NURSES' KNOWLEDGE AND PRACTICE IN THE MANAGEMENT OF CHILDHOOD MALNUTRITION IN SELECTED HEALTH CENTERS IN RWANDA

By

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a. *Declaration by the Student*

I do hereby declare that this *dissertation* submitted in partial fulfilment of the requirements for the degree of **MASTERS OF SCIENCE** in **NURSING**, at the University of Rwanda/College of Medicine and Health Sciences, is my original work and has not previously been submitted elsewhere. Also, I do declare that a complete list of references is provided indicating all the sources of information quoted or cited.

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In my capacity as a Supervisor, I do hereby authorize the student to submit his/her **dissertation**.

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DECLARATION

I, UWERA Monique, hereby declare that the study entitled "Nurse's knowledge and practice in the management of childhood malnutrition in selected health centers in Rwanda" contains my own work, that it has not been submitted for any degree or examination at any other higher learning institution, and that all references have, to the best of my knowledge, been correctly reported and acknowledged.

UWERA Monique

Date: 05th. 06. 2021

DEDICATION

To my husband RWANDEKWE Gilbert, to my children: Bienvenue Eric Rukundo , Irakarama Alliance Sandrine , Byiringiro Need Herve, Ngabo Happy Bruno.

This dissertation is sincerely dedicated to your Love, Support, Encouragement, and Unparalleled Patience. This dissertation is also dedicated to all conscientious nurses and other healthcare professionals who, despite difficult working conditions, consistently work to give people the best possible treatment. It is also dedicated to everyone who helped make this endeavor a success.

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LIST OF ABRIVIATIONS

AIDS : Acquired Immune Deficiency Syndrome

ANC : Antenatal Care

CHW : Community Health Worker

HIV : Human Immunodeficiency Virus

IDD : Iodine Deficiency Disorders

IEC : Information, Education, Communication

IMCI : Integrated Management of Childhood Illness

IPF : In patient Facility

IRB : Institutional Review Board

MUAC : Middle Upper Arm Circumference

NCHS : National Center for Health Statistics

OTP : Outpatient

PEM : Protein Energy Malnutrition

RESOMAL: Rehydration Solution for Malnutrition

RUTF : Ready Use Therapeutic Food

SAM : Severe Acute Malnutrition

UNICEF : United Nations Children's Fund

UR : University of Rwanda

WH : Weight/Height

WHO : World Health Organization

WHZ : Weight, Height, Zed score

ABSTRACT

Background: In Rwanda, malnutrition has a major impact on child morbidity and mortality. Studies have demonstrated that nurses frequently lack the expertise necessary to effectively address childhood malnutrition. To prevent and treat child malnutrition using the proper standards or protocols, nurses must have the necessary knowledge, skills, attitude, and practice.

Objectives: The aim of this study is to assess Nurses' knowledge and practice in management of childhood malnutrition in selected health centers in Rwanda.

Methods: This study used a quantitative technique with a descriptive cross-sectional study design. 196 nurses from the twenty-four health institutions in Rwanda's Gicumbi District participated in the study. To gauge nurses' socio-demographic traits, as well as their knowledge and skills regarding the management of childhood malnutrition, a questionnaire was used. The complete sample was utilized. Data were examined to ensure that there were no errors using SPSS version 20.0. Analysis of the frequency distributions, means, and participation percentages was done using descriptive statistics. Age, gender, education level, and number of years spent practicing nursing are examples of descriptive categories. The link between demographic factors and knowledge, attitude, and practice scores was ascertained using inferential statistics, more especially the bivariate analysis using Chi-square.

Results: The findings of the present study showed that in 196 nurse's participants, 93(48%) had high level of knowledge about malnutrition management because they passed with more than 75% marks, 34(17%) had low level of knowledge while 69(35%) had moderate level of knowledge. Results revealed that of 196 nurse's participants, 61% of them had high level of practice about malnutrition management as an acceptable level of practice was set at 75%, (13%) had low level of practice ,while (26%) had moderate level of practice. Most independent variables (socio-demographic characteristics) have showed a statistical relationship with dependent variables (level of knowledge).

Key worlds: Nurse, knowledge, practice, childhood malnutrition, and Rwanda

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CHAPTER ONE: INTRODUCTION

An overview of malnutrition in industrialized and developing countries, including Rwanda, is given in this chapter, this chapter offers an overview of the prevention and treatment of childhood malnutrition. It also covers the definition of important terms, the backdrop of the study, the problem statement, the study's aims, its research questions, its scope, its importance, its limitations, and its organizational structure.

1.1.Background of the study

One of the most frequent diagnoses for children in SSA and south Asia is malnutrition. It frequently results from a poor diet. In addition to inhibiting physical and intellectual growth, childhood malnutrition raises the chance of mortality or disability from common childhood illnesses such pneumonia and diarrheal diseases. This has an impact on long-term health. (1) 14,3 million kids under the age of 5 are severely wasted, 38,3 million kids under the age of 5 are overweight or obese, and 144 million kids are stunted. 47 million children under the age of five are squandered as well. About 45% of mortality in children under the age of five are caused by under nutrition (2).

Children who are malnourished run the danger of dying or suffering from severe stunting, which was on the rise in Rwanda in 2021. Nearly 800,000 children under the age of five in Rwanda are stunted, according to UNICEF. (3) There are three levels of malnutrition: mild, moderate, and severe. It is quite possible that nurses will come into contact with severely malnourished children in their regular practice in a nation where childhood malnutrition is widespread.(4) Ineffective(5) or hazardous medical procedures are frequently linked to nurses' lack of knowledge about the fundamental diagnosis and treatment of common diseases, according to a number of studies (6). Guidelines for the inpatient treatment of extremely malnourished children from the World Health Organization or United Nations International Children's Fund (WHO or UNICEF). By following these recommendations, hospitals have significantly reduced their death rates from 30% to 50% to 5% to 15%. (7). The persistently high case fatality rates in underdeveloped nations have been attributed to improper case management brought on by inadequate knowledge (8).

As a result, the bedside nurse is in charge of providing the severely malnourished kid with normal daily care as well as educating the parents or other caregivers. Given their responsibilities in pediatric healthcare, nurses must possess specialized expertise and positive attitudes toward treating extremely malnourished infants (9).

The 17.2% of the 872 pediatric patients in total were underweight at the time of admission. According to WFH z-scores, 20.2% of the children had acute malnutrition (wasting), while 17.3% had chronic malnutrition (stunting) based on HFA z-scores. 10.8% of pediatric patients lost weight during their hospital stay, with 1.9% of those losing weight significantly (more than 5% of their baseline body weight). 19.6% of the kids had lower oral intake throughout the aforementioned time, and 2.9% were fasting. A consultation with the NST was necessary for 34.3% of patients at admission and 30% of patients on pNday, respectively, who, according to the PYMS, were at a high risk of malnutrition. Additionally, 55% and 47.1%, respectively, of the patients at admission and on pNday were identified as medium- to high-risk, necessitating NST support, when they were screened with the STRONG children (8)

Choi et al.(10) stated that due to a lack of nutrition understanding, half of Korean nurses were unwilling to participate in nutritional treatment. However, little research has been done on the nurse's nutritional expertise and attitudes regarding patients' nutritional condition in clinical settings.

A study conducted in Ethiopia(11) in 2015 revealed that 55.5% of health care professionals have sufficient knowledge, and 65% had positive attitudes toward the assessment and management of childhood malnutrition, but their practice in making these decisions was subpar, and the standards outlined in their national nutritional assessment guideline were not fully followed. (11)

A research conducted in Ghana(4) in 2017 showed that Nurses' knowledge in malnutrition 54.0 Percent. The amount of nutrition courses completed in nursing school, the number of years spent working as a nurse, receiving a refresher course in nutrition after graduation, and receiving training on the guidelines were all associated with nurses' knowledge. Prior training, familiarity with WHO recommendations, clinical experience, and length of nursing career all positively impacted knowledge and attitude scores.

There have been findings among Ethiopian healthcare professionals, The nurses performed better on the seven content areas reviewed in this study, they did best on questions that tested their general knowledge of the causes of malnutrition; however, they performed worse on questions that tested their awareness of the symptoms of certain types of malnutrition, such as kwashiorkor. Significant knowledge gaps were also found in areas related to clinical nutritional therapy for children who are severely undernourished. For example, just 15% of the nurses knew that children with kwashiorkor shouldn't be prescribed certain medications. high-protein diets. The inadequate nutrition education provided to nursing students may be to blame for the nurses' subpar awareness of malnutrition. (12)

As shown by data from Rwanda, evidence has been revealed that between 2010 and 2015, rates of stunting, a chronic form of malnutrition, among children under 5 years of age dropped from 44% to 38%. The rates, however, are still excessively high. (4) Research indicates that the likelihood of stunting increases with age. Just 18% of infants between 6 and 8 months are stunted, but this figure soars to a startling 49% for infants between 18 and 23 months. (4)

In fact the practices and knowledge are very important indicators to be evaluated among nurses working in health centers to ensure the efficiency childhood malnutrition management.

1.2. Problem statement

One of the major health issues on which the Rwandan government is working to make headway is malnutrition (13). In Rwanda, health centers and district hospitals are supposed to offer a range of medical services, including education, growth monitoring, nutritional therapy, and activities relating to nutrition. However, health caregivers face barriers(6,14,15) in management of malnutrition in children, such as distance to sites program, lack of parents' confidence in the program, lack of parents' knowledge on malnutrition or not recognizing the child's condition as malnutrition, child cared by other siblings in harvest obligations, stigma (shame and fear of judgment or rejection leading to hiding children, discriminatory health care system in some areas where malnutrition is associated with poverty), shortage of caregivers among others.

The morbidity and mortality of children are dramatically impacted by malnutrition. For the purpose of preventing and treating child malnutrition using the proper standards or protocols,

nurses must possess the necessary knowledge, abilities, and attitudes. Closing knowledge gaps among nurses is a crucial step in improving care for malnourished inpatient children by developing and putting into practice tailored educational interventions. Nurses commonly miss dietary issues in children.This can be due to health professionals' lack of training, unclear responsibility assignments, lack of resources, and lack of time for nutritional assessment. (11)

Studies from sub-Saharan Africa have examined nurses' attitudes regarding nutrition and their knowledge of it (5,16–22). According to these studies, nurses have positive views regarding nutrition but little understanding in this area to nutritional management for children.

During her unpublished observation, the researcher realized that there are many children attending different health centers of Gicumbi district, and many of them are referred to the hospital with evidence of malnutrition yet the nurses are hesitant in the way of properly managing them at the health center level. In addition, with the literature review on the above topic, it was identified that there was a gap where there is no specific publication about nurses' knowledge and practices about childhood malnutrition management in   health centers located in Gicumbi District catchment. Therefore, this study intends to assess how nurses are knowledgeable and skilled in the management of childhood malnutrition.

1.3. Objectives of study

1.3.1. General objective

The general objective of the present research was to assess Nurses' knowledge and practice, in management of childhood malnutrition in selected health centers in Rwanda.

1.3.2. Specific objectives

1. To assess the level of nurses' knowledge in management of childhood malnutrition in selected health centers in Rwanda
2. To determine the level of practice in management of childhood malnutrition in selected health centers in Rwanda
3. To establish the relationship between the demographic profile-and nurses' knowledge in the management of childhood malnutrition in selected health centers in Rwanda.

1.4. Research questions

1. What is the level of nurses' knowledge in management of childhood malnutrition in selected health centers?
2. What is the level of practice in management of childhood malnutrition in selected health centers in Rwanda?
3. What is the relationship between the demographic profile-and Nurses' Knowledge, Attitudes and Practice in the management of childhood malnutrition?

1.5. Significance of the study

This study is significant to the researcher herself. The academic community (UR), the health community (practitioners, planners, policy makers, decision makers, etc.), as well as nursing domains (education, practice, research, and leadership).

1.5.1. Nursing education

Since nursing research has a considerable impact on both current and future professional nursing practice, it is an essential component of the training process. The nursing profession depends on nursing research for continual advancements that enable the delivery of the finest nursing care possible. The results of this study will help nurses improve patient care by identifying effective best practices. Peer-reviewed study findings can dispel myths, pave the way for new therapeutic modalities, and create cutting-edge methodologies, all of which improve patient outcomes.

Nursing practice: For Nursing practice, this study will help nurses to establish the finest techniques that work, and enhance patient care. Nursing will also benefit from being able to adapt to changes in the healthcare industry, patient populations, and legal requirements. The nursing profession is evolving as a result of new studies.

Nursing research: The finished product will be used by the academic community as a resource for upcoming researchers and advanced investigations. The study will be accessible at the UR library and used by other researchers who might be interested in this field of study.

1.5.2. Stake holders/ Policy makers

The research also will be used by the health community (policy makers, health administrators, health planners,…) to evaluate the level of health personnel in management of childhood malnutrition. It intends to encourage them to closer examine the reasons why substandard care coming from low level of knowledge and skills of health personnel in management of childhood malnutrition contribute to increase child deaths.

1.6. Scope of the study

This research was delimited in time, space and domain. It will cover the period from July 2020 to April 2021and will take 10 months. The study is limited in all twenty-four health centers of Gicumbi District of Northern Province which has been selected to represent Byumba District Hospital. This study is in domain of public health, on the importance of capacity building of nurses in promotion of child health.

1.7. Organization of the study

There are five chapters in this research project. The general introduction, definitions of essential concepts, historical context of the study, goals, research questions, importance of the study, and study constraints are the main topics of chapter one. The study's literature review is provided in chapter two, and chapter three mostly deals with the research methods. This chapter includes information about the study location, study design, study population, sample size and selection, and data collection method. The analysis and research findings are presented in Chapter 4, and the basic conclusions and suggestions are covered in Chapter five

CHAPTER TWO: LITERATURE REVIEW

2.1. Introduction

The researcher in determining the evidence already in existence or what is known and unknown regarding the research issue. It also provides direction when deciding on the study methodology and how to use the results. (23) As a result, the literature study conducted to determine nurses' knowledge and behaviors about child malnutrition and its care is discussed in this paper.

2.2. Operational definitions of key terms

2.2.1. Nurses' knowledge

 Knowledge is seen as information on a subject that you learn via experience or study, whether it is known by one individual or by people in general, according to the Cambridge English Dictionary. In this study, the term "nurses" refers to nurses level of remembering or recalling, understanding and application of management of childhood malnutrition information.

2.2.2. Nurses' practice

Practice, as defined by the World Health Organization, refers to "what is done." It is action rather than thought or idea, and it calls for the application of concepts, convictions, or competencies rather than theories about it (Cambridge dictionary,). The term "practice" used in this study by nurses refers to the extent to which nurses can put their knowledge into practice by completing specific procedures or engaging in hands-on management of childhood malnutrition prevention.

2.2.3. Malnutrition

Deficits, excesses, or imbalances in a person's intake of nutrients and/or energy are referred to as malnutrition. Two major illness subcategories are covered by malnutrition. One of these is "undernutrition," which is characterized by stunting (low height for age), wasting (low weight for height), and underweight (low weight for age) (a lack of important vitamins and minerals).

2.3. Theoretical literature

2.3.1. Concept of Malnutrition

Although health care providers can offer some solutions to the problem of malnutrition, it may also present as a health issue. To ensure that the correct kinds of food are produced in sufficient quantities, agriculturalists, and frequently other agricultural experts, are needed. It is necessary for educators, both official and informal, to help people—especially women—achieve and maintain adequate nutrition. Fighting malnutrition frequently necessitates the involvement of experts in the fields of medicine, business, social development, politics, government, labor, and many other fields. (16)

A lack of one or more of the basic nutrients—which the body cannot produce on its own but which are necessary for survival, for growth and reproduction, as well as for the ability to work, study, and participate in society—leads to malnutrition, a pathological condition. Malnutrition is described as occurring in those whose diets fall below the recommended internal level of consumption for these nutrients. (11) Malnutrition is also known as a pathological condition brought on by a relative, absolute, or overabundance of one or more important nutrients.(11)

Weight-for-age less than -2 standard deviations from the mean is considered underweight. Stunting is short for his or her age. Wasting is light for one's height. Birth weight less than 2500 g is considered to be low birth weight. vs incidence if prevalence is the proportion of instances in the population at any given time, incidence is the rate at which new cases are reported. In this way, incidence conveys information about the likelihood of developing the condition, whereas prevalence represents the amount of prevalence of the disease. (11) A number of things contribute to the high prevalence of stunting, including inadequate food, repeated infections that cause diarrhea, inadequate medical treatment, and inadequate brain stimulation.

2.3.3. Promotion and protection of nutritional well-being: The International Council on Nutrition approach

The International Conference on Nutrition established nine areas of focus for action in September 1978 to increase household food security, protect consumers through improved food quality and safety, prevent specific micronutrient deficiencies, support breastfeeding, encourage a healthy diet and active lifestyles, prevent and manage infectious diseases, and help the economically disadvantaged, and protect the nutritional welfare of the population. integrating nutrition goals into development strategies and plans.

By addressing challenges under these headings, it is easier for different sectors to build a shared knowledge of nutrition issues and to take a more targeted approach to finding solutions. This thematic approach to nutrition issues should guarantee that all of a problem's multiple aspects are highlighted, allowing each sector or agency to choose how it may contribute to improvements. (27)

2.4. Management of childhood malnutrition

2.4.1. Management of malnutrition in health facility in Rwanda

According to the Rwanda national protocols(28), For any reason, the personnel of the health center should measure each child's MUAC (mid upper arm circumference), weight-for-height/length Z-score (WHZ), and perform an edema test on them all. The staff will then test for appetite in those who meet any of the SAM criteria, and the nurse will gather information,

conduct a clinical evaluation, and decide whether to treat the kid in the OTP or refer them to an inpatient institution (IPF).

Table 1.Classification of cases for initial referral to inpatient or outpatient care(31)

Factor	Inpatient care	Outpatient care
Mother's choice	Mother is actually the primary healthcare worker for her own child. She knows the child and her home circumstances. The mother's choice must be respected. If not she will default, will not return and will not bring any other children in case the staff are angry with her or humiliate her. Legally she has the right to decide and we are her professional advisors.	
Appetite	Failed or equivocal appetite test	Passes appetite test
Bilateral oedema	Bilateral pitting oedema Grade 2 (++) & 3 (+++) Both marasmus and kwashiorkor (W/H < -3Z-score and bilateral oedema)	Bilateral pitting oedema Grade 1 (+) and W/H> -3Z
Skin	Open skin lesions	No open skin lesions
Medical	Any severe illness, using the IMCI	Alert with no medical
Complications	Criteria – respiratory tract infection, severe anaemia, clinical vitamin-A deficiency, dehydration, fever, lethargy, measles rash etc.	Complications

2.5. Management of childhood malnutrition in the community

Many children with SAM can be located in the community before they experience any severe health difficulties, despite having altered physiology and metabolism.

Children who are at least 6 months old, have SAM without problems, and have a healthy appetite—characteristics shared by the great majority of cases—are candidates for outpatient care. Nearly all children who are moved after receiving successful initial care in an IPF should also use it. Children who are first admitted for outpatient SAM management should have weekly medical exams to track their development as well as medical and therapeutic feeding treatments based on their weight. Have your appetite tested again if they are not gaining weight quickly.

Figure 1: Community screening
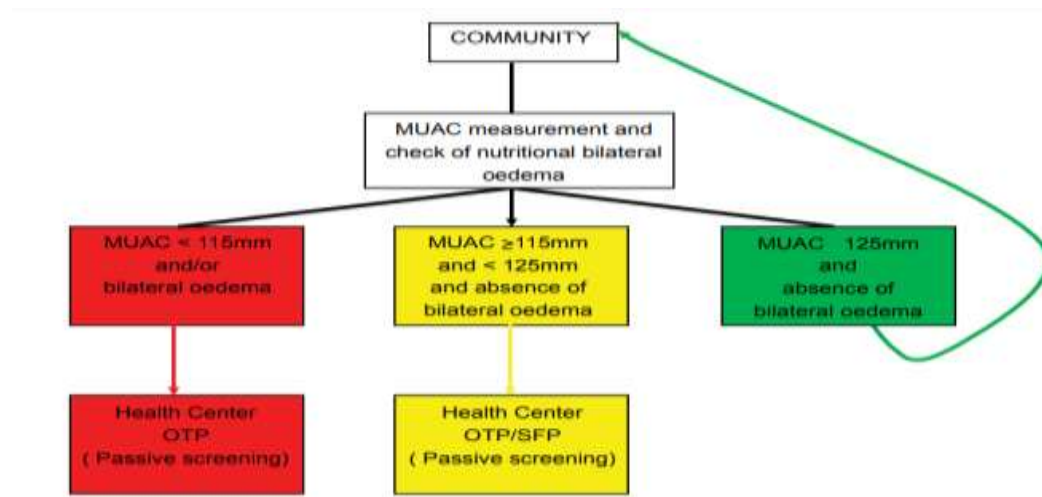
Community screening: Children over 6 months are screened for SAM using the mid-upper arm circumference (MUAC) and the presence of bilateral oedema; those with a MUAC 115 mm or oedema are then referred to the health center..

In community assess: A community health worker (CHW), a local volunteer, or an outreach worker conducts home visits. During the house visit, you can evaluate:

- Compliance with the treatment (RUTF and medication).

- Evaluate the level of hygiene, water management, waste disposal, cooking facilities, RUTF storage location and remaining stock, poverty level and coping mechanisms, and the type and quantity of family food present and stored.

- Measure MUAC; weigh the child and determine weight gain; ask about reasons for defaulting and encourage return to the OTP.

The RUTF is only a diet and medicine for children who are extremely underweight or swollen. It is the nourishment the infant requires to recover. Before receiving more food, the kid should finish eating his or her daily portion of RUTF. On demand nursing should continue for him. Children who are ill frequently dislike eating. Give the child therapeutic paste in small, frequent

meals and promote frequent eating. When there are no medical issues, a malnourished kid who has an appetite who is at least 6 months old is given a regular dose of RUTF that is weight-adjusted.

Table 2. Recommended dosage of RUTF according to the weight of the child(28)

WEIGHT CATEGORY (KG)	RUTF PASTE		RUTF SACHETS (92 G)		BISCUIT (BP100)®	
	GRAMMES PER DAY	GRAMMES PER WEEK	SACHET PER DAY	SACHET PER WEEK	BARS PER DAY	BARS PER WEEK
3.0 – 3.4	105	750	1¼	8	2	14
3.5 – 4.9	130	900	1½	10	2½	17½
5.0 – 6.9	200	1400	2	15	4	28
7.0 – 9.9	260	1800	3	20	5	35
>10.0	400	2800	4	30	7	49

2.6.Medication for patients newly followed in community

- Antibiotics: To address any underlying illnesses, all children should get a course of an oral antibiotic such amoxicillin. Children under 5 kg should never get chloramphenicol because they run the risk of developing "grey baby syndrome."

- Worm treatment: 1year below: None

1-2years(or<10kg): Mebendazole 500mg, Albendazole 200mg

≥2years (or>10kg): Mebendazole 500mg, Albendazole 400mg.

A single dose of albendazole/ mebendazole should be given on the second or fourth visit for outpatient treatment

- Vitamin A: the child will receive the dose of vitamin A at 4th week before discharge (if the child did not receive routine Vitamin A): 6–12 months: 100,000 IU

≥12 months: 200,000 IU

- Other medical treatments:

Iron supplementation Anemia may be problematic during the acute stages of SAM because it might raise the risk of infections, make malaria more severe, and damage tissues through oxidative stress.

Oral rehydration therapy for diarrhea: Diarrhea is often a precipitating cause leading to SAM. However, the use of standard is not recommended for children with SAM.

Table 3. Oral rehydration therapy

MEDICATION	WHEN GIVEN
Amoxicillin	On admission for all new patients – 5 days
Antimalaria drugs: lumefantrine-artemether (according to national protocol)	At any time if clinical signs indicative and paracheck/ microscopy confirm
Mebendazol/albendazol	Single dose on second week: 400 mg for children aged over 2 years, 200 mg for children aged 1-2 years.
Vitamin A (if RUTF not available)	If diet does not contain vitamin A (stock-out RUTF), to be given on admission unless already given in last 3–4 months. Do not given to children with oedema on admission; instead give a single dose on discharge.
Measles vaccination	One dose in week 4 The risk of nosocomial infections in OTP is low except if there is an outbreak of measles, when all children should be given vaccine.

Table 4.Criteria for admission and discharge from outpatient treatment (children aged 6– 59 months)

2.7.Management of complications of severe acute malnutrition in children

CRITERIA FOR DISCHARGE TO FOLLOW-UP		
Cured	Discharged with MUAC: MUAC ≥ 125 mma	and clinically well
	Discharged with weight-for-height/length: weight-for-height ≥ −1.5 Z-scoreb	
	Admitted with oedema: no oedema for 2 consecutive weeks and either MUAC ≥ 125 mm or weight-for-height/length ≥ −1.5 Z-score	
Confirmed default	Absent for three consecutive visits	Defaulters during 3 weeks of absence can die and it is important for our information to know if he/she is an unconfirmed or confirmed defaulter
Unconfirmed default	Absent for three consecutive visits	Absent for 3 weeks, without a home visit to determine if the child died
Died	Died during treatment in OTP	This should be confirmed with a home visit: otherwise several deaths will be inappropriately classified as defaulting
Non-recovereda	Did not meet the discharge criteria after four months in	RARE: action should be taken long before this stage.

Complication of severe acute malnutrition are treated symptomatically accordingly to the national guidelines(28): oxygenotherapy, rehydration, resuscitation, antibiotherapy, etc…

2.7. Empirical literature

2.7.1. Level of knowledge about malnutrition among nurses

A 2017 study in Ghana(4) found that 54.0% of nurses were knowledgeable about managing malnutrition. Prior training, familiarity with WHO recommendations, clinical experience, and length of nursing career all positively impacted knowledge and attitude scores.

Findings indicated that caregivers' knowledge of malnutrition was insufficient. Caregiver counseling was insufficient and inconsistent. The ability of caregivers to care for their children and access to healthcare were both hampered by gender inequality and poverty. Despite the existence of these evidence-based management standards, nursing homes, home care settings, and home nursing have inadequate identification of malnutrition, particularly undernutrition, and the causes of nutritional-related problems. Malnutrition rates in these settings range from 40 to 90% due to the poor detection of the condition. Negative effects of malnutrition include increased morbidity, mortality, care requirements, and hospital readmissions for patients, caregivers, and the healthcare system (30)

2.8.3. Nusres' practices towards Nutritional management

Numerous studies have revealed that less attention is placed on determining and monitoring a patient's nutritional state and that nurses lack adequate nutrition training. Additionally, "nursing assessment of nutritional status was fragmented and frequently non-existent," it has been highlighted (16). (21)

The study's findings are positive because 40.8% (n = 34) of the pregnant women were assigned to health centers, which are the first place they go when they need maternal healthcare. According to Symington et al., the bulk of maternal nutrition interventions are administered by nurses (2018). It has been estimated that 17 million children globally suffer from severe acute malnutrition (SAM). 2.9 million children, or around 17 percent of those in need of therapy, got it in 65 different countries in 2013, despite significant progress in recent years. Youngsters with SAM are nine times more likely to die than children who are well-nourished. The management of severe acute malnutrition (SAM), which is crucial for children's survival, must be a part of the scaling up nutrition framework in order to address under nutrition. Governments face substantial

challenges in developing capability and allocating sufficient funding for the prevention and treatment of acute malnutrition, a large portion also do so in developing nations unaffected by catastrophes. As a result, these countries face considerable obstacles to sustainable growth. The fight to safeguard women's and children's nutritional status is likely to be made more difficult by climate change and the rising frequency of natural catastrophes. (34)

Nurses commonly miss dietary issues in children. Initial information on patients' nutritional issues is frequently overlooked in the nursing assessment of nutritional status, which is fragmented. This could be a result of health professionals' lack of expertise, unclear responsibility assignments, lack of resources, and lack of time for nutritional assessment. (11)

In order to offer appropriate therapeutic treatment throughout the hospitalization, nurses are obliged to identify and manage the health issues affecting children. Nurses should therefore be aware of children's clinical and nutritional issues. In this context, one of the key determinants of children's nutritional status is thought to be nurses' involvement in nutritional care. (11) There has never been a study done on the nutritional knowledge and habits of Rwandan nurses. The purpose of this study is to examine nurses' practices and expertise about the care of children's nutritional needs in 24 health centers.

2.9. Research gap

The literature showed that studies from sub-Saharan Africa (5,16–22) have looked into nurses' attitudes and knowledge of nutrition. These research have revealed that nurses have restricted but good attitudes on nutrition knowledge related to nutritional management for children

All of these studies have looked at hospital malnutrition or geriatric nutrition, or they have examined nurses' general nutrition knowledge and attitudes. studies looking into nurses' perceived barriers in childhood management in health centers are limited and no one talking to Rwanda.

From the literatures, we only found three studies that looked at the knowledge, attitudes, and practices of health workers (including nurses) with regard to child malnutrition: one from southern Ethiopia (11), one from Ghana(9), and one from Guatemala(33). Although a significant number of health workers had favorable attitudes about nutrition-related concerns, the authors of those research discovered that they lacked sufficient knowledge and expertise in clinical nutrition themes. Lack of refresher training programs and insufficient nutrition teaching throughout nursing school have both been cited as contributing factors to nurses' limited understanding of malnutrition

2.10. Conceptual framework

Conceptual framework illustrates the independent variables and dependent variables.

2.10.1.Bloom's taxonomy as our conceptual framework.

The Bloom's cognitive taxonomy, commonly known as Bloom's educational objectives or simply Bloom taxonomy, served as the foundation for the conceptual framework used in this study. The Bloom's cognitive taxonomy, created by Benjamin Bloom in 1956 and updated in the 1990s, can be described as a scientific classification system for human learning abilities by Anderson and Krathwohl in 2001(35).
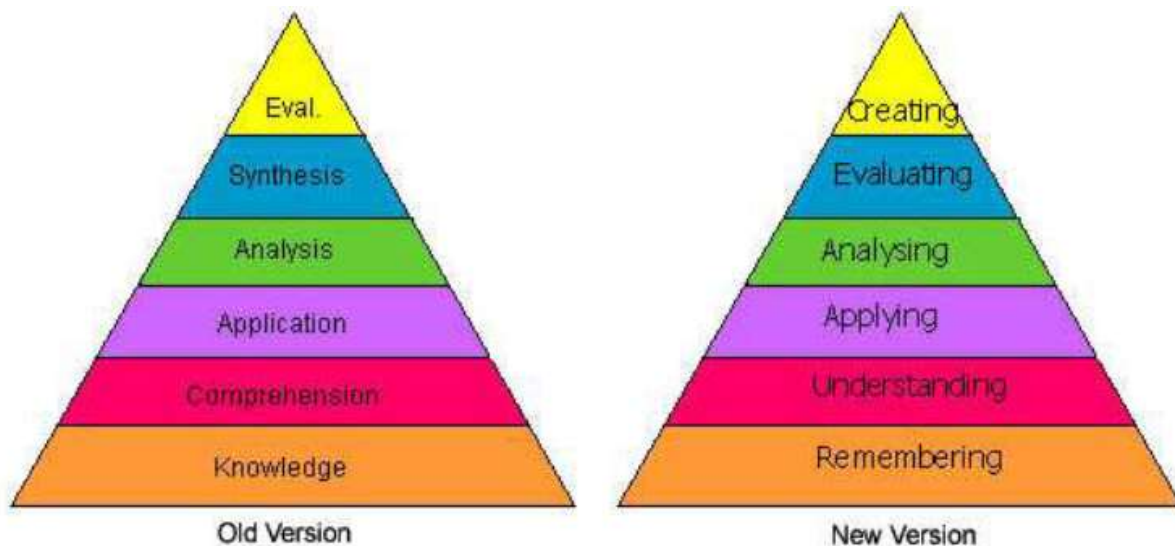
The most often used paradigm, it offers a way to categorize various modes of human thought into six levels, from the simplest and most fundamental to the most complex and from the tangible to the ethereal (36). Six educational objectives are categorized by the bloom taxonomy utilizing nouns: understanding, application, analysis, synthesis, and assessment. If we think of this as a knowledge hierarchy, the lowest level of knowledge ranges from a high level of producing and putting components together to make a coherent or functional whole to a basic memory of facts (35) Cognitive, emotional, and psychomotor domains are the three major categories that Bloom Benjamin used to categorize knowledge. He goes on to explain that information (cognitive) must be a necessary pre-requisite for acquiring practical skills and talents (psychomotor), and the learner must have a positive attitude (affective) toward the learning process in order for learning to occur. In an effort to understand the learning process, Bloom went on to discuss the function of the environment and learner characteristics. So the things that encourage learning would be a supportive environment and a motivated student.

Nurses' knowledge about malnutrition(Cognitive domaine):

1. Remembering
2. Understanding
3. Applying

Nurses' practices
1.Imitation
2.Manupulation
3.Precition

Socio-demography:age ,working experience,sex,training, **and** level of education
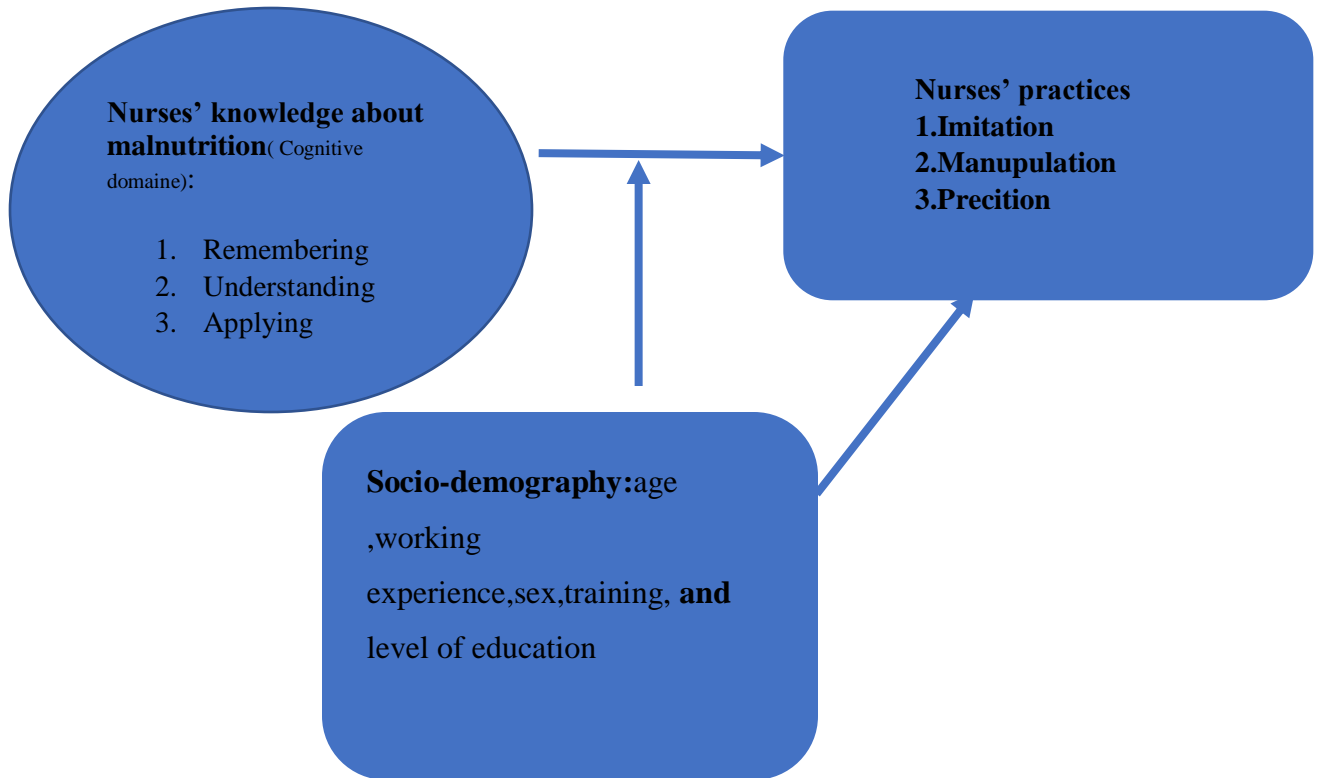
Conclusion

From reviewed literatures, researcher came across studies, (5,11,33,37) they examined the understanding and behavior of health professionals (including nurses) with regard to child malnutrition. The authors of the studies concluded that clinical nutrition-related knowledge and expertise among health professionals were deficient. Lack of refresher training programs and insufficient nutrition teaching throughout nursing school have both been cited as contributing factors to nurses' limited understanding of malnutrition.

In Rwanda, the circumstance is the same. In order to combat childhood malnutrition, studies have been done. Despite the fact that malnutrition is widespread in Rwanda, no prior study has evaluated nurses' understanding of the condition and how to treat it in Gicumbi district especially in health centers.

CHAPTERTHREE: RESEARCH   METHODOLOGY

3.1. Introduction

The present research methodology, research strategy, environment, population under study, sample size, sampling procedures, and research tools and methodology, ethical issues, the study's limits, data management and analysis, and the presentation of findings are all covered in this chapter.

3.2. Research design

In this study, a cross-sectional, descriptive study design using a quantitative approach was carried out because every participant has been met once during the period of the study. According to Erickson(38), descriptive studies describe, explain, and validate findings.

3.3. Research setting

The study was carried out in all 24 health centers of Gicumbi District including Bushara, Bwisige, Byumba, Cyumba, Gisiza, Giti, Kigogo, Manyagiro, Miyove, Muhondo, Mukarange, Muko, Mukono, Mulindi, Munyinya, Musenyi, Nyamiyaga, Rubaya, Ruhenda, Rushaki, Rutare, Ruvune, Rwesero and Tanda. The above mentioned health centers are located in Gicumbi district in Northern province specifically is cross-cut with the main road to Gatuna bordering Uganda country.

3.4. Study population

The study population includes 196 nurses working in health centers because in health centers all nurses participate in management of childhood malnutrition as they work by shift. They do not have specific service in charge of malnutrition. The entire sample was used.

3.4.1.Sample size

This included all 196 registered nurses (the full nursing population) employed by the aforementioned health centers who agreed to take part in the study.

Table 5.Distribution of sample size according to the Health Center

Study site	Study population	Sample size
1. RUHENDA	8	8
2. MULINDI	11	11
3. MIYOVE	7	7
4. CYUMBA	9	9
5. BYUMBA	14	14
6. RUBAYA	8	8
7. MANYAGIRO	8	8
8. MUSENYI	5	5
9.TANDA	7	7
10.RWESERO	10	10
11.RUVUNE	5	5
12.RUTARE	16	16
13.RUSHAKI	12	12
14.NYAMIYAGA	4	4
15.MUNYINYA	8	8
16.MUKO	6	6
17.MUKONO	10	10
18.BUSHARA	8	8
19.BWISIGE	4	4
20.GISIZA	6	6
21.GITI	7	7
22.KIGOGO	8	8
23.MUKARANGE	5	5
24.MUHONDO	10	10
TOTAL	196	196

3.4.2. Sampling strategy

The total population sampling approach, a kind of purposive sampling strategy that looks at the entire population, was utilized in this investigation. In this study, all nurses working in 24 selected health centers have used as the sample size.

3.4.3. Inclusion criteria

All nurses working in twenty-four health centers choosing to participate, were considered in the study.

3.5. Instrument

In this study, a questionnaire used has been adopted from the study of Victor Mogre (2017) with his permission. His study was about nurses' knowledge, attitudes and practices regarding childhood malnutrition management.All participants might be given the chance to submit feedback using the questionnaire, which has been used as a data collection instrument and was used to quickly collect data. Feedback is often anonymous and promotes candor and transparency.The questionnaire is composed by 3 sections including; section A (socio-demographic data with seven items), Section B (knowledge about malnutrition management with 30 items), and section C (nurses' practice with 9 items).

Validity: How exact the measurement are determined by the method's validity. A method may be seen to be valid if the results it produces closely match the values it is designed to measure. (39) The WHO or UNICEF (2006) reference the year's inpatient management guidelines for severely malnourished children, which are referred to as the guidelines in this study, will be used as the source for the items for the questionnaire's knowledge and attitude scores.

Content validity: Check the tool's content validity to see if it is representative of all validity factors. A tool, survey, or measuring method's content must include all pertinent aspects of the issue it is meant to assess in order to give reliable findings. The measurement's validity is at jeopardy if certain elements are absent.(39) The questionnaire covered all aspect of content including; Nurses' knowledge and practice about malnutrition management.

Construct validity: If a measurement tool accurately captures the phenomenon being studied, its construct validity will be evaluated. It's important for figuring out a method's overall validity. When a concept or quality can be evaluated by examining other signs that are connected to it but cannot be directly witnessed, it is said to be a construct. Construct validity (39) is the process of ensuring that the measurement method matches the construct you seek to examine. We must determine whether the questionnaire accurately measures the construct of malnutrition before we can create a questionnaire to diagnose the condition.But is there anything else being evaluated, such as the respondent's character or feeling of worth? (39).The researcher made sure that our indicators and measurements were properly designed based on pertinent current facts in order to attain construct validity. Only applicable questions that evaluate well-known indicators of child malnutrition should be included in the questionnaire. (39)

3.6. Face validity

The question of face validity examines how appropriate a test's subject matter appears at first glance. Although less formal and objective than content validity, face validity is nonetheless an important measurement.

When developing a questionnaire to assess the consistency of children's eating behaviors. We go over the survey items, which include inquiries regarding each day's meals as well as any between-meal munchies. We rate the study's face validity as being high since, on the surface, it appears to be a good picture of what we wish to assess.(39)Under validity of the instrument: Mention the research objectives, how many items (questions) measuring the knowledge and the name of the statistical test applied to measure knowledge.

3.7. Reliability

The consistency or precision with which an instrument measures an attribute is known as the reliability. The tool was reviewed by the main investigator and her supervisors to assess its reliability, and a pilot study was conducted to ensure that participants could grasp it in order to produce reliable results. The Cronbach's alpha test was also used. Internal consistency, or how closely connected a group of items are to one another, is measured by Cronbach's alpha. It serves as a gauge of scale dependability. Even if alpha has a "high" value, the metric might not be one-dimensional. Other analyses can be performed if you want to show that the scale is

unidimensional in addition to assessing its internal consistency. Uncovering dimensionality can be done in one way, with exploratory factor analysis. Technically speaking, Cronbach's alpha is a coefficient of dependability rather than a statistical test (or consistency). The Cronbach's alpha, which was derived for the current investigation and was 0.74, was determined by examining the data acquired during the aforementioned pilot study.

3.8. Ethical considerations

The University of Rwanda (College of Medicine and Health Sciences), the Director of the District Hospitals, and the administrators of the health centers all gave their permission for the current study. Prior to collecting any data, written informed consent was sought.

3.9 Right to confidentiality

All participants were made aware of the purpose and objectives, as well as the fact that participation was entirely optional. Additionally, participants were made aware that the research team would rigorously maintain the confidentiality of their answers. The researcher's office has a secured filing cabinet where responses are maintained.

3.10. Right to anonymity

During data collection was not even the researcher, is able to individually identify any of the study participants. In order to conduct an anonymous study, no information that could be used to precisely identify a person could be collected. The questionnaire won't include all of those data.

3.11 Right to privacy

According to the ethical principle of privacy for research participants, a human subject research participant has a right to privacy while taking part in the study. The researcher did not include any questions on the questionnaire that could link study participants' identities to their participation in the investigation like area of study or schools, marital status, number of their children etc. The code number was applied to each questionnaire.

3.12 Right to fair treatment

This is the justice principle, which relates to the participants' rights to privacy and to receive treatment that is just. In order to avoid excluding any group and to be as representative of the total target population as possible, the research questions and needs should be used to guide the selection of the types of participants needed for a study. Researcher must carefully examine the selection of research participants to ascertain whether researcher is purposefully choosing some groups of people for the study due to their vulnerability or accessibility.(41) In our research, all nurses who were willing to participate was involved regardless the gender, nationality or any other social group.

3.13. Informed consent

Every participant who is subjected to a procedure as part of a study must provide their informed consent before the operation can be carried out. The researcher has a responsibility to thoroughly inform the subject of the process's details as well as the potential outcomes if the protocol is not followed, in order for the subject to make an informed decision. During the morning staff meeting, the researcher approached the nurses and presented the study's title, primary goal, and eligibility requirements for participation. Each nurse who agreed to take part in the trial signed the consent form. After that, an English-language self-structured questionnaire was given out. The participants were told to complete the survey on their own, without assistance from a third party (a coworker, a book, or the internet), and to fill it out during downtime like lunch. Two days per week were set aside by the researcher to collect completed questionnaires.

3.14. Data collection procedure

The researcher gone twice to the study sites and explain the intention of the research and nurses who was meeting the eligibility criteria; consented to take part in the research. They received a questionnaire from the researcher. The participants were required to fill out the survey, and the researcher was on hand to address any questions of participant regarding the questionnaire. After completing the questionnaire, the participant submitted it to the health center secretary office in anonymous envelop where the researcher collected them.

3.11.Data analysis

SPSS version 20.0 was used and data were checked to remove any error. Descriptive statistics were used to examine participant means, percentages, and frequency distributions. Age, gender, education level, and number of years spent practicing nursing were among the descriptive characteristics. To ascertain the link between demographic factors and knowledge and attitude ratings, bivariate analysis with Chi-square was utilized.

3.12. Data management

Confidentiality was respected to the collected data. Anonymity of the participant who completed the questionnaire was assured and data were stored on a password protected hard disk; tools used in data collection was kept in privately locked cupboard to be destroyed after five years of storage.

3.13.Data dissemination

The result of this study is presented to the University of Rwanda and clinical settings. They will be also published in recognized journals.

3.14. Limitation of the study

A research was carried out only in one district therefore, it shows the limitation related to the small sample size, Sampling strategy and again the setting is associated with the homogeneity of the population and most of these concepts used may not give reliable result in order to generalize to all nurses nor to all districts of Rwanda.

Conclusion

This chapter outlines the research design, setting, study population, tools, and data collecting employed in this investigation and dissemination, ethical consideration and limitation of study were analyzed.

CHAPTER FOUR: RESULTS

4.1.Introduction

The demographic information from the study is described in this chapter, along with an evaluation of the nurses' management of malnutrition knowledge in the 24 health centers of the Gicumbi area. The information was gathered from nurses who work in healthcare located in Gicumbi district during three months of data collection. And the sample size was 196 nurses.

4.2.Demographic data

Table 1 displays results on age, gender, educational level, working experience, training about nutrition. The total 196 nurses from 24 health centers participated in this study. Regarding age, 88nurses were aged between 33-43 which is a dominant age group while 18 (9.1%) nurses were aged between 22-32 which represents the minority of age groups. Concerning gender, 126 (64.3%) of nurses were female and 70(35.7%) of nurses were male. Regarding educational level 160(81.6%) nurses were A1 with advanced diploma in nursing, 18(9.2%) nurses were A0 with bachelor and postgraduate degree in nursing. Regarding working experience, 88 (44.9%) nurses were worked between 1 to 10 years, 72 (36.7%) nurses were worked 11 to 20 years, 36(18.4%) nurses were worked 21 and more. Most 142 (72.4%) of the respondents had received training while 28.0% reported that they had less sessions of training concerning nutrition and malnutrition management. Finally, the majority of respondents 124 (63.3%), reported no refresher training gained on malnutrition management.

Table 6: Social demographic characteristics of respondents (N- 196)

Variable		Frequency	Percent
Gender	Male	70	35.7
	Female	126	64.3
	Total	**196**	**100**
Age group	22-32	18	9.1
	33-43	88	44.9
	44-54	54	27.6
	55-65	36	18.4
	Total	**196**	**100**

Working experience	1-10	88	44.9
	11-20	72	36.7
	21 and more	36	18.4
	Total	**196**	**100**
Level of nursing (education	Diploma	160	81.6
	Degree	18	9.2
	Postgraduate	18	9.2
	Total	**196**	**100**
In-service education	Yes	142	72.4
	No	54	27.6
	Total	**196**	**100**
Level of satisfaction in nutrition education during nursing education	very satisfied	18	9.2
	Dissatisfied	36	18.4
	Satisfied	124	63.2
	Very dissatisfied	18	9.2
	Total	**196**	**100**
Refresher training course/program in nutrition	Yes	72	36.7
	No	124	63.3
	Total	**196**	**100**

Table 7: The level of nurses' knowledge in management of childhood malnutrition in selected health centers in Rwanda

Variables		Frequency	Percent
1. Malnutrition is referred to	The consumption of fruits and vegetables	36	18.4
	The ingestion and digestion of foods	18	9.2
	A balance between energy intake and expenditure	36	18.4
	An imbalance between energy intake and	88	44.9

		expenditure		
		Don't know	18	9.2
2.	Malnutrition can be caused by all of the following **EXCEPT:**	• Poor food intake	54	27.5
		Heredity	124	63.3
		• I don't know	18	9.2
3.	A deficiency of energy and protein in children will result in:	• Obesity	18	9.2
		• Protein-energy malnutrition	160	81.6
		• I don't know	18	9.2
4.	Among children, a deficiency of energy will result in which of the following conditions?	• Marasmus	160	81.6
		• I don't know	36	18.4
5.	**A deficiency of protein in children will result in which of the following conditions:**	• Marasmus	36	18.3
		• Kwashiorkor	124	63.3
		• Measles	18	9.2
		• I don't know	18	9.2
6.	**All of the following are signs of protein-energy malnutrition in children EXCEPT:**	• Wasting	72	36.7
		• Weight gain	70	35.7
		• Stunting	18	9.2
		• I don't know	36	18.2
7.	**Which of the following is a cardinal sign of kwashiorkor?**	• Wasting	54	27.5
		• Bilateral pitting oedema	72	36.7
		• Oedema	52	26.5
		• I don't know	18	9.2

8. The presence of severe wasting of <70% weight-for-height or <-3SD and/or oedema on both feet denotes:	• Malnutrition	34	17.3	
	• Severe acute malnutrition	72	36.7	
	• Severe chronic malnutrition	54	27.5	
	• Severe acute obesity	18	9.2	
	• I don't know	18	9.2	
9. Which of the following methods can be used to diagnose malnutrition?	• Anthropometric (body) measurements	52	26.5	
	• Clinical signs	36	18.4	
	• Biochemical tests	18	9.2	
	• All of the above	72	36.7	
	• I don't know	18	9.2	
10. All of the following are terms used to describe the clinical manifestations of severe acute malnutrition EXCEPT?	• Marasmus	70	35.7	
	• Kwashiorkor	18	9.2	
	• Diarrhea	72	36.7	
	• I don't know	36	18.2	
11. The WHO guidelines for the inpatient treatment of severely malnourished children have been out lined in how many essential steps:	• Twelve	36	18.2	
	• Ten	72	36.4	
	• Nine	16	8.2	
	• I don't know	72	36.7	
12. Acute medical conditions are managed in	• Admission phase	36	18.2	
	• Feeding phase	54	27.5	
	• Rehabilitation phase	18	9.2	

which of the following phases of the essential steps for the inpatient treatment of severely malnourished children:	• Stabilization phase	18	9.2
	• I don't know	70	35.7
13. **Which of the following is the first step of the essential steps in the inpatient management of severely malnourished children?**	• Treat/prevent hypothermia	34	17.3
	• Treat/prevent dehydration	36	18.4

4.3. The level of nurses' knowledge in management of childhood malnutrition in health centers of Gicumbi district

When the knowledge (with 30 items or questions) of the nurses on childhood malnutrition was examined in the study, It has been identified that some of the nurses correctly answered the question on cause, diagnosis, indicators of malnutrition and practices in terms of management for childhood malnutrition while others failed to answer correctly those questions.

Variables		Frequency	Percent
1. Malnutrition is referred to	The consumption of fruits and vegetables	36	18.0
	The ingestion and digestion of foods	18	9.0
	A balance between energy intake and expenditure	36	19.0

	An imbalance between energy intake and expenditure	88	45.0
	Don't know	18	9.0
2. Malnutrition can be caused by all of the following **EXCEPT:**	• Poor food intake	54	27.0
	Heredity	124	64.0
	• I don't know	18	9.0
3. A deficiency of energy and protein in children will result in:	• Obesity	18	9.0
	• Protein-energy malnutrition	160	82.0
	• I don't know	18	9.0
4. Among children, a deficiency of energy will result in which of the following conditions	• Marasmus	160	82.0
	• I don't know	36	18.0
5. **A deficiency of protein in children will result in which of the following conditions:**	• Marasmus	36	18.0
	• Kwashiorkor	124	64.0
	• Measles	18	9.0
	• I don't know	18	9.0
6. **All of the following are signs of protein-energy malnutrition in**	• Wasting	72	37.0
	• Weight gain	70	35.0
	• Stunting	18	9.0
	• I don't know	36	19.0

	children EXCEPT:		
7. **Which of the following is a cardinal sign of kwashiorkor?**	• Wasting	54	28.0
	• Bilateral pitting oedema	72	37.0
	• Oedema	52	26.0
	• I don't know	18	9.0
8. **The presence of severe wasting of <70% weight-for-height or <-3SD and/or oedema on both feet denotes:**	• Malnutrition	34	18.0
	• Severe acute malnutrition	72	37.0
	• Severe chronic malnutrition	54	27.0
	• Severe acute obesity	18	9.0
	• I don't know	18	9.0
9. **Which of the following methods can be used to diagnose malnutrition?**	• Anthropometric (body) measurements	52	26.0
	• Clinical signs	36	18.0
	• Biochemical tests	18	9.0
	• All of the above	72	38.0
	• I don't know	18	9.0
10. **All of the following are terms used to describe the clinical manifestations of severe acute malnutrition EXCEPT?**	• Marasmus	70	35.0
	• Kwashiorkor	18	9.0
	• Diarrhea	72	38.0
	• I don't know	36	18.0
11. **The WHO guidelines for the inpatient treatment of severely**	• Twelve	36	18.0
	• Ten	72	37.0
	• Nine	16	9.0
	• I don't know	72	36.0

malnourished children have been out lined in how many essential steps:			
12. **Acute medical conditions are managed in which of the following phases of the essential steps for the inpatient treatment of severely malnourished children:**	• Admission phase	36	18.0
	• Feeding phase	54	29.0
	• Rehabilitation phase	18	9.0
	• Stabilization phase	18	9.0
	• I don't know	70	35.0
13. **Which of the following is the first step of the essential steps in the inpatient management of severely malnourished children?**	• Treat/prevent hypothermia	34	17.0
	• Treat/prevent dehydration	36	18.0
	• Treat/prevent hypoglycemia	54	29.0
	• Correct electrolyte imbalance	36	18.0
	• I don't know	36	18.0
14. **In a severely malnourished child, which of the following conditions usually occur**	• Hypothermia and hypoglycemia	72	38.0
	• Hypothermia and dehydration	18	9.0
	• Dehydration and hypoglycemia	34	17.0
	• Dehydration and loss of appetite	18	9.0
	• I don't know	54	27.0

	together?			
15.	**In the treatment of hypoglycemia in severely malnourished children, how often should one feed the child?**	• Every hour for 4 hours	54	28.0
		• Every 30 minutes for two hours	70	36.0
		• Every 40 minutes for 3 hours	18	9.0
		• Every hour for 2 hours	18	9.0
		• I don't know	36	18.0
16.	**During the treatment of hypoglycemia in a severely malnourished child, when should one monitor blood glucose and from which part of the body:**	Taking blood from the finger/heel after two hours	36	18.0
		Taking blood from the finger/heel after 1 hour	36	18.0
		Taking blood from the finger/heel after 30 minutes	54	27.0
		Taking blood from the forearm after two hours	18	11
		I don't know	52	26.0
17.	**If you are unable to test the blood glucose level of the severely malnourished child, what do you do?**	Refer the case to another hospital	52	27.0
		Assume that the child is hypoglycemic and treat accordingly	90	46.0
		Do nothing about it	36	18.0
		None of the above	18	9.0
18.	**In the treatment of hypothermia in severely malnourished children, what**	If rectal temperature from a low reading thermometer is > 35.0 degrees Celsius	34	18.0
		If axillary temperature is < 35.5 degrees and rectal temperature from a low reading thermometer is < 35.0 degrees Celsius	72	37.0

temperature denotes that the child as hypothermic?	•If axillary temperature is < 35.0 and rectal temperature from a low reading thermometer is < 35.5 degrees Celsius	90	45.0
19. **All of the following should be carried out for the treatment of hypothermia in severely malnourished children, EXCEPT**	• Feed straightaway	18	9.0
	• Clothe the child including the head	72	38.0
	• Put the child on the mother's bare chest	18	9.0
	• Do not start feeding until child's temperature is about normal	52	26.0
	• I don't know	36	18.0
20. **During the treatment of hypothermia in a severely malnourished child, body temperature:**	• Rectal temperature should be taken 3 hourlies until it rises > 35.0 degrees Celsius	54	27.0
	• Rectal temperature should be taken 2 hourlies until it rises > 36.5 degrees Celsius	72	38.0
	• Rectal temperature should be taken 1 hourly until it rises > 35.0 degrees Celsius	18	9.0
	• Rectal temperature should not be taken at all	34	17.0
	• I don't know	18	9.0
21. **During the treatment of hypothermia in a severely malnourished child, body temperature:**	• Rectal temperature should be taken 3 hourlies until it rises > 35.0 degrees Celsius	54	28.0
	• Rectal temperature should be taken 2 hourlies until it rises > 36.5 degrees Celsius	72	36.0
	• Rectal temperature should be taken 1 hourly until it rises > 35.0 degrees Celsius	18	9.0
	• Rectal temperature should not be taken at all	34	18.0
	• I don't know	18	9.0
22. **The following should be**	• Straight away start feeding two hourlies	36	18.0
	• Always give feeds throughout the night	70	36.0

considered to prevent hypothermia in severely malnourished children EXCEPT:	• Keep covered and away from drought	18	9.0
	• Feeds should not be given throughout the night	72	37.0

Figure 2. Answers rate for true and false
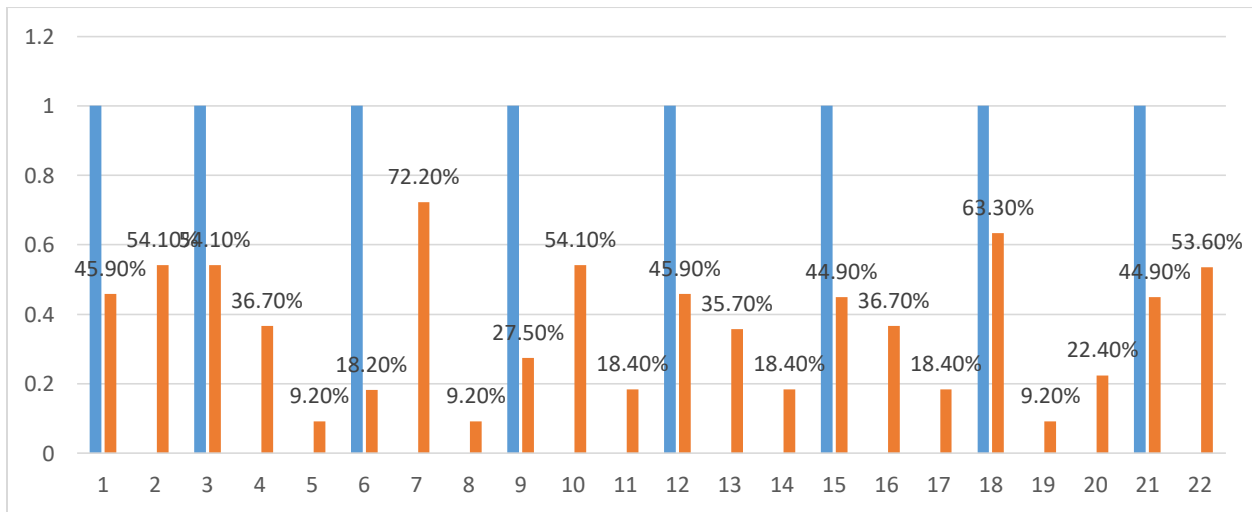
Keys : ▭ **False** ▬ **True**

4.4. Total Knowledge or Summary of Knowledge

Section two of the presents study comprises the total number of 30 items where 23 of them were correctly answered by most of respondents while 7 of them were incorrectly answered by most of participants.

Figure 3. The rate of how participant were answered
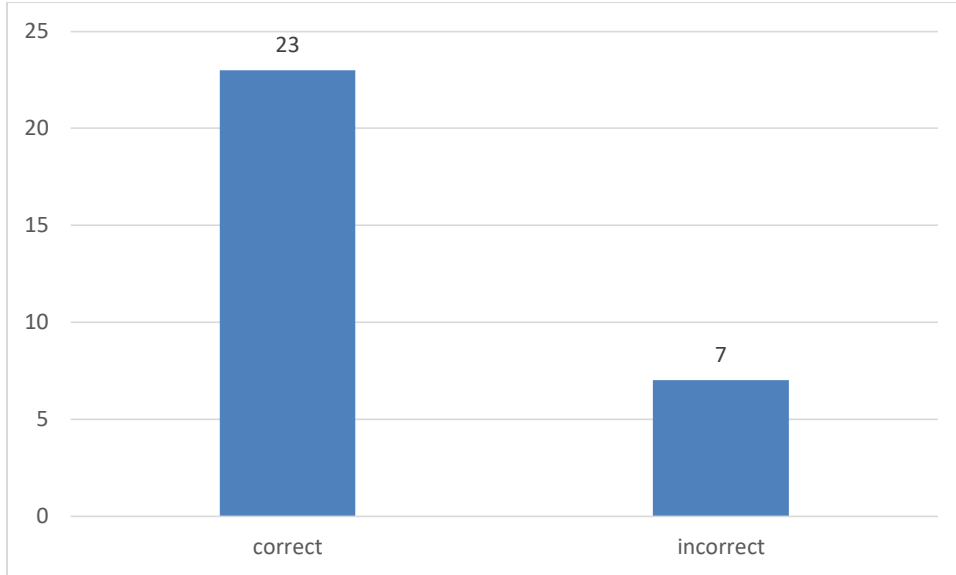
Results showed that in 196 nurse's participants, only 144(73%) had adequate knowledge about malnutrition management because had passed with more than 50% marks, 52(27%) had low level of knowledge.

Figure 4. Total knowledge about malnutrition
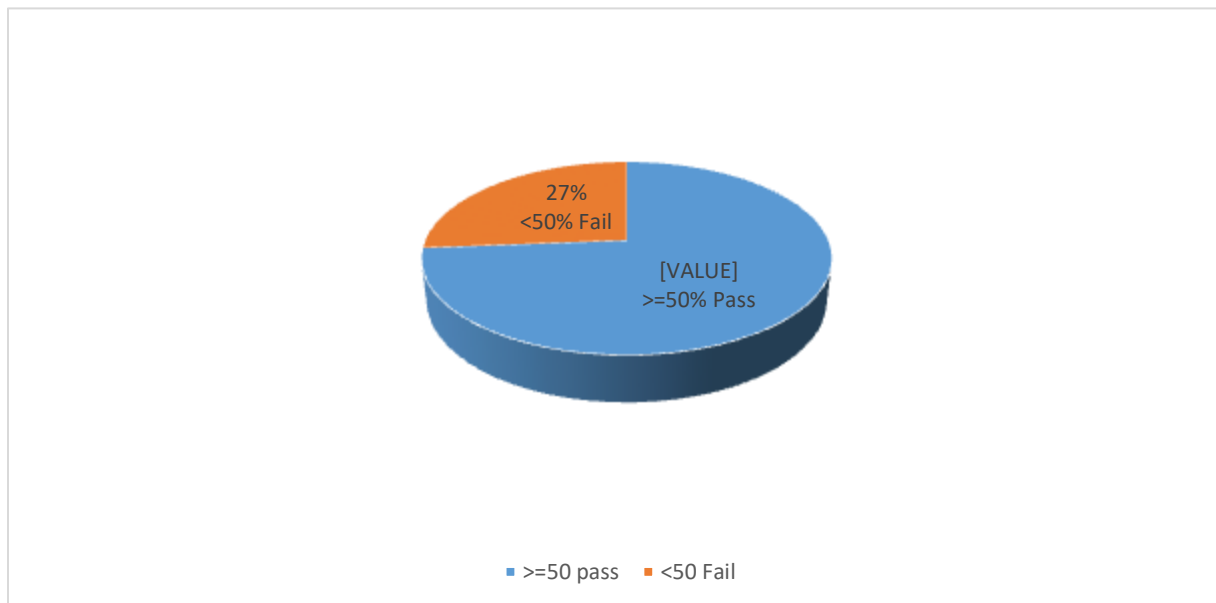
Question talking about the definition of malnutrition answered by 51(62.2%) correctly and 31(37.8%) incorrectly. Question related to the causes of malnutrition, was answered by

54(65.9%) correctly and 28(34.1%) incorrectly. 40(48.1%) of participants correctly answered the signs of malnutrition while 42(51.2%) didn't answer correctly. Moreover, for this question about the clinical indicators and diagnosis of malnutrition, only 6(7.3%) answered correctly, others 76(92.7%) didn't make it. 52(63.4%) Correctly answered the question about management, 30(36.6%) gave an incorrect answer. Results showed that in 196 nurse's participants, only 93(48%) had high level of knowledge about malnutrition management because had passed with more than 75% marks, 34(17%) had low level of knowledge while 69(35%) had moderate level of knowledge.

Figure 5. Total knowledge

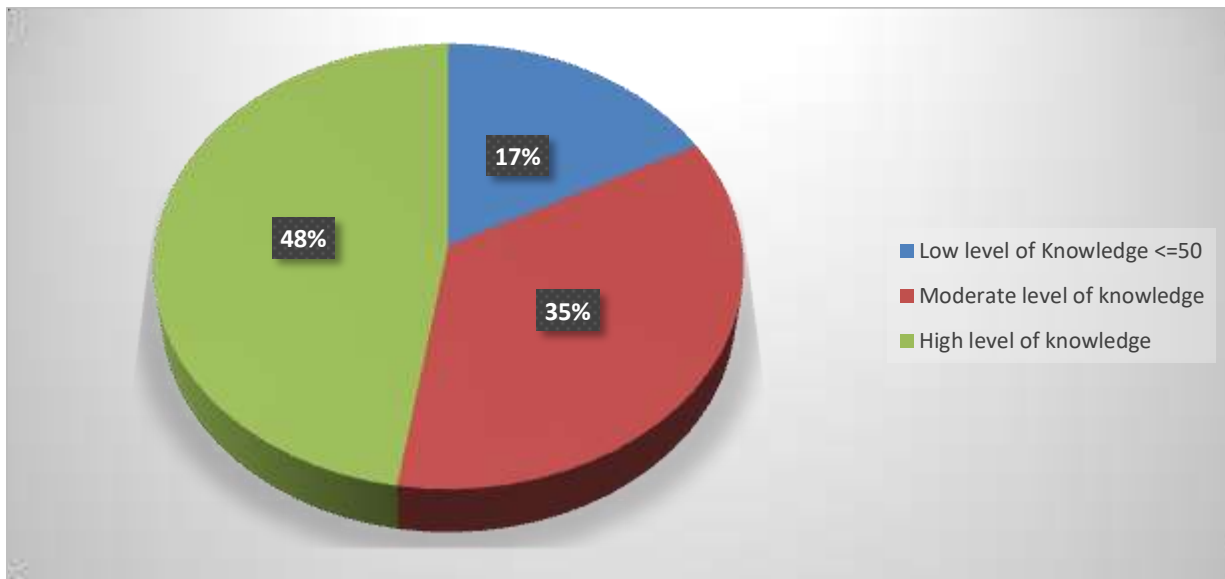**4.5. The level of practice in management of childhood malnutrition in selected health centers in Rwanda**

Of all nurses, 54(27.0%) measured Length whereas18(9.0%) measured Head circumference as anthropometric measurements used when assessing the malnutrition in children. Participants used MUAC: Weight-for-height 36(18.0%), MUAC: Weight-for-age 36(18.0%), Growth chart 70(35.0%), Other options 18(9.0%) and I don't know36(18.0) when assessing patient at risk of developing malnutrition**.** Large proportion of nurses 54(27.0%) used the WHZ tables, length board, and MUAC tapes (115mm) (WHO 2006) 36(18.0%), RUTF, sugar, potable water, and a scale or measuring cup for use in medicine (5 g precision) 36(18.0%), Hand washing with water

and soap 54(27.0%) and I don't know 16(8.0%) Among the tools which are the tools for OTP. Management of hypothermia in children with malnutrition is done by nurses as practice as follow; Warming the child, preferably using the "kangaroo" technique 60(30.0%), the child should be properly clothed, including the head, and covered with a warmed blanket 40(20.0). An incandescent lamp should be placed close to the mother and infant. There are 18(9.0%) and 78(39.0%) fluorescent lamps, respectively. The following examples show how nurses have effectively managed dehydration in practice: To monitor fluid balance and rehydration progress, weigh the child. On the critical care chart, note the liver edge, pulse, and breathing rate. 30 (15.0%). ReSoMal should be administered nasogastrically or orally to 65(33.0%) for a maximum of 12 hours, For the first two hours, ReSoMal 10 ml/kg every hour.starting with 49(25.0%). Determine whether the youngster is growing or losing weight by reweighing them at 18(9.0%)and 34(17.0%) during malnutrition management among children

Table 8: The level of practice in management of childhood malnutrition in selected health centers in Rwanda

Variables		Frequency	Percent
1. **Anthropometric measurements used when assessing the malnutrition in children**	Length	54	29.0
	Weigh	52	26.0
	Body swelling	36	18.0
	Height	36	18.0
	Head circumference	18	9.0
2. **Used when assessing patient at risk of developing malnutrition**	MUAC: Weight-for-height	36	18.0
	MUAC: Weight-for-age	36	18.0
	Growth chart	70	37.0
	Other options	18	9.0
	I don't know	36	18.0
3. **the tools for OTP:**	MUAC tapes (115mm)	54	27.0
	Scale, length board, WHZ tables (WHO 2006)	36	18.0
	RUTF, sugar, safe drinking water,	36	18.0

	medical measuring cup or scale (5 g precision)		
	Water and soap to wash hands	54	28.0
	I don't know	16	9.0
4. **Transfusion in a child with SAM**	Must be much slower and of smaller volume than for a well-nourished child.	36	18.0
	Malnourished child is unable to cope physiologically with sudden large changes	61	32.0
	in blood volume, particularly if this is already expanded during initial treatment with F75	57	29.0
	I don't know	42	21.0
5. **The management of dehydration**	Weigh the child to monitor fluid balance and the progress of rehydration	30	15.0
	Record the respiratory rate, pulse and liver edge on the critical care chart.	65	33.0
	Give ReSoMal orally or by nasogastric over a maximum of 12 hours	49	25.0
	Starting with: ReSoMal 10 ml/kg per hour for the first 2 hours orally.	18	9.0
	Re-weigh the child to determine if the child is gaining or losing weight	34	17.0
6. **Management of hypothermia**	Warming the child, using the "kangaroo" technique	60	3.0
	clothing the child well,covering with a warmed blanket	40	20.0

	placing an incandescent lamp near the mother and child. Fluorescent lamps are	78	39.0
	I don't know	18	9.0
7. **ETAT procedures in children with SAM indicate:**	Airway and breathing, "A" and "B	43	21.0
	Circulation "C	36	18.0
	Disability "D"	99	52.0
	Hypoglycemia	17	9.0
8. **Records practiced by the nurse with malnourished child for every day**	Weight (gain or loss)	52	26.0
	Oedema	90	47.0
	Respiratory rate	18	9.0
	Presence or absence of cough	18	9.0
	Temperature (a.m. and p.m.)	18	9.0
9. **Malnutrition preventive measures and management**	During hospitalization	72	37.0
	Before discharge	124	63.0

Total practices or Summary of practices

Section three which is about nurses' practices of the presents study comprises the total number of nine items where 6(67%) of them were correctly answered by most of respondents while 3(33%) of them were incorrectly answered by respondents.

Figure 6. The rate of answers about practices
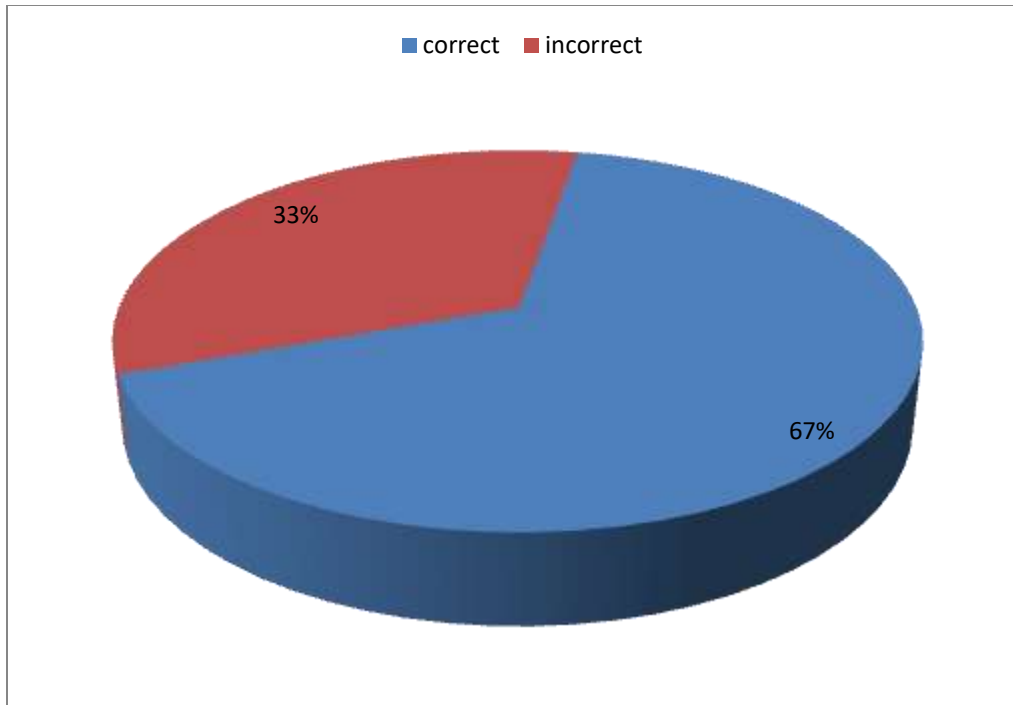
Results revealed that of 196 nurse's participants, only (61%) had high level of practice about malnutrition management as an acceptable level of practice was set at 75%, (13%) had low level of practice while (26%) had moderate level of practice.

Figure 7. Level of practice among nurses

Level of practice among nurses
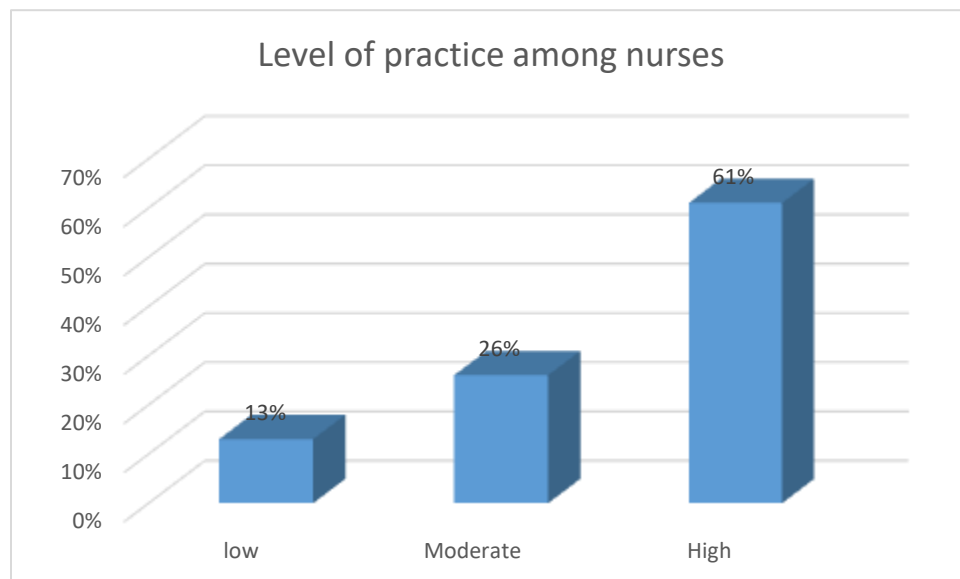
4.6. The relationship between the demographic profile-and nurses' knowledge, in the management of childhood malnutrition in selected health centers in Rwanda.

Table 6 below, shows that there is a connection between educational attainment and knowledge about management of child malnutrition with (**p-value<0.001**), working experience showed relationships with nurse's knowledge about management of child malnutrition with **p-value <0. 001).** Gender has been significantly showed statistical association (**p-value 0.001**) with nurse's knowledge about malnutrition management among children. Most of independent's variables has showed a statistical relationship with dependent variables.

Table 9. The relationship between the demographic profile-and nurses' knowledge

Variables		knowledge		P-
		>=50 pass	<50 Fail	value(<0.05)
Gender of participant	Male	48(68.0%)	22(31.0%)	0.001
	Female	96(76.0%)	30(23.0%	
Age (in group of years)	22-32	3(16.0%)	15(83.0%	0.001
	33-43	81(92.0%)	7(7.0%	
	44-54	42(77.0%)	12(22.0%	
	55-65	18(50.0%)	18(50.0%	

	01-Oct	81(92.0%)	7(7.0%	
Working experience	Nov-20	45(62.0%)	27(37.0%	0.001
	21 and more	18(50.0%)	18(50.0%	
High level of nursing training	Diploma	123(76.0%)	37(23.0%	
	Degree	3(16.0%)	15(83.0%	0.001
	Postgraduate	-100.00%	0(0.0%)	
Study about management of malnutrition	Yes	105(73.0%)	37(26.1%)	0.001
	No	39(72.0%)	15(27.0%)	
Satisfied level in nutrition education	very satisfied	18(100.0%)	0(0.0%)	0.001
	Dissatisfied	21(58.0%)	15(41.0%)	
	Satisfied	99(79.0%)	25(20.0%)	
	Very dissatisfied	6(33.0%)	12(66.0%)	
Refresher training course/programme	Yes	54(75.0%)	18(25.0%)	0.001
	No	90(72.0%	34(27.0%)	

CHAPTER FIVE: DISCUSSION

5.1 Introduction

Around 10% of children fewer than 5 worldwide suffer from childhood malnutrition, particularly those in developing nations who are living in conditions of extreme poverty. (42) Malnutrition, which is frequently brought on by an inadequate food, is one of the most typical diagnoses for kids in sub-Saharan African and south Asian healthcare facilities. In addition to inhibiting physical and intellectual growth, childhood malnutrition raises the chance of mortality or disability from common childhood illnesses such pneumonia and diarrheal diseases. This has an impact on long-term health. (1) The WHO recommendations for the inpatient management of severely malnourished children were used in the current study to evaluate nurses' knowledge and practices about malnutrition and related care in children.

Discussion about Nurses' level of knowledge

Only 93 (48%) of the nurses in this survey had excellent levels of knowledge regarding managing malnutrition since they passed with more than 75% marks. A number of discoveries have been reported by medical practitioners in Ethiopia. The nurses fared better on tests of their general knowledge of causes of malnutrition than they did on tests of their understanding of the signs and symptoms of various forms of malnutrition, such as kwashiorkor, across the seven topic areas reviewed in this study. In areas pertaining to the clinical nutritional therapy of critically malnourished children, significant knowledge gaps were also discovered. For example, just 15% of the nurses knew that children with kwashiorkor shouldn't be prescribed certain medications high-protein diets. The inadequate nutrition education provided during nursing school may be to blame for the nurses' subpar awareness of malnutrition.(12)

Discussion about nurses' practice

The finding of the presents study shows that more than, 54(27.0%) nurses measured Length whereas18(9.0%) measured Head circumference as anthropometric measurements used when assessing the malnutrition in children. Participants used MUAC: Weight-for-height 36(18.0%), MUAC: Weight-for-age 36(18.0%), Growth chart 70(35.0%), Other options 18(9.0%) and I don't know36(18.0) when assessing patient at risk of developing malnutrition. Large proportion

of nurses 54(27.0%) used the WHZ tables, length board, scale, and MUAC tapes (115mm) (WHO 2006) 36(18.0%), RUTF, sugar, potable water, and a scale or measuring cup for use in medicine (5 g precision) 36(18.0%), Hand washing with water and soap 54(27.0%) and I don't know 16(8.0%) Among the tools which are the tools for OTP. This is contradicting with another study which revealed that treatment practices include giving the kid oral rehydration, beginning of an antibiotic course, continuation of breastfeeding, beginning of therapeutic feeding, and keeping the kid warm are all necessary. Use an oral rehydration solution to treat malnutrition (ReSoMal). (43). When people arrive at clinics, OTP, etc., it's important to provide them with water or sugar water to drink, as well as a shady place to sit if they have to wait to be seen. F100 should not be given to very ill children in phase 1 and should never be given to newborns weighing less than 3 kg since it will produce hyperosmolar syndrome unless diluted with plain water. It is a concentrated diet with a high renal-solute load. (43). F75 is administered to patients throughout the stabilization stage of inpatient treatment; they receive a spread of 80–100 kcal/kg/d for youngsters. For three to seven days, youngsters receive about 80–100 kilocalories per kilogram per day (kcal/kg/d) distributed over 8–12 meals. (44) The above discrepancy can result from different places using different guidelines. We also considered aspects relating to their knowledge. It was shown that nurses had sufficient knowledge of malnutrition and how to treat it. It was discovered that several factors included the number of nutrition courses completed in nursing school, the length of time spent working as a nurse, completing a nutrition refresher course after graduation, and receiving training on the recommendations, all of which were connected to nurses' knowledge. (12) According to the same findings of a different study, nurses who had ever taken a refresher course in nutrition training after graduation did much better than those who hadn't and factors, respectively(25.5 ± 6.55 v 20.7 ± 6.82; $p = 0.001$)(12).

CHAPTER SIX: SUMMARY, RECOMMENDATION AND CONCLUSION

6.1. Introduction

Conclusions from the study's findings are presented in chapter six. In terms of managing malnutrition, recommendations are also given to nursing practice, nursing education, and nursing research.

6.2. Summary of the study

The research on assessment of nurse's knowledge about childhood malnutrition management among nurses working in 24 health centers in Gicumbi district, Rwanda, with objectives of assessing the nurses' knowledge about the malnutrition management; the practices related to the malnutrition management; assess relationship between nurses' knowledge and their demographic data among nurses working in Gicumbi district catchment area. This study has revealed a good level of nurse's knowledge and practice with a statistical association between independents variables (sociodemographic characteristics of respondents) and dependents variables which is he nurses knowledge.

6.3. Recommendations

The aim of this study was to evaluate the knowledge and skills of nurses. about childhood malnutrition management among nurses working in 24 health centers of Gicumbi district. The results found that nurses have enough knowledge about malnutrition in general especially its management among children. The researcher made recommendations to practice, nursing education and research so that childhood malnutrition management should be improved. The study recommended the following:

6.3.1. Recommendation to the nursing practice

- Continuous nursing education and in-service training programs are necessary to improve the standard of nursing care offered and patient outcomes should be set up within Gicumbi district health centers and furnished with the appropriate instructional resources.-Close supervision and teaching on spot during work is needed to ensure that quality of care is provided by nurses caring of patients about malnutrition management.

- Regular reading to upgrade their knowledge should be added to a nurse's daily tasks.

6.3.2. Recommendation to the nursing education

It is important to always urge them to go to scientific gatherings and conferences in order to keep up with the ever expanding body of information and skills required for proper, effective nursing care.

6.3.3. Recommendation to the nursing research

Further studies are recommended to evaluate the reflection of in-service training program regarding knowledge about malnutrition and nursing management with malnutrition especially children and consequently on the patients' outcome.

6.3.4. Recommendation to the ministry of health

Ministry of health and their partners should organize and manage the implementation of different program related to nutrition activities including but not limited to the increase of skilled health providers, material, equipment and other resources.

6.4. Conclusion

The findings of the present study have revealed a high level of knowledge where has been also revealed to be associated with most of sociodemographic data. The results of the study have brought to light an area not explored in relation to knowledge and sociodemographic of nurses working in health centers at Gicumbi district. Malnutrition management within children is a challenge to the nurses, patients, and the families in health center of Gicumbi district. More training sessions and deep analytical research are needed.

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APPENDIX

APPENDIX 1: QUESTIONNAIRE

UNIVERSITY OF RWANDA

COLLEGE OF MEDICINE AND HEALTH SCIENCES

SCHOOL OF NURSING AND MIDWIFERY

QUESTIONNAIRE I.D…………………………….

INTRODUCTION AND CONSENT

Introduction

My name is   **UWERA Monique**, a graduate student at the University of Rwanda/ College of Medicine and Health Sciences in Master of Science in Nursing/ Pediatric track.

I am inviting you to participate in my research titled "**NURSE'S KNOWLEDGE AND PRACTICE IN CHILDHOOD MALNUTRITION MANAGEMENT IN SELECTED HEALTH CENTERS IN RWANDA".**

Purpose of the study

The purpose of this study is to assess Knowledge and practices of nurses on management of childhood malnutrition in selected health centers of Gicumbi District.

Description of study procedures

You will be asked to choose your best answer by ticking in the provided box and place. This will take approximately 20 minutes of your time. Please don't write your name on the questionnaire.

Confidentiality

Confidentiality will be maintained as no names will appear on the questionnaire at any stage of data collection and they will be coded. Signed consent forms will not be attached to instruments to ensure anonymity. Data will be stored in a locked cabinet and not be accessible to any other person other than the investigator. However, absolute confidentiality cannot be guaranteed and personal information may be disclosed if required by the law. The supervisors of the researcher and the institutional review board (IRB) of the college of Medicine and health sciences will also access the data for the quality and data analysis. All documents for the study will be destroyed after 5years of study completion.

Right to refuse or withdraw from the study

The participation in the current study is purely voluntary. You may participate or not and if you do not wish to continue, you have the right to withdraw from the study, without penalty and this, at any time.

Risks of the study

There will be no risks from participating in the current study. As explained, do not write your name on the questionnaire. Neither your colleague nor your employers will access on the information you provided and you will be treated the same as usual. (no consequences to participate). I am ready to provide you more explanations about the provided question. Please feel free to ask any question you don't understand or other clarification on this study.

Benefits of the study

The benefit of this research is that you will help us to know the level of nurses' knowledge and their practices to find out where are the gap to create strategies to overcome them. At individual level as a participant, your participation in this study will help you to be aware on your own level of knowledge and practices regarding childhood malnutrition management to finally correct where necessary.

Right to Ask Questions and Report Concerns

You have the right to ask questions about this research study and getting answers from either the researcher (me), or the supervisor before, during and after the study.

If you have any further questions about the study, feel free to contact the researcher (me). At any time. Here are the contacts: The telephone number: **+250 788 477404** & E-mail: **miqueuwera73@gmail.com**

APPENDIX 2.CONSENT TO PARTICIPATE IN THE STUDY

Your signature below indicates that you have decided to be a volunteer as a research participant for this study, and that you have read and understood the information provided above.

Names of the participant: …………………………………………………………………………

Signature of the participant   Date

Print names of investigator: ……………………………………………………………………….

Signature of the investigator …………………………………………….Date …………………

SECTION A: **Socio-demographic data**

A. Socio-demographic data (Please tick where appropriate)

1. Gender: Male   Female

2. Age (in group of years)

• 20-24	
• 25-30	
• 31-35	
• 36-40	
• 41 and more	

3. Area of work:

4. Years of work experience

• 1-5	
• 6-10 b	
• 11-15	
• 16-20	
• 21-25	
• 26 and more	

5. What is your highest level of nursing training?

• Diploma	
• Degree	

• Postgraduate	

- Others (specify)

6. Were you taught on the management of malnutrition in children during your training in nursing school?

Yes		No	

7. How satisfied are you with the nutrition education you received during training in school?

• Very dissatisfied	
• Dissatisfied	
• Unsure	
• Satisfied	
• Very satisfied	
• I don't know	

8. Apart from nursing school, have you had any refresher training course/programme in nutrition?

Yes		No	

If Yes where?

SECTION B: knowledge on malnutrition and WHO/UNICEF guidelines for the inpatient treatment of severely malnourished children

B. *The following are questions relating to malnutrition and the WHO/UNICEF guidelines for the inpatient treatment of severely malnourished children. Indicate the most appropriate answer by ticking in the box in front of the answer. If you do not know the answer to any of the questions, feel free to indicate so.*

COGNITIVE DOMAIN (KNOWLEDGE)

Malnutrition is referred to as:

• The consumption of fruits and vegetables	
• The ingestion and digestion of foods	
• A balance between energy intake and expenditure	
• An imbalance between energy intake and expenditure	
• Don't know	

Malnutrition can be caused by all of the following EXCEPT:

• Poor food intake	
• Infections	
• Poor sanitation	
• Heredity	
• I don't know	

A deficiency of energy and protein in children will result in:

• Obesity	
• Protein-energy malnutrition	
• Diabetes	
• Dental caries	
• I don't know	

Among children, a deficiency of energy will result in which of the following conditions?

• Marasmus	
• Kwashiorkor	
• Measles	
• Tetanus	
• I don't know	

A deficiency of protein in children will result in which of the following conditions:

• Marasmus	
• Kwashiorkor	
• Measles	
• Tetanus	
• I don't know	

All of the following are signs of protein-energy malnutrition in children **EXCEPT**:

• Poor growth	
• Wasting	
• Weight gain	
• Stunting	
• I don't know	

Which of the following is a cardinal sign of kwashiorkor?

• Stunted growth	
• Wasting	
• Bilateral pitting oedema	
• Oedema	
• I don't know	

The presence of severe wasting of <70% weight-for-height or <-3SD and/or oedema on both feet denotes:

• Malnutrition	
• Severe acute malnutrition	
• Severe chronic malnutrition	
• Severe acute obesity	
• I don't know	

Which of the following methods can be used to diagnose malnutrition?

• Anthropometric (body) measurements	
• Clinical signs	
• Biochemical tests	
• All of the above	
• I don't know	

All of the following are terms used to describe the clinical manifestations of severe acute malnutrition EXCEPT?

• Marasmus	
• Kwashiorkor	
• Marasmic kwashiorkor	
• Diarrhoea	
• I don't know	

The WHO guidelines for the inpatient treatment of severely malnourished children have been out lined in how many essential steps:

• Twelve	
• Eleven	
• Ten	
• Nine	
• I don't know	

Acute medical conditions are managed in which of the following phases of the essential steps for the inpatient treatment of severely malnourished children:

• Admission phase	
• Feeding phase	
• Rehabilitation phase	
• Stabilization phase	
• I don't know	

Which of the following is the first step of the essential steps in the inpatient management of severely malnourished children?

• Treat/prevent hypothermia	
• Treat/prevent dehydration	
• Treat/prevent hypoglycaemia	
• Correct electrolyte imbalance	
• I don't know	

In a severely malnourished child, which of the following conditions usually occur together?

• Hypothermia and hypoglycaemia	
• Hypothermia and dehydration	
• Dehydration and hypoglycaemia	
• Dehydration and loss of appetite	
• I don't know	

In the treatment of hypoglycaemia in severely malnourished children, how often should one feed the child?

• Every hour for 4 hours	
• Every 30 minutes for two hours	
• Every 40 minutes for 3 hours	
• Every hour for 2 hours	
• I don't know	

During the treatment of hypoglycaemia in a severely malnourished child, when should one monitor blood glucose and from which part of the body:

• Taking blood from the finger/heel after two hours	
• Taking blood from the finger/heel after 1 hour	
• Taking blood from the finger/heel after 30 minutes	
• Taking blood from the forearm after two hours	
• I don't know	

If you are unable to test the blood glucose level of the severely malnourished child, what do you do?

• Refer the case to another hospital	
• Assume that the child is hypoglycaemic and treat accordingly	
• Do nothing about it	
• None of the above	
• I don't know	

In the treatment of hypothermia in severely malnourished children, what temperature denotes that the child as hypothermic?

• If rectal temperature from a low reading thermometer is > 35.0 degrees Celsius	
• If axillary temperature is < 35.5 degrees Celsius and rectal temperature from a low reading thermometer is < 35.0 degrees Celsius	
• If axillary temperature is < 35.0 degrees Celsius and rectal temperature from a low reading thermometer is < 35.5 degrees Celsius	
• None of the above	
• I don't know	

All of the following should be carried out for the treatment of hypothermia in severely malnourished children, EXCEPT:

• Feed straightaway	
• Clothe the child including the head	
• Put the child on the mother's bare chest	
• Do not start feeding until child's temperature is about normal	
• I don't know	

During the treatment of hypothermia in a severely malnourished child, body temperature:

• Rectal temperature should be taken 3 hourlies until it rises > 35.0 degrees Celsius	
• Rectal temperature should be taken 2 hourlies until it rises > 36.5 degrees Celsius	
• Rectal temperature should be taken 1 hourly until it rises > 35.0 degrees Celsius	
• Rectal temperature should not be taken at all	
• I don't know	

The following should be considered to prevent hypothermia in severely malnourished children EXCEPT:

• Straight away start feeding two hourlies	
• Always give feeds throughout the night	
• Keep covered and away from drought	
• Feeds should not be given throughout the night	
• I don't know	

Answer the following as true or false. If you do not know the answer, feel free to indicate so

In preventing hypothermia and hypoglycaemia in the inpatient management of severely malnourished children frequent feeding is required.

TRUE	
FALSE	
DON'T KNOW	

In severely malnourished children low blood volume can coexist with oedema.

TRUE	
FALSE	
DON'T KNOW	

The standard ORS should be used for the treatment of dehydration in severely malnourished children.

TRUE	
FALSE	
DON'T KNOW	

Oedema in severely malnourished children can be treated with a diuretic:

TRUE	
FALSE	
DON'T KNOW	

Food for severely malnourished children should be prepared without salt.

TRUE	
FALSE	
DON'T KNOW	

Broad spectrum antibiotics should be given routinely for the treatment of infections in severely malnourished children.

TRUE	
FALSE	
DON'T KNOW	

Oedematous children should lose weight during the stabilisation phase of the treatment of severely malnourished children.

TRUE	
FALSE	
DON'T KNOW	

In the treatment of a severely malnourished child, he/she (the child) should be weighed each morning before feeding.

TRUE	
FALSE	
DON'T KNOW	

It is appropriate to prescribe a high protein diet for children with kwashiorkor

TRUE	
FALSE	
DON'T KNOW	

C. PRACTICE

The following are questions relating to nurse' practice in the management of childhood malnutrition. Indicate the most appropriate answer by ticking in the box in front of the answer. If you do not know the answer to any of the questions, feel free to indicate so.

What are anthropometric measurements used when assessing the malnutrition in children?

• Length	
• Weigh	
• Body swelling	
• Height	
• Head circumference	
• I don't know	

What can be used when assessing patient at risk of developing malnutrition?

• MUAC: Weight-for-height	
• MUAC: Weight-for-age	
• Growth chart	
• Other options	

• I don't know	

Among the tools which are the tools for OTP:

• MUAC tapes (115mm)	
• Scale, length board, WHZ tables (WHO 2006)	
• Registration book, patient charts (OTP charts)	
• RUTF, sugar, safe drinking water, medical measuring cup or scale (5 g precision)	
• Water and soap to wash hands	
• I don't know	

One of the following statements indicate the true answer. Transfusion in a child with SAM:

• Must be much slower and of smaller volume than for a well-nourished child.	
• Malnourished child is unable to cope physiologically with sudden large changes	
• in blood volume, particularly if this is already expanded during initial treatment with F75	
• I don't know	

The following statements indicate the management of dehydration

• Weigh the child to monitor fluid balance and the progress of rehydration	
• Record the respiratory rate, pulse and liver edge on the critical care chart.	
• Give ReSoMal orally or by nasogastric over a maximum of 12 hours:	
• Starting with: ReSoMal 10 ml/kg per hour for the first 2 hours orally.	

• Re-weigh the child to determine if the child is gaining or losing weight	
• I don't know	

Management of hypothermia in children with malnutrition is done by:

• Warming the child, preferably using the "kangaroo" technique, by placing the child on the mother's bare chest or abdomen (skin-to-skin) and covering both of them	
• clothing the child well (including the head), covering with a warmed blanket	
• placing an incandescent lamp near the mother and child. Fluorescent lamps are	
• I don't know	

ETAT procedures in children with SAM indicate:

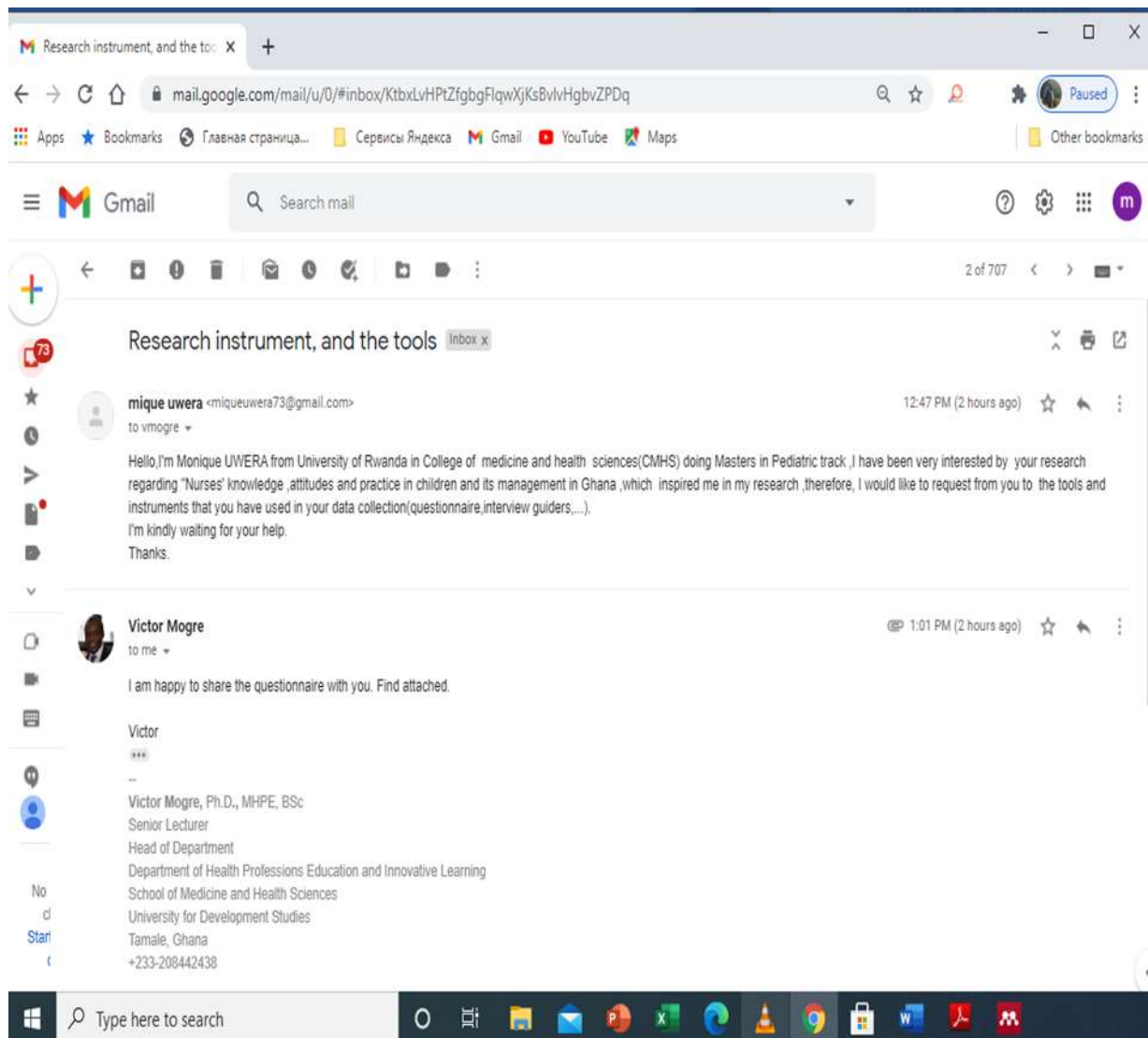|	
• Airway and breathing, "A" and "B	
• Circulation "C	
• Disability "D"	
• Level of consciousness	
• Convulsions	
• Hypoglycemia	
• Hypothermia	
• Hyperthermia	
• I don't know	

The followings are records practiced by the nurse with malnourished child for every day

• Weight (and graphs the weight to examine gain or loss)	
• Oedema	
• Respiratory rate	
• Presence or absence of cough	
• Pulse rate	
• Temperature (a.m. and p.m.)	
• Stools passed	
• Diarrhea	
• Vomit	
• Feeding plan	
• Antibiotics and other medication prescribed and given	
• Nasogastric tube in place, infusions and transfusions and Resomal	
• I don't know	

Patient's & care giver's health education on childhood malnutrition preventive measures and management should be given:

• During hospitalization	
• Before discharge	
• I don't know	

Thank you very much for taking your time and trouble to fill out the questionnaire. We are very grateful.

APPENDIX 3: PERMISSION TO USE THE QUESTIONNAIRE AND CHECKLIST

APPENDIX 4: STUDY BUDGET

3.1. PREPARATION OF PROPOSAL

No	Item	No of Persons	No of Days	Cost/Unit RWF	Total RWF
1	Communication fees	1	12	**500**	7000
2	Refreshment	1	8	**2000**	**16,000**
3	Computer	1	1 used for all	**-**	**For self**
	Sub-Total 1				**23.000**

3.2. PREPARATION FOR THE STUDY/ DISTRIBUTION OF QUESTIONNAIRE

No	Item	No of Persons	No of Days	Cost/day RWF	Total RWF
1	Communication fees	1	12	**500**	**6000**
2	Printing of checklist	**196 persons**	**1 checklist**	**30/ page**	**19,480**
3	Pens	1	1 pen/ 100	**100**	13,100

				person		
4	**Sub-Total 2**					**25,580**

3.3. WORKSHOP FOR REPORT VALIDATION (data analysis and report preparation)

No	Item	Quantity	No of Days	No. Person-days	Cost/Unit RWF	Total RWF
1	Computer	**1**	**8**	**1**	-	-
2	Internet	**1000**	**8**	**1 (using 1 computer)**	-	**8000**
3	**Refreshment**	1	8 3	1	2000	**16000**
4	**Printing**	40 pages	**1**	3 copies (submission,2 for each researcher)	30	**4000**
5	**Sub-total 3**	**17000**				

3.4. DATA COLLECTION –TRANSPORT FEES

no	Health center	Amount on moto (going) in RWF	Amount on moto (returning) RWF
1	Byumba health center	300	300
2	Ruhenda health center	1000	1000
3	Rubaya health center	6000	6000
4	Manyagiro health center	6000	6000
5	Mulindi	6000	6000
6	Cyumba health center	6000	6000
7	Miyove	3000	3000
8	Musenyi health center	5000	5000
9	Muhondo health center	2000	2000
10	Mukarange health center	5000	5000
11	Kigogo health center	6000	6000
12	Giti health center	9000	9000
13	Gisiza health center	5000	5000
14	Bwisige health center	7000	7000
15	Bushara health center	5000	5000
16	Mukono health center	5000	5000
17	Muko health center	10000	10000
18	Munyinya health center	4000	4000
19	Nyamiyaga health center	6000	6000

20	Rushaki health center	10000	10000
21	Rutare health center	6000	6000
22	Ruvune health center	6000	6000
23	Rwesero health center	6000	6000
24	Tanda health center	10000	10000
	Total	135300	135300

3.5. BUDGET SUMMARY

No	Item	Sub-Total (frw)
1	Preparation for proposal	**23000**
2	Preparation survey/distribution	**13580**
3	Workshop for report validation	**17000**
4	Transport fees in Rwandan franc	135300
5	**Grand Total**	**188880**

APPENDIX 5. STUDY TIMELINE

Months/ 2021 Activities	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Study proposal		�©	▨									
Proposal approval				▨								
Data collection				▨	▨							
Data entry & Analysis						▨						
Preparation of report							▨					
Dissemination of the study							▨					

UR/CMHS

SoNM

Post graduate

Paediatric track

KIGALI-RWANDA

Email:miqueuwera73@ gmail.com

Kigali,31ⁿ/08/2021

To the Director General Byumba District Hospital

Re: Requesting for authorization of data collection in 24 HCs for Byumba District Hospital.

Sir,

I would like to request you the allowance to collect data in 24 HCs of Byumba district Hospital as I Fulfil all IRB requirements,Im a student in masters in nursing sciences Peadrick track post graduate UR.

In fact,Im conducting the research proposal entitled:NURSES'KNOWLEDGE AND PRACTICE IN THE MANAGEMENT OF CHILDHOOD MALNUTRITION IN SELECTED HEALTH CENTERS IN RWANDA.

Thus, this project in supervised by Dr Lakshmi RajesWaRan.This research will be fruitful in Pediatrick health promotion.

I look forward to hearing the enjoyable reply from you.

Your sincerely.

UWERA Monique.