used where it indicated that the number of under five years children was 507 in Murambi cell. Based on the formula below, sample size was calculated:

$$n= = \frac{N}{1+N(e)^2}$$

N is total number of parents

e: is error of sampling

n: is sample size

According to the National Institute of Statistic of Rwanda (NISR), the number of children under five years living Murambi cell was 123 parents in 2022.

Therefore, from the formula above the sample size n can be calculated as follow:

$n = \frac{123}{1+507(0.05)^2}$ = 94 parents

Sampling techniques

A multi stage sampling method was used to select a representative sample for the study. Murambi cell has two villages, the researcher picked a half sample from each village in Murambi cell using a non-probability purposive sampling.

VARIABLES

Variable: Is any quality of a person, group, or situation that varies or takes on different values (Polit and Hungler, 1989).

Dependent variable: It is a variable that changes as the independent variable is manipulated by the researcher, sometimes called the criterion variable (Basavanthappa, 2007).

The dependent variable in this study is the prevalence of malnutrition among the under five children in MURAMBI cell.

Independent variable: This is a variable that is purposefully manipulated or changed by the researcher, also called the manipulated variable (ibid). The independent variables in the study were immunization, mother's education level, marital status of the mother, occupation of the mother, economic status, source of drinking water, place of delivery, breastfeeding in the first six months.

3.8 DATA COLLECTION METHOD

3.8.1 DATA COLLECTION INSTRUMENTS

This study was made by one primary source of data which is questionnaire, this questionnaire has closed questions where participants responded by ticking one right response. The questionnaire contains two sections, the first section seeks demographic data and the second section seeks socioeconomic factors contributing to malnutrition in Murambi cell. We collected data using different tools and techniques, namely questionnaires, anthropometry measurement of children. These questionnaires were translated from English into Kinyarwanda for data quality control.

3.8.2 DATA COLLECTION PROCEDURE

The researcher first gave explanation to parents about the research and confidentiality. Then, parents who could write were given questionnaire to fill whereas others were helped to complete the questionnaire. Data collections were done with voluntary participation; participants have signed a consent form before engaging in the exercise. The questionnaires were composed in English and translated in Kinyarwanda. To determine whether a child is malnourished or not, the researcher used anthropometric measures to assess the height, Middle Upper Arm Circumference (MUAC) and weight. Then, the researcher used a check list and reference chart of National Child Development Agency (Early Childhood Development). The researcher has used the register of National Early Childhood Development Program of Rwamagana district where Murambi cell is situated to check the prevalence of the previous years, from 2018 to 2022.

3.9 VALIDITY AND RELIABILITY

VALIDITY

Validity of an instrument concerns the extent to which the research measures what it aims to measure without bias or distortion (Kate Gerrish, 2015). To test the validity of the instrument, a copy of the questionnaire will be submitted to the study supervisor to examine whether the number and type of items in the questionnaire measure the concept or construct of interest (content validity). Questions in the tool will be developed based on findings from previous studies and the literature reviewed.

RELIABILITY

In order to ensure reliability of the instrument in this study, a pilot study will be conducted. This involves testing the actual tool will take 10% from the target population of the study. A week before execution of the study, the actual questionnaire will be administered to participant, in order to ensure that the tool will collect the desired data and that the questions are clear. After analyzing data from the pilot study, unclear questions will be rephrased to ensure that appropriate responses will be obtained in the future.

3.10 DATA ANALYSIS PROCEDURES

Data from the questionnaire were cleaned and verified to minimize entry errors, outliers and missing values. Responses from questionnaire were coded and the codes were saved in the code book and used during the interpretation. Collected data entered into the tables of frequencies and percentages in order to ensure its accuracy. Data cleaning was done to check for the forgotten entries, consistency and outliers. Frequencies of variables were generated; tabulation and percentages were used to illustrate study. Data analysis was performed using the Statistics Package of Social Sciences software (SPSS Version 23.0).

3.11 ETHICAL CONSIDERATION

Prior to data collection, the researcher obtained the clearance of the study from KIBOGORA Polytechnic ethical committee, and obtained the research permit from MURAMBI cell. Before the participants participate in the study, the researcher made sure that they were well informed and explained in details the aim and objectives of the study, the inclusion criteria, voluntary participation by signing the consent form to show their willingness to participate in the study. To ensure confidentiality every participant filled the questionnaire alone. Only age of the participant was needed for the study and no names were recorded.

CHAPTER FOUR: RESEARCH FINDINGS AND DISCUSSION

4.0 Introduction

This chapter contains the descriptive demographic details of results, extent of malnutrition, then the factors contributing to malnutrition such as parent education, family incomes, feeding habits, the family size and the level at which they impact malnutrition of under five years old children living in Murambi Cell. At the end of the chapter there is a summary of data analysis.

4.1 Demographic characteristics of respondents

More than half of the under-five children about 52 (55.9%) in the study were males while 42 (44.1%) were females.

The study also shows that the majority were about 43 (46.2%) aged 24-59 months while those aged 6-23 months were about 28 (30.2%) and those aged below 6 months were about 23 (23.4%).

More than half of the children about 51 (54.9%) were of birth order 1-2 while those in the birth order of 3-4 were 36 (38%) and about 7 children were in 5+ order (7.1%) respectively.

This study showed that about 46 (48.4%) were of birth intervals equal or less than two years. There was also quite a large number of children about 44 (47.6%) born in the birth interval of 3-4 years, while those in the birth interval of 5-6 were about 4 (4%).

On the age of the mother at birth, majority of the children about 50 (53.1%) had their mothers aged 30-39 years while a number of children about 32 (33.9%) had their mothers aged 20-29 years at birth. A Small proportion of about 4 (4.0%) had their mothers aged less than 20 years, while about 8 (9.1%) had their mothers aged 40-49 years at birth.

The immunization status of the under-five years children that were involved in the study reveals that majority of the childrenabout 78 (82.9%) were fully immunized up to date according to the Expanded Programme of Immunization, while about 16 (17.1%) were not immunized.

The percentage distribution of under-five children according to the education level of the mother indicates that majority of the mothers about 65 (69%) had received primary level education and

quite a few about 4 (4%) had never been to school. Findings further reveal that about 25 (27%) children had mothers with secondary education and above.

The distribution of under-five years children according to the marital status of their mother indicates that majority of the children 74 (80%) were born to mothers who were married/cohabiting and another proportion of the under five children were born to never married about 7 (7%), about 5 divorced (5%) and 8 widowed mothers (8%).

The findings also indicate that about 70 (76%) had their mothers who were farmers as their occupation while 12 (13%) had mothers who were civil servants, 8 (8%) children also had mothers were doing business while 2 (2%) had mothers who were pastoralists. There were also a few children 2 (2%) whose mothers did handcrafts as their occupation as detailed in Table 3.1.

Table 1: Demographic characteristics of respondents

Child Factors (n=94)	Frequency	Percentage (%)
Variables		
SEX		
Male	52	55.9
Female	42	44.1
Age (months)		
<6	23	23.4
6-23	28	30.2
24-59	43	46.2
Birth order		
1-2	51	54.9
3-4	36	38
5+	7	7.1
Birth intervals (years)		
≤2	46	48.4
3-4	44	47.6
5-6	4	4.0
Fully immunized according to WHO standards		
Yes	78	82.9
No	16	17.1
Age of mother at birth (years)		
<20	4	4.0
20-29	31	33.8
30-39	50	53.1
40-49	9	9.1
Mother's Education Level		
No education	4	4.0
Primary	65	69.0
Secondary and above	25	27.0
Marital status of the mother		
Never married	7	7.0
Married/Cohabitating	74	80.0
Widowed	8	8.0
Divorced	5	5.0
Maternal occupation		
Farmer	70	76.0
Pastoralist	2	2.0
Civil servant	12	13.0
Business	8	8.0
Handcrafts	2	2.0

4.2. Prevalence of malnutrition in under five years old children from 2018-2022

Years of assessments	Total children consulted by NECDP	Under 5 years old with Acute malnutrition	
		frequency	percentage
2018-2019	740	273	37.0%
2019-2020	817	249	30.5%
2020-2021	887	319	36.0%
2021-2022	613	192	31.4%
Total	**3057**	**1033**	**33.7%**

4.2. Source: National Early Childhood Development Program Reports (2018-2022)

The table above presents the prevalence of malnutrition among children under five years old residing in Murambi cell 2018-2022 collected by the Early Child Development, currently known as the National Child Development Agency.

The NECDP reports revealed that the prevalence of malnutrition of under five years old children increased in 2020-2021 with the impact of Covid-19 where the percentage of malnutrition in Murambi cell surged to 36.0% corresponding to 319 children. The reports also showed that in 2018-2019, 273 children were found to have malnutrition, corresponding to 37.0%.

The reports demonstrated a significant reduction in 2019-2020 where only 249 children were confirmed to have malnutrition in 817 consulted, corresponding to 30.5%. In addition, in 2021-2022 the reports show a reduction in the surge where the prevalence of malnutrition in Murambi cell was confirmed in 192 children, corresponding to 31.4%.

4.3 Malnutrition among under-five years children with child and maternal factors

A comparison of stuntedness between males and females showed almost an equal proportion of malnutrition among females; (83.5%) compared to 73.5% of the males. For wasting females and males were equally wasted and for underweight males were almost more underweight than girls.

However, there were few children underweight from 6-23 months (1.9%) unlike those aged 24- 59 (8.7%). For birth order, the proportion of stunting is higher among children of birth order 3-4 (41.8%) than those of order 1 to 2 (35.4%).

On the birth interval, the proportion of stunting is higher among underfive years children with birth interval of 2 years and below (41.4 %) than those of 3-4 or even 5-6 years (39.3%-16.7%).

For mother's occupation the proportion of stunting was higher in children whose mothers were from peasant farmers (37.5%) than other occupation of mothers.

Regarding economic status, findings showed a high proportion of all three indices among children born to mothers found in first category of Ubudehe (poorest).

In relation to low birth weight, a proportion of 11.3% children born with low weight were stunted, while 4.1% children were wasted and 2% of children born with low weight were underweight. Regarding small number of daily meals taken by the child, study findings revealed a high proportion of stunted (35.7%), wasted (4.3%) and underweight children (1.7%) who experienced small number of daily meals than those who did not have small number of daily meals taken.

Concerning child illness, results indicated a high proportion of stunted children (28.6%) who have experienced illness in their childhood, 5.8% with wasting, and 2.9% with underweight.

Children who were delivered at home, study results highlighted a high proportion of stunted children (51.7%) compared to those born in a health facility 26.4%, a high proportion of underweight children (27.5%) born at home compared to 19.5% born in health facility.

Furthermore, a remarkable fraction of wasted children (15.4%) was found in children not vaccinated while 10% of wasted children were found in vaccinated children.

Source of drinking water showed a significant proportion 52.7% to those using protected water sources and 47.3% to those who use unprotected water sources with stunting (p-value=0.049) as

Table 2: bivariate analysis: Association between factors and malnutrition among under five years' children

Variable		X^2	Degree of freedom	P=value
Not breastfed in the first 6 months	Yes	.846	1	0.0158
	No			
Education level	No education	.562	2	0.0051
	Primary	.525	1	0.0369
	Secondary and above	.079	1	0.0779
Marital status of the mother	Never married	11.424	3	0.3101
	Married/cohabitating	3.510	1	0.6135
	Widowed	.466	1	0.0157
	Divorced	.719	1	0.0029
Economic status	Category 1	1.481	3	0.0025
	Category 2	7.224	1	0.0172
	Category 3	9.226	1	0.0924
	Category 4	12.354	1	0.1035
Place of delivery	Home	16.600	1	0.1712
	Health facility	2.357	1	0.0632
Vaccination	Yes	14.239		0.1028
	No			
Source of drinking water	Unprotected source	16.631		0.1029
	Protected source	4.129		0.0927

In this study, there is a significant at 5% association between breastfeeding in the first 6 months of under five years old children and malnutritition (x^2=0.846, df=1, P=0.0158). There is a significant at 5% association between the education level of the mother and malnutrition (x^2=0.562, df=2, P=0.0051). There is insignificant at 5% association between the place of delivery of under five years old children and malnutrition (x^2=16.600, df=1, P=0.1712). There is a significant at 5% association between the first category of Ubudehe of the families and malnutrition (x^2=1.481, df=1, P=0.0025), while there is an insignificant at 5% association between children belonging to fourth category of Ubudehe and malnutrition (x^2=12.354, df=1, P=0.1035). There is insignificant at 5% association between children from married and cohabitating parents and malnutrition (x^2=3.510, df=1, P=0.6135) while there is a significant 5% association between children belonging to divorced parents (x^2=0.719, df=1, P=0.0029) and widowed parents (x^2=0.466, df=1, P=0.0157) and malnutrition. There is insignificant at 5% association between the source of drinking water and malnutrition (x^2=0.16631, P=0.1029). There is insignificant at 5% association between vaccination status of under five years old children and malnutrition (x^2=14.239, P=0.1028).

4.8 Discussion of findings

The objectives of this study were: first objective; to determine the prevalence of malnutrition among under-five children in Murambi Cell from 2018 to 2022. Second objective; to identify the risk factors related to malnutrition among under-five children in Murambi Cell. To determine the association between the risk factors and malnutrition in Murambi cell.

4.8.1 Demographic characteristic of respondents

The results of this study have found that 52 children under five years old (55.9%) were males while 42 (44.1%) were females. The study also shows that the majority were 43 (46.2%) aged 24-59 months while those aged 6-23 months were 28 (30.2%) and those aged below 6 months were 23 (23.4%). This is similar to a study conducted in Nigeria to assess the prevalence of malnutrition among under-five children in Enugu metropolis, the study revealed that out of the 749 children, 379 (50.6%) were males while 370 (49.4%) were females. (Duru CB, et al., 2015).

In this study, more than half of the children 51 (54.9%) were of birth order 1-2 while those in the birth order of 3-4 were about 36 (38%) and about 7 under five years old children were in 5+ order (7.1%) respectively. This is different to a cross sectional study conducted in two districts in Nepal where the study found that out of total 398 children under five years old, approximately half (46.5%) were eldest (Ghimire U, Manandhar J, Gautam A, Tuladhar S, Prasai Y, Tesfayi G., 2019).

Moreover, this study showed that about 46 (48.4%) were of birth intervals equal or less than two years. There was also quite a large number of children 44 (47.6%) born in the birth interval of 3-4 years, while those in the birth interval of 5-6 were about 4 (4%). This is similar to what a quantitative study conducted in India in assessment of prevalence of malnutrition of childern under five years ago found that about 109 (49.7%) were born less than two years, whereas those who were born in the birth interval of 3-4 were about 92 (42%), and about 19 (8.3%) were born in the birth interval of 5-6 (Islam S, Mahanta TG, Sarma R, Hiranya S. , 2014).

On the age of the mother at birth, the majority of the children 50 (53.1%) had their mothers aged 30-39 years while a number of children 32 (33.9%) had their mothers aged 20-29 years at birth.

A small proportion of 4 (4.0%) had their mothers aged less than 20 years, while 8 (9.1%) had their mothers aged 40-49 years at birth. This is different to a cross sectional study conducted on prevalence and predictors of underweight, stunting, and wasting among children aged under five in Western Kenya, the results showed that more than half (58.3%) of the mothers were between the age group 21–29 years followed by 30 and above (29.4%) years (Bloss E, Wainana F, Bailey RC. , 2004).

The immunization status of the under-five years children that were involved in the study reveals that majority of the children 78 (82.9%) were fully immunized up to date according to the Expanded Programme of Immunization, while 16 (17.1%) were not immunized.

The percentage distribution of under-five children according to the education level of the mother indicates that majority of the mothers 65 (69%) had received primary level education and quite a few 4 (4%) had never been to school. Findings further reveal that 25 (27%) of the children had mothers with secondary education and above. This is contrary to a cross sectional study conducted on predictors of the number of under-five malnourished children where the study found that almost

one-fifth (18.8%) of the mothers were illiterate while nearly one-fourth (24.4%) of mothers had higher-level education (Islam MM, Alam M, Tariquzaman M, Kabir MA, Pervin R, Begum M, et al, 2013).

1. Prevalence of malnutrition in Murambi Cell

The study reveals that prevalence of malnutrition in Murambi cell is 34.5%. Rwanda Demographic and Health Survey 2019-2020 says the country's malnutrition level is at 32.4 %. The Prevalence of malnutrition of children under five years old found in Murambi cell is higher than the whole prevalence of Eastern Province 27.8% and 32.4% of the whole country, according to the Comprehensive Food Security and Vulnerability Analysis 2021. In addition, the prevalence in Murambi cell was relatively lower than the previous study conducted in Ethiopia (Asfaw M, Wondaferash M, Taha M, Dube L., 2015) and in Tanzania (Mgongo M, Chotta NAS, Hasham TH, Uriyo JG, Darmian DJ. , 2017) where the prevalence in these countries were 39.7%, 38.9% respectively, but it was higher than the study conducted in Nairobi, Kenya (Chesire EJ, Oago ASS, Oteba LP, Echoka E., 2018) at 33.1%.

The possible explanation for this difference in prevalence could be due to a difference in the socioeconomic, agricultural productivity, food insecurity at household level, and no- madic nature of the population. An additional explanation for this could also be due to a difference in cultural and child feeding habits, study setting, and periods of the study.

2. Factors associated with malnutrition in under five years children in Murambi cell

Results from this study indicated that children aged 24-59 months were underweight since the statistical significance the p-value (p=0.04) was less than the critical value of 0.05 at 95% confidence interval. Moreover, this fact has been witnessed by many previous trials from African region and South Asia (Ajao K, Ojofeitimi E, Adebayo A, Fatusi A, Afolabi O. , 2010). The above findings agree with similar findings at national level that the percentage of children who are underweight increases steadily from 4 percent among those less than age 6 months to 9 percent among those aged 6-11 months and 11 percent among those age 12-17 months, after which it decreases slightly to 9 percent among children age 18-23 months before once again increasing to 11 percent among children age 24-35 months (Olwedo MA, Mworozi E, Bachou H, Orach CG.,

2008). Similar findings have been observed by several researchers in Uganda, Kenya, Nigeria and Ghana (Yisak H, Gobena T, Mesfin F. , 2015)

Findings indicate that there is a significant relationship between mother's occupation and malnutrition among under five children (p=0.03) in Murambi cell. Children whose mothers were civil servant were less likely to be underweight unlike their counterparts whose mothers were peasant farmers. However, the findings contrary to a study done in Malaysia found out that children from mothers who were civil servants had an increased risk of malnutrition because they rarely get time to care for their children hence end up leaving them under the care of elder siblings or inexperienced maids. This might be caused by the time limited that civil servant spend with their children (Shashikala S, Kandiah M, Zalilah MS, Khor GL., 2005)

Moreover, marital status of the mother was found significantly associated with all three domains of malnutrition. In a study conducted in Nigeria on identifying risk factors associated with malnutrition, a higher proportion of cases with malnutrition were of children born to mothers who are either widowed or divorces compared to mothers who were married or cohabitating (Schlaudecker EP, Steinhoff MC, Moore SR, 2011).

The study also found that children belonging to the Category 1 of Ubudehe (poorest) are prone to malnutrition than children under five years old born to families belonging to the Category 3 of Ubudehe (middle). A cross sectional study was conducted on 357 children under five years old in Ruhengeri Referral Hospital in 2019 has found the same results. Study analysis also measured relation of health indicators like vaccination and common child illness with malnutrition. Not fully immunized status was not found associated with malnutrition; however, child illness was found significantly related to malnutrition, wasting and underweight status. Child illness impairs growth and that underlying malnutrition is a major risk factor for these conditions. Episodes of diarrhea may predispose to pneumonia in undernourished children.

This study also found that children who were not breastfed in the first six months were significantly exposed to malnutrition ($P<0.05$). Source of drinking water was shown statistically with insignificant association with outcome variable. Children whose families use drinking water from unprotected source were equally exposed to malnutrition on the same level as those children whose

family uses drinking water from protected source. The study shows that malnutrition was higher among children who had illiterate mothers that those whose mothers were literate. The study showed that as mother's educational level increased, child nutritional well-being also increases. This might be due to the fact that educated mothers would have proper management of resources, practice better health promoting behaviors, and might develop better children centered caring practices. This result is in line with other studies conducted in Hawassa Zuria, Ethiopia, (D. D. Debeko and A. T. Goshu, , 2015), and Iran (G. Sharifzadeh, H. Mehrjoofard, and S. Raghebi , 2010).

4.3. SUMMARY OF FINDINGS

This study was conducted to assess the prevalence and identify the risk factors associated with malnutrition among children under five years old. We used a quantitative research method, the majority of respondents 52(55.9%) were males and the majority of respondents were 43 (46.2%) aged 24-59 months. More than half of the children about 51 (54.9%) were of birth order 1-2. This study showed that about 46 (48.4%) were of birth intervals equal or less than two years. On the age of the mother at birth, majority of the children about 50 (53.1%) had their mothers aged 30-39 years. The immunization status of the under-five years children that were involved in the study reveals that majority of the children about 78 (82.9%) were fully immunized up to date according to the Expanded Programme of Immunization. The percentage distribution of under-five children according to the education level of the mother indicates that majority of the mothers about 65 (69%) had received primary level education.

The study results indicate that there is a significant relationship between mother's occupation and malnutrition among under five children ($p=0.03$) in Murambi cell. Children whose mothers were civil servant were less likely to be underweight unlike their counterparts whose mothers were peasant farmers. Also, marital status of the mother was found significantly associated with all three domains of malnutrition. The study also found that children belonging to the Category 1 of Ubudehe (poorest) are prone to malnutrition than children under five years old born to families belonging to the Category 3 of Ubudehe (middle). This study also found that children who were not breastfed in the first six months were significantly exposed to malnutrition ($P<0.05$). Source of drinking water was shown statistically with insignificant association with outcome variable.

CHAPTER FIVE: CONCLUSIONS AND RECOMMENDATIONS

5.0 Introduction

This chapter contains summary of findings relevant to the study objectives including the prevalence of malnutrition, and risk factors contributing to malnutrition according to immunization, mother's education level, marital status of the mother, occupation of the mother, small number of meals, breastfeeding in the first six months, economic status, source of drinking water, etc…

5.1. CONCLUSIONS

This study was conducted to assess the prevalence and associated factors of malnutrition among children under five years in Murambi cell. We used a quantitative approach and cross-sectional design. More than half of the under-five children about 52 (55.9%) in the study were males while 42 (44.1%) were females. The study also shows that the majority were about 43 (46.2%) aged 24-59 months while those aged 6-23 months were about 28 (30.2%) and those aged below 6 months were about 23 (23.4%). More than half of the children about 51 (54.9%) were of birth order 1-2 while those in the birth order of 3-4 were 36 (38%) and about 7 children were in 5+ order (7.1%) respectively. This study showed that about 46 (48.4%) were of birth intervals equal or less than two years. There was also quite a large number of children about 44 (47.6%) born in the birth interval of 3-4 years, while those in the birth interval of 5-6 were about 4 (4%).

The prevalence of malnutrition among children under five years old in Murambi cell in 2018 was 37.0%. The reports demonstrated a significant reduction in 2019-2020 where only 249 children were confirmed to have malnutrition in 817 consulted, corresponding to 30.5%. In addition, in 2021-2022 the reports show a reduction in the surge where the prevalence of malnutrition in Murambi cell was confirmed in 192 children, corresponding to 31.4%.

5.1.1 Objective one: The prevalence of malnutrition in under five year's children

Almost 34.5% of the respondents, about 32 of 94 respondents were malnourished. Two of them were wasted at the same time stunted and underweight, but another 21 children were stunted and underweight in common.

5.1.2 Objective two: Factors contributing to malnutrition of children under five years old

The study results indicate that there is a significant relationship between mother's occupation and malnutrition among under five children (p=0.03) in Murambi cell. Children whose mothers were civil servant were less likely to be underweight unlike their counterparts whose mothers were peasant farmers. Also, marital status of the mother was found significantly associated with all three domains of malnutrition. The study also found that children belonging to the Category 1 of Ubudehe (poorest) are prone to malnutrition than children under five years old born to families belonging to the Category 3 of Ubudehe (middle). This study also found that children who were not breastfed in the first six months were significantly exposed to malnutrition ($P<0.05$). Source of drinking water was shown statistically with insignificant association with outcome variable.

According to the findings, the main associated factors with malnutrition among children under five years in Murambi cell were maternal occupation, economic status of households, education level of the mothers, children breastfeeding habits in the firsrt six months, and marital status if the mother.

5.3 Recommendations

To the Ministry of Health:

Mothers should be provided with a series of trainings about the provision of adequate micronutrients before and during pregnancy and how they can promote optimal infant and young child feeding (IYCF) and care practices in their households. There is a need to improve adequate infant and young child feeding practices.

To the community and local leaders:

Given that socioeconomic status has an impact on child nutrition, raising household income is highly recommended so that mothers with low income can afford adequate food that will provide a nutritious and diverse diet to children within the households, and help sufficiently those in need who are unable to earn an income for their families.

5.4 Suggestions for further study

Future researchers should focus on one specific factor that contributes to malnutrition rather than studying about risk factors associated with malnutrition in general.

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APPENDICES

APPENDIX 1: Recommendation letter from KIBOGORA Polytechnic

KIBOGORA POLYTECHNIC

Kibogora, June 8, 2023

Received by DS Murambi Cell on 13/06/2023

To Mr Executive Secretary of Murambi Sector

RE: REQUEST OF CONDUCTING RESEARCH

Dear Sir,

We are writing this letter to humbly request you to allow **Mr. MUGISHA NDANYUZWE Charles** and **Mrs. MUHORAKEYE Saidate** to conduct a research in your sector.

The above mentioned students are bonafide students of KIBOGORA Polytechnic pursuing a Bachelor's degree in General Nursing.

These students are currently conducting a research topic on: **"ASSESSMENT OF PREVALENCE AND ASSOCIATED RISK FACTORS OF MALNUTRITION AND ASSOCIATED RISK FACTORS AMONG UNDER-FIVE CHILDREN IN MURAMBI SECTOR."**

We are convinced that your sector will constitute a valuable source of information pertaining to their research, the purpose of this letter is to humbly request you to provide to them the pertinent information they may need. We pledge to ensure that all provided information will be confidential and used in the strict academic purpose.

Any assistance rendered to the candidates will be highly appreciated!

Yours sincerely,

Mr. NSENGIYUMVA Jean Paul

Ag. Dean of health Sciences Faculty

Kibogora Polytechnic

KIBOGORA POLYTECHNIC · SCIENCE · FAITH · CONSCIENCE

APPENDIX 2: Check list to diagnose malnutrition in children

Age:

Sex:

Weight:

Height:

Weight for Height (for assessing wasting):

Weight for age (for assessing underweight):

Height for age (for assessing stunting):

APPENDIX 3: Consent form from parents of children

I, Parent of....., agree to participate in this research project on "**ASSESSMENT OF PREVALENCE AND ASSOCIATED RISK FACTORS OF MALNUTRITION AMONG UNDER-FIVE YEARS OLD CHILDREN IN MURAMBI CELL**" conducted by **MUHORACYEYE Saidate** and **MUGISHA Ndanyuzwe Charles** I understand this study very well.

I understand that my participation in this study is entirely voluntary, and that if I wish to withdraw from the study, I may do so any time and I do not need give reasons for doing so. If I withdraw from the study, I understand that this will have no effect on any relations with the researcher. I understand that I may not receive any direct benefit from participating in this study, but my participation may help others in the future. I understand that the information I give will be kept confidential to the extent permitted by law. I have read and understand that this information and agree to take part in this study.

Date: …../..06../..2023…

APPENDIX 4: Questionnaire

QUESTIONS TO BE ASKED TO MOTHER/FATHER RESIDING IN MURAMBI Cell.

Tick in appropriate box by V or X Date:……/..**06**../..**2023**..

Q1. Gender

1. Male ☐
2. Female ☐

Q2. Age

1. 18 years to 28 years ☐
2. 29 years to 39 years ☐
3. 40 years to 50 years ☐
4. 51 years to 61 years ☐

Q3. Martial status

1. Single ☐
2. Married ☐
3. Divorced ☐
4. Widowed ☐

Q4. Level of education

1. illiterate ☐
2. Primary school ☐
3. Secondary school ☐
4. University ☐

Q5. How many children in the family: 1-4 ☐ 5 or more ☐

Q6. Where do you get income:

Agriculture ☐ Monthly ☐ Salary ☐ Business ☐

Q7. Do you have conflicts with your partner? YES ☐ NO ☐

Q8. How long did you breastfeed your child? Below two years ☐ Two years or more ☐

Q9. Did you get pregnant two years after the following born YES ☐ NO ☐

Q10. Do you feed your child three times per day? YES ☐ NO ☐

Q.11. Economic class (ubudehe category)

1. Ubudehe category I ☐
2. Ubudehe category II ☐
3. Ubudehe category III ☐
4. Ubudehe category IV ☐

Q.12. What is the distance to the nearest water source?

1. Below 500 m ☐
2. Between 500m and 1000m ☐
3. Above 1000m ☐

Q13. Is the child currently having any disease?

1. Yes ☐
2. No ☐

APPENDIX 5: Questionnaire in Kinyarwanda

Urutonde rw'ibibazo

Koresha akamenyetso mu gusubiza V cg X Date:……/..**06**../..**2023**..

Q1. Igitsina

I. Gabo ☐

II. Gore ☐

Q2. Imyaka

a) Kuva 18 kugera 28 ☐

b) Kuva 29 kugera 39 ☐

c) Kuva 40 kugera 50 ☐

d) Kuva 51 kugera 61 ☐

Q3. Ibijyane no kubaka urugo

a) Ingaragu ☐

b) Arubatse ☐

c) Twaratandukanye ☐

d) Umupfakazi ☐

Q4. Ikigero cy'amashuri

a) Ntayo ☐

b) Amashuri abanza ☐

c) Amashuri yisumbuye ☐

d) Kaminuza ☐

Q5. Mufite abana bangahe: 1-4 ☐ 5 cg barenga ☐

Q6. Mukura he ibibatunga:

Ubuhinzi ☐ Umushahara w'ukwezi ☐ Ubucuruzi ☐

Q7. Ese waba ufitanye amakimbirane nuwo mwashakanye YES ☐ NO ☐

Q8. Wonkeje umwana mu gihe kingana iki? Kitageze imyaka 2 ☐ Imyaka 2 cg irenze ☐

Q9. Umwana uheruka yakurikiwe mu gihe kingana iki?

Munsi y'imyaka 2 ☐ Imyaka 2 cg irenze. ☐

Q10. Ugaburira umwana inshuro eshatu ku munsi? Yego ☐ Oya ☐

Q.11. Icyiciro cy'ubudehe

a) Ubudehe cya 1 ☐
b) Ubudehe cya 2 ☐
c) Ubudehe cya 3 ☐
d) Ubudehe cya 4 ☐

Q.12. Intera iri aho muvomera hafi hashoboka?

a) Munsi ya m 500 ☐
b) Hagati ya 500 na m 1000 ☐
c) Kurenga m 1000 ☐

Q13. Ese umwana wawe hari indwara yaba afite?

1. Yes ☐
2. No ☐

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