



**KNOWLEDGE AND PRACTICES OF MOTHERS ON HOME
MANAGEMENT OF DIARRHOEA IN UNDERFIVES CHILDREN AT
RULI HEALTH CENTER IN GAKENKE DISTRICT**

NDAYISABA Archange

College Of Medicine and Health Sciences

School Of Nursing and Midwifery

Master of Science in Nursing (Pediatric)

August 2019



**KNOWLEDGE AND PRACTICES OF MOTHERS ON HOME
MANAGEMENT OF DIARRHEA IN UNDERFIVES CHILDREN AT
RULI HEALTH CENTER IN GAKENKE DISTRICT**

By

NDAYISABA Archange

Reg: 217297463

A dissertation submitted in partial fulfilment of requirements for the degree of
MASTER'S OF SCIENCE IN NURSING (**Pediatric**)

In

DIRECTORATE OF POSTGRADUATE STUDIES

In the

COLLEGE OF MEDICINE AND HEALTH SCIENCES

Supervisor: Dr. Geldine CHIRONDA, PhD, MPH, MSCN
Co-Supervisor: Mrs. Marie Jeanne TUYISENGE, RN, MSCN

KIGALI August 2019

DECLARATION

I declare that this dissertation work entitled knowledge and practice of mothers on home management of diarrhea in underfives children at Ruli health center in Gakenke district has never been presented anywhere in other universities. But other author s ‘works have been referred to and have been referenced accordingly. Also, I do declare that a complete list of references is provided indicating all the sources of information quoted or cited”

NDAYISAB Archange

Date...../..... /.....

Reg: 217297463

Signature

DEDICATION

I dedicate this work to:

The almighty God, different supporters.

Mr UWIZEYIMANA Adrien for his support during my studies.

All my brothers and sisters for their collaboration and support throughout the completion of this dissertation

All my classmates, family and relatives for their help.

May Almighty God bless you.

ACKNOWLEDGMENT

No-one can accomplish this kind of work alone. I humbly thank the almighty God for his unconditional love and protection from childhood to-date. I am highly indebted to my supervisor Dr. Geldine CHIRONDA and co-supervisor Mrs Marie Jeanne TUYISENGE for their continued guidance, support, and encouragement that greatly contributed to the completion of this work.

I express my gratitude to all staffs of UR/CMHS in general for the existence of the master's program and especially those of dean of nursing and midwifery, for the intellectual package they provided and the persons who helped and guided me where was necessary. I thank HRH program for their financial and technical support to master's program. I thank Ruli Higher Institute of Health administration and staffs who allowed me to attend Master's program. I attribute also my thanks to Ruli Health Center Administration and staff, community health workers who supported me during data collection. I really thank Mr UWIZEYIMANA Adrien for his continued support and guidance, inspiration that significantly contributed to the accomplishment of this work.

I really attribute my thanks to KAMIKO Takanashi who provided the data collection tool and permission to use the tool.

I thank also my colleagues who helped me in one way or another and contributed to the achievement of my objectives.

May all almighty God bless you all!

ABSTRACT

Background: Diarrhea is one of the major public health problem worldwide, especially in developing countries. Knowledge and practices of the mothers are crucial in home management of diarrhea in under-five children. They are important determinants of the occurrence and outcome of diarrheal disease.

The aim of the study: The aim of this study is to assess knowledge and practice of mothers on home management of diarrhea in under-fives children at Ruli health center in Gakenke district.

Methodology: A nonexperimental descriptive cross-sectional design with quantitative approach was employed on 160 mothers at Ruli health center, Gakenke distric, Rwanda via a probability simple random sample. Knowledge and practices were assessed using structured interview schedule. Data analysis was performed using inferential and descriptive statistics. Testing for significant demographic factors associated with mother's knowledge and practices, and for relationship between knowledge and practice of mothers were performed by multivariate logistic regression and correlation (bivariate analysis).

Results: of the total 160 mothers, 71 (44.4%) had good level of knowledge, while 76 (47.5%) had good level of practice. Knowledge was significantly associated with age ($p=0.035$); and wealth status ($p=0.033$). Practice was significantly associated with age ($p=0.002$) and child's care taker ($p=0.040$). There is a strong significant positive linear correlation between practice and knowledge ($r = .755$ $p=0.0001$)

Conlusion: The level of knowledge and practice was low among mothers as regards to the home management of diarrhea among under-fives children. The correlation results revealed an increase in knowledge to necessitate an increase in the practice of mothers. Therefore, this calls for need to devise an effective health education strategies of mothers to promote their knowledge and practices regarding home management of diarrhea in children under 5 years of age.

Key words: knowledge, practice, diarrhoea, home management, under 5.

TABLE OF CONTENT

DECLARATION	i
DEDICATION	ii
ACKNOWLEDGMENT	iii
ABSTRACT	iv
TABLE OF CONTENT	v
LISTS OF SYMBOLS AND ABBREVIATIONS /ACCRONYMS	viii
LIST OF TABLES	ix
LIST OF FIGURES AND GRAPHS	x
LIST OF APPENDICES	xi
CHAPTER ONE: INTRODUCTION	1
1.1. INTRODUCTION.....	1
1.2. BACKGROUND OF THE STUDY	1
1.3. PROBLEM STATEMENT	3
1.4. AIM OF THE STUDY	4
1.5. RESEARCH OBJECTIVES	4
1.6. RESEARCH QUESTIONS.....	4
1.7. SIGNIFICANCE OF THE STUDY	5
1.8. OPERATION DEFINITION OF KEY TERMS PERTINENT TO THE STUDY.....	6
1.9. STRUCTURE / ORGANIZATION OF THE STUDY.....	7
1.10. CONCLUSION TO CHAPTER ONE.....	7
CHAPTER TWO: LITERATURE REVIEW	8
2. 1. INTRODUCTION.....	8
2.2. THEORETICAL LITERATURE.....	8
2.2.1. Definition, signs and symptoms of diarrhea.....	8
2.2.2. Prevalence of diarrhea	9
2.2.3. Causes of diarrhea	10
2.2.4. Diagnosis of diarrhea.....	11
2.2.5. Mothers management of diarrhea at home	11
2.3. EMPIRICAL LITERATURE.....	12
2.3.1. Knowledge of mothers on home management of diarrhea.....	12
2.3.2. Practices of mothers on home management of diarrhea.....	16
2.3.3. Factors associated with knowledge and practices of mothers on home management of diarrhea.....	20

2.4. CRITICAL REVIEW AND RESEARCH GAP IDENTIFICATION	22
2.5. CONCEPTUAL FRAMEWORK	23
2.6. CONCLUSION TO CHAPTER TWO	24
CHAPTER THREE. RESEARCH METHODOLOGY	25
3.1. INTRODUCTION	25
3.2. RESEARCH DESIGN	25
3.3. RESEARCH APPROACH	25
3.4. RESEARCH SETTING	25
3.5. STUDY POPULATION	26
3.5.1. Inclusion criteria	26
3.5.2. Exclusion criteria	27
3.6. SAMPLING	27
3.6.1. Sample size	27
3.6.2. Sampling strategy	28
3.7. VALIDITY AND RELIABILITY OF RESEARCH INSTRUMENT	28
3.7.1. Data collection instrument	28
3.7.2. Validity of research instrument	29
3.7.3. Reliability of research instrument	30
3.8. DATA COLLECTION PROCEDURE	31
3.9. DATA ANALYSIS	32
3.10. ETHICAL CONSIDERATIONS	34
3.11. DATA MANAGEMENT	35
3.12. DATA DISSEMINATION	35
3.13. LIMITATIONS AND CHALLENGES OF THE STUDY	36
3.14. CONCLUSION TO CHAPTER THREE	36
CHAPTER FOUR: PRESENTATION OF THE RESULTS	37
4.1. INTRODUCTION	37
4.2. Demographic characteristics of study	37
4.3. Knowledge of mothers on home management of diarrhea among children under-fives	39
4.4. Practices of mothers on home management of diarrhea	40
4.5. Participants level of knowledge and practice regarding home management of diarrhea	42

4.6. Sociodemographic factors associated with knowledge and practice of mothers on home management of diarrhea in under-five children.....	44
4.7. Relationship between knowledge and practice of mothers on home management of diarrhea in under-five children	46
4.4. CONCLUSION OF RESULTS.....	46
CHAPTER FIVE: DISCUSSION.....	47
5.1 INTRODUCTION.....	47
5.2 DISCUSSION OF THE VARIABLES UNDER STUDY	47
5.2.1. Discussion of demographic variables	47
5.2.2. Level of knowledge of mothers on home management of diarrhea among under-fives children.	48
5.2.3. Level of practices of mothers on home management of diarrhea among under-fives children	50
5.2.4. Sociodemographic factors associated with knowledge and practice of mothers on home management of diarrhea in under-five children.....	52
CHAPTER SIX: CONCLUSION AND RECOMMENDATIONS	54
6.1. INTRODUCTION.....	54
6.2. CONCLUSION	54
6.3. RECOMMENDATIONS	54
LIST OF REFERENCES.....	56

LISTS OF SYMBOLS AND ABBREVIATIONS /ACCRONYMS

CHWs: Community Health Workers

LIMC: Low Income and Middle Countries

MoH: Ministry of Health

NISR: National Institute of Statistics Rwanda

RDHS: Rwanda Demographic Health Survey

UDHS: Uganda Demographic Health Survey

UNICEF: United Nations International Children's Emergency Fund

WHO: World Health Organization

ORS: Oral Rehydration Solution

SDGs: Sustainable Development Goals

UR: University of Rwanda

CMHS: College of Medicine and Health Sciences

HC: Health center

FBC: Full blood count

CRP: C-reactive protein

IBD: Inflammatory bowel disease

GI: Gastrointestinal

PH: Potential of Hydrogen

SSS: Salt sugar solution

CVR: Content validity ration

CVI: Content validity index

IRB: Institutional review board

LIST OF TABLES

Table 3.1. Table of Content validity	30
Table 4. 2. Sociodemographic characteristics of study participants (N=160)	38
Table 4.3. Knowledge of mothers home management of diarrhea (N= 160)	40
Table 4.4. Practices of mothers on home management of diarrhea (N=160).	42
Table 4.5, Participants level of knowledge and practice regarding home management of diarrhea (N=160).....	43
Table 4.6. Sociodemographic factors associated with knowledge and practice of mothers on home management of diarrhea in under-five children (N=160)	45
Table 4.7. Correlation between knowledge and practice of mother on home management of diarrhea (bivariate analysis)(N=160)	46

LIST OF FIGURES AND GRAPHS

Figure 1. Conceptual framework adapted from Pender Health Promotion Model 2011: Interacting interlinked factors leading to diarrhea home management practices.	24
---	----

LIST OF APPENDICES

APPENDIX 1. UR ETHICAL CLEARANCE	A
APPENDIX 2. REQUEST FOR DATA COOLECTION	B
APPENDIX 3. PERMISSION TO COLLECT DATA.....	C
APPENDIX 4. PERMISSION TO USE INSTRUMENT FOR DATA COLLECTION	D
APPENDIX 5. INDIVIDUAL INFORMED CONSENT FORM	E
APPENDIX 6.QUESTIONNAIRE INSTRUCTIONS.....	F
APPENDIX 7.DATA COLLECTION TOOL ENGLISH VERSION	G
APPENDIX 8. AMASEZERANO Y'UBUFATANYE MUBUSHAKASHATSI	M
APPENDIX 9.ICYEMEZO CYEMEZA KUGIRA URUHARE MURI UBU BUSHAKASHATSI	P
APPENDIX 10. AMABWIRIZA Y'URUPAPURO RW'IBIBAZO	Q
APPENDIX 11. IBIBAZO BY'UBUSHAKASHATSI MU KINYARWANDA.	R
APPENDIX 12. WORK PLAN	X
APPENDIX 13.BUDGET.....	Z

CHAPTER ONE: INTRODUCTION

1.1. INTRODUCTION

Diarrhea remains the main cause of morbidity and mortality in under 5 children which accounts for 2 million deaths per year globally (Divya et al., 2016 p1). A large percentage of these deaths, about 80% are found in Africa and South Asian countries. (Mihrete, Alemie and Teferra, 2014.p2). For example a child experiences five episodes of diarrhoea per year in Africa and 800,000 children die each year due to diarrhea and dehydration with an account of 25 to 57% of all childhood diseases (Tambe, Nzefa and Noline, 2015 p2).

In Rwanda, diarrhea is at the third place in causing childhood morbidity and mortality where it counts for 15% of deaths (Nsabimana, Mureithi, and Habtu 2017 p1). The prevention of these death can be achieved through quick management at home. (Mumtaz, 2014 p5). Knowledge and practices of mothers on diarrhea home management in under 5 children play a vital role in the occurrence and outcome of diarrheal diseases(Ogbeyi, Onyemochi and Ogbonna, 2016 p1). Hence the need for mothers knowledge and practices on diarrhoea home management in order to diminish the mortality and morbidity.

1.2. BACKGROUND OF THE STUDY

The WHO consider diarrhea as the passage of liquid or loose stool for three times and more per day (WHO, 2017p2). Children with diarrhea often present different signs and symptoms that include abdominal pain, abdominal cramps, flatulence, nausea and vomiting. In addition, the child may also experience loss of bowel control and loss of electrolytes through dehydration which affects the volume of water in the body, muscle movement or activities and other main body functions. Nearby infections that cause diarrhea can also lead to fever, chills and bloody stool (Kabayiza, 2014 p.7). Diarrheal diseases in under 5 remain to be a public health problem worldwide (Diouf, et al., 2014 p.1). Globally, diarrhea prevalence among under 5 is estimated 3.6% of the worldwide burden of disease (Thiam et al., 2017 p.2), and diarrhea prevalence is still high in sub-Saharan Africa and Asia. In Rwanda, diarrhea prevalence was 12.1% in 2014-2015. (RDHS 2014-2015 p19).

The studies conducted in different areas of world revealed that

Studies from diverse areas of the world showed that different pathogens play a role in the growth of infantile diarrhea, those include bacteria, virus and parasites. (Duru, Agbagwa,

Umoren, 2014 p.1-11, and Bonkougou et al., 2013 p.2-6). Beside this, some disorders and diseases like functional gastrointestinal (GI) disorders, food intolerance, allergies, and Inflammatory bowel diseases (IBD) have been also reported to cause diarrhea diseases. (Turnbull, Adams and Gorard, 2014 p.69). Diarrhea remains one of the childhood killer diseases worldwide, where it accounts for 15% of under-five mortality (Ntaji et al., 2014 p2). Every year, 2.5 billion cases of diarrhea result in death (Services, 2013 P.2).The highest rates are found in low and middle-income countries of Sub-Saharan Africa and Southeast Asia where diarrhea is the second leading cause of death among under-fives(Diouf et al., 2014 p.1). In Rwanda, diarrhea is the third leading cause of childhood morbidity and mortality where it counts for 15% of deaths (Nsabimana, Mureithi, and Habtu. 2017 p1).For example, Reports from 2010 stated that around 38,000 of under five years old children died in Rwanda because of various diseases but diarrhea was among the top ten leading causes of morbidity (NISR, 2015).

These death can be prevented by simple home based practices of mothers coupled with their knowledge on home management of diarrhea. As primary caregivers to under-five children, mothers' knowledge and practices are important to minimize the effects of morbidity and mortality associated with diarrheal diseases (Desta, Assimamaw and Ashenafi, 2017 p.7).

Knowledge and practices of mothers on the early home management of diarrhea is a key element in the management of diarrhea in a child so as to intervene early and thereby avoiding complications (Chiabi et al., 2018 p2). Timely and correct identification of diseases and early home management with increased fluid intake, administration of oral rehydration solution (ORS), provision of zinc supplements(tablets or syrup) for 10-14 days and continued feeding and breastfeeding play a key role in reducing diarrhea related mortality, dehydration and nutritional damage. Therefore, mothers should begin prompt initiation of home management before seeking medical care (Ogbeyi, Onyemocho and Ogbonna, 2016).The role of mothers is a cornerstone in the management and prevention of diarrhea disease (Dodicho, 2016).

To attain sustainable development goals (SDGs), the government of Rwanda is putting greater attention to reducing diarrhea morbidity and mortality since it is a major contributor to the under 5 morbidity and mortality. To achieve significant reduction in morbidity and mortality due to diarrhea, there is a need for improvement in diarrhea case management in homes within the community (WHO, 2016 p 5). The government of Rwanda in collaboration

with WHO country cooperation strategic agenda (2014-2018) is putting emphasis on health promotion, disease prevention and end up of the epidemic of water-borne diseases and other communicable diseases such as diarrhea by training the communities and community health workers on home management of these diseases (WHO, 2015 p.2). In addition, the government of Rwanda in SDGs Target 3.3 is to provide universal and equitable access to safe and affordable drinking-water, sanitation and hygiene. It is also targeting to safely manage sanitation coverage, which includes access to a hand-washing facility with water and soap (WHO, 2016.p8). Lastly, majority of Rwandans around 84 % (NISR, 2010, 2015) across the country have access to both water and sanitation (MoH, 2013 p.24). Despite these efforts, diarrheal diseases continue to be among the top ten leading causes of mortality and morbidity for children under 5 years in Rwanda (MoH, 2013 p.24). Data from Rwanda demographic health survey (RDHS) 2014-2015), showed that diarrhea prevalence among children under five was 12, 1%; whereby the prevalence was greater in young children between 12-23 months (22%) and those between 6-11 months (18%) (RDHS, 2014-2015 p20).

1.3. PROBLEM STATEMENT

Poor practices of mothers regarding home management of diarrhea among under-fives children has been identified. Poor practices of the mothers on home management of diarrhea have many consequences that include dehydration, growth faltering, stunting, impaired cognitive development, and malnutrition in countries with limited resources (Farthing et al; 2013p.2).In addition, poor practices of the mothers are associated with increased hospitalization, treatment cost, and childhood morbidity and mortality (Ngabo. et al.2016 p.2)

Studies have shown that mothers poor knowledge contribute to poor practices on home management of diarrhea in under-fives children, poor knowledge limit them from taking appropriate timely actions (Shah et al., 2011 p.76). The knowledge of mothers on home management of diarrhea in under-fives has paramount importance to reduce diarrhea-related morbidities and mortalities (Olopha and Egbewale, 2017 p3). In addition to poor knowledge of mothers, studies also revealed that sociodemographic characteristics of mothers contribute to poor practices and poor knowledge of mothers on diarrhea home management among under-fives (Ghasemi et al., 2013 p.6).

Rwanda has put much efforts to increase mother's knowledge and practice toward diarrhea home based management, despite this, diarrhea morbidity and mortality are still high in under

5 in Rwanda. There is no study documented on knowledge and practices of mothers on diarrhea home management in Rwanda, hence the need to conduct the present study.

1.4. AIM OF THE STUDY

This study aimed at assessing knowledge and practices of mothers on home management of diarrhea in under-fives children at Ruli health center in Gakenke district.

1.5. RESEARCH OBJECTIVES

1. To determine the level of knowledge of mothers on home management of diarrhea among under-fives children at Ruli H. C
2. To determine the level of practice of mothers on home management of diarrhea in under-five children at Ruli HC.
3. To determine sociodemographic factors associated with knowledge and practice of mothers on home management of diarrhea in under-five children at Ruli HC.
4. Examine the relationship between knowledge and practice of mothers on home management of diarrhea in under-five children at Ruli HC.

1.6. RESEARCH QUESTIONS

1. What is the level of knowledge of mothers on home management of diarrhea in under-fives children at Ruli H. C?
2. What are the practices of mothers on home management of diarrhea in under-five children at Ruli HC?
3. What are the sociodemographic factors associated with knowledge and practice behaviors of mothers on home management of diarrhea in under-five children at Ruli HC?
4. What is the relationship between knowledge and practice of mothers on home management of diarrhea in under-five children at Ruli HC?

1.7. SIGNIFICANCE OF THE STUDY

This study had five major areas of significance.

Nursing research:

This study identified the knowledge and practices of mothers on home management of diarrhea in under-five children. By providing information to mothers related to home management of diarrhea, new avenues were identified providing a basis for further research. In addition, the results from this study established the baseline information which may be used by other researchers to conduct other studies on diarrhea diseases in children under five years.

Nursing practice

The health professionals such as nurses used the results of this study to implement responsive health programs targeting to reduce morbidity and mortality related to diarrhea among under-fives children. The findings of this study were useful to develop guidelines fit for local setting and to encourage mothers to change their home practices for preventing diarrhea among children.

Nursing Administration:

Results of this study informed national healthcare policy makers and Ruli health Center administration in particular, to recognize gaps in mother's knowledge and practices on home management of diarrhea in under-fives and associated effects hence developing useful guidelines fit for local setting and set adequate and suitable strategies to address diarrhea diseases among children under five years old. This study also increased mother's awareness about their own responsibilities in relation to home management of diarrhea.

Nursing education:

The findings of this study were used by nursing education institutions to develop and implement responsive educational programs aimed at equipping graduates to deliver safe and quality care, preventive and curative care to mothers and children under-fives years of age and contribute to reduction of diarrhea occurrence, mortality and morbidity rate and achieving sustainable development goals.

Community

The finding of this study Supported and promoted the importance of community health workers and other health care providers in general in educating the community about home based management of diarrhea in under-fives.

1.8. OPERATION DEFINITION OF KEY TERMS PERTINENT TO THE STUDY

Knowledge: Facts, information, and skills acquired through experience or education; the theoretical or practical understanding of a subject (Oxford English dictionary 2016). In this study knowledge refers to the correct response given by mothers regarding home management of diarrhea to the knowledge questionnaire.

Practices: Performance of an activity or skill so as to acquire or maintain proficiency in it. (Oxford English dictionary 2016). In this study, practice refer to the mothers' activities toward diarrhea home based management in under-fives children.

Mother: A female that creates, nurtures, protects something. (Collins English dictionary 2018). In this study, mother refers to someone who take care of under-five child (child's own mother, father, child care taker, relatives).

Child: 'Child' is a person who is below the age of 18, unless the laws of a particular country set the legal age for adulthood younger. (UNICEF 2018). In this study, a child is the one aged below five years old.

Diarrhea is defined as the passage of three or more loose or liquid stools per day (WHO, 2017 p.2).In the context of this study, diarrhea is a condition where the under-fives children passes three or more loose or liquid stools within 24hours.

Home management of diarrhea: household practices targeted for treating diarrhea, which essentially are administration of salt-sugar solution, homemade fluids, hand washing, breastfeeding and continued feeding (WHO 2014 p18).

In the context of this study, Home management of diarrhea refers to mother's practices to manage diarrhea at home before seeking help from skilled health service providers. Those practices include giving salt sugar solution (SSS), increased amounts of appropriate household fluids (like soups, rice water, porridge, yogurt drinks, or drinking water) after each wet stool, continuous breast milk or milk feeding, soft foods such as cereals, vegetables and hand washing with soap.

1.9. STRUCTURE / ORGANIZATION OF THE STUDY

This dissertation is subdivided into the following parts. The first part (with small roman numerals) includes the Presentation of the project : The title page, declaration, dedication, acknowledgement, abstract, table of contents, list of symbols and abbreviations/acronyms, list of tables, list of figure and list of appendices. The second part (with Arabic numerals) contains 6 chapters: chapter one that covers the introduction, Chapter two: the literature review, chapter three: the methodology, chapter four: presentation of the results, chapter five: discussion and chapter six, conclusion and recommendations. It also includes references and appendices.

1.10. CONCLUSION TO CHAPTER ONE

There is an increased prevalence of diarrhea among under-fives worldwide, accounting for an estimate of 3.6% of the global burden of disease. The prevalence is still high especially in Asia and sub-Saharan African countries including Rwanda, and is responsible for high under-fives morbidity and mortality. Home treatments are an essential part of the correct management of diarrhea diseases. Mother's knowledge and practices plays an important role and are the cornerstones in reducing morbidity and mortality of diarrhea among under-five

CHAPTER TWO: LITERATURE REVIEW

2. 1. INTRODUCTION

A Literature Review is "a systematic, explicit, and reproducible method for identifying, evaluating, and synthesizing the existing body of completed and recorded work produced by researchers, scholars, and practitioners (Okoli and Schabram 2010 .P1). This chapter shows the literature search strategies used, both empirical and theoretical literatures about knowledge and practices of mothers on home based management of diarrhea in under 5 children, the adapted conceptual frame and lastly the identified gaps in the literature about the topic under study are shown in this chapter.

Literature search strategies

The research words used to get this literature are mother's knowledge and practices on home management of diarrhea among under-fives, factors associated with knowledge and practice, and relationship between knowledge and practice. There exist different scholars with different theories and arguments in relation to this study. Google scholar, pub med and Hinari and articles from 2011 to 2018 are the main source of information the researcher used to get the literature used in this study.

2.2. THEORETICAL LITERATURE

2.2.1. Definition, signs and symptoms of diarrhea.

Diarrhea is defined as the passage of three or more loose or liquid stools per day. (WHO, 2017 p.2). Children with diarrhea often have abdominal pain, abdominal cramps, nausea, vomiting and urgent need to use the bathroom, or loss of bowel control, loss of electrolytes through dehydration that affects the amount of water in the body, muscle activity, and other important functions. Some infections that cause diarrhea can also cause fever and chills or bloody stool (Kabayiza, 2014.p28).

In addition, children with diarrhea exhibit frequent, watery, loose stools, malaise, flatulence, nausea, vomiting, foul bloody stools that contain mucus and fever ranged within two weeks (Lindberg et al., 2013 p.12). It can also result in persistent diarrhea, rectal prolapse, septicemia (blood poisoning), and haemolytic-uraemic syndrome (HUS), a condition that affects the kidneys and blood clotting system (Hatz et al; 2015 p.45).

2.2.2. Prevalence of diarrhea

Globally, Diarrhea prevalence among under-fives children accounts for an estimated 3.6% of the global burden of disease (Thiam et al., 2017p.2). Many studies conducted across different countries show that the prevalence of diarrhea among under-fives is still high especially in sub-Saharan Africa and Asia countries. For instance, a study conducted in India showed that the prevalence of diarrhea among under-fives was 21.70% in 2015 (Ganguly et al., 2015 p.1). The overall diarrhea prevalence in Bangladesh among children under 5 years was counted to be 5.71% (Sarker et al., 2016 p.1). In Iran, 10.3% of children experienced significant diarrhea during the past two weeks with the average number of episodes of 2.8 per child. (Costs, 2015 p.1). In Brazil, the prevalence of diarrhea among under-fives was 11.9% (Konstantyner et al., 2015 p.1).

Global diarrheal diseases in Sub-Saharan Africa is a major public health concern, especially in children under five years (Tambe, Nzefa, and Nicoline, 2015 p.1). The prevalence of diarrheal cases in Africa is high, accounting for 2.5 billion cases among children under five; the global dehydration is ranged from 25 to 75% of all childhood diseases (Tambe, Nzefa, and Nicoline, 2015p.1).The current study conducted in Senegal noted that the prevalence of diarrhea among under-fives was 19% (Thiam et al., 2017 p.2). In Zambia, the prevalence of diarrhea among under-fives it was 44.6% (Chilambwe, 2015.p1).The study conducted in Nigeria indicated that the prevalence of diarrhea among the under-fives was 43.4%. The rate of diarrhea was higher among children of mothers who prepared child's food on the floor (45.5 %) than those who prepared it on the table (40.7 %), and those who used only water for hand washing (48.2 %) than those who used soap and water (40.3 %) (Ntaji, et al., 2014 p9).

The Ethiopian Demographic and Health Survey showed that the prevalence of under-five childhood diarrhea in the two-week period was 18% in Ethiopia. A 2011 Demographic and Health Survey also showed that 13% of children under the age of five had diarrhea, in the two-week period before the survey (Mohammed and Zungu, 2016.P2). The study conducted in Mkuranga District (Tanzania) reported that the prevalence of diarrhea in children under five years old was 32, 7% (Kakulu, 2012 p. 38). In the same country, another study conducted by Mashoto and colleagues in 2014 revealed that diarrhea diseases was estimated at 6.1% and children aged between 12 to 23 months (11.6% to 15.8%) were mostly affected (Mashoto, et al., 2014 p.1).

Diouf et al conducted a study in Burundi in 2014 found that diarrhea episodes affected 32.6% of children under 5 years old (Diouf et al., 2014 p. 1). In Uganda, diarrhea affected 32 to 48% of children under 5 years in the two weeks preceding Uganda Demographic and Health Survey (UDHS, 2011 p.400). The prevalence of diarrhea in Rwanda was recorded in the recent DHS 2014-2015. According to the report; 12% of Children under 5 years had diarrhea within two weeks preceding the Rwanda Demographic and Health Survey (RDHS). Most cases were identified among those aged between 12-23 months and 6-11 months 22% (NISR, 2015 p.8).

2.2.3. Causes of diarrhea

Studies from different areas of the world showed that various pathogens were involved in the development of childhood diarrhea, those include bacteria, virus and parasites. For example, the study conducted in Nigeria in 2014 reported that *Escherichia Coli* (23.0%), *Salmonella* species (10.0%), and *Shigella* species (8.0%) were among pathogens that caused acute diarrhea to the under-five children (Duru, Agbagwa and Umoren, 2014 pp.1-11). Another study conducted in Ouagadougou Burkina Faso reported that among hospitalized children under five, rotavirus was found in 30% of patients whereas *Escherichia Coli* was observed in 24% (Bonkougou et al., 2013 p.2-6).

The study conducted in Kathmandu, Nepal (hospital) to detect parasites which were involved in development of diarrhea among hospitalized under five children reported that protozoal parasites were found in 10,7% whereas helminthic parasites were 1.3%. The parasitic infection prevalence was higher in children of less than 2 years. *Entamoeba histolytica* (6, 7%) was the chief cause of diarrhea in this age group followed by *Giardial lambia* (3, 4%) (Ansari, et al., 2012 p.1)

Viral gastroenteritis are the main causes of diarrhea among which the rotavirus is the most leading cause of severe complication of dehydration especially in developing countries where there is drinking of unimproved water source and poor sanitation. The proportion of diarrhea cases hospitalized with positive rotavirus is estimated at 40.3% in Sub-Saharan countries (Tate. et al 2016 p.6)

Many disorders and diseases can cause chronic diarrhoea in young children. Those diseases are connected to common causes like infections, functional gastrointestinal (GI) disorders, food intolerance, allergies, and inflammatory bowel diseases (IBD).They cause chronic diarrhea along with malabsorption as the small intestine does not absorb nutrients from food.

If children do not absorb enough nutrients from the food they eat, they may become malnourished (Turnbull, Adams and Gorard, 2014 p.69).

Food intolerances or food poisoning: Sometimes children cannot digest correctly some foods such as lactose, gluten found in wheat, sugar found in milk and barley as well as some solid foods. Frequently the food intolerance or poisoning is caused by bacteria in undercooked food or spoiled food (Turnbull, Adams and Gorard, 2014 p.69).

In Rwanda, amoebic dysentery is the most common serious cause in children, bacterial infections (e.g. shigella, salmonella), parasitic infestations (e.g. amoebic dysentery), milk allergy, chronic inflammatory bowel disease also cause diarrhea in children under-fives in Rwanda (MoH 2013 p.35).

2.2.4. Diagnosis of diarrhea

In children with diarrhea, a stool pH level of 5.5 or less or presence of reducing substances indicates carbohydrate intolerance, which is usually secondary to viral illness and transient in nature. Examine any exudates found in stool for leukocytes. Such exudates highly suggest colitis (80% positive predictive value). Many different culture mediums are used to isolate bacteria, common bacteria and optimum culture mediums for their growth. Always culture stool for Salmonella, Shigella, and Campylobacter organisms and Y enterocolitica in the presence of clinical signs of colitis or if fecal leucocytes are found. Bloody diarrhea with a history of ground beef ingestion must raise suspicion for enterohemorrhagic E coli (Aziz 2014. P.28)

In Rwanda, diarrhea is diagnosed by carrying out different investigations which vary according to the suspected etiology, those include Stool examination (PH, White blood count, Fat, Ova, osmolality, Culture), Full blood count (FBC), C-reactive protein (CRP), electrolytes, urea and creatinine, Sweat chloride if suspicion of cystic fibrosis, Barium study, Small bowel biopsy and Endoscopy (Sigmoidoscopy or coloscopy with biopsy) (MoH, 2013. P35)

2.2.5. Mothers management of diarrhea at home

Home treatment is an essential part of diarrheal management. The importance of home management of diarrhea (which essentially is administration of fluid, use of zinc tablets, correct feeding during diarrheal episodes and recognition of time to seek health care) lies on the fact that diarrhea starts at home, and continues at home or return after being seen at a

health facility. Mothers are the key caregivers to under-five children. They are the ones who decide about the type of food given to the child and the overall management of the disease. (Olopha and Egbewale, 2017).

Since 2004, the World Health Organization and UNICEF recommend the use of low-osmolality oral rehydration salts (ORS) consists of using either a solution prepared from sachets of oral rehydration salts, or a solution prepared at home with water, sugar and salt, known as the salt-sugar solution (SSS), zinc supplementation, increased amounts of appropriate home-based fluids (e.g., soups, rice water, yoghurt drinks or clean water) and continued feeding to treat diarrhea at home (WHO 2014 p18).

Even though diarrhea prevalence is high in Rwanda, several strategies were put in place to control diarrheic diseases among children under five where much emphasis was made on its home management and prevention. The Ministry of Health recommend the use of oral rehydration salt, a 10-14 day supplemental treatment course of dispersible 20 mg zinc tablets, continued breastfeeding if the child is breast feeding, feed the child many times in small quantities daily if the child has started eating, and to increase the drinks offered to the child each day (water from rice, porridge, clean water) in diarrhea home management of under-fives. (MoH 2012 p33-34). In addition, the Ministry of Health advises mothers to wash hands with the use of soap after using the toilet, after cleaning a child who has defecated, before preparing food and eating food, and before serving the child food (MoH 2012 p33-34).

Furthermore, the Ministry of Health, through a process of task shifting principles, has enabled Community Health Workers (CHWs) to play a pivotal role in educating communities about home based management of diarrhea, sanitation and identifying diarrheal cases in early stages and refer them to health facilities (Haver, et al. 2015, p. 33). Lastly, majority of Rwandans around 84 % (NISR, 2010, 2015) across the country have access to both water and sanitation (MoH, 2013 p.24)

2.3. EMPIRICAL LITERATURE

2.3.1. Knowledge of mothers on home management of diarrhea

The proper management of diarrhea in under-fives is based on home management. The extent to which mothers of under-five children can adopt this therapy is tied to their level of knowledge and practices. Mothers are the ones to firstly recognize diarrhea and to decide about management of diarrhea at home before seeking medical care, therefore their

knowledge and practices with regards to diarrhea at home remains a crucial point in the management so as to intervene early on the first signs and avoid complications (Olopha and Egbewale, 2017). Their knowledge has paramount importance in reducing diarrhea-related morbidities and mortalities, if mothers are knowledgeable appropriate timely actions are taken (Chiabi et al., 2018 P2).

A Study conducted by Ogbeyi, Onyemocho and Ogbonna (2016) in Nigeria indicated that (42.7%) of the respondents had fair knowledge of the correct definition of diarrhea in a child, while 57.3% had poor knowledge of the definition of diarrhea. (68.1%) identified teething as a major cause of diarrhea, 32(10.9%) identified germs as causes of diarrhea. (23.4%) of the respondents opined breast feeding as one of the ways a child could contract diarrhea, (13.6%) opined that contact with another person is a recognized route in which a child could get diarrhea. The most common measures mentioned for managing diarrhea at home was mist kaolin 189(64.1%) and metronidazole 175(59.3). A fair knowledge of anti-diarrhea drugs and ability to name at least one drug was observed. The result also showed that 71.2% of caregivers were aware of ORS (Ogbeyi, Onyemocho and Ogbonna 2016 p.5-6)

The study also revealed that 68.8% had a good knowledge that disposing faeces in a pit latrine was correct, 65% also had good knowledge that rising away children's faeces while washing was incorrect. However, 76.9% had poor knowledge that throwing faeces outside the yard was a proper method of sanitary disposal. Majority (61.1%) of the respondents' opined that it was proper to wash their hands after using toilet, 40.0% opined that it was proper to wash their hands after attending to a child that defecated (Ogbeyi, Onyemocho and Ogbonna, 2016 P5)

The study conducted by Amare, D et al, 2014 in Ethiopia indicated that 66.6% of the mothers knew that diarrhea is caused by poor hygiene, and 2.3% of the mothers knew that diarrhea can be caused by bacteria, and 0.6% of the mothers knew that diarrhea can be caused by virus. However, 26.6% of the mothers had no any knowledge about the cause of Diarrhea.

A Study conducted by Chiabi et al., 2018 in the urban area of Ngaoundere of Cameroon indicated that more than 55% of the mothers lived in households that used tap water and latrine, majority (76.1%) of which had sufficient knowledge about diarrhea. Health facilities were the most cited source of information by 85.7% of the mothers. Most of them (37.8%) knew the definition of diarrhea as the emission of more than 3 liquid stools per day. Most

(91.7%) cited inadequate food hygiene as a cause of diarrhea and proper food hygiene as a means of prevention (93%) (Chiabi et al. 2018 p2)

A Study conducted by Olopha and Egbewale, 2017 in Nigeria reported poor level of mothers' knowledge of childhood diarrhea management. In this study; only 32.5% of the respondents rightly indicated that zinc tablet or suspension could be used in managing childhood diarrhea, 6.9% erroneously indicated 'no' while the largest proportion of the respondents 60.5% stated that they do not know. Lower level of knowledge was also reported on the timing of zinc administration as only 17.0% of the respondents correctly reported administration of zinc tablet or suspension daily. 5.7%, 3.3% and 0.7% wrongly stated administration of zinc twice, thrice and four times daily respectively. Moreover, the largest proportion of the respondents (72.3%) reported not having knowledge of the timing of administration of zinc. On the duration of zinc administration, only 24.4% of the respondents correctly reported that zinc is given 10-14 days with the largest proportion (75.6%) reporting that they do not know the duration of zinc administration (Olopha and Egbewale, 2017 p.7)

Shah et al., 2012 in India also reported that the majority (80%) of the mothers knew about at least one life-threatening symptom of diarrhea, the prominent among them being many watery stools (85%) and repeated vomiting (54%) and blood in stools (32.3%). Few of the respondents knew that marked thirst and poor feeding are danger signs. It was noteworthy that none of the mothers thought reduced urine output as a sign that should alarm them (Shah et al., 2011 p.77)

A Study conducted by Shah et al., 2012 in India showed that majority (72%) of mothers were aware of the use of ORS in the home management of diarrhea, but only 30% were able to explain the correct method of its preparation. Shah et al also revealed that out of 23 children on exclusively breast-feeding, approximately 60% were continued with the breast-feeding as usual. Among the other group of 221 children, continued feeding was reported in 50.7% of the children during an episode of acute diarrhea (Shah et al., 2012 p. 6)

A study conducted by Shah et al., 2012 in India indicated that (46.5%) knew about ORS and of these only 29.8% knew about the correct method of preparation. Out of 38.7% of the respondents who knew about home available fluids, the commonest solution used was the sugar salt solution (51.3%). When asked about the amount of home available fluids that could be given, more than half of the mothers didn't know about the correct quantity. No mothers were aware of zinc supplementation (Shah et al., 2012 p78)

The Study conducted by Dodicho, 2016 in Ethiopia showed that twenty eight (4.3%) of the respondents agreed that diarrhea is a normal process when a child is growing up and due to toething period. Respondents also listed four danger signs necessitating the treatment of diarrhea outside home namely: passage of bloody/mucoid stool (34.7%), diarrhea with fever (38.7%), diarrhea with vomiting (15.3%) and sunken eyes & fontanel (9.2%). (56.4%), (33.8%), (2.6%), (3.1%) stated that ORS, breast milk, salt sugar solution and rice water were preferred oral fluid to be given to their children during diarrhea respectively. Concerning ORS, 79.1% of the respondents were aware of ORS. But only 20.3% of the respondents were aware of salt sugar solution (SSS).67% of mothers had good knowledge but the rest 33% had poor knowledge on home management of diarrhea in children (Dodicho, 2016 P.72)

Dodicho 2016 in Ethiopia revealed that of the 466 respondents who were aware of ORS preparation, 338 mothers mentioned the correct procedure (i.e. 4 glasses of boiled & cooled water is required to prepare a packet of ORS) while 128 gave incorrect response. More than half (54%) of respondents said that ORS should be used within 24 hours of its preparation. Of the 133 respondents who were aware of homemade ORS also known as salt sugar solution (SSS) preparation, only 50 of them were able to mention the components correctly (that is 1 tea spoonful salt, 8 tea spoonful sugar and 1 liter boiled and cool water) while the rest 83 gave wrong response (Dodicho 2016 P.72-73)

Study conducted by Ghasemi et al., 2013 in Iran showed that 28.8% of mothers had a good knowledge of diarrhea, while the 46.5% had medium and 24.7% had low knowledge in diarrhea. Also, findings from the studies conducted in Nepal, Iran, and Nigeria showed inadequate level of knowledge of caregivers (mothers) on home management of diarrhea (Abdinia 2014 p 8).

The Study conducted by Desta, Assimamaw and Ashenafi, 2017 in Ethiopia found that 208 (56.2%) of caregivers had adequate knowledge while 162 (43.8%) caregivers had inadequate knowledge regarding home management of diarrhea in under-five children. This study also found that out of all caregivers, two hundred forty-two (65.4%) had correct knowledge of meaning of diarrhea and concerning the signs of diarrhea, 156 (42.2%), 97 (26.2%), and 252 (68.1%) of caregivers said that frequent passage of diarrhea, sunken eyes, and weakness/lethargic are signs of diarrhea in children, respectively. Around 213 (57.6%) of caregivers said that poor hygiene is the cause of diarrhea and about 30.3% caregivers did not know any cause of diarrhea. For about 276 (74.6%) of respondents' source of information

regarding diarrhea and its management was health workers, while 12.7% caregivers did not have any information about diarrhea. About 269 (72.7%) of caregivers said that diarrhea is not treatable at home and more than half of the caregivers (51.6%) did not know any type of fluids used for management of diarrhea at home and 28.1% caregivers knew that ORS is one of the fluids used in diarrhea (Desta, Assimamaw and Ashenafi, 2017 p.6)

Regarding the use of ORS, only 67 (18.1%) caregivers said that it replaces fluid lost during diarrhea but 239 (64.6%) caregivers said it stops diarrhea, while 64 (17.3%) of caregivers did not know the use of ORS. More than two hundred eighty (76.2%) of participants had correct knowledge on preventive ways of diarrhea disease in under-five children, of which 41.6% and 37.3% said that personal hygiene and vaccination are preventive ways of diarrhea (Desta, Assimamaw and Ashenafi, 2017 p.7).

The study conducted by Birungi et al., 2016 in Kabarole district, Uganda on Maternal knowledge, attitude and practices related to diarrhea in children aged less than five years indicated that 83.5% of mothers/caretakers knew the passing out of loose stools three or more times per day as a symptom of diarrhea, 83.5% identified drinking untreated water as a cause of diarrhea, 83.5% mentioned the housefly as a vector for diarrhea, 83.5% singled out blood or mucus in stool as a danger sign for diarrhea, and 83.5% knew the use of ORS to prevent dehydration as the care given to the child with diarrhea in the home setting. Results further indicated that 79.1% mothers/caretakers mentioned eating of uncooked food as a means through which diarrhea could spread while 95.3% mentioned boiling of drinking water as the best method for treating water (Birungi et al., 2016 P.41)

In Rwanda, there is limited literature in regard to the knowledge of mothers on management of diarrhea in under-fives children.

2.3.2. Practices of mothers in the management of diarrhea at home

Good practices of mothers on home management of diarrhea in under-fives plays an important role in reducing diarrhea-related morbidities and mortalities. On the other side, poor mother's practices are associated with high morbidities and mortalities (Chiabi et al., 2018 p2).

The study conducted by Sharma, P. and Sujeeta, M., 2019 in India on Practice of Mothers on Home Management of Diarrhea among under five children revealed that majority 65.5% of respondents were having poor practice on home management of diarrhea and minority 34.5%

of respondents were having good practice on home management of diarrhea among under-fives children.

The Study conducted by Ogbeyi, Onyemochi and Ogbonna, 2016 in Nigeria reported that a high proportion of caregivers (72.9%) practiced home management on their children. Majority (93.2%) of the respondents did not wash their hands with soap and water when child's faeces were disposed, while 20(6.8%) of the caregivers washed their hands with soap and water the last time the child defecated. Thirty-two (10.8%) washed hands with soap and water before cooking, 24(8.0%) of the respondents washed their hands before feeding their children.

Over 195(65%) of the respondents managed the index child with anti-diarrheal agent last time child had diarrhea while only 103(34.9%) gave more ORS. It was observed that over 84.4% of the index children had initial immunization. In the case of a child having adequate immunization, 23.7% of the index children had appropriate immunization for their age as compared to 76.3% with inadequate immunization scheduled for their age. Majority (95.3%) of the respondents had breastfeed their children in the past, but the practice of exclusive breast feeding among the respondents was low (2.4%). More than half (61.0%) of the respondents give more fluids to their children during episodes of diarrhea disease (Ogbeyi, Onyemochi and Ogbonna, 2016 p.5-6)

A study conducted by Okoh and Hart, 2014 in Southern Nigeria indicated that of the 157 caregivers, 78 (49.7%) gave their children oral rehydration solution (ORS) and 44 (28.0%) gave different types of drugs consisting of antibiotics, anti-malarials, anti-motility agents, Zinc and Teething mixtures (Okoh and Hart, 2014 p5)

Another study conducted by Shah et al in 2012 in India showed that thirteen children with diarrhea were on exclusive breastfeeding. Out of them; 69% were still being breastfed, whereas in 31% cases, it was interrupted. A similar pattern of interruption was also seen in the feeding of the other children suffering from diarrhea (Shah et al 2012 p78)

A Study conducted by Dodicho 2016 in Mareka district southern Ethiopia reported that the management options chosen by mothers to manage their child during diarrhea are giving leftover drugs (28.3%), treatment at health facilities (24.9), herbal medication (19.3%), homemade fluids (15%) and ORS (12.5%) respectively. Thirty one percent of mothers said that diet should be decreased during diarrhea while 16.7% mothers said that diet should be increased and 33.8% were in favor of no change in diet. Majority (70.3%) of the respondents

supported sustained feeding during episodes of diarrhea in their children while 29.7% supported diet withdrawal. Liquid diets (fluids) were the commonest type of food withdrawn by majority (81.4%) of mothers. Sustained feeding for two consecutive weeks following diarrheal episode was supported by only 16.7% of mothers (Dodicho 2016 P.73)

Dodicho 2016 also showed that 47.2% of participants had good practice but 52.8% of participants had poor practice according to the evaluation of practice related responses. The level of practice of caregivers on the home-based management of diarrhea was also poor as determined by studies conducted in Nepal, Iran, Pakistan, and Kenya (Osonwa 2016 and Shah et al 2012 p 6).

Study conducted in Ethiopia in 2016 by Desta, Assimamaw and Ashenafi, 2017 revealed that 139 (37.6%) caregivers had the good practice while 231 (62.4%) caregivers had a poor practice regarding home management of diarrhea. Regarding caregivers practice, 20.3% of caregivers did not take any measure, about 71.6% of caregivers took to the health center, and 5.1% of caregivers gave homemade fluids during the episode of diarrhea in their children (Desta, Assimamaw and Ashenafi, 2017 p.6)

This study further revealed that about 0.5% and 1.9% of caregivers had given traditional herbs and decreased/stopped feeding pattern during the episode of diarrhea, respectively. Regarding the preparation of homemade fluid, only 35 (9.5%) caregivers used to prepare it, of which only 31 (8.4%) of caregivers had been preparing homemade fluids correctly. More than seventy (73.2%) caregivers had given ORS to their children during the episode of diarrhea of which about 85.4% prepared ORS powder correctly with the recommended amount of water. Regarding methods of ORS giving, about 329 (88.9%) caregivers used cup while 41 (11.1%) of them used the spoon (Desta, Assimamaw and Ashenafi, 2017 p.4)

Concerning frequency, this study showed that only 60 (16.2%) caregivers administered ORS after each episode of diarrhea while 226 (61.1%) caregivers gave it only whenever the child wants to drink. About 197 (53.2%) caregivers said that they keep the reconstituted ORS for 12 hours while the rest of the mothers said that they keep it for 24-hour duration (Desta, Assimamaw and Ashenafi, 2017 p.4)

Beyond the inadequacy of knowledge and practice, there is also some evidence that shows harmful practices like food restriction, breast feeding reduction, and use of traditional and inappropriate medicine which is of unknown effect in managing diarrhea at home performed

by caregivers which are also believed to be due to lack of knowledge (Masiha et al., 2015 in Pakistan).

The study conducted on Predisposing and Risk Factors of Diarrhea in Children Seen at Enugu State University Teaching Hospital, Enugu-Nigeria indicating mothers frequency of hand wash after defecation showed that 6(2.03%) never washed their hands, 65(21.96%) washed their hands sometimes, 217(73.31%) washed their hands always and 8(2.70%) did not specify. The washing of hand was either by water only (33.69%) or with water and soap (66.31%) (Eleazar, Ogochukwu and Udoh, 2015 P5)

The complementary foods are added to diet of children at age six months, studies have shown that some mothers did not practiced basic hygiene like washing of hands with soap after visiting the toilet, after changing the baby's diaper and before preparing and feeding their babies most often, babies feeding tools such as bowls, spoons and feeding bottles are usually left unwashed and houseflies settle and contaminate them. All these lifestyle factors of mothers predisposed the children under five to diarrhea (Ameyaw et al., 2017.p4).

Additionally; eating with the hands; eating raw foods; or drinking unboiled water, increased the risk of diarrhea. For example, the inadequate food hygiene practices, resulting in food and water contaminated with pathogens can increase the risk of having diarrhea up to 70% among under-fives children in low socioeconomic status (Agustina et al., 2013 p.2).

The study conducted in District of Gujarat in India in 2014 about maternal knowledge and Practices towards Sanitation and their Relationships with occurrence of diarrhea in children showed that majority of the mothers (256; 47.8%) scored fairly on food hygiene. Most of the mothers (317; 59%) were unaware about the safe temperatures for heating leftover moist food for consumption and almost half the mothers didn't know about the safe duration of storage of cooked moist food stored at room temperature before consumption (Seksaria and Sheth, 2014 p.7)

High percentage of mothers (423; 78.9%) were ranked as "very good" for practices on food hygiene. Desirable food hygiene practices followed by mothers included using soap for washing utensils, washing fruits and vegetables before use and air drying of utensils after washing. The most undesirable food hygiene practices included dipping a container in stored water vessel (where hand comes in contact with water) for drawing water and consuming moist leftover food without sufficient heating. (Seksaria and Sheth, 2014 p.8). A survey

conducted by UNICEF in 2005 on well-being of children and women had shown that only 47% of rural children in the age-group 5-14 wash hands after defecation (Divya. et al., 2017 p 4).

Various studies noticed that children who did not wash hands before eating or after defecation, mothers who don't wash hands before feeding children or mothers who don't clean foods before cooking, children who eat with their hands rather than with a spoon, eating of cold leftovers, dirty feeding bottles and utensils, unhygienic domestic places (kitchen, living room, yard), improper food storage, living with animals inside the house, lack of strategies to limit flies inside the house, were associated with greater risk of diarrhea in children (Gebru, Taha and Kassahun,2014 p.2).

The study conducted by Birungi et al., 2016 in Kabarole district, Uganda on Maternal knowledge, attitude and practices related to diarrhea in children aged less than five years indicated that only 21.8% washed their hands with soap at all times, only 7.7% washed their hands with soap at all times before preparing food while only 10.2% washed their hands at all times before serving food. Only 54.5% used the toilet/latrine for defecation at all times and only 27.3% of the children drunk treated or boiled water all times. It was also discovered that majority of the mother/caretakers 90.6% had never washed a child's utensil with hot water. Only 43.3% of the mother/ caretakers gave ORS at all times to the child with diarrhea (Birungi et al., 2016 p.41).

In Rwanda, no study documented regarding practices of mothers on home management of diarrhea among under-fives children.

2.3.3. Factors associated with mothers' knowledge and practices regarding the management of diarrhea at home

The study conducted by Dodicho 2016 in Ethiopiain Mareka District, Southern Ethiopia indicated that age and educational status of mothers were strongly associated with better knowledge of mothers on home management of diarrhea in children($P=0.000$, $P=0.001$). Education and residence were found to influence the practice of mothers. ($P=0.000$, $P=0.000$) (Dodicho 2016 p 79).

The study conducted by Ghasemi et al., 2013 in Iran indicated that the knowledge of the mothers had significant relation with their age ($P=.0.0001$), education of the father($P=.0.005$), number of children($P=.0.005$), occupation of the mother ($P=0.01$) and the source of

the knowledge ($P=0.0005$). The mothers older than 31 years and those who were working outside the home and the mothers with three or more children had significantly better knowledge. The knowledge was not related to the education of the mothers ($P=0.096$), however the women with higher educated husbands had significantly better knowledge ($P=0.005$) (Ghasemi et al., 2013 p.6).

A study conducted by Desta, Assimamaw and Ashenafi, 2017 in Ethiopia indicated that age of caregivers, marital status, educational status, occupation of mother, and source of information about diarrhea were significantly associated with mother's knowledge and practice in the home management of diarrhea (Desta, Assimamaw and Ashenafi, 2017 p.5)

A study conducted by Okoh and Hart, 2014 in south Nigeria indicated that a higher knowledge score on home management of diarrhea was significantly associated with the Social class ($P=0.002$) and mother's educational level ($P=0.002$). Same for practice score on home management of diarrhea where a higher practice score was also significantly associated with the Social class ($P<0.001$) and mother's educational level ($P<0.001$). After adjusting for various factors, mother's educational level significantly influenced both level of knowledge ($P=0.022$) and practice ($P=0.012$) of the home management of diarrhea. Mothers' practices were significantly improved with the level of parental education and with their profession. Best practices were observed in mothers in the civil service and in those whose husbands were civil servants (Okoh and Hart, 2014 p5)

Ameyaw et al., 2017 conducted a study in Ghana indicated that children of mothers with no education have a high prevalence of diarrhea diseases. It has been proven that educated mothers practice good practices on home management of diarrhea in under-fives. Furthermore, education brings about health awareness among women who utilize the acquired knowledge to promote health of their children through home management of diarrhea (Ameyaw et al., 2017 p3)

The study conducted by Chiabi et al 2018 in cameroon reported that the mothers' and fathers' level of education significantly ($P=0.02$ and 0.000 respectively) influenced the mothers' knowledge. The study further showed that academic level and profession of the parents ($P < 0.01$) were the factors influencing good practices of the mother (Chiabi et al 2018)

The study conducted by Boma et al 2014 in Nigeria also revealed that a higher knowledge score was significantly associated with the Social class ($P=0.002$) and mother's educational

level ($P=.002$). Moreover, Boma A. et al (2014) indicated that a higher practice score was significantly associated with the Social class ($P<.001$) and mother's educational level ($P<.001$). (Boma et al 2014)

In Rwanda, there is no study that highlighted Factors associated with knowledge and practices of Mothers on home management of diarrhea in under-fives.

2.4. CRITICAL REVIEW AND RESEARCH GAP IDENTIFICATION

Home-based management of diarrhea among caregivers of under-five children is not adequate especially in developing countries because of the inadequacy of knowledge and practice gaps (Ogunrinde et al., 2012). Mothers as primary caregivers to under-five children in Rwanda, their knowledge and practices on home management of diarrhea are important to minimize the effects of morbidity and mortality associated with diarrheal diseases. Through the review of literature, some articles were written in relation to this study. In Rwanda, the study conducted by Nsabimana, Mureithi, and Habtu 2017 in Nyarugenge district indicated that mother's level of education and occupation was statistically associated with the occurrence of diarrhea in their under-fives children, but they did not described the level of knowledge and practices of mothers on home management of diarrhea in under-fives (Nsabimana, Mureithi, and Habtu. 2017 p2)

The prevalence of diarrhea in Rwanda was recorded in the recent DHS 2014-2015 according to the report, 12% of Children under 5 years had diarrhea within two weeks preceding the Rwanda Demographic and Health Survey (RDHS). However, there are no previous studies in Rwanda that have assessed the level of knowledge, practice and associated factors on home-based management of diarrhea among caregivers of under-five children. Therefore, this study seeks to determine knowledge, practice, and associated factors on home-based management of diarrhea among mothers of under-five children attending under-five service of Ruli Health Center in Gakenke district in Rwanda.

There is limited literature about knowledge and practices of mothers on diarrhea home management in under-fives. Some literature found are specific to some countries like India, Iran and some African countries such as Nigeria, Cameroon and Ethiopia but there is no literature found about knowledge and practices of mothers on diarrhea home management in under-fives in Rwanda, Though, the diarrhea occurrence increases because of poor mothers knowledge and practices.

2.5. CONCEPTUAL FRAMEWORK

The conceptual framework of this study was adapted from the health promotion model (HPM) developed in the early 1980s by Nola Pender. This model represents a theoretical perspective that explores the factors and relationships contributing to health-promoting behavior and therefore to the enhancement of health and quality of life. In addition, they are other studies that used the same conceptual framework adapted from Pender health promotion model as well, those are , but not limited to: Knowledge, practice, and associated factors of home-based management of diarrhea among caregivers of children attending under-five clinic in fagita lekoma district, Ethiopia (2016). Mothers' knowledge, attitude and practice towards the prevention and home-based management of diarrheal disease among under-five children in diredawa, Ethiopia (2016). Mother's nutrition-related knowledge and child nutrition outcomes: empirical evidence from Nigeria. This model has three Components:

Individual Characteristics and Experiences

Prior related behavior – frequency of the same or similar health behavior in the past Personal factors (biological, psychological, sociocultural) – general characteristics of the individual that influence health behavior such as age, personality structure, race, ethnicity, and socioeconomic status(Nola,2011). In this study, Individual Characteristics and Experiences were sociodemographic characteristics of mothers that influence mother's knowledge and practices.

Behavior-Specific Cognitions and Affect

Perceived self-efficacy – judgment of personal capability to organize and execute a particular health behavior; self-confidence in performing the health behavior successfully (Nola, 2011).

Activity-related affect – subjective feeling states or emotions occurring prior to, during and following a specific health behavior (Nola, 2011). In this study, the researcher assumed that mothers knowledge show behavior-specific cognitions about diarrhea home management.

Behavioral Outcome- Health Promoting Behavior

Health promoting behavior – the desired behavioral end point or outcome of health decision-making and preparation for action (Nola, 2011). In this study, mothers 'diarrhea home management practices determined Behavioral Outcome.



Figure 1. Conceptual framework adapted from Pender Health Promotion Model 2011: Interacting interlinked factors leading to diarrhea home management practices.

2.6. CONCLUSION TO CHAPTER TWO

Poor mother's knowledge and practices on home management of diarrhea carries a health risky and economic burden to the wellbeing of under-fives children, increasing cost of medical care, economic expense for society and death. Mothers continue to inadequately practice poor home practices that contribute to the occurrence of diarrhea to their children. Good mother's knowledge and practices on diarrhea home management is a cornerstone in reducing morbidity and mortality related diarrhea among under-fives children (Shikur and Dessalegn, 2014 P2). It is the role of health care providers to continue educating mothers regarding optimal home practices for good health and wellbeing of their children

CHAPTER THREE. RESEARCH METHODOLOGY

3.1. INTRODUCTION

Methodology in research refers to a systematic way of gathering data from a given population so as to understand a phenomenon and to generalize facts obtained from a larger population (Cohen, Manion and Morrison, 2013). It explains the process and methods used to conduct a study which includes the study area, study population, study design, sample size and sampling methods, data collection methods and procedures, data analysis, study limitation and problems, and ethical consideration.

3.2. RESEARCH DESIGN

Parahoo (2014) describes a research design as “a plan that describes how, when and where data are to be collected and analyzed”. The study used a descriptive non-experimental cross-sectional design to collect data from participants.

The primary focus for the study was to describe the level of knowledge and practices of mothers on home management of diarrhea among under-fives. In addition, factors associated with knowledge and practices were described. The design involved variables that were not manipulated by the researcher and instead were studied as they existed. Data were collected at one point in time, often in order to make comparisons across different types of respondents or participants.

3.3. RESEARCH APPROACH

Research approach is a plan and procedure that consists of the steps of broad assumptions to detailed method of data collection, analysis and interpretation (Creswell, 2013). The study used quantitative approach which attempted to establish statistically significant relationships, addresses questions by measuring and describing, and was based on objective measurement and observation, and was concerned with correlation and causation (Hamer and Collinson 2014).

3.4. RESEARCH SETTING

The study was conducted at Ruli Health Center. This is an approved health center belonging to the Archdiocese of Kigali. It is located in Northern Province, Gakenke District, Ruli Sector, Ruli Cell. Around this health center are Ruli District Hospital, Ruli Higher Institute of Health and Ihangane project. It was built in 1970 by Spanish fathers and officially opened its

doors to patients on 15/12/1970 with a mission of providing quality care and primary health care in the community. It covers the whole population of the Ruli sector. It has 14 beds and serves a population equivalent to 19727 spread over 30 villages, among them are 1765 mothers with under-fives children. The staff of the health center consists of 25 people providing the service at the Health Center. The services of the health center are vaccination, natural family planning, curative consultation, prenatal and postnatal consultation, dressing and injection, Pharmacy, voluntary counselling testing, prevention of mother-to-child transmission, laboratory, nutritional service, secretariat and accounting, supervision of community health workers, data management, and maternity, reproductive health services.

3.5. STUDY POPULATION

Parahoo (2014) defines **population** as “the total number of units from which data can be collected”, such as individuals, artifacts, events or organizations.

The study population of interest was made of mothers from Ruli health center catchment area with under-fives children and whose children have ever suffered from diarrhea during the past six months making a total of 266 as showed by Ruli health center monthly report (report from September 2018 to February 2019).

Target population is “the entire aggregation of respondents that meet the designated set of criteria” (Burns & Grove, 2011).The target population was made of mothers whose under-fives children ever suffered from diarrhea who ever visited Ruli health center in the past six months.

Accessible population is the portion of the target population to which the researcher has reasonable access (Porter, 2012).Accessible population was made of mothers whose under-fives children ever suffered from diarrhea and who met the inclusion criteria and who were available during data collection period.

3.5.1. Inclusion criteria

Burns and Grove (2011) define eligibility criteria as “a list of characteristics that are required for the membership in the target population”

The study included all present mothers from Ruli health center catchment area of under-fives children and whose children have ever suffered from diarrhea for the past six months and who voluntary accepted to participate in the study and all mothers who could communicate verbally and gave consent form to participate in the study.

3.5.2. Exclusion criteria

Talbot (2014) defines exclusion criteria as “characteristics, which a participant may possess, that could adversely affect the accuracy of the results”

The study excluded all mothers whose under-fives children have never experienced any episode of diarrhea in the past six months, mothers who refused to participate in the study, and those who were not able to consent for study, mothers fulfilling inclusion criteria who were not available during data collection, and those mothers residing other than selected rural community and mothers included in pilot study.

3.6. SAMPLING

3.6.1. Sample size

The Sample size was determined using Taro Yamane formula.

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

N = population (mothers whose under-fives children suffered from diarrhea in the past six months from Ruli health center catchment area that is equal to 266.)

n= sample size required for this study

e =margin error (the acceptable sampling error). Margin error is the calculated statistical imprecision due to interviewing a random sample instead of the entire population. (Kotrlik and Higgins, 2001.) An acceptable margin of error for the study fell at 5/100 (0.05), the researcher was at 95% confident that a sample result fell within a certain range of the true population level. This margin error was used because a representative sample was used to guess something about a full population, guess contained some uncertainty.

$$n = \frac{266}{1+266(0.05)^2} = \frac{266}{1.665} = 159.75 \text{ approximately equal to } 160.$$

The Sample Size required for this study was 160 mothers whose under-fives children have ever suffered from diarrhea.

3.6.2. Sampling strategy

A process of selecting a group of people, events or behavior with which to conduct a study. (Burns and Grove, 2014). Polit et al (2010) confirms that in sampling a portion that represents the whole population is selected. The study used a probability sampling method specifically simple random sample without replacement in order to gain sample of mothers who participated in the study and to avoid the strange assumption of one person being tallied as two or more. A simple random sample means that all combinations of sampling units with the specified sample size have an equal and independent chance of being selected (Brink 2017). A simple random sample without replacement means that once an individual is sampled, that person is not placed back in the population for re-sampling (Ben-hamou, Peres and Salez, 2014).

Sampling frame was piled up by making a list of two hundred sixty eight (268) mothers and their addresses, whose under-fives children ever suffered from diarrhea and who consulted for pediatric services of Ruli health center in the past six months and assigning numbers on piece of papers to each subject mother and placed into a container. Numbers were picked up from the container at random until the desired sample of 160 was achieved and the numbers picked determined the mothers to be interviewed in the study.

3.7. VALIDITY AND RELIABILITY OF RESEARCH INSTRUMENT

3.7.1. Data collection instrument

According to Polit & Hungler (2013) an instrument is the written device that an investigator uses to collect data. Data of the study was collected using a structured interview schedule to assess knowledge and Practices of mothers on home management of diarrhea in their under-fives. Structured interview schedule enable the investigator to be consistent in asking questions and make the data easy to analyze (Polit & Hungler, 2013).

The instrument was adapted from KAMIKO Takanashi questionnaire 2009 who tested and used it to assess knowledge, attitude and practice of mothers on home management of childhood diarrhoea in Hanoi, Viet Nam. The instrument was translated from English into Kinyarwanda by translators who had not been previously involved in the project and who have no prior knowledge of the objectives or its specific context.

The instrument of the study comprised of three sections. Section A: demographic characteristics of mothers. The demographic data question evoked the personal descriptive data of mothers. This section included items 1 to 10. On item 2 the researcher used observations skills to determine gender of the patients. Item 10 elicited responses on mothers having under-five child with diarrhea to reinforce inclusion criteria.

Section B contained items 1 to 15 and elicited responses concerning knowledge of mothers on home management of diarrhea in under-fives. Each questionnaire item was scored on a true and false scale where true response were given the score of 1 and 0 for the false response.

Section C contained items 1 to 19 and elicited responses concerning practices of mothers on home management of diarrhea. Each questionnaire item on this section was scored using agree and disagree rating scale where the score of 0 or 1 was given to each item depending on the rate of agreement or disagreement. A face to face interview lasted at least 30 minutes per subject.

3.7.2. Validity of research instrument

The researcher conducted validity and reliability testing of the tool. According to Polit and Hungler (1995:353), validity refers to “the degree to which the instrument measures what it is supposed to be measuring”.

Face validity. Face validity refers to the degree to which a test appears to measure what it claims to measure. (Leedy & Ormrod, 2004). Face validity was considered and achieved through structuring the research tool into three separate section. Each section had valid items pertaining to the variable under study. Face validity is the weakest measure of validity, hence the need to evaluate content validity as well.

Content validity.

The researcher mostly focused on content validity, which refers to the extent to which the question on the instrument and the scores from these questions represent all possible questions that could be asked about the content or skill (Creswell, 2005). Therefore content validity was applied to check how accurately the questions asked tended to elicit the information sought.

A Knowledge Attitude and Practice Survey adapted from KAMIKO Takanashi was used to collect data from the mothers. Only questions on knowledge and practices of this survey that

were applicable to Rwandan context were taken. In addition, questions on knowledge and practices were taken from deep literatures on the same subject to ensure that all content regarding knowledge and practices were well covered. This inclusion ensured that the research tool had content validity. The questionnaire was given to an expert in academic field (supervisor), an expert in clinical area, an expert in the community area to ensure content validity.

Content Validity Ratio (CVR) and Content Validity Index (CVI) was used to quantify validity of an assessment instrument or tool as evaluated by review of clinical experts. (Adamson & Prion, 2012b, 2012c). The items were given to the above mentioned experts rating each item, then CVR was calculated for each item to reject or retain it. Items with a CVR of 0.78 or higher with three or more experts was considered evidence of good content validity. The item that did not reach this threshold was deleted from the final instrument.

Table 3.1. Table of Content validity

Objectives	Components of conceptual framework	Sections of the research instrument
To determine the level of knowledge of mothers.	Behavior-Specific Cognitions and Affect	Section B
To determine practice of mothers.	Behavioral Outcome- Health Promoting Behavior	Section C
To determine sociodemographic factors associated with knowledge and practice of mothers.	Behavior-Specific Cognitions and Affect. Behavioral Outcome- Health Promoting Behavior. Individual Characteristics and Experiences	Section A,B, C
Examine the relationship between knowledge and practice of mothers.	Behavior-Specific Cognitions and Affect. Behavioral Outcome-Health Promoting Behavior.	Section B, C

3.7.3. Reliability of research instrument

Reliability relates to the precision and accuracy of the instrument. If used on a similar group of respondents in a similar context, the instrument should yield similar results (Cohen et al 2007:117). The translation of the research instrument from English to Kinyarwanda guaranteed collection of reliable data, free from misconception. The instrument was pretested before the period of main data collection.

Pre-testing the instrument

Pre-testing is the administration of the data collection instrument with a small set of respondents from the population for the full scale survey (Collins, D., 2011.). The instrument of this study was pre-tested to identify problems with the data collection instrument and find possible solutions to reducing error to acceptable level, to get at the thinking behind the answers so that the researcher could accurately assessed whether the questionnaire was being filled out properly, whether the questions were actually understood by mothers, and whether the questions asked what the researcher thought they were asking. Pre-testing also helped to assess whether mothers were able and willing to provide the needed information.

To ensure reliability of the tool, the tool was pre-tested on 10% of the sample size, equal to 16 mothers. Mothers filled out the questionnaire, gave their views along the way or afterward, asked for clarification of answers and clarification of questions along the way. Clarification of questions, answers, adjustments on the instruments were done after the pretest to ensure reliability of the tool. In addition, accurate and careful phrasing of each question using the same wording and sequencing, consistency of responses and lack of ambiguities during the pretest gave the researcher confidence that the instrument was reliable.

After completion of the questionnaire, data were entered into SPSS to compute Cronbach's Alpha coefficient that provided a measure of the internal consistency of the instrument (internal consistent reliability). According to Tavakol and Dennick 2011. The tool is reliable when Cronbach's Alpha coefficient value ranging from 0.70 to 0.95. The coefficient of reliability falls between 0 and +1, higher values closer to +1 reflect higher reliability and higher degree of internal consistency and no reliability equaling 0. The Cronbach's alpha for the present study instrument was 0.847. This means that the instrument is a very good measure of the level of knowledge and practices.

3.8. DATA COLLECTION PROCEDURE

Data collection is "a systemic way of gathering information, which is relevant to the research purpose or questions" (Burns & Grove 2016).

Following approval from CMHS institutional review board (IRB), the researcher contacted Ruli health center administration to request for permission to conduct the study in its

institution. The approval from Ruli health center administration to conduct the study within the institution was received, the researcher consulted the register and made a list of all mothers who consulted the pediatric service of Ruli health center in the past six months and whose under-fives children were suffering from diarrhea at the time of consultation equaling to two hundred sixty eight, the researcher also took their addresses. The researcher randomly selected one hundred sixty mothers equal to the sample size. After obtaining the required mothers for the study and their addresses, the researcher contacted the community health workers of each of the village of Ruli health center catchment area where the mothers were located. The researcher visited each mother at home in the village on different days being directed by community health workers or calling the mother using telephone before reaching her. Once reaching the mother 's home, the researcher introduced himself to the mothers of under-fives children and gave an explanation about the study in brief, the importance of her participation, the procedures to be followed and the purpose of the study also shared.

After this, consent forms and information sheet forms was delivered to the mother for her to sign for her participation in the study, then after, the researcher collected data during eight weeks of April to May 2019 using face to face structured interview by reading the questions and recorded mother' responses on individual questionnaires. Working three days a week from 8:00 AM to 5:00 PM and interviewed an average of seven mothers per day and each interview lasted 30 minutes. The researcher filled the questionnaire on mothers' behalf because some mothers were not able to comprehend some terminologies, they needed more clarifications and explanations.

3.9. DATA ANALYSIS

Data analysis is "the systematic organization and synthesis of the research data and the testing of research hypotheses, using those data" (Polit & Hungler 2013). It also entails "categorizing, ordering, manipulating and summarizing the data and describing them in meaningful terms" (Brink 2012).

Raw data were checked for clarity and completeness then coded before entering them in the computer. Data were analyzed using statistical package for the social sciences (SPSS).

Data were entered in SPSS 20 and output were imported into Microsoft Excel, and the results were presented in tables and graphs and charts.

The analysis included three variables: demographic characteristics, knowledge of mothers and their practices.

Demographic independent Variables

Demographic variables were analyzed using descriptive statistics like the mean, frequencies and percentages.

Knowledge of mothers: Dependents variables

The research question was: What is the level of knowledge of mothers on home management of diarrhea in under-fives children at Ruli health center?

This question assessed the level of knowledge of mothers on home management of diarrhea in under-fives children at Ruli health center. Responses to individual questions on level of knowledge were analyzed using descriptive statistics specifically frequencies and percentages.

Practices of mothers: Dependents variables

The research question was: what are the practices of mothers on home management of diarrhea in under-fives children at Ruli health center?

The question assessed the practices of mothers on home management of diarrhea in under-fives children at Ruli health center. Responses to individual questions on practices were analyzed using descriptive statistics specifically frequencies and percentages.

Descriptive statistics allowed the researcher to shape data in a manner that gave meaning to the study variable.

Sociodemographic factors associated with knowledge and practice

The research question was: what are the sociodemographic factors associated with knowledge and practice of mothers on home management of diarrhea in under-five children at Ruli health center?

The question was analyzed using inferential statistics of multiple linear regression to predict sociodemographic factors associated with knowledge and practices of mothers and

Multivariate logistic regression to establish sociodemographic factors associated with knowledge and practices of mothers.

Relationship between knowledge and practice

The research question was: what is the relationship between knowledge and practice of mothers on home management of diarrhea in under-five children at Ruli health center?

The question was analyzed using inferential statistics of Correlation (bivariate analysis) was used to examine the relationship between knowledge and practice of mothers.

Data coding was done whereby correct responses was coded as 1 and incorrect responses was coded as 0. The level of knowledge and practices were categorized using mean score as cut off point. Mean of knowledge was 9.46 (63%) and mean of practice score was 11.17 (58.78%)

Good Knowledge: Mothers who answered above and equal to the mean of knowledge questions are considered as having good knowledge. (63-100%). Poor Knowledge: mothers who answered below to the mean of knowledge questions are considered as having poor knowledge (<62-0%). Good Practice: Mothers who answered above and equal to the mean of practice questions are considered as having the good practice. (58.78-100%). Poor Practice: mothers who answered below the mean of practice questions are considered as having poor practice. (<58.78 -0%)

3.10. ETHICAL CONSIDERATIONS

Pera and Van Tonder (2011) define ethics as “a code of behavior considered correct”.

The study proposal needed official approval from different sources. The research committee from Institutional Review Board from the UR/CMHS and Ruli Health Center administration reviewed the proposal to reduce study risks to subjects in the study.

Permission to conduct the study

Permission was obtained from Institutional Review Board from the UR/CMHS and Ruli health center administration before conducting the study. The research was therefore found to be ethically sound since various ethics review boards approved the study

Right of self-determination /voluntary participation

Participants as autonomous individuals have the right to choose to either participate or not, in the research. The researcher ensured that the participants participated in the study voluntary and independently without coercion.

Privacy

The researcher ensured that the participants responded to addressed questions in an isolated place of mothers' home where no other person could see him/her.

Informed consent and information sheet provided

After full explanation of the nature of the study, participants were asked to give either verbal consent for those who could not read or write or written consent of their willingness to participate in the study. A signed consent form and information sheet were used to allow the researcher to conduct the study.

Protection from harm:

The risks that might encountered in research included physical, psychological, emotional, social and financial. In the present study, the researcher controlled these risks by minimizing the time of interviewing the participants, maintaining privacy, confidentiality and anonymity also prevented these harms.

Confidentiality and anonymity

In this study, the information were kept confidential by not putting names on the questionnaires, informed consent and the information sheet. The researcher at the end could not be able to link any information to any participant. The interview and answering to questions was conducted in an isolated place where no other person could see or hear the conversation. The participants were assured that the information for the study were confidential and used for study purposes. Code numbers were put on questionnaires to ensure confidentiality. Because the researcher met the respondents face to face during data collection and interview, anonymity which refers to data collected from respondents who are completely unknown to anyone associated with the survey was not ensured.

3.11. DATA MANAGEMENT

Soft copy data were kept confidential in the researcher personal computer protected by a password whereas hard copy data were kept in a locked cupboard for a period of five years whereby unauthorized access is prohibited then destroyed.

3.12. DATA DISSEMINATION

After presentation of the results to the panelist, the researcher will publish his work in journals in order to be accessible to the user in need. The researcher will also provide feedback to the study setting in order to facilitate them to set strategies aiming at increasing mothers' knowledge and practices on home management of diarrhea in under-fives. Finally, a

final copy of this work will be submitted to UR library for future readers and researchers in the related field of study.

3.13. LIMITATIONS AND CHALLENGES OF THE STUDY

During this study, some limitations were encountered, those included selection bias, information bias, Hawthorne effect, data were collected from the representative sample of one health center, this may affect the generalizability of the findings to the whole country. Due to time constraints, knowledge and practices of mothers on home management of diarrhea after visiting health facility were not assessed.

3.14. CONCLUSION TO CHAPTER THREE

A descriptive non-experimental cross-sectional design using quantitative approach helped the researcher to randomly collect data from 160 mothers with under-fives children from Ruli health center, determined using Taro Yamane formula for the total population of 266. A direct questioning (structured interview) was used to assess mother knowledge on home management of diarrhea, the Validity and reliability of the instrument was tested in Rwandan context, data were analyzed using descriptive and inferential statistics. Data were kept confidentially and results are waiting to be published for being accessible for users.

CHAPTER FOUR: PRESENTATION OF THE RESULTS

4.1. INTRODUCTION

This chapter presents results of the current study, the description of sociodemographic characteristic of participants, level of knowledge and practice of mothers on diarrhea home management, along with statistical test of multiple linear and logistic regression of sociodemographic factors associated with knowledge and practice. Correlation for relationship between knowledge and practice of mothers on home management of diarrhea are presented and interpreted.

4.2. Demographic characteristics of study.

Table 4.2 displays results on sociodemographic variables of the participants. According to the results on Table 4.2, the majority of respondents 65(40.6%) were between 31-40 years old while the minority 10(6.3%) were greater than 50 years old. In term of gender, majority 147(91.9%) were female. Analysis of participant's marital status revealed that majority 129 (80.6%) were married while the minority 4(2.5%) were divorced. A high proportion of participants 151 (94.4%) were Christians whereas 2 (1.3%) of participants were non-denominational. With regard to the participants wealth status, majority 82 (51.3%) were in category III of ubudehe while the minority 1(.6%) were in category IV of ubudehe. The majority 102 (63.8%) of participants attended primary school although the minority 13 (8.1%) never attended the school. 66 (41.3%) of participants were unemployed while 14 (8.8%) were skilled worker. Majority 139 (86.9%) of participants had one under-five child in household though minority 1(.6%) had three under-five children in household. Majority of participants 135 (84.4) who took care of the child most frequently were mothers.

Table 4. 2. Sociodemographic characteristics of study participants (N=160)

Demographic variables	Frequency (%)
Age	
18-30	58(36.3)
31-40	65(40.6)
41-50	27(16.9)
Greather than 50	10(6.3)
Gender	
Male	13(10.6)
Female	147(80.6)
Marital status	
Single	17(10.6)
Married	129(80.6)
Divorced	4(2.5)
widower	10(6.3%)
Religion	
Christian	151(94.4)
Islam	7(4.4)
non-denominational	2(1.3)
Wealth status	
Ubudehe category I	22(13.8)
Ubudehe category II	55(34.4)
Ubudehe category III	82(51.3)
Ubudehe category IV	1(0.6)
Education	
primary school	102(63.8)
secondary school	30(18.8)
University	15(9.4)
never attended the school	13(8.1)
Occupation	
self employed	65(40.6)
skilled worker	14(8.8)
semi-skilled worker	15(9.4)
unemployed	66(41.3)
Number of under 5 in household	
1	139(86.9)
2	20(12.5)
3	1(0.6)
Child's care taker	
Mother	135(84.4)
Grand mother	11(6.9)
child' sister/brother	3(1.9)
house-maid	8(5.0)
Father	3(1.9)

4.3. Knowledge of mothers on home management of diarrhea among children under-fives

Objective one: To determine the level of knowledge of mothers on home management of diarrhea among children under-fives at Ruli H. C.

Table 4.3, displays results on knowledge of mothers on home management of diarrhea. In terms of definition and causes of diarrhea, majority of respondents 96(50%), 147(91.9%), 126(78.8), 134(83.8%) knew correctly the definition of diarrhea, knew that poor hygiene causes diarrhea among children under-fives, knew that food poisoning causes diarrhea among children under-fives, knew that micro-organisms (bacteria, virus, parasites) are the causes of diarrhea among children under-fives years respectively while minority 64(40%), 13(8.1%), 34(21.3%), 26(16.3) did not know.

As stated in table 4.3, of the 160 respondents, majority 138(86.3%), 131(81.9%), 130(81.3%) knew that the under-five child contracts diarrhea through drinking contaminated water, eating contaminated food, unhygienic breastfeeding manner respectively, while minority of respondents 22 (13.8%), 29(18.1%), 30(18.8%) did not know ways the child could contract diarrhea. In terms of signs and symptoms of diarrhea in table 4.3, majority 94(58.8%) of respondents knew that under-five child with diarrhea has abdominal pain while 66(41.3%) did not know. 77(48.1%) knew that under-five child with diarrhea has nausea and vomiting whereas majority 83(51.9%) did not know. Majority of respondents 113(70.6%) did not know that under-five child with diarrhea urinates less frequently while 47(29.4%) knew. Majority of respondents 132(82.5%) knew that under-five child with diarrhea has loose, watery stools while 28(17.5%) did not know. 87(54.4%) knew that under-five child with diarrhea has loss of control of bowel movements whereas 73(54.6%) do not know.

According to the results in table 4.3, majority of respondents 103(64.4%) knew the components of homemade oral rehydration salt while 57(35.6%) did not know. Majority 132(82.5%) did not know the correct method of preparation of homemade oral rehydration salt whereas 28(17.5%) knew. Minority 43(26.9%) of the respondents knew the function of homemade oral rehydration salt while majority 117(73.1%) did not know the function of homemade oral rehydration salt.

Table 4.3. Knowledge of mothers home management of diarrhea (N= 160)

variables	Frq (%)	True	False
Knowledge on definition and causes of diarrhea			
Diarrhea is defined as the passage of three or more loose or liquid stools per day	Frq (%)	96(50)	64(40)
Poor hygiene causes diarrhea among children under-fives years.	Frq (%)	147(91.9)	13(8.1)
Food poisoning causes diarrhea among children under-fives years	Frq (%)	126(78.8)	34(21.3)
Micro-organisms (bacteria, virus, and parasites) cause diarrhea among children under-fives years.	Frq (%)	134(83.8)	26(16.3)
Knowledge on ways of contamination of diarrhea			
The under-five child contracts diarrhea through drinking contaminated water	Frq (%)	138(86.3)	22(13.8)
The under-five child contracts diarrhea through eating contaminated food.	Frq (%)	131(81.9)	29(18.1)
The under-five child contracts diarrhea through unhygienic breastfeeding manner.	Frq (%)	130(81.3)	30(18.8)
Knowledge of mothers on signs and symptoms of diarrhea.			
The under-five child with diarrhea has abdominal pain			
The under-five child with diarrhea has nausea and vomiting.	Frq (%)	94(58.8)	66(41.3)
The under-five child with diarrhea urinates less frequently.	Frq (%)	77(48.1)	83(51.9)
The under-five child with diarrhea has loose, watery stools.	Frq (%)	47(29.4)	113(70.6)
The under-five child with diarrhea has loss of control of bowel movements.	Frq (%)	132(82.5)	28(17.5)
	Frq (%)	87(54.4)	73(54.6)
Knowledge of mothers on Homemade Oral Rehydration Salts			
The components of Homemade Oral Rehydration Salts are Salt, Sugar and Water	Frq (%)	103(64.4)	57(35.6)
The Home made Oral Rehydration Salts (ORS) is prepared by mixing Six (6) level teaspoons of Sugar with Half (1/2) level teaspoon of salt and one liter of clean drinking or boiled water and then cooled.	Frq (%)	28(17.5)	132(83.5)
The function of Homemade Oral Rehydration Salts is to Replace the body salts, energy and water lost in diarrhea.	Frq (%)	43(26.9)	117(73.1)

4.4. Practices of mothers on home management of diarrhea.

Objective two: To determine the level of practice of mothers on home management of diarrhea in under-five children at Ruli HC.

The table 4.4, displays results on practices of mothers on home management of diarrhea, in terms of types of fluids used to treat diarrhea at home , table 4.4, showed that majority of respondents 116(72.5%) agreed that they used homemade fluids to treat their children at home while 44(27.5) disagreed to use homemade fluid. The majority of respondents

88(55%) disagreed that they did not use breast milk, water from rice, porridge, clean water to treat diarrhea to their children while 72(45%) agreed to use them. Majority of respondents 122(76.3%) agreed that they gave soft drinks, sweetened tea, sweetened fruits drinks, coffee to their children when suffering from diarrhea whereas 38(23.8%) disagreed. 87(54.4%) of the participants gave the same fluid as usual to their children while 73(45.6%) did not. 76(47.5%) of respondents agreed that they gave less fluid than usual to their children whereas 84(52.5%) disagreed. 86(53.8%) of the respondents gave more fluid than usual to their children while 74(46.3%) did not. Minority 12(7.5% of respondents agreed that they stopped fluid to their children while having diarrhea though majority 148(92.5%) of respondents disagreed. The majority of respondents 90(56.3%) gave the prepared homemade fluid to their children after each bowel motion whereas 70(43.8%) did not give any fluid. 94(58.8%) of respondents did not use the prepared homemade fluid in less than 24 hours to treat their children with diarrhea while 66(41.5%) used it. 77(48.1%) of respondents agreed that they used the prepared homemade fluid in more than 24 hours to treat diarrhea in their children whereas 83(51.9%) disagreed to use it in more than 24hours.

According to the table 4.4, majority of respondents 104(65%), 144(90%) fed their children immediately after cooking, continued to feed or breastfeed their children when having diarrhea respectively, 56(35%), 16(10%) did not. 83(51.9%) of the respondents gave reheated leftover to their children before eating although 77(48.1%) did not.

The results in table 4.4, showed that of the 160 respondents, 105(65.6%) washed their children's hands after the toilet while 55(34.4%) did not. 99 (61.9%) used water with soap to wash their children's hands before and after eating whereas 61(38.1%) did not. The majority of respondents 99(61.9%), 109(68.1%), agreed that they washed utensils with water and soap before and after every use, washed food and fruits before feeding their children respectively while 61(38.1%), 51(31.9%) disagreed.

Table 4.4. Practices of mothers on home management of diarrhea (N=160).

Variables		Agree	Disagree
Practices of mothers on types of fluids used to manage diarrhea.			
Do you use homemade fluids (sugar, salt, water) to treat your child with diarrhea at home?	Frq (%)	116(72.5)	44(27.5)
Do you use breast milk, water from rice, porridge, clean water to treat your child with diarrhea at home?	Frq (%)	72(45)	88(55)
Do you give Soft drinks, sweetened tea, sweetened fruits drinks, coffee to treat your child suffering from diarrhea at home?	Frq (%)	122(76.3)	38(23.8)
Do you give the same fluid as usual to your child when having diarrhea?	Frq (%)	87(54.4)	73(45.6)
Do you give less than usual fluid to your child when having diarrhea?	Frq (%)	76(47.5)	84(52.5)
Do you give more fluid than usual to your child when having diarrhea?	Frq (%)	86(53.8)	74(46.3)
Do you stop giving fluids to your child when having diarrhea?	Frq (%)	12(7.5)	148(92.5)
Do you give the prepared homemade fluid to your child after each bowel motion?	Frq (%)	70(43.8)	90(56.3)
Do you use the prepared homemade fluid in less than 24 hours to treat your child with diarrhea?	Frq (%)	66(41.5)	94(58.8)
Do you use the prepared homemade fluid in more than 24 hours to treat diarrhea in your child?	Frq (%)	77(48.1)	83(51.9)
Practices of mothers on feeding the child			
Do you feed your child immediately after cooking?	Frq (%)	104(65)	56(35)
Do you give reheated leftover to your child before eating?	Frq (%)	83(51.9)	77(48.1)
Do you continue to feeding or breastfeed your child when having diarrhea?	Frq (%)	144(90)	16(10)
Practices of mothers on washing (hands, food, utensils)			
Do you wash your child's hands after the toilet?	Frq (%)	105(65.5)	55(34.4)
Do you use water only to wash your child's hands before and after eating?	Frq (%)	52(32.5)	108(67.5)
Do you use water with soap to wash your child's hands before and after eating?	Frq (%)	99(61.9)	61(38.1)
Are your hands washed with water and soap before preparing food (cooking)?	Frq (%)	100(62.5)	60(37.5)
Are utensils washed with water and soap before and after every use?	Frq (%)	99(61.9)	61(38.1)
Do you wash food/ fruits before feeding your child?	Frq (%)	109(68.1)	51(31.9)

4.5. Participants level of knowledge and practice regarding home management of diarrhea

Table 4.5, displays participants' level of knowledge and practice on home management of diarrhea, according to the table 4.5, of the total 160 participants who were interviewed, the

majority 89 (55.6%) had poor knowledge on home management of diarrhea among under-fives while minority 71 (44.4%) had good knowledge. The mean knowledge score was 9.46 (63%) with 3.053 Std. deviation. Table 4.4, further shows that the majority 84 (52.5%) of participants had poor practice on home management of diarrhea among children under-fives whereas minority 76 (47.5%) had good practice. the mean practice score was 11.64 (61%) with 3.736 Std. deviation.

Table 4.5, Participants level of knowledge and practice regarding home management of diarrhea (N=160)

knowledge Score out of 15	Frequency (%)	Knowledge percentage score	Level of knowledge/Frequency	Mean (SD)
1	1(0.6)	6.6		
2	1(0.6)	13.3		
3	3(1.9)	20		
4	4(2.5)	26.6	Poor knowledge – 89 (55.6%)	9.46 (3.053)
5	8(5.0)	33.3		
6	3(1.9)	40		
7	17(10.6)	46.6	Good knowledge –71 (44.4%)	
8	24(15.0)	53.3		
9	28(17.5)	60		
10	20(10.5)	66.6		
11	10(6.3)	73.3		
12	10(6.3)	80		
13	11(6.9)	86.6		
14	9(5.6)	93.3		
15	11(6.9)	100		
practice score out of 19	Frequency (%)	Practice percentage score	Level of practice/Frequency	Mean(SD)
2	1(0.6)	10.5		
3	3(1.9)	15.7		
4	5(3.1)	21		
5	5(3.1)	26.3	Poor practice – 84(52.5%)	11.17(3.736)
6	5(3.1)	31.5		
7	7(4.4)	36.8		
8	12(7.5)	42.1	Good practice – 76(47.5%)	
9	16(10)	47.3		
10	15(9.4)	52.6		
11	15(9.4)	57.8		
12	18(11.3)	63.1		
13	16(10)	68.4		
14	9(5.6)	73.6		
15	12(7.5)	78.9		
16	5(3.1)	84.2		
17	7(4.4)	89.4		
18	3(1.9)	94.7		
19	6(3.8)	100		

4.6. Sociodemographic factors associated with knowledge and practice of mothers on home management of diarrhea in under-five children

Objective three: To determine sociodemographic factors associated with knowledge and practice of mothers on home management of diarrhea in under-five children at Ruli HC.

Table 4.6, shows the results on sociodemographic factors associated with knowledge and practice on home management of diarrhea in under-five children, according to the table 4.6, the analysis by multiple linear regression to predict sociodemographic factors associated with knowledge indicated that age in years ($p=0.001$), wealth status ($p=0.002$), and child's caretaker most frequently ($p=0.43$) were statistical significantly predicted the knowledge. The results by multiple linear regression analysis in table 4.5 further showed that age in years ($p=0.001$), wealth status ($p=0.037$), occupation ($p=0.000$) and child's care taker most frequently ($p=0.001$) were statistical significantly predicted the practice.

Multivariate analysis by logistic regression in table 4.6, revealed that age ($p=0.035$); and wealth status ($p=0.033$) were the sociodemographic factors associated with knowledge. Age is a factor more likely to influence good knowledge (odds=1.555; 95% CI= 1.032-2.343) than wealth status (odds =0.587, 95% CI =0.360-0.957). Additionally, the results of Multivariate analysis by logistic regression in table 4.6 revealed that age ($p=0.002$); and child's care taker most frequently ($p=0.040$) were the sociodemographic factors associated with practice. Age is a sociodemographic factor more likely to influence practice (odds=1.886; 95% CI= 1.253-2.837) than child's care taker most frequently (odds =0.616, 95%CI =0.388-0.979). The age is a sociodemographic factor that influence both knowledge and practices of mothers on home management of diarrhea among children under-five.

Table 4.6. Sociodemographic factors associated with knowledge and practice of mothers on home management of diarrhea in under-five children (N=160)

Multiple linear regression analysis for sociodemographic factors associated with knowledge

Variables	Coefficient (B)	95%CI(B)	P value
Age in years	-1.071	-1.662 - -.480	.000
Gender	-.786	-2.422 - .850	.344
Marital status	-.321	-1.112 - .469	.423
Religion	.446	-1.055 - 1.948	.558
Wealth status	1.063	.381 - 1.744	.002
Education level	.317	-.205 - .838	.232
Occupation	-.331	-.669 - .007	.055
Number of underfive children in household	.566	-.653 - 1.784	.360
Child's care taker most frequently	.559	.018 - 1.100	.043

Multiple linear regression of sociodemographic factors associated with practice

variables	Coefficient (B)	95% Confidence Interval	P value
Age in years	-1.147	-1.840 - -.454	.001
Gender	.111	-1.808 - 2.031	.909
Marital status	-.875	-1.802 - .053	.064
Religion	.185	-1.576 - 1.946	.836
Wealth status	.853	.054 - 1.652	.037
Educational level	.288	-.324 - .900	.354
Occupation	-.739	-1.136 - -.343	.000
Number of under-fives children in household	.522	-.907 - 1.951	.471
Child's care taker most frequently	1.057	.422 - 1.692	.001

Multivariate logistic regression of sociodemographic factors associated with Knowledge (reference category: good knowledge)

Variables	Odds ratio	95% CI	P.value
Age in years	1.555	1.032-2.343	0.035
Wealth status	0.587	0.360-0.957	0.033

Multivariate logistic regression of sociodemographic factors associated with practice (reference category: good practice)

Variables	Odds ratio	95% CI	P.value
Age	1.886	1.253-2.837	0.002
Child's care taker	0.616	0.388-0.979	0.040

4.7. Relationship between knowledge and practice of mothers on home management of diarrhea in under-five children

Objective four: To examine the relationship between knowledge and practice of mothers on home management of diarrhea in under-five children at Ruli HC.

Table 4.7, displays results of bivariate analysis of the relationship between knowledge and practice of mothers on home management of diarrhea in under-five children, according to the table 4.7, the results revealed a significant strong positive linear correlation between knowledge and practice ($r = .755$ $p=0.0001$) . As knowledge increases, the practice of mothers also increases.

Table 4.7. Correlation between knowledge and practice of mother on home management of diarrhea (bivariate analysis) (N=160)

		Practices core
knowledge	Pearson	
score	Correlation	.755**
	Sig. (2-tailed)	.0001
	N	160

4.4. CONCLUSION OF RESULTS

Over all, the results revealed that both the level of knowledge and practice were low among mothers as regards to the home management of diarrhea among under-fives children. The level of knowledge was found to be significantly associated with age and wealthstatus of the mother, in addition, the level of practice was significantly associated with age of the mother and child's care taker most frequently, and the age is a factor that influence both knowledge and practices of mothers. There is a significant linear correlation between knowledge and practice of mothers regarding home management of diarrhea among under-fives children.

CHAPTER FIVE: DISCUSSION

5.1 INTRODUCTION

Within this chapter, the study findings are discussed following study aim, variables under the study along with conceptual framework, study limitation, future recommendation and the conclusion of the research study.

5.2 DISCUSSION OF THE VARIABLES UNDER STUDY

5.2.1. Discussion of demographic variables

The aim of this study was to assess the level of knowledge and practices of mothers on home management of diarrhea in under-fives children at Ruli health center in Gakenke district. Among 262 mothers with under-fives children consulted Ruli health center within the past 6 months, 160 were selected to participate in the study. The sociodemographic characteristic analysis showed that the majority of the participants were female 147 (91.9%) compared to male 13 (8.16), the highest number of participants were practicing Christianity religion 151 (94.4%), the high number of participants were married 145(80.6%), and majority 102(63.8%) of participants completed primary school and 13(8.1%) never attended the school, the majority of participants were between 31-40 years old 65 (40.5%). According to their wealth status in table 4.2, the majority were in category III of ubudehe, 66 (41.3%) were unemployed. The findings of the study in table 4.2, revealed that the under-fives children were most frequently cared for by their own mothers than others. The majority 139(86.9) of respondents had one underfive child in household.

The similar results were observed in the study conducted by Olatona et al (2016) in Nigeria who reported that majority of the respondents were Christians (85.4%) and (98.4%) were married, differently, the Secondary education was the highest level of education for a larger proportion (42.7%). Gabriel (2016) in Nigeria reported the similar findings where by of the total 295 caregivers recruited for the study, majority 228(76.0%) had completed primary education and 291(98.8%) were Christians. On contrary to the findings of this study, chiabi et al (2018) reported that among 540 mothers of children below 5years who participated in the study, majority of mothers (40.7%) were between 15-25 years old, 40.7% of them attended secondary school and 23.7% were uneducated.

The study conducted by Desta, Assimamaw and Ashenafi (2017) revealed similar findings on different aspects of sociodemographic of participants where by about 96.8% of participants were females while the rest were males, about 99.7% participants were Orthodox and 86.2% of the participants were married. More than half (58.6%) of the participants were illiterates and about 65.4% of mothers were housewives. Around 63.8% of mothers have 1-2 children. Differently, Ansari et al, (2012) reported that majority 90 % of the mothers were from the age group 16 - 30 years, mothers were mostly (93%) housewives and majority (> 62 %) of the mothers were not educated.

5.2.2. Level of knowledge of mothers on home management of diarrhea among under-fives children.

The results of the study revealed that the high proportion 89(55.6%) of mothers who participated in this study had poor knowledge on home management of diarrhea while 71(44.4%) mothers had good knowledge on management of diarrhea among under-fives children, this is contrary to the study conducted by Desta, Assimamaw and Ashenafi, 2017 in Ethiopia who found that majority 208 (56.2%) of caregivers had adequate knowledge while 162 (43.8%) caregivers had inadequate knowledge regarding home management of diarrhea in under-five children.

The results of the study found that the majority of respondents 96(50%) knew correctly the definition of diarrhea whereas 64(40) respondents did not know, on the contrary to the study conducted by Ogbeyi, Onyemochi and Ogbonna (2016) in Nigeria which indicated that minority (42.7%) of the respondents had fair knowledge of the correct definition of diarrhea in a child, while majority 57.3% had poor knowledge of the definition of diarrhea.

The results of the present study showed that majority 147(91.9) of respondents reported Poor hygiene as cause of diarrhea among children under-fives years while 13(8.1) did not know. These results support the findings by Desta, Assimamaw and Ashenafi (2017) in Ethiopia who found out that around 213 (57.6%) of caregivers said that poor hygiene is the cause of diarrhea and about 30.3% caregivers did not know any cause of diarrhea.

The findings of this study found that majority 134(83.8%) of respondents knew that micro-organisms (bacteria, virus, parasites) are the causes of diarrhea among children under-fives

years respectively while minority 26(16.3) did not know. This result is lower compared with findings from the study conducted by Amare et al (2014) in Ethiopia on Maternal knowledge and practice towards diarrhea management in under five children which showed that 2.3% of the mothers knew that diarrhea can be caused by bacteria, 0.6% of the mothers knew that diarrhea can be caused by virus and 66.6% of the mothers knew that diarrhea is caused by poor hygiene. However, 26.6% of the mothers had no any knowledge about the cause of diarrhea.

The study findings revealed that majority 83(51.9%) of respondents did not know that under-five child with diarrhea has nausea and vomiting while 77(48.1%) respondents knew, on the contrary, Shah et al., 2012 in India found that majority (54%) of respondents reported repeated vomiting as sign of diarrhea in under-fives children.

The results of the study showed that Majority of respondents 132(82.5%) knew that under-five child with diarrhea has loose, watery stools while 28(17.5%) did not know, this is reinforced by Shah et al., 2012 in India who reported that majority (85%) of respondents knew watery stools as sign of diarrhea among under-fives.

The results of the present study indicated that majority of respondents 103(64.4%) knew the components of homemade oral rehydration salt while 57(35.6%) did not know, this were differently to the study conducted by Dodicho 2016 in Ethiopia who reported that of the 133 respondents who were aware of homemade ORS also known as salt sugar solution (SSS) preparation, only 50 (37.6%) of them were able to mention the components correctly.

The findings of the study revealed that majority 132(82.5%) of respondents did not know the correct method of preparation of homemade oral rehydration salt whereas 28(17.5%) knew. Similarly to the study conducted by Shah et al., 2012 in India who showed that majority (72%) of mothers were aware of the use of ORS in the home management of diarrhea, but only 30% were able to explain the correct method of its preparation, the results support The findings from the study conducted by Amare et al (2014) in Ethiopia which indicated that 44.9% of the mothers were able to prepare correctly home fluids to manage diarrhea, although 53.1% of mothers were unable to prepare correctly home fluid of diarrhea management. But this is dissimilar to the study conducted by Dodicho (2016) in Ethiopia who reported that of the 466 respondents who were aware of homemade ORS preparation, majority of them 338 mentioned the correct methods of its preparation while 128 gave incorrect response.

Differently to the Study conducted by Desta, Assimamaw and Ashenafi (2017) in Ethiopia where the majority 67 (18.1%) correctly knew that ORS replaces fluid lost during diarrhea, 239 (64.6%) caregivers said that ORS stops diarrhea, while minority 64 (17.3%) of caregivers did not know the use of ORS, the results of this study indicated that majority 117(73.1%) of respondents did not know that function of homemade oral rehydration salt is to replace the body salts, energy and water lost in diarrhea whereas minority 43(26.9%) of the respondents correctly knew the function of ORS.

5.2.3. Level of practices of mothers on home management of diarrhea among under-fives children

The findings of the study showed that the majority 84 (52.5%) of respondents who participated in this study had poor practices on home management of diarrhea while minority 76 (47.5%) of respondents had good practice, this is similar to the results from the study conducted by Sharma and Sujeta (2019) in India on Practice of Mothers on Home Management of Diarrhea among under five children who revealed that majority 65.5% of respondents were having poor practice on home management of diarrhea while minority 34.5% of respondents were having good practice on home management of diarrhea among under-fives children. This result supports the study conducted by Dodicho (2016) in Ethiopia who showed that 47.2% of participants had good practice but 52.8% of participants had poor practice on home management of diarrhea. This result is lower when compared with findings from the study conducted by Desta, Assimamaw and Ashenafi (2017) in Ethiopia who reported that 139 (37.6%) caregivers had the good practice while 231 (62.4%) caregivers had a poor practice regarding home management of diarrhea.

The results of this study revealed that, majority 116 (72.5%) of respondents reported that they used homemade fluids to manage under-five child with diarrhea at home while 44(27.5) did not use it. The similar results were observed in the study conducted by Desta, Assimamaw and Ashenafi (2017) in Ethiopia who reported that more than seventy (73.2%) caregivers had given homemade ORS to their children during the episode of diarrhea. This finding is higher when compared to the study conducted by Okoh and Hart, 2014 in Southern Nigeria which indicated that of the 157 caregivers, 78 (49.7%) gave their children homemade oral rehydration solution (ORS) and 44 (28.0%) gave different types of drugs consisting of antibiotics, anti-malarials, anti-motility agents, zinc and teething mixtures.

The findings of the study indicated that majority of respondents 88(55%) did not use breast milk, water from rice, porridge, clean water to treat diarrhea to their children while minority 72(45%) of respondents used them to treat diarrhea to their children. The similar results were observed in the study conducted by Dodicho (2016) in Ethiopia who reported that minority of participants (33.8%), (2.6%) used breast milk, rice water respectively treat diarrhea to their children while (56.4%),(3.1%) participants used ORS , salt sugar solution respectively.

The results of the study conducted by Ogbeyi, Onyemocho and Ogbonna, 2016 showed that Over 195(65%) of the respondents managed the child with anti-diarrheal agent last time child had diarrhea while only 103(34.9%) gave more homemade oral rehydration salt. This result is lower compared to the findings of this study which revealed that majority 86(53.8%) of the respondents gave more fluid than usual to their children during episode of diarrhea disease while minority 74(46.3%) did not give more fluids to their children during episode of diarrhea.

The majority of respondents 90(56.3%) gave the prepared homemade fluid to their children after each bowel motion, 70(43.8%) did not give fluid after each bowel motion, on the contrary, the study conducted by Desta, Assimamaw and Ashenafi (2017) reported that only 60 (16.2%) caregivers administered homemade ORS after each episode of diarrhea while 226 (61.1%) caregivers gave it only whenever the child wanted to drink.

The finding of the present study revealed that 94(58.8%) of respondents did not use the prepared homemade fluid in less than 24 hours to treat their children with diarrhea while 66(41.5%) used the prepared homemade fluid in less than 24 hours. This finding is lower when compared with the results from the study conducted by Desta, Assimamaw and Ashenafi (2017) who reported that about 197 (53.2%) caregivers said that they keep the reconstituted ORS for 12 hours while the rest of the mothers said that they keep it for 24-hour duration and more.

The findings of the present study showed that majority 144(90%) of respondents continued to feed or breastfeed their children when having diarrhea though 16(10%) stopped feeding or breastfeeding their children while having diarrhea.this results reinforces the results from the study conducted by Dodicho (2016) in Ethiopia who revealed that majority (70.3%) of the respondents supported sustained feeding or breastfeeding during episodes of diarrhea in their children while 29.7% supported diet and breastfeeding withdrawal.

The results of this study showed that, of the 160 respondents, majority 105(65.6%) washed their children's hands with water and soap after the toilet while 55(34.4%) did not wash their children's hands after the toilet. on the contrary to the findings by Ogbeyi, Onyemocho and Ogbonna (2016) in Nigeria who reported that majority (93.2%) of the respondents did not wash their children's hands with soap and water when child's faeces were disposed, while 20(6.8%) of the caregivers washed their children's hands with soap and water the last time the child defecated.

The findings of of this study revealed that majority 100 (62.5%) of respondents washed their hands with water and soap before food preparation while 60(37.5%) did not wash their hands with water and soap. These result are similar to the results from the study conducted by the Eleazar, Ogochukwu and Udoh, (2015) who reported that 66.31% washed their hands water and soap, (33.69%) washed their hands with water only. These results are higher when compared to the results from the study conducted by conducted by Birungi et al., 2016 in Uganda who reported that only 21.8% washed their hands with soap at all times, only 7.7% washed their hands with soap at all times before preparing food while only 10.2% washed their hands at all times before serving food.

The findings from this study indicated that majority 99(61.9%) of respondents washed utensils with water and soap before and after every use and 61(38.1%) did not wash utensils with water and soap. 109(68.1%) washed food and fruits before feeding their children while 51(31.9%) did not. These results support the finding by Seksaria and Sheth (2014) who found that 423 (78.9%) of respondents used soap for washing utensils, washing fruits and vegetables before use.

5.2.4. Sociodemographic factors associated with knowledge and practice of mothers on home management of diarrhea in under-five children

Differently to the findings of this study in table 4.6. which revealed that only age with $p=0.035$; and wealth status with $p=0.033$ were the sociodemographic factors associated with knowledge of mothers on home management of diarrhea while the other sociodemographic factors were not significantly associated with knowledge of mothers , the study conducted by Dodicho 2016 in Ethiopiain showed a strong significant association of age ($P=0.000$) and educational status of mothers with better knowledge of mothers on home management of diarrhea in underfive children ($P=0.001$).

Also the study conducted by Ghasemi et al., 2013 in Iran indicated that the knowledge of the mothers had significant relation with their age ($P=0.0001$), education of the father ($P=0.005$), number of children ($P=0.005$), occupation of the mother ($P=0.01$) and the source of the knowledge ($P=0.0005$). The findings of the present study also differs from the results by the study conducted by Okoh and Hart, 2014 in south Nigeria which indicated that a higher knowledge score on home management of diarrhea was significantly associated with the Social class ($P=0.002$) and mother's educational level ($P=0.002$).

Dissimilar findings were observed in the study conducted by Chiabi et al (2018) in cameroon who reported that the mothers' and fathers' level of education significantly ($P=0.02$ and 0.000 respectively) influenced the mothers' knowledge. The results of this study were also dissimilar to the results from the study by Boma A. et al(2014) in Nigeria who revealed that a higher knowledge score was significantly associated with the Social class ($P=0.002$) and mother's educational level ($P=0.002$).

Multivariate analysis by logistic regression in the table 4.3.3 revealed that age with $p=0.002$; education with $p=0.000$ and child's care taker with $p=0.040$ were the sociodemographic factors associated with practice. These results are quite similar to the results from the study conducted by chiabi et al (2018) in Cameroon who indicated that academic level and profession of the parents ($P < 0.01$) were the factors influencing good practices of the mother. Differently to the study conducted by Dodicho 2016 in Ethiopiain who revealed that education and residence were found to influence the practice of mothers. ($P=0.000$, $P=0.000$). These results are also dissimilar to the results from the study conducted by Boma A. et al (2014) in Nigeria who indicated that a higher practice score was significantly associated with the Social class ($P < 0.001$) and mother's educational level ($P < 0.001$).

CHAPTER SIX: CONCLUSION AND RECOMMENDATIONS

6.1. INTRODUCTION

This chapter presents the conclusion of the study on mother's knowledge and practices on diarrhea home management among children underfives, it provides recommendations in four aspect based on findings namely nursing research, nursing practice, nursing administration and nursing education.

6.2. CONCLUSION

The present study concludes that most of mothers have poor knowledge as well as poor practices towards the home management of diarrhea among under-fives children. The level of knowledge was significantly associated with age of mother and wealthstatus of mother. The level of practice was significantly associated with age of mother, child's care taker most frequently. There is a significant linear correlation between knowledge and practice of mothers regarding home management of diarrhea among under-fives children. Therefore, health education of mother in particular should be used as an effective tool to promote knowledge and practices regarding home management of diarrhea in children under 5 years of age.

6.3. RECOMMENDATIONS

Based on the research findings, the following recommendations are made:

Nursing research:

This study identified the knowledge and practices gaps regarding to mothers home management of diarrhea in under-five children, therefore, more investigations in different regions of the country for a deeper understanding of knowledge, practices of mothers on home diarrhea management as well as sociodemographic factors associated with knowledge and practice are needed to further reduce the threat of diarrheal diseases to children under-fives years old and to generalize the result for the whole Rwandan population.

Nursing practice

The health professionals such as nurses used the results of this study to implement responsive health programs targeting to reduce morbidity and mortality related to diarrhea among under-fives children. The findings of this study were useful to develop guidelines fit for local setting and to encourage mothers to change their home practices for preventing diarrhea among children.

Nursing Administration:

Results of this study revealed gaps in mother's knowledge and practices on home management of diarrhea in under-fives, we recommend nursing administration to develop useful guidelines fit for local setting and set adequate and suitable strategies to address diarrhea diseases among children under five years old. Additionally, we recommend Ruli health center administration in particular to organize and implement more health campaigns, health education, community conversation and dissemination of information so as to increase the knowledge and practices of mothers towards home management of diarrhea and ultimately reduce the morbidity and mortality rates from diarrhoeal diseases among children less than 5 years of age. There is also a need to train all health care providers especially nurses and community health workers on home management of diarrhea in children under-fives so that they can later train and educate the community on diarrhea home management, therefore reducing morbidity and mortality related to diarrhea disease.

Nursing education:

We recommend nursing education institutions to develop and implement responsive educational programs aimed at equipping graduates to deliver safe and quality care, preventive and curative care to mothers and children under-fives years of age and contribute to reduction of diarrhea occurrence, mortality and morbidity rate.

LIST OF REFERENCES.

- Tambe, A.B., Nzefa, L.D. and Nicoline, N.A., 2015. Childhood diarrhea determinants in sub-Saharan Africa: a cross sectional study of Tiko-Cameroon. *Challenges*, 6(2), pp.229-243.
- Mihrete, T.S., Alemie, G.A. and Teferra, A.S., 2014. Determinants of childhood diarrhea among under-five children in Benishangul Gumuz Regional State, North West Ethiopia. *BMC pediatrics*, 14(1), p.102.
- Divya, S., Saju, C.R., Navya, C.J., Joshy, V.M., Jini, M.P. and Radhamani, M.V., 2017. A study on selected behavioral factors of mothers influencing acute diarrhoea in under-five children in a rural part of Kerala, India. *International Journal of Community Medicine and Public Health*, 3(8), pp.2211-2216.
- Kabayiza, J.C., Andersson, M.E., Nilsson, S., Bergström, T., Muhirwa, G. and Lindh, M., 2014. Real-time PCR identification of agents causing diarrhea in Rwandan children less than 5 years of age. *The Pediatric infectious disease journal*, 33(10), pp.1037-1042.
- Thiam, S., Diène, A.N., Fuhrmann, S., Winkler, M.S., Sy, I., Ndione, J.A., Schindler, C., Vounatsou, P., Utzinger, J., Faye, O. and Cissé, G., 2017. Prevalence of diarrhoea and risk factors among children under five years old in Mbour, Senegal: a cross-sectional study. *Infectious diseases of poverty*, 6(1), p.109.
- Chilambwe, M., Mulenga, D. and Siziya, S., 2015. Diarrhoea Prevalence in Under-Five Children in Two Urban Populations Setting of Ndola, Zambia: An Assessment of Knowledge and Attitude at the Household Level. *J Infect Dis Ther*, 3(227), pp.2332-0877
- Ganguly, E., Sharma, P.K. and Bunker, C.H., 2015. Prevalence and risk factors of diarrhea morbidity among under-five children in India: A systematic review and meta-analysis. *Indian journal of child health*, 2(4), p.152
- Konstantyner, T., de Oliveira Konstanty, T.C.R., amaral Mais, L., Warkentin, S. and Taddei, J.A.D.A.C., 2015. Prevalence and hospitalization rates due to diarrhoea in infants: the 2006 Brazilian National Demographic Health Survey. *Journal of Epidemiological Research*, 2(1), p.29
- Kakulu, R.K., 2012. Diarrhoea among under-five children and household water treatment and safe storage factors in Mkuranga district, Tanzania (Doctoral dissertation, Muhimbili University of Health and Allied Sciences).

- Mengistie, B., Berhane, Y. and Worku, A., 2013. Prevalence of diarrhea and associated risk factors among children under-five years of age in Eastern Ethiopia: A cross-sectional study. *Open Journal of Preventive Medicine*, 3(07), p.446.
- Aziz, D., diarrhea in children from 1 month to 24 months (Doctoral dissertation).
- Diouf, K., Tabatabai, P., Rudolph, J. and Marx, M., 2014. Diarrhoea prevalence in children under five years of age in rural Burundi: an assessment of social and behavioural factors at the household level. *Global health action*, 7(1), p.24895.
- Demographic, U., 2015. Health survey (UDHS) 2011. Uganda Bureau of Statistics Kampala, Uganda.
- Duru, E.E., Agbagwa, O.E. and Umoren, F.E., 2014. Bacterial agents associated with infantile diarrhea and their antibiotics susceptibility pattern in Port Harcourt, South-South, Nigeria. *J Medical Sci Public Health*, 3(1), pp.1-12.
- Bonkougou, I.J.O., Haukka, K., Österblad, M., Hakanen, A.J., Traoré, A.S., Barro, N. and Siitonen, A., 2013. Bacterial and viral etiology of childhood diarrhea in Ouagadougou, Burkina Faso. *BMC pediatrics*, 13(1), p.36.
- Ministry of Health 2013. Pediatrics Clinical treatment guidelines
- Ntaji, M.I., Oyibo, P.G. and Bamidele, J.O., 2014. Food hygiene practices of mothers of under-fives and prevalence of diarrhoea in their children in Oghara, Delta state. *Journal of Medicine and Biomedical Research*, 13(2), pp.134-145.
- Vakili, R., Moghadam, Z. E., Khademi, G. and Vakili, S. (2015) 'Child Mortality at Different World Regions : A Comparison Review', 3(20), pp. 809–816.
- Krumkamp, R., Sarpong, N., Schwarz, N. G. and Adelkofer, J. (2015) 'Gastrointestinal Infections and Diarrheal Disease in Ghanaian Infants and Children : An Outpatient Case-Control Study', pp. 1–14. doi: 10.1371/journal.pntd.0003568.
- NISR (2015) 'Rwanda Demographic and Health Survey', National Institute of Statistics.
- World Health Organization, 2016. UN-water global analysis and assessment of sanitation and drinking-water (GLAAS) 2014 report: investing in water and sanitation: increasing access, reducing inequalities.

World Health Organization, 2015. Guidelines for drinking-water quality: recommendations (Vol. 1). World Health Organization.

Farthing, M., Salam, M.A., Lindberg, G., Dite, P., Khalif, I., Salazar-Lindo, E., Ramakrishna, B.S., Goh, K.L., Thomson, A., Khan, A.G. and Krabshuis, J., 2013. Acute diarrhea in adults and children: a global perspective. *Journal of clinical gastroenterology*, 47(1), pp.12-20.

Oxford English dictionary 2016

Walker C, Rudan I, Liu L, Nair H, Theodoratou E, B. and ZA (2013) ‘Global burden of childhood pneumonia and diarrhoea’, *The Lancet*, 381(9875), pp. 1405–16.

Ngabo, F., Mvundura, M., Gazley, L., Gatera, M., Rugambwa, C., Kayonga, E., Tuyishime, Y., Niyibaho, J., Mwenda, J.M., Donnen, P. and Lepage, P., 2016. The economic burden attributable to a child’s inpatient admission for diarrheal disease in Rwanda. *PLoS One*, 11(2), p.e0149805.

Mohammed, S. and Tamiru, D., 2014. The Burden of Diarrheal Diseases among Children under Five Years of Age in Arba Minch District, Southern Ethiopia, and Associated Risk Factors: A Cross-Sectional Study. *International scholarly research notices*, 2014.

Gebru, T., Taha, M. and Kassahun, W., 2014. Risk factors of diarrhoeal disease in under-five children among health extension model and non-model families in Sheko district rural community, Southwest Ethiopia: comparative cross-sectional study. *BMC public health*, 14(1), p.395.

Agustina, R., Sari, T. P., Satroamidjojo, S., Bovee-oudenhoven, I. M. J., Feskens, E. J. M. and Kok, F. J. (2013) ‘Association of food-hygiene practices and diarrhea prevalence among Indonesian young children from low socioeconomic urban areas’, *BMC Public Health*. *BMC Public Health*, 13(1), p. 1. doi: 10.1186/1471-2458-13-977.

Guarino, A., Guandalini, S. and Vecchio, A.L., 2015. Probiotics for prevention and treatment of diarrhea. *Journal of clinical gastroenterology*, 49, pp.S37-S45.

WHO (2015) ‘Definitions of Indicators’, pp. 4–7.

Nsabimana, Mureithi, and Habtu. 2017. Factors Contributing to Diarrheal Diseases among Children less than five years in Nyarugenge District, Rwanda. *Journal of Tropical Diseases*

Andreas Chiabi, Félicitée D Nguefack , Palma H Abouame , Seraphin Nguefack , Nelson S. Njedock , Edmond N, Roland M Chiabi and Marie T Obama 2018. Assessment of Knowledge and Practices of Mothers on the Home Management of Diarrhea in the Northern Part of Cameroon.

Gabriel Ofikwu Ogbeyi, Audu Onyemocho, Chikaike Ogbonna 2016. Assessment of caregiver's knowledge of diarrhoea and practice of home management of diarrhoea disease among under two children in Opialu, a rural community in Benue State, Nigeria

Terefe Dodicho 2016. Knowledge and Practice of Mothers/Caregivers on Home Management of Diarrhea in Under Five Children in Mareka District, Southern Ethiopia.

Farthing, M., Salam, M.A., Lindberg, G., Dite, P., Khalif, I., Salazar-Lindo, E., Ramakrishna, B.S., Goh, K.L., Thomson, A., Khan, A.G. and Krabshuis, J., 2013. Acute diarrhea in adults and children: a global perspective. *Journal of clinical gastroenterology*, 47(1), pp.12-20

Hatz, C.F., Bally, B., Rohrer, S., Steffen, R., Kramme, S., Siegrist, C.A., Wacker, M., Alaimo, C. and Fonck, V.G., 2015. Safety and immunogenicity of a candidate bioconjugate vaccine against *Shigella dysenteriae* type 1 administered to healthy adults: A single blind, partially randomized Phase I study. *Vaccine*, 33(36), pp.4594-4601.

Costs, T. (2015) 'Country Context', World bank, (Nutrition at a Glance), p. 2

Mohammed, A.I. and Zungu, L., 2016. Environmental health factors associated with diarrhoeal diseases among under-five children in the Sebeta town of Ethiopia. *Southern African Journal of Infectious Diseases*, 31(4), pp.122-129.

Amare, D., Dereje, B., Kassie, B., Tessema, M., Mullu, G., Alene, B. and Ayele, A., 2014. Maternal knowledge and practice towards diarrhoea management in under five children in fenote selam town, west gojjam zone, amhara regional state, Northwest Ethiopia, 2014. *Journal of Infectious Diseases and Therapy*.

Mashoto, K.O., Malebo, H.M., Msisiri, E. and Peter, E., 2014. Prevalence, one week incidence and knowledge on causes of diarrhea: household survey of under-fives and adults in Mkuranga district, Tanzania. *BMC Public Health*, 14(1), p.985.

Kakulu, R.K., 2012. Diarrhoea among under-five children and household water treatment and safe storage factors in Mkuranga district, Tanzania (Doctoral dissertation, Muhimbili University of Health and Allied Sciences)

Sarker, A. R., Sultana, M., Mahumud, R. A., Sheikh, N., Meer, R. Van Der and Morton, A.(2016) ‘Prevalence and Health Care – Seeking Behavior for Childhood Diarrheal Disease in Bangladesh’. doi: 10.1177/2333794X16680901.

Ansari, S., Sherchand, J.B., Parajuli, K., Paudyal, B.M., Adhikari, R.P., Shrestha, S., Mishra, S.K., Dahal, R.K., Tandukar, S., Khadka, R. and Shrestha, R., 2012. Pattern of acute parasitic diarrhea in children under five years of age in Kathmandu, Nepal. *Open Journal of Medical Microbiology*, 2(3), p.95.

Tate, J.E., Burton, A.H., Boschi-Pinto, C., Parashar, U.D., World Health Organization–Coordinated Global Rotavirus Surveillance Network, Agocs, M., Serhan, F., de Oliveira, L., Mwenda, J.M., Mihigo, R. and Ranjan Wijesinghe, P., 2016. Global, regional, and national estimates of rotavirus mortality in children < 5 years of age, 2000–2013. *Clinical Infectious Diseases*, 62(suppl_2), pp.S96-S105.

Olatona, F.A., Obrutu, O.E. and Adeniyi, O.F., 2016. Home management of childhood diarrhea including zinc supplementation among mothers attending primary health centers in an urban community in Lagos. *Tropical Journal of Health Sciences*, 23(2), pp.23-29.

Thankappan, K.R., 2014. Diarrhoea morbidity among under-five children: A comparative study of two villages (No. 39). Centre for Development Studies.

Ameyaw, R., Ameyaw, E., Acheampong, A.O. and Appiagyei, P., 2017. Diarrhoea among Children Under Five Years in Ghana. *Global Journal of Research and Review*, 4(2).

Eleazar, C.I., Ogochukwu, E.I. and Udoh, I.P., 2015. Predisposing and Risk Factors of Diarrhea in Children Seen At Enugu State University Teaching Hospital, Enugu-Nigeria. *International Journal of Health Sciences and Research (IJHSR)*, 5(6), pp.205-211.

Sheth, M.K. and Seksaria, S.A., 2014. Maternal Knowledge and Practices Towards Sanitation and Their Relationships with Occurrence of Diarrhoea in Children. *International Journal of Public Health Science*, 3(3).

<https://en.oxforddictionaries.com/definition/practice> accessed on 12 may 2018

Jager, K.J., Zoccali, C., Kramar, R. and Dekker, F.W., 2007. Measuring disease occurrence. *Kidney international*, 72(4), pp.412-415.

Ngabo, F., Mvundura, M., Gazley, L., Gatera, M., Rugambwa, C., Kayonga, E., Tuyishime, Y., Niyibaho, J., Mwenda, J.M., Donnen, P. and Lepage, P., 2016. The economic burden

attributable to a child's inpatient admission for diarrheal disease in Rwanda. PLoS One, 11(2), p.e0149805.

Turnbull, J. L., Adams, H. N. and Gorard, D. A. (2014) 'Alimentary Pharmacology and Therapeutics Review article : the diagnosis and management of food allergy and food intolerances'. doi: 10.1111/apt.12984.

Services, H. (2013) 'Diarrhea : Common Illness, Global Killer', pp. 1–4.

WHO (2009). Diarrhoeal disease fact sheet. [Online] Available at <http://www.who.int/mediacentre/factsheets/fs330/en/index.html>. Retrieved 12th June 2018

Santosham M, Chandran A, Fitzwater S, Fischer-Walker C, Baqui AH, Black R, et al. (2013) Progress and barriers for the control of diarrhoeal disease. *Lancet*. 2010; 376: 63–67.

UNICEF 2015 'Global databases based on Multiple Indicators Cluster Surveys, Demographic and Health Surveys and other nationally representative sources.

World Health Organization (2017) .The treatment and prevention of acute diarrhoea. Practical guidelines, 2nd edition. Geneva: WHO. 49 p.

MoH 2014, integrated community case management of childhood disease

Professor Farthing M. et al 2012. Acute diarrhea in adults and children: a global perspective. *World gastroenterology*.

WHO, UNICEF. 2012 Behavior Change Perspectives and Communication Guidelines on Six Child Survival Interventions. WHO, UNICEF;:p 59–60.

Pender, N.J., 2011. Health promotion model manual.

Takanashi, K., Chonan, Y., Quyen, D.T., Khan, N.C., Poudel, K.C. and Jimba, M., 2009. Survey of food-hygiene practices at home and childhood diarrhoea in Hanoi, Viet Nam. *Journal of health, population, and nutrition*, 27(5), p.602.

Mumtaz and Z. Mumtaz, 2014 "Knowledge, attitude and practices of mothers about diarrhea in children under 5 years," *JJdow uni health sci*, vol. 8, no. 1, pp. 3–6,

Ogunrinde, T. Raji, O. A. Owolabi, and K. M. Anigo, 2012 "Knowledge, attitude and practice of home management of childhood diarrhoea among caregivers of under-5 children with diarrhoeal disease in northwestern Nigeria," *Journal of Tropical Pediatrics*, vol. 58, no. 2, Article ID fmr048, pp. 143–146,

Abdinia, 2014 “Knowledge and practice of mothers in the management of children’s Diarrhea, in Northwest, Iran,” *Archives of Pediatric Infectious Diseases*, vol. 2, no. 4, Article ID e17581.

Osonwa Kalu and S. Ema, “Ema s. 2016 Utilization of oral rehydration therapy in the management of diarrhea in children among nursing mothers in Odukpani local government area of cross river state,” *Nigeria. American journal of public health research*, vol. 4, no. 1, pp. 28–37.

Shah, A. Ahmad, N. Khalique, S. Afzal, M. A. Ansari, and Z. Khan, 2012 “Home-based management of acute diarrhoeal disease in an urban slum of Aligarh, India,” *Journal of Infection in Developing Countries*, vol. 6, no. 2, pp. 137–142,.

Masiha, A. Khalid, B. Malik, and S. M. A. Shah, 2015 “Oral rehydration therapy-knowledge, attitude and practice (KAP) survey of Pakistani mothers,” *Journal of Rawalpindi Medical College Students Supplement*, vol. 19, no. 1, pp. 51–54,.

E. Gazi, A. Chowdhury, R. Kumar, A. P. Sarkar, S. S. Basu, and S. Saha, 2015 “Can mothers care for acute diarrhoeal disease of their under-five children effectively at home? a cross sectional study in slum community in bankura,” *Journal of Evidence Based Medicine and Healthcare*, vol. 2, no. 36, pp. 5575–5584,

Stephen, B., Apidechkul, T., Suma, Y. and Suttana, W., 2016. Maternal knowledge, attitude and practices related to diarrhea in children aged less than five years in Kabarole district, Uganda. *Journal of Public Health and Development*, 14(2), pp.33-48.

Sharma, P. and Sujeeta, M., 2019. Practice of Mothers on Home Management of Diarrhea among under five children in selected area of Dadra and Nagar Haveli. *International Journal of Advances in Nursing Management*, 7(1), pp.84-86.

Burns, N. and Grove, S.K., 2011. *Understanding Nursing Research. Building an Evidence-Based Practice*. 4th. *Maryland Heights, MO: Elsevier Saunders*

Okoli, C. and Schabram, K., 2010. A guide to conducting a systematic literature review of information systems research.

Cohen, L., Manion, L. and Morrison, K., 2013. Action research. In *Research methods in education* (pp. 368-385). Routledge.

Parahoo, K., 2014. *Nursing research: principles, process and issues*. Macmillan International Higher Education.

Zhang, W. and Creswell, J., 2013. The use of “mixing” procedure of mixed methods in health services research. *Medical care*, 51(8), pp.e51-e57.

Riddle, M.S., Murray, J.A. and Porter, C.K., 2012. The incidence and risk of celiac disease in a healthy US adult population. *The American journal of gastroenterology*, 107(8), p.1248.

Edwards, A. and Talbot, R., 2014. *The hard-pressed researcher: A research handbook for the caring professions*. Routledge

Kotrlik, J.W.K.J.W. and Higgins, C.C.H.C.C., 2001. Organizational research: Determining appropriate sample size in survey research appropriate sample size in survey research. *Information technology, learning, and performance journal*, 19(1), p.43.

Ben-Hamou, A., Peres, Y. and Salez, J., 2018. Weighted sampling without replacement. *Brazilian Journal of Probability and Statistics*, 32(3), pp.657-669.

Baird, G., Charman, T., Baron-Cohen, S., Cox, A., Swettenham, J., Wheelwright, S. and Drew, A., 2000. A screening instrument for autism at 18 months of age: a 6-year follow-up study. *Journal of the American Academy of Child & Adolescent Psychiatry*, 39(6), pp.694-702.

Fitzgerald, R., Widdop, S., Gray, M. and Collins, D., 2011. Identifying sources of error in cross-national questionnaires: Application of an error source typology to cognitive interview data. *Journal of Official Statistics*, 27(4), pp.569-599.

Van Rensburg, G.H., 2011. Ethics in healthcare, SA Pera & S. van Tonder (Eds.), revised by JM Oosthuizen and DM van der Wal: book review. *Africa Journal of Nursing and Midwifery*, 13(2), pp.135-137.

Tavakol, M. and Dennick, R., 2011. Making sense of Cronbach's alpha. *International journal of medical education*, 2, p.53..

APPENDIXES

APPENDIX 1. UR ETHICAL CLEARANCE



CMHS INSTITUTIONAL REVIEW BOARD (IRB)

Kigali, 20/03/2019
Ref: CMHS/IRB/115/2019

NDAYISABA Archange
School of Nursing and Midwifery, CMHS, UR


Dear Archange,

RE: ETHICAL CLEARANCE

Reference is made to your application for ethical clearance for the study entitled « *Knowledge and practice of mothers on home management of diarrhea in under five children at Ruli health center in Gakenke District* »

Having reviewed your application and been satisfied with your protocol, your study is hereby granted ethical clearance. The ethical clearance is valid for one year starting from the date it is issued and shall be renewed on request. You will be required to submit the progress report and any major changes made in the proposal during the implementation stage. In addition, at the end, the IRB shall need to be given the final report of your study.

We wish you success in this important study.



Professor Galuph Jean Bosco
Chairperson Institutional Review Board,
College of Medicine and Health Sciences, UR

Cc:
- Principal College of Medicine and Health Sciences, UR
- University Director of Research and Postgraduate studies, UR

APPENDIX 2. Request for Data Collection

NDAYISABA ARCHANGE
STUDENT AT UR, CMHS, SCHOOL OF
NURSING AND MIDWIFERY
MASTER'S PROGRAM IN NURSING
PHONE CELL: +250785029583
EMAIL: arhandros@gmail.com
22nd March 2019.

Dear Head of Ruli Health Center,

RE: Request for Data collection

Dear Sir,

I am a student in Masters of Sciences in Nursing, Pediatric track at the University of Rwanda, College of Medicine and Health Sciences, School of Nursing and Midwifery.

I am writing to requesting permission to collect data within your institutions for my research dissertation entitled " Knowledge and practices of mothers on home management of diarrhea in under-fives children at Ruli health center in Gakenke District. Find attached copy of ethical clearance and research proposal.

I am looking forward to hearing from you, hopping that my request will meet your favorable response.

Your sincerely

NDAYISABA Archange.



APPENDIX 3. PERMISSION TO COLLECT DATA

REPUBLIC OF RWANDA
NORTHERN PROVINCE
GAKENKE DISTRICT
RULI SECTOR
RULI CELL
BALIZA VILLAGE
RULI HEALTH CENTER
25th March 2019.

Dear NDAYISABA Archange

Re: Your request for data collection

Reference made to your letter requesting for permission to collect data within Ruli Health Center for your research proposal entitled " Knowledge and practices of mothers on home management of diarrhea in under-fives children at Ruli health center in Gakenke District" and based on approvals Ref: CMHS/IRB/115/2019 from university of Rwanda, we are pleased to inform you that your request to collect data within our institution was accepted. You are required to present the results of your study to our institution before publication.

Sincerely

Head of Ruli Health Center



APPENDIX 4. PERMISSION TO USE INSTRUMENT FOR DATA COLLECTION

Re: Requesting for Instrument for Data Collection - arhandros@gm... <https://mail.google.com/mail/u/3/#search/kumiko-takanashi@ils>

☰ Gmail

🔍 kumiko-takanashi@ilsjapan.org

11

Re: Requesting for Instrument for Data Collection

Inb*

Kumiko Takanashi <kumiko-takanashi@ilsjapan.org>
to me

Dear Ndayisaba,

As per your request, I am sending you the questionnaire.

Best regards,

Kumiko Takanashi

NDAYISABA

----- Forwarded message -----

From: **Archange NDAYISABA** <arhandros@gmail.com>
Date: 2018-04-06 20:28 GMT+09:00
Subject: Requesting for Instrument for Data Collection.
To: mjimba@m.u-tokyo.ac.jp

Dear Dr. Masamine Jimba

I am NDAYISABA Archange, a student at University RWANDA, College

APPENDIX 5. INDIVIDUAL INFORMED CONSENT FORM

I am Archange NDAYISABA ; a student in masters of Science in Nursing, department of General Nursing, school of nursing and midwifery in the college of medicine and health sciences/University of Rwanda Under the supervision of Dr Geldine CHIRONDA and Mrs. Marie Jeanne TUYISENGE, RN, MSCN, lecturers at the College of medicine and health sciences. I am conducting a research dissertation on **“Knowledge and practices of mothers on home management of diarrhoea among under-fives children at Ruli health centre in Gakenke District”** as partial fulfilment of my studies.

I am seeking your cooperation to participate in this study. This study is important because it will help researchers learn more about Knowledge and practices of mothers on home management of diarrhoea among under-fives children. From the information collected and studied in this project, we hope to learn more about optimal mother’s practices on home management of diarrhoea and how best we can teach our communities, mothers, and the highest quality or standards practices that contribute to the health and wellbeing of their children.

With your permission, I kindly request you to give as much information as possible. Seek by responding to the questions in the questionnaire will be addressed to you.

There are no anticipated risks associated with this study. Your decision whether or not to participate in this study will not affect you at all.

The information you provide will be confidential and only used for the purpose of this research.

Your identity will not be disclosed in any published and written material resulting from the study. The participation in this study is voluntary,

I agree to participate in this study, and understand that I can decide at any time to stop my participation, I can ask questions later if I have them, or discuss any changes with me.

Date and Signature of Participant __/__/2019

APPENDIX 6.QUESTIONNAIRE INSTRUCTIONS

Dear Mother,

I am Archange NDAYISABA; student in masters of Science in Nursing, department of General Nursing, school of nursing and midwifery in the college of medicine and health sciences/University of Rwanda. Under the supervision of Dr Geldine CHIRONDA and Mrs. Marie Jeanne TUYISENGE, lecturers at college of medicine and health sciences, I am conducting a research dissertation on “**Knowledge and practices of mothers on home management of diarrhoea among under-fives children at Ruli health centre in Gakenke District**” as partial fulfilment of my studies.

It is for this regard that I seek your cooperation to respond to the asked questions on this questionnaire. The information you provide will be kept and only used for the purpose of this research confidentially. The questionnaire will remain anonymous and no name will be published.

1. The questionnaire is addressed to you individually
2. No names must be mentioned on questionnaire
3. Select the appropriate response by a ticking or selecting the letter corresponding to the right answer

Your contribution is highly appreciated for the success of this study.

Contact information:

Archange NDAYISABA, Mob: 0785029583/0722472427

APPENDIX 7.DATA COLLECTION TOOL ENGLISH VERSION

QUESTIONNAIRE FOR KNOWLEDGE AND PRACTICES OF MOTHERS ON HOME MANAGEMENT OF DIARRHEA AMONG UNDER-FIVES CHILDREN.

SECTION A: SOCIO-DEMOGRAPHIC INFORMATION

Answer to all questions asked by the researcher by selecting the option that best applies to you/ your child.

- 1. Select your appropriate Age group :**
 - a. 18-30
 - b. 31-40
 - c. 41-50
 - d. >50
- 2. What is your Sex?**
 - a. Male
 - b. Female
- 3. What is your marital status?**
 - a. Single
 - b. Married
 - c. Divorce
 - d. Widower
- 4. What is your Religion?**
 - a. Christians
 - b. Islam
 - c. Non-denominational
- 5. What is your wealth status/ socioeconomic status?**
 - a. Ubudehe Category I
 - b. Ubudehe Category II
 - c. Ubudehe Category III
 - d. Ubudehe Category IV
- 6. What is your educational level?**
 - a. Primary school
 - b. Secondary school
 - c. University

SECTION B: KNOWLEDGE OF MOTHERS ON HOME MANAGEMENT OF DIARRHEA.

B1. Knowledge of mothers on definition and causes of diarrhea

Replay by **True** or **False** for the following statements

Statements	True	False
1. Diarrhea is defined as the passage of three or more loose or liquid stools per day.	1	0
2. Poor hygiene causes diarrhea among children under-fives years.	1	0
3. Food poisoning causes diarrhea among children under-fives years	1	0
4. Micro-organisms(bacteria, virus, parasites) cause diarrhea among children under-fives years	1	0

B2. Knowledge of mothers on ways of contamination of diarrhea

Replay by **True** or **False** for the following statements

Statements	True	False
5. The under-five child contracts diarrhea through drinking contaminated water	1	0
6. The under-five child contracts diarrhea through eating contaminated food	1	0
7. The under-five child contracts diarrhea through unhygienic breastfeeding manner	1	0

B3. Knowledge of mothers on signs and symptoms of diarrhea

Replay by **True** or **False** for the following statements

Statements	True	False
8. The under-five child with diarrhea has abdominal pain	1	0
9. The under-five child with diarrhea has nausea and vomiting	1	0
10. The under-five child with diarrhea urinates less frequently	1	0
11. The under-five child with diarrhea has loose, watery stools	1	0
12. The under-five child with diarrhea has loss of control of bowel movements	1	0

B4. Knowledge of mothers on Homemade Oral Rehydration Salts (ORS) or Sugar salt solution (SSS).

Replay by **True** or **False** for the following statements

Statements	True	False
13. The components of Homemade Oral Rehydration Salts are Salt, Sugar and Water	1	0
14. The Home made Oral Rehydration Salts (ORS) is prepared by mixing Six (6) level teaspoons of Sugar with Half (1/2) level teaspoon of salt and one liter of clean drinking or boiled water and then cooled.	1	0
15. The function of Homemade Oral Rehydration Salts is to Replace the body salts, energy and water lost in diarrhea	1	0

SECTION C: PRACTICES OF MOTHERS ON HOME MANAGEMENT OF DIARRHEA.

C1. Practices of mothers on types of fluids

Rate your level of agreement on the following questions

Questions	Agree	Disagree
1. Do you use homemade fluids (sugar, salt, water) to treat your child with diarrhea at home?	1	0
2. Do you use breast milk, water from rice, porridge, clean water to treat your child with diarrhea at home?	1	0
3. Do you give Soft drinks, sweetened tea, sweetened fruits drinks, coffee to treat your child suffering from diarrhea at home?	0	1
4. Do you give the same fluid as usual to your child when having diarrhea?	0	1
5. Do you give less than usual fluid to your child when having diarrhea?	0	1
6. Do you give more fluid than usual to your child when having diarrhea?	1	0
7. Do you stop giving fluids/ food to your child when having diarrhea?	0	1
8. Do you give the prepared homemade fluid to your child after each bowel motion	1	0
9. Do you use the prepared homemade fluid in less than 24 hours to treat your child with diarrhea?	1	0
10. Do you use the prepared homemade fluid in more than 24 hours to treat diarrhea in your child?	0	1

C2. Practices of mothers on feeding the child

Rate your level of agreement on the following questions

Questions	Agree	Disagree
11. Do you feed your child immediately after cooking?	1	0
12. Do you give reheated leftover to your child before eating?	1	0
13. Do you continue to feed or breastfeed your child when having diarrhea?	1	0

C3. Practices of mothers on washing (hands, food, utensils)

Rate your level of agreement on the following questions

Questions	Agree	Disagree
14. Do you wash your child's hands after the toilet?	1	0
15. Do you use water only to wash your child's hands before and after eating?	0	1
16. Do you use water with soap to wash your child's hands before and after eating?	1	0
17. Are your hands washed with water and soap before preparing food (cooking)?	1	0
18. Are utensils washed with water and soap before and after every use?	1	0
19. Do you wash food/ fruits before feeding your child?	1	0

Thank you for your participation

APPENDIX 8. AMASEZERANO Y'UBUFATANYE MUBUSHAKASHATSI KAMINUZA NKURU Y'U RWANDA KOREJI Y'UBUVUZI N'UBUMENYI.

Nitwa NDAYISABA Archange ndi umunyeshuri muri kaminuza nkuru y'urwanda, koreji y'ubuvuzi, ndetse n'ubumenyi nkaba ndigukora ubushakashatsi k'ubumenyi n'ibikorwa by'ababyeyi mukuvura impiswi murugo mubana bari muni y'imyaka atanu kukigonderabuzima cya Ruli mukarere ka Gakenke.

Mbere yuko utangira kugira uruhare muri ubu bushakashatsi wemerewe kubaza ibizazo byose.

Icyo ubushakashatsi bugamije

Ubu bushakashatsi bugamije kureba ubumenyi n'ibikorwa by'ababyeyi mukuvurira murugo abana bari muni y'imyaka itanu bafite impiswi kukigonderabuzima cya Ruli mukarere ka Gakenke.

Ibizakorwa muri ububushakashatsi

Ubu bushakashatsi buzakorwa umubyeyi ahabwa urupapuro ruriho ibibazo agomba gusubiza cyangwa agirana ikiganiro n'umushakashatsi mugihe yaba atabasha kwandika no gusoma kugirango harebwe ubumenyi n'ibikorwa by'ababyeyi mukuvurira murugo impiswi abana bari muni y'imyaka itanu.

Guhitamo abazajya muri ubu bushakashatsi.

Ababyeyi bose bafite abana bari muni y'imyaka itanu barwaye cyangwa bigeze kurwara impiswi, ababyeyi bose bashobora gusinya amasezerano yo kugira uruhare muri ubu bushakashatsi, ababyeyi bose bavuriza abana babo ku kigo nderabuzima cya Ruli muri serivisi y'abana, ababyeyi bose badafite ibibazo byo mu mutwe cyangwa ubundi burwayi bubakomereye bakaba byibuze bafite hejuru y'imyaka 18 y'ubukure.

Uburyo ubushakashatsi buzakorwa

Kugira uruhare muri ubu bushakashatsi biragusaba kwihangana ugasubiza neza ibibazo byose uzabazwa kurupapuro cyangwa se mukiganiro uzagirana n'umushakashatsi. Turagusaba kutubwiza ukuri kugirango tubone amakuru ahagije yadufasha gukora ubuvugizi bugamije kuzamura ubumenyi bw'ababyeyi n'imivurire yimpiswi mungo mubana bafite muni y'imyaka itanu.

Ingaruka

Ntangaruka dukeka ko umuntu yahura nazo aramutse yemeye kugira uruhare muri ubu bushakashatsi. Ariko ufite uburenganzira bwo guhagarika kugira uruhare muribwo igihe cyose ubishakiye. Haramutse hari ikintu kidasanze kikubayeho igihe uri mu biganiro cyangwa urigusubiza ibibazo bijyanye n'ubushakashatsi, uri gukora ubushakashatsi azaguhaha ubufasha bibaye ngombwa.

Inyungu

Birashoboka ko utagira inyungu zako kanya muri ubu bushakashatsi ariko amakuru azavamo azadufasha gusubiza ibibazo twibajije mbere yo gukora ubu bushakashatsi, bitume dukora ubuvugizi bwatuma ababyeyi bagira ubumenyi bwisumbuyeho ku impiswi ndetse nimivurire yayo mungo.

Agahimbazamusyi

Ntamafaranga cyangwa impano duteganya gutanga kubazemera kugira uruhare muri ubu bushakashatsi

Kugira ibanga

Amakuru yose tuzakura muri ubu bushakashatsi azaguma ari ibanga. amakuru yose tuzakubaza akwerekeyeho azabikwa ahantu hizewe kandi ntawundi muntu usibye umushakashatsi wemerewe kuyabona.

Uburyo amakuru avuye mubushakashatsi azatangazwa

Amakuru yose azava muri ubu bushakashatsi azatangarizwa ikigonderabuzima cya Ruli aho abemeye kugira uruhare mubushakashatsi bavuriza abana babo, ashobora kandi nanone gutangarizwa mu manama azabera mugihugu cyangwa mpuzamahanga, ashobora kandi gutangarizwa mu binyamakuru sayantifike mpuzamahanga. Aya makuru kandi ashobora kuba yagaragarizwa abagize uruhare muri ubu bushakashatsi igihe cyose babisabye. Ibanga rizakomeza kubahirizwa kandi mukuyatangaza uwo yaturutseho ntashobora kumenyekana. Amakuru azatangwa ntabwo ari ayumuntu kugiti cye ahubwo nayahurijwe hamwe avuye mubantu benshi.

Uwo wabaza

Niba hari ikibazo ufite ushobora kukibaza nonaha cg se nyuma igihe ubushakashatsi bwaba bwatangiye, niba hari ikibazo ushobora kwifuza kuzabaza nyuma ushobora kukibaza: Archange NDAYISABA nyiri ububushakashatsi akaba n'umunyeshuri muri koreji y'ubuvuzi, ubuzima, n'ubuhanga muri kaminuza y'u Rwanda

Kuri murandasi wamubona kuri:arhandros@gmail.com, telefoni:0785029583.

Ubu bushakashatsi bwemewe na komite y'igihugu ishinzwe kureba ireme ry'ubushakashatsi agashami gakorera muri koreji y'ubuzima muri kaminuza y'U Rwanda. Ahanini iyo komite ishinzwe kureba niba ubwo bushakashatsi budashobora gutera ingaruka mbi abemeye kubugiramo uruhare.

Niba wifuza andi makuru kubyerekeye iyi komite wabaza umuyobozi mukuru w'ikigo cy'ubushakashatsi cya Kaminuza y'U Rwanda ishami ry'ubuvuzi n'ubumenyi kuri telefone igendanwa ariyo 0783340040.

**APPENDIX 9.ICYEMEZO CYEMEZA KUGIRA URUHARE MURI UBU
BUSHAKASHATSI**

Nahamagariwe kugira uruhare muri ubu bushakashatsi bugamije kumenya byimbitse
Ubumenyi n'ibikorwa by'ababyeyi mukuvura impiswi murugo mubana bari muni y'imyaka
atanu.

Numvise kandi ko ni nemera kugira uruhare muri ubu bushakashatsi, nemera kuzuza
urupapuro rw'ibibazo cyangwa kugirana ikiganiro n'umushakashatsi kubijyanye n'ubumenyi
mfite ku impiswi, nuko mvurira murugo umwana uri muni y'imyaka itanu ufite impiswi.

Bambwiye kandi ko kugira uruhare muri ubu bushakashatsi ntangaruka byangiraho, kandi ko
nta nyungu kugiti cyanjye nzakura mukwemera kugira uruhare muri ubu bushakashatsi, kandi
ko ntamafaranga cg impano nzahabwa nindamuka nemeye kugira uruhare muri ubu
bushakashatsi. Nahawe kandi umwirondoro w'ukuriye ubushakashatsi, kuburyo nshobora
kumubaza ibibazo bijyanye nubu bushakashatsi igihe icyo aricyo cyose.

Ibyo byose mvuze haruguru nabyisomeye/ nabisomewe. Nabonye kandi n'umwanya wo
kubaza ibibazo kandi kubibazo byose nabajije nabonye ibisubizo binshimishije. Nemeye
kugira uruhare muri ubu bushakashatsi kugiti cyanjye kandi numvise ko nshobora guhagarika
kugira uruhare muri ubu bushakashatsi igihe icyo aricyo cyose ntibingireho ingaruka mu
kwivuzza muri iki kigonderabuzima.

Amazina y'uwemeye kugira uruhare mu
bushakashatsi.....

Umukono wuwemeye kugira uruhare mu
bushakashatsi.....

Italiki...../...../.....

Kopi y'icyemezo cy'uwemeye kugira uruhare mubushakashatsi yayihawe nabari gukora
ubushakashatsi

APPENDIX 10. AMABWIRIZA Y'URUPAPURO RW'IBIBAZO

Mubyeyi,

Nitwa NDAYISABA Archange, ndi umunyeshuri muri kaminuza nkuru y'urwanda, koreji y'ubuvuzi, ndetse n'ubumenyi bw'ubuzima, niga mukiciro cya gatatu cya kaminuza mu ishami ry'ubuforomo rusange mugashami ko kuvura abana.

Ndigukora ubushakashatsi k'ubumenyi n'ibikorwa by'ababyeyi mukuvurira murugo abana bafite impiswi bari muni y'imyaka itanu bivuriza kukigonderabuzima cya Ruli. Nkaba ndimo gufashwa n'abarimu banjye kugirango ndangize amasomo yanjye aribo Dr Geldine CHIRONDA na **Madamu** Marie Jeanne TUYISENGE, abarimu muri kaminuza nkuru y'urwanda.

Nimuri urwo rwego nifuzako mugira uruhare muri ubu bushakashatsi musubiza ibibazo byose biri kurupapuro rw'ibibazo. Amakuru yose mutanga azabikwa mu ibanga kandi azakoreshwa kumpamvu y'ubu bushakashatsi gusa. Ntazina rizagaragara kurupapuro rw'ibibazo cyangwa ngo ritangazwe.

1. Urupapuro rw'ibibazo niwowe rugenewe kugiti cyawe.
2. Ntazina rigomba kugaragara kurupapuro rw'ibibazo.
3. Hitamo inyuguti ijyanye n' igisubizo nyacyo cyangwa uvuge nibyo, sibyo. Ndabyemera cyangwa simbyemera kubibazo usanga kurupapuro rw'ibibazo.

Uruhare rwawe ni ingenzi cyane mumigendekere myiza y'ubu bushakashatsi.

Kuyandi makuru, wabaza:

Archange NDAYISABA, Mob: +250785029583/ +25072247242

APPENDIX 11. IBIBAZO BY'UBUSHAKASHATSI MU KINYARWANDA.

Code: _____

Itariki y'ubushakashatsi:

**URUPAPURO RW'IBIBAZO KU BUMENYI N'IBIKORWA
BY'ABABYEYI BAFITE ABANA BARI MUNSI Y'IMYAKA ITANU
MUKUVURA IMPISWI MURUGO.**

IGICE CYA MBERE: AMAKURU AJYANYE N'UMWIRONDORO.

Subiza ibibazo byose ubajijwe uhitamo igisubizo nyacyo.

1. **Hitamo icyiciro cy'imyaka urimo:**
 - a. 18-30
 - b. 31-40
 - c. 41-50
 - d. >50
2. **Igitsina cyawe ni ikihe?**
 - a. Umugabo
 - b. Umugore
3. **Irangamimerere yawe ni iyihe?**
 - a. Ingaragu
 - b. Ufite umugore
 - c. Watandukanye n'umugore
 - d. Uri umupfakazi
4. **Idini ryawe ni irihe?**
 - a. Umukirisitu
 - b. Umuyisiramu
 - c. Ntadini ugira
5. **Uba mucyiciro cyakangahe cy'ubudehe?**
 - a. icyiciro cya mbere
 - b. icyiciro cya kabiri
 - c. icyiciro cya gatatu
 - d. icyiciro cya kane

6. **Wize ayahe mashuri?**

- a. Amashuri abanza
- b. Amashuri yisumbuye
- c. Kaminuza
- d. Ntabwo wigeze ugera mu ishuri

7. **Umurimo wawe ni uwuhe?**

- a. Ndikorera kugiti cyawe
- b. Nkorera leta cyangwa ikigo cyigenga
- c. Nkorera abandi
- d. Ntakazi ngira

8. Ufite abana bangahe bari muni y'imyaka itanu?

9. **Ninde wita ku mwana igihe kinini? (hejuru y'amasaha cumi nabiri kumunsi)**

- a. Nyina w'umwana
- b. Nyirakuru
- c. Mushikiwe cyangwa musazawe
- d. Umukozi wo murugo
- e. Ise w'umwana
- f. Undi, muvuge,,,,,,,,

10. Wigeze ugira umwana uri muni y'imyaka itanu ufite impiswi? Yego

Oya

IGICE CYA KABIRI: UBUMENYI BY'ABABYEYI MUKUVURA INDWARA Y'IMPISWI MURUGO

UBUMENYI BY'ABABYEYI KU GISOBANURO CY'IMPISWI NIKIZITERA

Subuza interuro zikurikira ukoresheje ijambo nibyo cyangwa sibyo.

INTERURO	NIBYO	SIBYO
1. Impiswi ni ukwituma umusarani woroshye cyangwa w'amazi inshuro eshatu cyangwa hejuru yazo mugihe cy'amasaha makumyabiri nane.	1	0
2. Isuku nke itera impiswi mubana bari munsi y'imyaka itanu.	1	0
3. Ibyo kurya byanduye bitera impiswi mubana bari munsi y'imyaka itanu.	1	0
4. Udukoko cyangwa mikorobe turimo bagiteri, virusi dutera impiswi mubana bari munsi y'imyaka itanu.	1	0

UBUMENYI BW'ABABYEYI KUBURYO IMPISWI YANDURA

Subuza interuro zikurikira ukoresheje ijambo nibyo cyangwa sibyo.

INTERURO	NIBYO	SIBYO
5. Umwana uri munsi y'imyaka itanu yandura impiswi mukunwa amazi yanduye.	1	0
6. Umwana uri munsi y'imyaka itanu yandura impiswi mukurya ibiryo byanduye.	1	0
7. Umwana uri munsi y'imyaka itanu yandurira impiswi mukonka mugihe hatubahirijwe isuku.	1	0

UBUMENYI BY'ABABYEYI KU BIMENYENSO BY'IMPISWI.

Subuza interuro zikurikira ukoresheje ijambo nibyo cyangwa sibyo.

INTERURO	NIBYO	SIBYO
8. Umwana urimunsi y'imyaka itanu ufite impiswi aribwa munda.	1	0
9. Umwana urimunsi y'imyaka itanu ufite impiswi agira iseseme no kuruka kenshi.	1	0
10. Umwana urimunsi y'imyaka itanu ufite impiswi yihagarika gake.	1	0
11. Umwana urimunsi y'imyaka itanu ufite impiswi yituma umusarane woroshye w'amazi.	1	0
12. Umwana urimunsi y'imyaka itanu ufite impiswi atakaza uburyo bwo kumva ko ashaka kwituma.	1	0

UBUMENYI BW'ABABYEYI K'UMUTI UKORERWA MURUGO

URWANYA UMWUMA.

Subuza interuro zikurikira ukoresheje ijambo nibyo cyangwa sibyo.

INTERURO	NIBYO	SIBYO
13. Umuti ukorerwa murugo urwanya umwuma ugizwe n'umunyu, isukari n'amazi.	1	0
14. Umuti ukorerwa murugo urwanya umwuma utegurwa havanzwe utuyiko dutandatu tw'isukari (6) na kimwe cyakabiri cy'akayiko k'umunyu muri litiro imwe y'amazi meza cyangwa amazi atetse.	1	0
15. Umuti utegurirwa murugo urwanya umwuma ukora mugusimbura imyunyu ngugu, imbaraga n'amazi bitakara mugihe cy'impiswi.	1	0

IGICE CYA GATATU: UKO ABABYEYI BAVURA IMPISWI MU RUGO

UKO ABABYEYI BAKOresha UMUTI W'AMAZI CYANGWA IBYO KUNWA MU KUVURA IMPISWI MU RUGO.

Garagaza ingano y'uko wemera ku bibazo bikurikira.

IBIBAZO	NDABY EMERA	NTAGOMB YEMERA
1. Ukoresha umuti w'amazi utegurirwa mu rugo ugizwe n'amazi, umunyu n'isukari mukuvura impiswi kumwana wawe murugo?	1	0
2. Ukoresha amashereka, amazi y'umuceri utetse, igikoma, amazi meza mukuvura impiswi umwana wawe murugo?	1	0
3. Uha icyayi cyirimo isukari, umutobe w'imbutu ziryohereye, ikawa cyangwa ibindi binyobwa bitarimo umunyu umwana wawe mukumuvura impiswi murugo.	0	1
4. Uha umwana wawe amazi nkuko usanzwe uyamuha mukumuvura impiswi?	0	1
5. Uha amazi make kurusha ayo usanzwe uha umwana wawe igihe afite impiswi?	0	1
6. Uha amazi menshi umwana wawe kurusha ayo usanzwe umuha igihe afite impiswi?	1	0
7. Uhagarika ibyo kunwa cyangwa ibyo kurya kumwana wawe igihe afite impiswi?	0	1
8. Uha umwana wawe umuti w'amazi uteguye nyuma yaburi uko yitumye?	1	0
9. Ukoresha umuti w'amazi uteguye mukuvura umwana wawe impiswi mugihe kitarenze amasaha makumyabiri nane (24)?	1	0
10. Ukoresha umuti w'amazi uteguye mukuvura umwana wawe impiswi mugihe kirenze amasaha makumyabiri nane (24)?	0	1

UKO ABABYEYI BAGABURIRA ABANA.

Garagaza ingano y'uko wemera ku bibazo bikurikira.

IBIBAZO	NDABY EMEYE	NTAGOMB YEMERA
11. Ugaburira umwana wawe ako kanya ibyo kurya bikimara gutekwa?	1	0
12. Ubanza gushyusha ibyo kurya mbere yo kubigaburira umwana wae?	1	0
13. Ukomeza kugaburira cyangwa konsa umwana wawe mugihe afite impiswi?	1	0

UKO ABABYEYI BAKARABA INTOKI, BOZA IBYOKURYA N'IBYOMBO.

Garagaza ingano y'uko wemera ku bibazo bikurikira.

IBIBAZO	NDABY EMERA	NTAGOMB YEMERA
14. Ukarabya umwana wawe intoki iyo arangije kwituma.	1	0
15. Ukoresha amazi gusa woza intoki z'umwana wawe mbere na nyuma yo kumugaburira?	0	1
16. Ukoresha amazi n'isabune woza intoki z'umwana wawe mbere na nyuma yo kurya?	1	0
17. Ukaraba intoki ukoresheje amazi n'isabune mbere yo gutegura ibyo kurya?	1	0
18. Woza ibyombo ukoresheje amazi n'isabune mbere na nyuma yaburi uko ubikoresheje?	1	0
19. Woza imbuto cyangwa ibyo kurya mbere yo kubigaburira umwana?	1	0

APPENDIX 12. WORK PLAN

TASK TO BE COVERED	2018				2019			
	Feb to May	June to August	Sept. to Oct.	Nov. Dec	Jan. Feb	Marc.	Apr.	May-June
1. Research Proposal preparation, presentation and submission	X	X						
2. Proposal correction and submission to IRB committee			X	X	X			
4. Ethical clearance and permission to do the work					X			
5. Requesting permission from selected study sites					X			
6. Pre-testing and finalizing research instrument					X			
7. Data Collection					X	X		
8. Data coding, and entry into computer						X		
9. Data analysis						X	X	
10. Report Writing						X	X	

11. Report Presentation								X
12. Finalize Report Writing								X
13. Submission of Final Report								X
14. Feedback to the study sites								X

APPENDIX 13.BUDGET

NO	DESCRIPTION OF ITEMS	QUANTITY	UNIT PRICE(FRW)	TOTAL PRICE(FRW)
1	Pens	60 pens	150	9,000 rwfr
2	Papers	5 reams	4000	20,000 rwfr
3	Printing	2,608 pages	50	130,400 rwfr
4	Typing	2,608 pages	100	260,800 rwfr
5	Binding	8 books	500	4,000 rwfr
6	Lunch	40 lunches	2000	80,000 rwfr
7	Drinks	80 bottles	300	24,000 rwfr
8	Transport	24times	2000	48,000 rwfr
9	Airtime	10 cards	1000	10,000 rwfr
10	Internet	90 days	500	45,000 rwfr
11	Data coding	-	-	200,000 rwfr
12	Data analysis	-	-	300,000 rwfr
13	Data discussion	-	-	200,000 rwfr
14	Report production	-	-	100,000 rfr
15	Final activities	-	-	100,000 rwtr
	TOTAL	-	-	1,531,200 rwfr