



**KNOWLEDGE AND PREVENTIVE PRACTICE REGARDING
CARDIOVASCULAR DISEASES RISK FACTORS AMONG RURAL
POPULATION.**

AT A SELECTED DISTRICT IN RWANDA

By

NYIRAHABIMANA Marie Vestine

College of Medicine and Health Sciences

School of Nursing and Midwifery

Master of Science Degree in Nursing (Medical-Surgical Track)

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A dissertation Submitted in Partial Fulfillment of the Requirements for the degree of

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In the College Of Medicine and Health Sciences

Supervisor: **MUHAYIMANA Alice**

Co-Supervisor: Professor **BUSISIWE Bhengu**

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DECLARATION

I do hereby declare that this *dissertation* submitted in partial fulfillment 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.

Date and Signature of the Student



26/07/2017

NYIRAHABIMANA Marie Vestine

a. Authority to Submit the dissertation

Surname and First Name of the Supervisor: **MUHAYIMANA Alice**

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

Date and Signature of the Supervisor:



24/07/2017

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ABSTRACT

Background: Cardiovascular disease (CVD) is the leading cause of morbidity and mortality worldwide. However, the poor knowledge toward risk factors of cardiovascular disease has been noted to be challenging in prevention of CVDs.

Problem statement: The research project revealed that CVDs will be the most causes of death worldwide in 2020 (Mahajan *et al.*, 2012). Many rural populations are unaware of their personal risk factors of CVD (Mosca *et al.*, 2004). In East African community; the countries experience the challenge in prevention of CVDs, related to poor knowledge toward its risk factors (Reiner, Sonicki and Tedeschi-Reiner, 2012). In Rwanda, no study has been done to assess the knowledge and preventives practices of CVDs risk factors among rural population.

The aim of the study: Is to assess the knowledge and preventive practices regarding cardiovascular disease risk factors among rural population. At a selected district in Rwanda.

Materials and methods: The ethical clearance to carry out the study was granted by the Institutional Review Board (IRB) and UR/CMHS administration. A descriptive, cross sectional, non-experimental design was used. Quantitative method was used. The study population included the adult community members from 18 to 65 years old. Sample size was 388. Multistage sampling method was used. Questionnaire was prepared for 388 residents. The data was analyzed using SPSS version 21.

Results: The findings revealed that a majority 85.8% of rural participants had poor knowledge about cardiovascular disease risk factors (CVDRFs). About 79.6% had alcohol consumption habit; 23.7% were engaged in smoking habit; 66.2% eat cooking oil every day; 53.1 % eat vegetables and only 5.9% eat fruits every day. The majority 99.0% have never performed test for blood cholesterol, 66.5% have never performed blood pressure and 60.1% have never visited a clinic for check up. Relationship between knowledge and preventive practice was statically significant at 0.01 levels.

Conclusion: The findings indicated that knowledge on Cardiovascular Diseases Risk Factors among participants is insufficient. Preventive practices also were at low level.

Key words: Cardiovascular disease, Risk factors, rural population, Knowledge, preventive practices.

DEDICATION

I dedicate this work

To my Congregation of sisters Bernardines for the considerable support.

To my beloved parents.

To my classmates.

To those who are doing their best to preserve and promote cardiovascular health and prevent cardiovascular diseases.

To my beloved Rwandans.

LIST OF ACRONYMS AND ABBREVIATION

%: percentage

CAD: Coronary Artery Disease

CHD: Coronary Heart Disease

CVD: Cardiovascular Disease

CVD RFs: Cardiovascular Disease Risk Factors

HMIS: Rwanda's Health Management Information System

HPM: Health Promotion Model

MOH: Ministry of health

IRB: Institutional Review Board

NCD: Non Communicable Diseases

NCNM: National council of Nursing and Midwifery

P: p- value

SPSS: Statistical package social sciences

UR/CMHS: University of Rwanda/ College of Medicine and Health Sciences

WHO: World Health Organization

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CHAPTER 1: INTRODUCTION

1.1. Introduction

Non communicable diseases are a major health and development challenges (WHO, 2014). This chapter describes the background of the study, the problem statement, objectives of the study, research questions, significance of the study, definition of key concepts, and organization of the study.

1.2. Background

Non communicable diseases are major health and development challenge worldwide (WHO, 2014). Cardiovascular disease have been acknowledged as one of the main reasons why the prevalence of NCDs continues to devastate societies around the world (WHO, 2015). They are the most causes of morbidity and mortality (Andsoy *et al.*, 2015; Yadav K.D, 2012; Aljefree and Ahmed, 2015). In 2012, over 38 million deaths occurred due to NCDs like CVDs, hypertension, diabetes, etc (WHO, 2014). More than 40% were early under 70 years of age (WHO, 2014). In 2008, out of 17.3 million of CVDs deaths, 7.3 million died from heart attacks and 6.2 million from strokes (Aljefree and Ahmed, 2015).

A study done in 2012, 7.4 million died due to heart disease, with 158 deaths per million in high-income countries and 107 per million in upper-middle-income countries (Ammouri *et al.*, 2016). A similar study found that 17.5 million died from CVDs and 31% of all global deaths (WHO, 2015). In Filipino Americans, CVDs are the leading causes of death (Angosta and Speck, 2014). The results shown that, the risk factors among them were: hypertension (47.7%), High blood sugar (14%), overweight (36.7%), abdominal obesity (80.6%), smoking (11.7%), and lack of physical exercises (48%) (Angosta and Speck, 2014). The study done in Pakistan, revealed that many countries have implemented a primary prevention approach. However, a key aspect affecting the success of this method

is the knowledge of the individuals at risk regarding a specific health problem (Mustaqeem *et al.*, 2015).

Another study revealed that knowledge regarding risk factors of CVDs in Iranian general population has increased; while significant gaps continue to exist (Alhossaini *et al.*, 2016). However, those risk factors are preventable among population; except age, sex and heredity which are non-modifiable (Andsoy *et al.*, 2015).

In Africa, CVDs manifest themselves differently across countries, communities, social groups and individuals (Yadav K.D, 2012). CVDs are a major barrier to effective responses to the country development and a serious burden on the economy of low and middle-income countries (WHO, 2015). The studies have noted that NCDs kill 16 million people under the age of 70 years; 82% are in developing countries and 37% are caused by CVDs (WHO, 2015). In the developing countries, many people are detected of the disease late and have premature death from CVDs (WHO, 2015). According to the study done in Nigeria, the knowledge regarding risk factors of CVDs is low among University workers in Nigeria (Akintunde, Akintunde and Opadijo, 2015). This study further revealed a high number of people (49.0%) with poor knowledge, while 31.2% had fair knowledge, only (19.9%) of participants had good knowledge of CVDs risk factors.

In sub-Saharan Africa, CVDs have been neglected (Mocumbi, 2012). NCDs have traditionally not been given high priority (Bass *et al.*, 2014).

The study done in Kenya, rural sub-Saharan Africa population, showed that the participants had a significant presence of hypertension. The rates of hypertension were lowest amongst those with low body mass index scores and highest among those with higher body mass index scores. The author revealed that more attention on need to change dietary habits and regular screening for hypertension is needed among these rural

communities. The relatively high prevalence of dysglycaemia in this rural community and the fact that the majority are not aware of their health status calls for enhanced health-prevention and -promotion campaigns, involvement of the mass media through radio which is available in a majority of households (Bloomfield *et al.*, 2013, p. 7).

In East African Community, the study done in Uganda and Rwanda, revealed that NCDs have traditionally not been given high priority (Bass *et al.*, 2014). According to the study done in Uganda, NCD accounts 28% of total death while CVDs accounts 10% (Who, 2015, p. 1). The study done in Kenya founded that NCD accounts for 27% while CVDs accounts 8% (World Health Organization, 2014, p. 1). Another study conducted in Rwanda showed that NCDs accounts for 36% of total mortality while CVDs accounts 13% (WHO, 2014b, p. 1). In Rwanda, however, the country is experiencing that NCDs are increasing (HMIS, 2014).. In Rwanda NCDs account for 36% of total deaths (WHO, 2014); 51.86% of all District Hospital outpatients' consultations and 22.3% of District Hospital hospitalizations (Ministry of Health Rwanda, 2015).

In 2013; the causes of NCD cases treated in all health facilities were 4% of CVD, Diabetes 1%, and cancer 1% (HMIS, 2014). Total death caused by CVDs was 13% in 2014 (WHO, 2014) regarding all ages and both sexes.

A population study survey conducted in 2012-2013 found that the risk factors for CVDs in Rwanda are: tobacco use with 12.9%, engaged in alcohol drinking 23.5%; 16.1% are overweight; obesity 22.3%; while only 0.9% eat vegetables; 0.3% of fruit consumption per day; 21.4% were engaged in physical exercises(WHO, 2015). There is a need to increase the public knowledge of CVD risk factors among populations by education programs on different lifestyles including nutrition and physical activity (Aljefree and Ahmed, 2015). People need early detection and management. The study has shown that knowledge regarding risk factors of CVD helps individuals to assess their personal risk

and motivates them to increase prevention (Andsoy *et al.*, 2015). In addition, life style change towards risk factors have been shown to reduce the risk of cardiovascular diseases (WHO, 2015). According to WHO, appropriate knowledge about CVD risk factors among individuals, will help them to be practical in decreasing risk factors, seeing that the majority are modifiable (WHO, 2014). The individuals who recognize themselves to have a high risk of developing CVDs, may establish lifestyle and behavioral changes in order to moderate these risks and accordingly their chances of causing the diseases (Andsoy *et al.*, 2015).

Health professionals, therefore, have a responsibility to minimize the risk factors of CVD among population through education about diet, weight management, regular exercise, alcohol consumption and smoking. Primary care providers should focus on the strategies to increase knowledge among population in order to reduce risk factors of CVD (Andsoy *et al.*, 2015).

This study hopes to identify the knowledge and preventive practices regarding risk factors of CVDs among rural population in Rubona sector, at Rwamagana District. The findings will be used to establish strategies for early detection and treatment in prevention of CVDs among rural community members.

1.3. Problem statement

The World Health Organization noted that thirty one percent of all deaths were caused by CVDs in 2012 (WHO, 2015). Another research project revealed that CVDs will be the most causes of death worldwide in 2020 (Mahajan *et al.*, 2012). Barriers to the best prevention of CVD still exist in the form of low levels of knowledge of the risk factors, lack of screening opportunities and access to follow-up care and management (Aljefree and Ahmed, 2015). Although, many rural population are unaware of their personal risk factors of CVD (Mosca *et al.*, 2004). Those factors make rural population an important

population to focus on in the fight against CVD. In East African community; the countries experience the challenge in prevention of CVDs, related to poor knowledge toward its risk factors (Reiner, Sonicki and Tedeschi-Reiner, 2012). In Rwanda, CVDs continue to increase (HMIS, 2014); and the risk factors exist in the community members (Ministry of Health Rwanda, 2015). In Rwanda, no study has been done to assess the knowledge and preventives practices of CVDs risk factors among rural population.

This study hopes to explore the knowledge and preventive practices regarding risk factors of CVDs among rural population in Rwamagana District.

1.4 .The main objective of the study

To investigate the knowledge and preventive practices regarding risk factors of CVDs among rural population in Rwamagana District.

1.5. Specific objectives

1. To assess the knowledge regarding risk factors of CVDs among community members at Rwamagana District.
2. To identify the preventive practices taken by community members at Rwamagana District in prevention of CVDs.
3. To examine the relationship between knowledge and preventive practice of CVDs risk factors among rural population at Rwamagana District.

1.6. Research questions

1. What is the knowledge regarding risk factors of CVDs among community members at Rwamagan District?
2. What are preventive practices taken by community members at Rwamagana District in prevention of CVDs?

3. What is relationship between knowledge and preventive practices regarding CVDs risk factors among rural population at Rwamagana District?

1.7. Significance of the study

The research findings would be a useful guide for improving the knowledge of CVDRFs and preventive practices in prevention of CVDs among rural population in Rwanda. It could be the data base on which other researchers can refer to while making more investigations in the same area, and can be used in advocating for better workplace support in prevention of CVDs. Specifically it could answer the gaps regarding knowledge of CVDRFs.

In addition this study could bring the improvement in preventive practices taken by the rural population in prevention of CVDs. It could add more information to the existing literature on knowledge and preventive practice in the community, and provide baseline data for large scale studies to be conducted in future in this domain. It can also help in designing strategies necessary for CVDs prevention and early detection at individual, family, groups and community level. It could help in increasing the level of knowledge about gaps that could be identified and could contribute to decrease the morbidity and mortality related to CVDs. Further the findings of the research could help in establishing policies related to knowledge and preventive practices of CVDs in Rwandan especially in rural population depending on the gaps identified to promote health.

It was the first research done in Rwanda about knowledge and preventive practice among rural population regarding CVDRFs. It could be useful in conducting other researches to explore more about knowledge, and it could contribute to education interest by providing the new knowledge about the study in our country. After

completing my research project the findings will be shared with Rwamagana district in regard to improve the populations 'knowledge by promoting the preventive practice of CVDs in similar population.

1.8. Definition of concepts

Cardiovascular disease (CVDs): According to WHO, CVDs are a condition of disorders of blood vessels and heart. (WHO, 2015).

Knowledge: The fact and condition of having information or being aware of something. <http://www.merriam-webster.com/dictionary/knowledge>. Retrieved on 28th August 2016.

Risk factors: A risk factor is exposure of an individual to a condition that increases the likelihood of developing CVDs (Awad and Al-Nafisi, 2014).

CVDRFs are defined as an aspect of personal behavior or lifestyle, an environmental exposure, an inborn or inherited characteristic that, on the basis of scientific evidence, are known to be associated with meaningful health-related condition (Porta, 2008). In this study, disease conditions are CVDs.

1.9. Subdivision of the study

Five main chapters make the study.

Chapter 1: Introduction

This is composed of the introduction, background, problem statement, the aim of the study, research objectives, research questions, significance of the study, definition of concepts, structure/organization of the study, conclusion to chapter one.

Chapter 2: Literature review

This is composed of different theories related to the current study; including knowledge regarding risk factors of CVDs and preventive practices taken by rural community members in prevention of CVD.

Chapter 3: Methodology

This is composed of the description and the process of the study including, introduction, research design, research approach, research settings, population, sampling, data collection, data analysis, ethical consideration, data management, data dissemination, limitations and challenges and conclusion to the chapter.

Chapter 4: Results

This chapter includes the presentation of results related to socio-demographic characteristics of the study population; knowledge regarding risk factors, preventive practices regarding CVDs, and relationship between knowledge and practice among participants.

Chapter 5: Discussion

This chapter includes presentation of findings as aligned with objectives.

Chapter 6: Summary, conclusions and recommendations

This chapter include summary of findings in accordance with objectives, interpretation and conclusions including recommendations and limitations. The pages following pages contain references and appendices such as ethical clearance letters from IRB and from study areas, certificate, consent form, questionnaire and ethics.

CHAPTER 2. LITERATURE REVIEW

2.1. Introduction

The aim of the literature review is to provide the author of the current studies with an overview of the ideas, and significant literature currently published similar to the topic under search. This chapter talks about cardiovascular diseases risk factors, the knowledge and preventive practice regarding risk factors of cardiovascular diseases, importance of knowledge, challenge to preventive practice related to cardiovascular diseases, prevention and control of CVDs. Pub Med, Google scholar and HINARI were used to look for information related to objectives of current study. Different key words were used like, NCD, CVD, CVD RFs, knowledge, preventive practices, rural population. Most of articles used were published from 2012-2016.

A review of the literature was presented with a focus on epidemiology, risk factors and preventive practices in prevention of CVD among rural population.

2.2. Empirical literature review

2.2.1. Knowledge and preventive practice regarding CVDs risk factors

The study done by Reiner, poor knowledge toward risk factors of cardiovascular diseases, has been noted to be challenging in prevention of CVD (Reiner, Sonicki and Tedeschi-Reiner, 2012, p.8). A study done in Iranian among population shown that the public knowledge of CVD has increased; however significant gaps continue to exist (Alhossaini *et al.*, 2016, p.1).

Another study done in Kalantan, Malaysia on risk factors of CVD revealed that knowledge of 55.6% of respondents still limited and need a support from health care providers (Yahya, Muhamad and Yusoff, 2012, p. 1); (Boo *et al.*, 2017); (Salahshoori *et al.*, 2015).

In Nigeria, the study have shown that knowledge regarding risk factors of heart diseases is low among University workers. The study revealed that 19.9% of all participant has good knowledge about risk factors of heart diseases, while 49.0% had poor knowledge (Akintunde, Akintunde and Opadijo, 2015). Another study done on Knowledge, attitude and practice on risk factors of cardiovascular diseases at Malaysian, public university students found that, the levels of knowledge were quite high, but it conveys no relation to the level of attitude (Ibrahim *et al.*, 2016); (Noor Hassim *et al.*, 2016). This study used a stratified random sampling method. However, appropriate knowledge about CVD risk factors among individuals, will help them to decrease the risk factors seeing that the majority are modifiable (WHO, 2014a). The study done in Turkey's revealed that CVDs continue to be a leading cause of death for Turkish people. This study confirmed that individuals who recognize themselves to have a high risk of developing CVD, may establish lifestyle in order to moderate these risks and accordingly their chances of causing the diseases (Andsoy *et al.*, 2015, p. 8).

The study done in Malaysia showed that participants in rural area generally have higher CVD risk compared to urban populations due to ageing, lower educational status and unhealthy diet. The author concluded that rural population must be considered for focused preventive actions especially strengthening of community based program and healthcare resource allocation (Noor Hassim *et al.*, 2016, p.6). Another study done in rural community in West Bengal, India showed that that 52.53% population have high BP, 45.58% have high triglyceride (TG), 23.14% have high fasting blood glucose, 11.22% have high total cholesterol, and 11.62% have low high-density lipoprotein. The present study showed that prevalence of CVD risk factors is considerably high in the study population and reasonable early intervention is needed (Nag and Ghosh, 2015, p. 1)

2.2.2. Importance of knowledge about cardiovascular diseases risk factors

Appropriate knowledge about CVDs risk factors among individuals, will help to motivate them to take action to protect themselves from the risk factors (WHO, 2014). The study done in Kuwait showed that knowledge about CVD and its modifiable risk factors were vital conditions to change the individuals' health attitudes, behaviors and lifestyle practices. Good knowledge about CVD risk factors among individuals will aid them to be proactive in decreasing their risk since the majority of the risk factors are modifiable (Awad and Al-Nafisi, 2014, p. 2).

According to (Meena *et al.*, 2015, p. 1) poor knowledge of CVDRFs was seen among study participants with less than half of subjects identifying family history (24%), tobacco and alcohol intake (48%, 47%), and so forth as risk factors for CVDs. High burden of risk factors, such as high salt intake (35%), inadequate physical activity (77%), and raised blood sugar (5%) and poor health-seeking behavior were observed.

The study survey conducted in Rwanda in 2012-2013 found that only 21.4% were engaged in low level of activity; 23.5% were engaged in alcohol drinking, obesity were 22.3% , 16.1% were overweight and 12.9% were tobacco use (Ministry of Health Rwanda, 2015). Therefore, that risk factors can be reduced by implementing appropriate intervention measures (Andsoy *et al.*, 2015).

2.2.3. Challenge to preventive practices related to cardiovascular diseases

Positive changes in CVDRFs such as smoking cessation and insistent treatment of metabolic CVDRFs. Three very cost-effective interventions in primary care are tobacco control, salt reduction and a multidrug strategy to treat people who are at high CVD risk. However, inadequate healthcare resources, insufficient access to healthcare services and political failure are main barriers to widely implementing these established cost-effective interventions in the primary healthcare system (Clinical and Perspectives, 2012, p. 17).

The study done in rural Australia revealed that people in rural encounter a range of challenges around participation in cardiac rehabilitation programs which is associated with travel to sites from which these programs are run. Such programs are important in reducing the morbidity and mortality associated with cardiovascular disease, as well as reducing the risk factors of CVDs (Foundation, 2015, p. 2).

2.3. Critical review and research gap identification

The study done by (Andsoy *et al.*, 2015) confirmed that individuals who recognize themselves to have a high risk of developing CVD, may establish lifestyle in order to moderate these risks factors and accordingly their chances of causing the diseases (Andsoy *et al.*, 2015).

The researcher does not show specific strategic used to prevent CVD RFs.

The study done by (Alhossaini *et al.*, 2016) in Iranian among population shows that the public knowledge of CVD has increased; however significant gaps continue to exist (Alhossaini *et al.*, 2016). The author used term gap which does not seem to be specific to show at which level participants need to perform their knowledge about CVDs. The author also doesn't mentioned alcohol consumption and age as RFs of CVD.

2.3.1. Cardiovascular disease risk factors

Epidemiologic studies have found strong correlations between certain physiologic characteristics, lifestyle behaviors, and the development of CVD (Mendis S., Puska P., 2011). These characteristics and behaviors have been coined "risk factors." A risk factor is defined as, an aspect of personal behavior or lifestyle, an environmental exposure, or an inborn or inherited characteristic that, on the basis of scientific evidence, is known to be associated with meaningful health-related condition(s) (Porta, 2008, p. 218). Some CVD factors are non-modifiable and some or modifiable. Non-modifiable risk factors include

advanced age, male gender, menopause, and family history. Aging is associated with a decrease in endothelium repair and increase in vulnerability to endothelial injury that can lead to atherosclerosis. Genetics and shared environmental exposures and lifestyles contribute to the familial impact on Atherosclerosis (Nag and Ghosh, 2015, p. 4).

Modifiable risk factors are factors that we can alter by intervention and consequently reduce the probability of occurrence of disease (Porta, 2008). Modifiable CVD risk factors include cigarette smoking, physical inactivity, unhealthy diet, harmful use of alcohol, obesity, HTN, dyslipidemia, diabetes, and stress (Mendis et al., 2011). Cigarette smoking, physical inactivity, unhealthy diet, and harmful use of alcohol are estimated to be responsible for about 80% of CHD and stroke cases worldwide (Who, 2012). Hypertension, dyslipidemia, diabetes or elevated blood sugars, and obesity are often manifestations of sedentary lifestyle and unhealthy diet and are also referred to as metabolic CVD risk factors.

The study done in India showed that the prevalence of CVD risk factors is gradually increasing in the rural population of India and represents a public health concern. It seems reasonable to fall out that environment is irrespective for increasing the CVD risk factors (Nag and Ghosh, 2015, p. 4).

Independent variables and dependent variables

Independents variables: Knowledge regarding CVDs risk factors.

Dependents variables: Are all preventive practices taken by the population in prevention of CVDs.

2.4. Theoretical literature review

2.4.1. Cardiovascular disease a growing epidemic of non communicable disease.

Non communicable diseases are a global health issue worldwide. CVDs exist worldwide and are most common causes of morbidity and mortality (Andsoy *et al.*, 2015). CVDs are the different diseases affecting heart and vessels (WHO, 2015); (Fahs *et al.*, 2017). Cardiovascular diseases are the leading cause of morbidity and mortality worldwide (Andsoy *et al.*, 2015); (Yadav K.D, 2012); (Aljefree and Ahmed, 2015); (WHO, 2015) In 2008, out of 17.3 million CVD deaths globally, 7.3 million died from heart attacks and 6.2 million from strokes (Aljefree and Ahmed, 2015). A big number of 16 million people died under 70 years old due to NCDs, 82% from in low and middle income countries, 37% are caused by CVDs (WHO, 2015). According to the research, 82% of all deaths are in low and middle income countries, CVDs have a high percentage of 37% (WHO, 2015).

The study showed that CVDs are the first cause of death globally (WHO, 2015). CVD are considered to be a major barrier to effective responses to the country development (WHO, 2015). According to the study in 2012, 7.4 million deaths due to ischemic heart disease, with 158 deaths per million in high-income countries and 107 per million in upper-middle-income countries (Ammouri *et al.*, 2016). The study has projected that in the year 2020 coronary artery disease (CAD) and CVD will be the most causes of death worldwide (Mahajan *et al.*, 2012).

Cardiovascular disease in Rwanda continue to increase (HMIS, 2014). Based on Rwanda's Health Management Information Systems (HMIS 2013) from January to December 2013, the findings showed top eight causes of morbidity in district hospitals (Ministry of Health Rwanda, 2015). In 2013 in Rwanda, the causes of Non-Communicable Disease cases treated in all health facilities, were 4% of CVD, Diabetes 1%, and cancer 1% (HMIS,

2014). Total death caused by CVDs was 13% in 2014 regarding all age and both sexes (WHO, 2014a). NCDs accounted for at least 51.86% of all District Hospital outpatients' consultation and 22.3% of District Hospital hospitalization (Ministry of Health Rwanda, 2015).

2.4.2. Potential risk factors of cardiovascular diseases among rural population.

Modifiable risk factors are factors that are modifiable, consequently reduce the probability of occurrence of disease (Porta, 2008, p.218). Several factors have been identified to influence CVDs among community members. These include high blood pressure, nutrition, physical inactivity, smoking, diabetes, harmful use of alcohol, stress, and obesity has increased (Alhossaini *et al.*, 2016).

Non-modifiable risk factors include advanced age, gender, and family history (Alhossaini *et al.*, 2016). In Filipino Americans, heart disease is the leading cause of death: the findings of the study have showed that the risk factors among them were: hypertension with (47.7%), diabetes (14%), overweight (36.7%), abdominal obesity (80.6%), smoking (11.7%), and lack of exercise (48%) (Angosta and Speck, 2014); (Noor Hassim *et al.*, 2016).

Another study done in 2012-2013 revealed that risk factors for NCDs in Rwanda, are tobacco use with 12.9%, unhealthy diet, only 0.3% of fruit consumption per day; 0.9% they eat vegetables, and 99.1% were less than 5 servings of fruits and/or vegetables; only 21.4% were engaged in low level of activity; while 23.5% were engaged in heavy episodic drinking, 41.3% were currently drinking, obesity (body mass index) 22.3%, overweight 16.1%, and 2.7% were obese (Ministry of Health Rwanda, 2015). However, risk factors of cardiovascular diseases are preventable (Andsoy *et al.*, 2015).

2.4.3. Prevention and control of cardiovascular diseases

A primary prevention approach have been implemented in many countries; however, a key aspect affecting the success of this method, is the knowledge of the individuals at risk regarding a specific health problem (Mustaqeem *et al.*, 2015). In sub-Saharan Africa, NCDs have traditionally not been given high priority (Bass *et al.*, 2014). The research has shown that individuals who recognize themselves to have a high risk of developing CVDs, may establish lifestyle and behavioral changes in order to moderate these risks and accordingly their chances of causing the diseases (Andsoy *et al.*, 2015); (Sharma *et al.*, 2015);

In addition, cessation of tobacco use, adequate nutrition, regular physical activity and avoiding harmful use of alcohol have been showed to reduce risk of cardiovascular disease (WHO, 2015). Regarding the prevalence of morbidity and mortality related to CVD, there is a need to increase the public knowledge regarding the risk factors of CVDs by education programs on different lifestyles (Aljefree and Ahmed, 2015). Health professionals, therefore, have a responsibility to minimize the risk factors of CVD by increasing knowledge and practices among population, seeing that population's knowledge motivates them to increase prevention (Andsoy *et al.*, 2015). This study hopes to identify the knowledge and practice regarding risk factors of CVD among rural community members at Rubona sector, Rwamagana District, in Rwanda. The findings will used to establish different strategies in prevention of CVDs among rural community members in different area.

2.5. Conceptual frame work

Pender's theory: Health Promotion Model

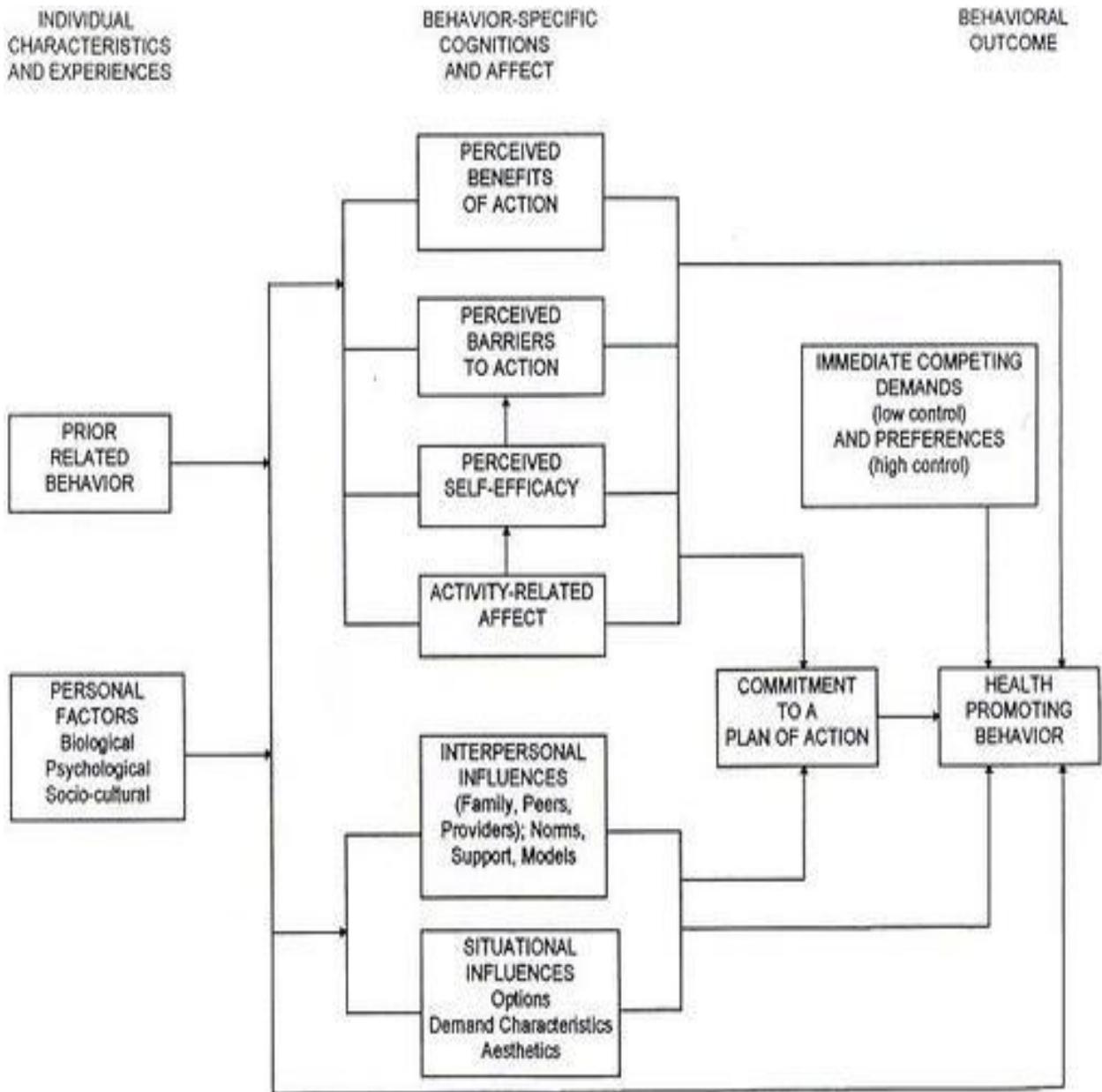
The guiding frame work used to support this study is the Health Promotion Model (HPM) (Pender, 2011, p. 5). Pender promotion model focuses on:

Personal, environment, health, nursing and illness.

This research used HPM would help to indicate certain risk factors that may influence health behavior more than others. As epidemiological evidence continues to grow, it is evident that managing modifiable CVD RFs through HPM in reducing CVD. Health promotion is central to prevent and management of CVD among rural population. According to(Pender, 2011, p. 5), health promotion is motivated by the desire to increase well being. Health promotion and primary prevention are beneficial in improving life and longevity (Pender, 2011, p. 5).

Pender's theory demonstrates that socio-economic status influence modifiable health behaviors which will influence the risk factors. The risk factors strongly influence the outcome. If primary prevention is carried out and modifies the status of modifiable health behaviors the outcome will also be different and disease burden will decrease.

Nola Pender: The Health Promotion Model



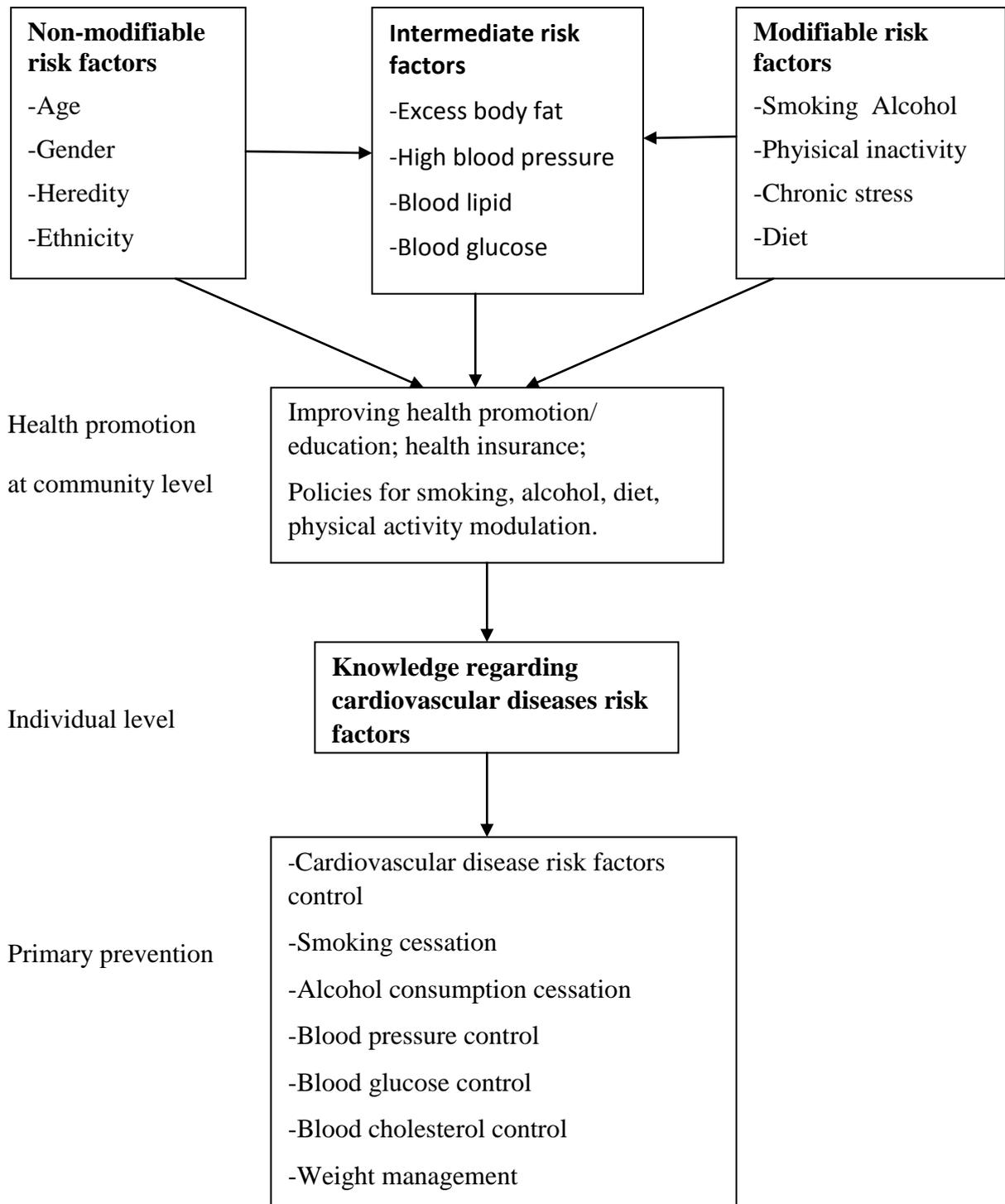
Health promotion model (Pender, N. et al, 2002).

According to Pender's HPM: personal biological factors include age, gender, body mass index.

Perceived self efficacy include: Judgment of personal capability to organize and execute a health and promoting behavior.

Interpersonal influence include: Families, peers, health care providers and norms.

Note: Out of this model, the current study focused on the following variables:



This model focuses on health promotion and is used widely in the community health setting. According to Pender, if a person perceives the benefit of an action, he or she is more likely to engage in that action. One assumption of Pender's Health Promotion Model

is that individuals have the capacity for reflective self-awareness, and they can assess their own competencies (Pender, et al., 2011). Pender's model focuses on three main areas, such as individual characteristics and risk factors; behavior-specific cognitions; and behavior outcomes (Pender, et al., 2011).

This study illustrates characteristics and risk factors that are essential to identify if there is a difference in the knowledge level and preventive practice regarding CVDRFs.

The findings will promote knowledge and self behavior outcomes, which lead to improve community health. Assessing the knowledge of cardiovascular disease risk factors among rural population, will need further evaluation in the community. Pender's model may be used to develop health promotion activities for this population. In summary, this conceptual framework was useful in exploring the knowledge and preventive practices regarding cardiovascular disease risk factors among rural population.

Conclusion

This chapter included different studies done on knowledge and preventive practice regarding CVDRFs among rural population; Key words used to search information and search engines used. It also included conceptual frame work and adapted for current study.

CHAPTER 3. METHODOLOGY

3.1. Introduction

Many research methods exist to conduct quantitative research. This chapter was highlighting the methods that were used to collect data. This chapter covers the introduction, research design, research approach, research settings, population, sampling, data collection, data analysis, ethical consideration, data management, data dissemination, limitations and challenges including conclusion to the chapter. Data collection methods and data analysis were used to respond to the specific objectives.

3.2. Research design

A descriptive, cross sectional, non-experimental design was used. This design was chosen because it provides a clear snapshot of the outcome and the characteristics associated with it at a specific point in time (Creswell, 2013). This design was used in this study because of its ability to identify and measure different aspects of the population, further research, and help in planning resource allocation. Descriptive research helped to provide answers to the questions of who, what, when and how associated with a particular research question (Creswell, 2013; Peffers *et al.*, 2007). In this study, it was intended to assess knowledge and preventive practice regarding CVDRFs risk factors among rural community members at Rubona sector, in Rwamagana District, one of the districts in Rwanda. Quantitative data were collected and analyzed.

3.3. Research approach

Quantitative research approach was used in this study. Quantitative research emphasizes objective measurements and the statistical analysis of data collected through questionnaire, and surveys, or by manipulating pre-existing statistical data using computational techniques (Ingham-broomfield, 2015). In this study, quantitative research was focused on

assessment of knowledge and preventive practices regarding risks factors of CVDs among rural population. A structured questionnaire was used.

3.4. Research setting

The study was conducted in Rwanda, Eastern Province, Rwamagana District, especially in Rubona sector. Rwanda has 30 Districts, 416 sectors, 2 146 cells and 14 837 villages (MINALOC, 2015). Rwamagana District has 14 sectors, is located in KIGABIRO sector, at 60 km from KIGALI city. It has 313 461 population. Rural population is 91, 4% of the residents population. Only 8.6 % lives in urban areas (Rwamagana District profile, 2015).

Rubona is one of the 14 sectors of Rwamagana district, is located at 18km from Rwamagana city. Is limited by Mwirire sector on the North; Munyaga and Kigabiro sectors on the East; Mugesera sector in Ngoma district on the South; Nzige and Karengwe sectors on the Western border. Rubona sector is composed by 6 cells (Kabatasi, Karambi, Kabuye, Nawe, Mabare and Byinza) and 38 villages. Rubona sector has 24 136 populations and rural population is 100%. Under 18 years old are 11 443 population, and 60 years old and above are 1 125 (Rwamagana District profile, 2015). Rubona sector has one health center and one post health.

3.5. Population

The study population included the adult community members, from Rubona sector who were aged from 18 to 65 years old.

3.5.1. Inclusion criteria

Participants were recruited from rural population of Rubona sector. People who accepted to sign a formal consent were participated in the survey.

3.5.2. Exclusion criteria

The participants who were under 18 years old and who were over than 65 years old at the time of data collection were not participated in the study. Those who were not residents of Rubona sector were also excluded. Those who refused to sign a consent form were excluded.

3.6. Sampling

3.6.1. Sampling strategy

Definition: Sampling strategy is a small part obtained from the big one sharing the same characters for being focused on the study (Burns and Grove, 2005).

In this study, all people with inclusion criteria were eligible to participate. The researcher has chosen this method because of its advantages that include its ability to focus on relevant subjects from whom accurate information is expected, and less costs in terms of time and finance (Ingham-broomfield, 2015). During sampling strategy, multistage sampling method was used.

The researcher after numbering each village from 3 cells of Rubona sector into a small bolus, the researcher chosen 4 villages from Kabatasi, 2 villages from Karambi and 2 villages from Kabuye cells. Eight villages selected from those 3 cells, the researcher selected 40 household by each village according to the number of household. The interval was 4th household for each village.

3.6.2. Sample size

Taro Yamane (Yamane, 1973) formula was taken into used.

Confidence level of 95% and 5% sampling error was considered. This formula was used

for get the samples from local residents
$$n = \frac{N}{1+N(\epsilon^2)} \quad (\text{Yamane, 1973}).$$

According to this formula, the sample size will be selected randomly from eligible population.

n - The sample size

N - The population size

e - The acceptable sampling error 0.05

95% confidence level

Total eligible population= 12,568 (Rwamagana District profile, 2015).

According to the Yamane formula, Sample size was

$$n=12,568/1+12,568*(0.05)^2$$

$$n=12,568/1+12,568*0.0025$$

$$n=12,568/32.42$$

$$n=387.66$$

$$n=388 \quad \text{Sample size was 388 participants}$$

3.7. Data Collection

3.7.1. Data Collection instruments

The data collection tool may include questionnaire, interview and observation. Before using the instrument, the researcher make certain that the instrument chosen is valid and reliable (Annum, 2016). For this study, basing on the literature review, the study questionnaire from an another author, after receiving his permission, the tool was tested for reliability and validity basing on objectives and research questions of current study. The questionnaire was been made of open and closed ended questions (Annum, 2016).

The section A: included items to provide information about demographic and health status of the respondents (age, gender, marital status, educational level, employment, personal

health, height, weight, smoking status, alcohol use, physical exercises, healthy food, lifestyle, and family history of CVD).

The section B: consisted of questions to provide information about knowledge of participants regarding risk factors of CVDs.

The section C: was included the questions to determine preventive practices in prevention of CVDs.

3.7.1.1. Validity and reliability of Questionnaire

Before conducting the study, a questionnaire from original author was modified according to the objectives, research questions and the target population. This was achieved through a pre-test on 38 participants (10%) of sample size in the community, and the questionnaire was modified according to the results from the **pilot study**. Some questions about knowledge were retrieved and others modified. The research tested the questionnaire using SPSS version 21. The questions on knowledge had Cronbarch's Alpha .753, questions on practices had Cronbarch's Alpha .728; the validity of questionnaire was Cronbarch's Alpha .797 which is accepted to be used.

3.7.1.2. Training of research assistants

The research assistants selected from the students nurses were trained for one day on instruments, consent form, community data collection and how to administer the questionnaire to the participants.

3.7.2. Data collection procedure

After receiving the ethical clearance from IRB and UR/CMHS administration and permission from Mayor of Rwamagana District, the researcher was introduced to the local leaders from sector level to the villages. After contacting the local leaders, after receiving their permission, the researcher started the real data collection with 10 research assistants.

The participants were free to participate in the study. A systematic explanation was given to the participants about the purpose of the study, main objectives and significance of the study, to obtain written consent from participants. The questionnaire was developed in English and translated in Kinyarwanda by the researcher, because this is the local language that was commonly used by the target population.

Those who were agree to take part in the study received explanation of the research purpose, objectives and the process including the potential risks and their rights in their participation in the study. They were received a written consent form from the researcher, to participate in the study. After collecting all consent forms, the researcher dispensed the questionnaires to the participants, which were completed anonymously and collected after completion (Ingham-broomfield, 2015). They were assured of confidentiality. The participants' names were not mentioned. The data was collected via self-administered questionnaire. The researcher in collaboration with local administrators and community health workers (CHWs) met the community members at their home.

During data collection some of the participants received the questionnaire; others who didn't know to read were helped by author and research assistants. Those research assistants were grouped into 3 groups in order to work as a team and to encourage each other. The strategy used was household. The researcher contacted on phone the local leaders before to meet the participants at their home. Every day the researcher collected the answer from participants and kept them in secured area.

After data collection, the questionnaire was kept in a safe area waiting the right time for data analysis. After data analysis, the copies will be kept for 5 years.

3.8. Data analysis.

After collecting data, the questionnaires were organized and data cleaned by the researcher to ensure that only those completed are used. The questionnaire in Kinyarwanda were translated back to English for easy analysis and information was analyzed using SPSS version 21 in tables and percentage. The code was been used in order to assure confidentiality. A summary of responses for each question about demographics, health status, knowledge regarding risk factors of CVD and preventive practices in prevention of CVD was done by the researcher.

The P value of 0.05 or less was considered significant, SPSS version 21 was used to analyze data using inferential statistics like chi-square thereafter, tables, graphs and diagrams were used to present data. The data were statistically analyzed with the assistance of a statistician. Descriptive statistics such as the frequency, percentage and mean was used to analyze data about knowledge and preventive practices regarding risk factors of CVDs. Inferential statistics specifically Pearson's correlation test was used to examine the relationship between knowledge and preventive practices regarding CVDRFs.

3.9. Ethical considerations

The ethical clearance to carry out the study was granted by Institutional Review Board (IRB) and University of Rwanda/ College of Medicine and Health Sciences (UR/CMHS) administration that have introduced the researcher to the authorities of Rwamagana District. After obtaining permission from Rwamagana District, the researcher was introduced herself to the local leaders, who have given a permission to conduct the study among population. Participation in the study was voluntary. Those who were agreeing to take part in the study received a written consent form from the researcher, to participate in the study. All information collected from the research were been confidential and were used for study purposes only. To ensure confidentiality each participant received his

completed questionnaire and consent form. Participants' names doesn't mentioned on study questionnaire. The researcher have used a password for saving the data in laptop, the hard copies were also kept. If any complaints, those copies will be available for that issue only.

3.10. Data management

At the end of the day data collected were entered and stored in the computer that had password to secure information collected from participants. Data entry and data manipulation were highly checked for regular errors until the researcher finished doing analysis and reporting the finds. Data collected during this study were stored as soft copy in the lap top and on the flash disk, and hard copies were archived in the safe area well locked during 5 years then after they will be burnt.

3.11. Data Dissemination

The researcher will develop a plan to disseminate data. Data will be disseminated through presentation of findings in College of Medicine and Health Sciences, the findings will also be disseminated at Rwamagana district. Data will be disseminated also in different conferences and seminars. Data will be also published. The researcher will describe the ways of communication in order to describe how the results will be used in implementation of CVDs prevention among community members in Rwamagana district (WHO, 2014).

3.12. Limitation and challenges

This study used a self administered questionnaire, has its limitations.

Another limitation of the study is cross sectional nature of data, that are collected in one point of time and don't reflect any change among participants about knowledge regarding CVDs risk factors. The information from participants is not an indication for population's

health. There is a need of another study for screening and follow up. Rubona sector is allocated in rural area, at 18 km from Rwamagana District. During the raining season, the researcher and research assistant were unable to conduct data collection. Another challenge was that in the morning, most participants were not at home.

Conclusion

This study used quantitative, cross sectional design. One district was chosen, one sector from this district was chosen. The data collection was done using structured questionnaire which was translated into Kinyarwanda to make it understandable and participants were given the information about ethical concern. Then the data was entered into computer where the regular checking of error was performed and computer was protected using password. Moreover the data analysis was performed by using descriptive statistics and parametrical test was used to compare knowledge and preventive practices regarding CVDRFs. The data will be disseminated through conferences and data will be published.

CHAPTER 4. RESULTS

4.1. Introduction

In this chapter, the findings of the study are summarized in form of frequency, percentage, mean and standard deviation; tables and graphs are organized by socio-demographic characteristics, health status of participants and objectives related to knowledge and preventive practices taken by rural population in prevention of cardiovascular disease risk factors.

4.2. Results

Referring to the table 1. The majorities 231(59.5%) of the participants were female and the rest were male. The table shows also that the study participants were aged between 18 to 65 years old. Majority 24.7% of the respondents belonged to age group 26-35 years, 23.7% of the respondents were of age group 18-25 years, with lowest of the participants having their ages between 56-65 years old 12.1%.

Regarding educational level of the participants, the results showed that the majority 203 (52.3%) have primary level, while 79 (20.4%) have secondary level and those with university level were 19 (4.9%). No formal educations were 87 (22.4%). Regarding current professional, most of participants 277 (71.4%) were farming, 32 (8.2%) were students, 29 (7.5%) reported self employed, 18 (4.6%) were professional while 32 (8.2%) were unemployed.

About the marital status, majority were married 234(60.3%), 94(24.2%) were single, widower 34 (8.8%) and 20 (5.2%) are separated while 6(1.5%) were divorced.

Table 1. Demographic characteristics of participants**n=388**

Demographic characteristics	Frequency	Percentage (%)
Age		
18-25	92	23.7
26-35	96	24.7
36-45	63	16.2
46-55	90	23.2
56-65	47	12.1
Gender		
Male	157	40.5
Female	231	59.5
Educational level (n=388)		
No formal education	87	22.4
Primary	203	52.3
Secondary	79	20.4
University/college	19	4.9
Current professional (n=388)		
Unemployed	32	8.2
Farming	277	71.4
Student	32	8.2
Professional	18	4.6
Self employed	29	7.5
Marital status (n=388)		
Married	234	60.3
Single	94	24.2
Divorced	6	1.5
Separated	20	5.2
Widower	34	8.8

Table 2. Distribution of participants according to health status.

n=388

Health status characteristics	Frequency	Percentage (%)
Awareness of having any disease conditions		
Yes	98	25.3
No	290	74.7
Disease condition as identified by participants		
Don't have any disease	290	74.7
Diabetes	14	3.6
High blood pressure	39	10.1
Heart disease	4	1.0
Kidney disease	23	5.9
Arthritis	11	2.8
Gastritis	7	1.8
Taking medication for the disease condition as identified by participants		
Yes	55	14.2
No	43	11.1
I don't have any disease condition	290	74.7
The raison for not taking medication for the disease condition as identified by participants		
		n=43
No insurance to go to the Health center/Hospital	7	16.2%
I don't feel very sick	14	32.55%
I take traditional medicine	21	48.8%
Family history of cardiovascular disease self reported by participants		
Yes	53	13.7
No	335	86.3

Table .2. below shows health status of participants, the majority of 290 (74.7%) reported being healthy, 98 (25.3%) reported having any disease conditions. Among them 39 (10.1%) of total participants had self reported blood pressure, 23 (5.9%) had kidney disease, 14 (3.6%) of the respondents had diabetes, 4 (1.0%) had self reported heart disease, while 11 (2.8%) reported arthritis and 7 (1.8%) had gastritis. Among those who reported having any disease conditions, 55 (14%) of participants reported taking medications for the disease, while 43(11.1%) didn't take medications.

The reason for not taking medications for any disease condition, 21 (48.8%%) of the 43 participants take traditional medicine; 14 (32.55%) of participants who had chronic disease didn't take medication because they didn't feel very sick, while 7 (116.2%) didn't have health insurance at the time of data collection. Among 388 respondents, 13.7% of the respondents had family history of cardiovascular diseases.

Table 3. Presence of palpitation, chronic headache, swelling around ankles and breathlessness or fail to lie flat among participants in the past 4 weeks.

N=388

Variables		Frequency	Percentage %
Palpitation	Yes	134	34.5
	No	254	65.5
Chronic headache	Yes	87	22.4
	No	301	77.6
Swelling around ankles	Yes	58	14.9
	No	330	85.1
Breathlessness or fail to lie flat	Yes	42	10.8
	No	346	89.2

Results in table 3. showed that among 388 participants, 34.5% had self reported palpitation in the past 4 weeks, 22.4% of the respondents had self reported chronic headache, 14.9%

of the respondents had swelling around ankles and 10.8% had breathlessness or fail to lie flat. From this table, it can be seen that there is a need for another study for screening among this population.

**Table 4. Weight and height as identified by the participants
n=388**

Height category as identified by participants	Frequency	Percentage %
150-160cm	26	6.7
161-170cm	39	10.1
171-187cm	8	2.1
Total	73	18.8
Missing System	315	81.2
Weight category as identified by participants		
42-52kg	26	6.7
53-62kg	70	18.0
63-72kg	78	20.1
73-85kg	17	4.4
Total	191	49.2
Missing System	197	50.8

The results of this table regarding the height and weight of the participants, showed that the majority 315(81.2%) didn't know their height and 197(49%) didn't know their weight. Missing system in this table showed that the majority of participants didn't know their weight /height. The results of this table illustrated that weight management of participants is poor.

Table 5. Knowledge of participants regarding cardiovascular disease risk factors

n=388

Variables	Yes		No/I don't know	
	Frequency	Percentage %	Frequency	Percentage %
Diabetes is a risk factor for developing CVDs	171	44.1	217	55.9
High blood pressure is a risk factor for CDs	284	73.2	104	26.8
Smoking is a risk factors for CVDs	220	56.7	168	43.3
Being overweight increase a person's risk for CVDs	197	50.8	191	49.2
Excessive alcohol consumption is a risk for CVDs	148	38.1	240	61.9
Excessive stress increase a person's risk for developing CVDs	198	51.0	190	49.0
Physical inactivity will increase a person's risk of CVDs	85	21.9	303	78.1
Unhealthy diet such as fatty food consumption and excessive table salt consumption increase risk of CVDs	112	28.9	276	71.1
Family history is a risk of CVDs	48	12.4	340	87.6
High blood cholesterol is a risk factor CVDs	71	18.3	317	81.7
Walking is considered exercise that will help lower a person's chance to develop CVDs	84	21.6	304	78.4
If a person stop smoking will decrease their risk for developing CVDs	73	18.8	315	81.2
Increasing age is a risk factor for CVDs	73	18.8	315	81.2
Regular blood pressure control will reduce a person's risk for CVDs	76	19.6	312	80.4

Among 388 respondents, majority of them 284(73.2%) knew that high blood pressure is a risk factor of CVDs, 56.7% of the respondents knew smoking as a risk factor of CVDs, 51.0% of the respondents knew that excessive stress is a risk factor of CVDs, 50.8% of the participants knew being overweight as a risk factor for CVDs while only 44.1% of the respondents knew that diabetes is a risk factor for CVDs.

Among total respondents, 87.6% didn't know family history of CVDs as a risk factor for CVDs, only 12.4% of the participants knew family history as a risk factor for CVDs. Regarding high blood cholesterol, 81.7% of the respondents didn't know cholesterol as a risk factor of CVDs, 78.1% didn't know physical inactivity as a risk factor for CVDs, 71.1% of participants didn't know that excessive fatty food consumption and excessive table salts consumption increase risk for CVDs, 61.9% didn't know excessive alcohol consumption as a risk factor for CVDs and 55.9% said that diabetes is not a risk factor for CVDs. Regarding increasing age, 81.2% of participants didn't know increasing age is a risk factor of developing CVDs, only 18.8% knew increasing age as a risk factor for CVDs. Likewise 80.4% of the respondents didn't know that regular blood pressure control will decrease a person's risk for CVDs.

Among various risk factors, most mentioned risk factor by the respondents was high blood pressure, followed by smoking and excessive stress while least mentioned risk factor was family history of CVDs.

Table 6. Level of knowledge regarding risk factors of CVDs.

Total knowledge level	Frequency	Percentage %
Excellent knowledge on risk factors of cardiovascular disease	19	4.9
Moderate knowledge on risk factors of cardiovascular disease	36	9.3
Poor knowledge on cardiovascular diseases risk factors	333	85.8

The level of knowledge was calculated from 14 items about knowledge of participants regarding cardiovascular disease risk factors. The poor knowledge level was categorized between 0-8.4 (0-59.99%), the moderate level categorized between 8.54-11.2 (60%-79.99%) of knowledge represents the respondents who were able to answer correctly on 8-11 questions among 14, while 11.34- 14 (80%-100%) were categorized as high level of knowledge who were able to answer correctly 11-14 questions among 14. The results showed poor knowledge regarding CVDRFs among participants.

Figure 1. Knowledge regarding cardiovascular disease risk factors, as identified by participants n=388

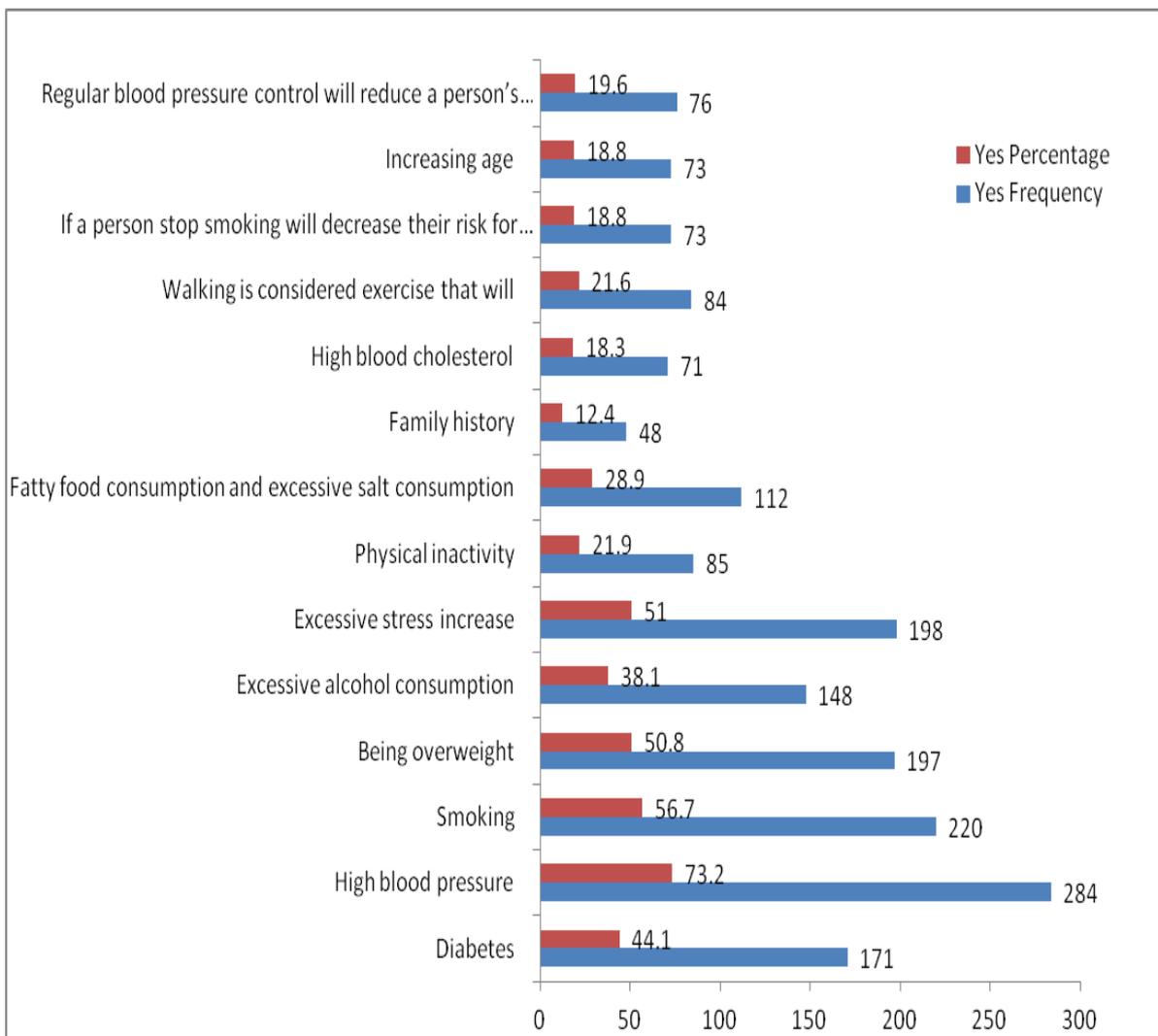


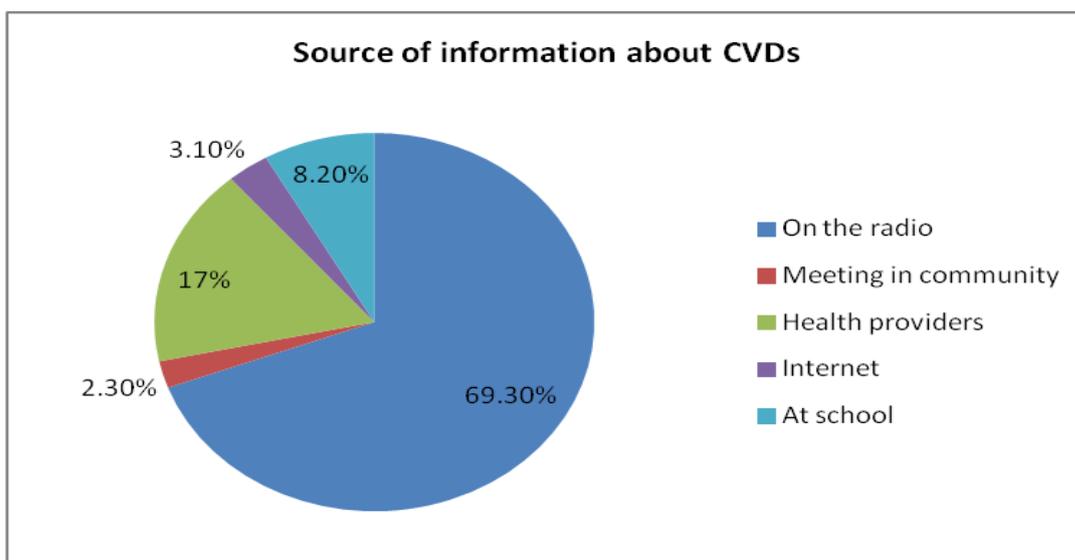
Fig.1.Regarding this figure, the participants were asked to give an appropriate answer. Knowledge regarding cardiovascular disease risk factors was assessed as a variable. The most common risk factor identified by the participants was high blood pressure 284 (73.2%) followed by smoking 220(56.7%), excessive stress 198(51.0%) and excessive alcohol consumption 148(38.1%). Among 388 participants, only 12.4% knew family history as risk factors of CVDs and 71(18.3%) knew high cholesterol as a risk factor of cardiovascular disease. The mean score for CVDs identified by participants was 4.74 out of possible 14. Standard deviation score for CVDs risk factors identified by the participants was (2.99).

Table 7. Total knowledge score

Mean	4.7423
Median	4.0000
Std. Deviation	2.99449

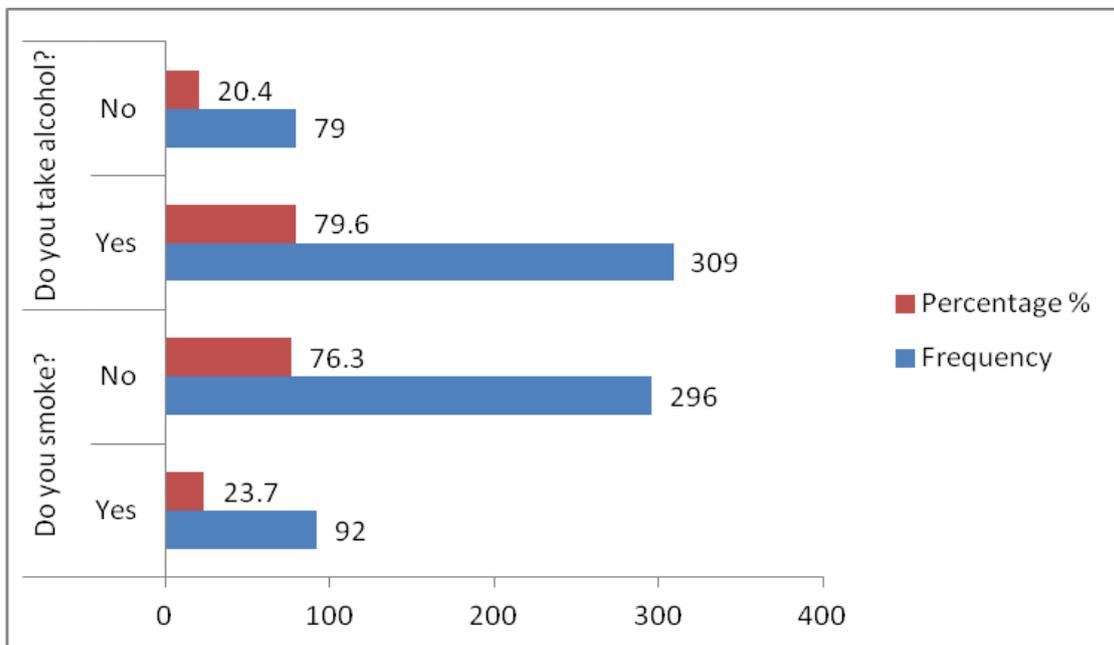
Table 4.7. From this table, it can see that total knowledge of participants regarding CVDRFs is very low. The mean is 4.7423; median 4.000 and standard deviation is 2.99449 .

Figure 2. Source of information regarding risk factors as identified by participants



Over half of the participants reported hearing about cardiovascular disease risk factors. The findings from this study highlighted that majority of participants 269(69.3%) get information about risk factors of CVDs from the radio, 66(17.0%) get information from health care professional, 32(8.2%) get information about CVDs at school while 12(3.1%) only get information from internet and the minimum 9(2.3%) get information during the meeting in community. The results showed that majority of participants get information from the radio.

Figure 3. Smoking habit and alcohol consumption as identified by the participants. (n=388)



From this figure below, the data presented illustrated that majority of participants 309(79.6%) were alcohol drinkers; while 92(23.7%) had smoking habit, only 20.4% said that they didn't take alcohol. The study showed that alcohol consumption was very high among this population.

Table 8. Physical activities in prevention of CVDs as identified by participants

n=388

Physical activity	Time /week	Frequency	Percentage %
Walk for exercise	None	234	60.3
	Less than 30 min /week	95	24.5
	30-60 min/week	36	9.3
	1-3 hours /week	14	3.6
	More than 3 hours /week	9	2.3
Bicycling	None	329	84.8
	Less than 30 min /week	39	10.1
	30-60 min/week	9	2.3
	1-3 hours /week	6	1.5
	More than 3 hours /week	5	1.3
Running	None	330	85.1
	Less than 30 min /week	33	8.5
	30-60 min/week	14	3.6
	1-3 hours /week	8	2.1
	More than 3 hours /week	3	.8
Playing (Foot ball/ volley ball/ basket ball)	None	316	81.4
	Less than 30 min /week	40	10.3
	30-60 min/week	19	4.9
	1-3 hours /week	7	1.8
	More than 3 hours /week	6	1.5

Concerning the results below regarding physical activity of participants, the majority didn't engage in physical exercises. Regarding the type of exercise done by the participants at least 30 minutes of exercise by week, 24.5% were involved in walking, running was done by 8.5% of participants, 10.3% were involved in playing of (football/ volley ball/ basket ball), 10.1% were involved in bicycling. Majority of the participants

84.8% were not involved in bicycling, 81.4% of participants were not involved in playing (foot ball/volley ball/basket ball) and 60.3% of participants were not involved in walking.

Table 9. Diet practice among participants in prevention of cardiovascular disease

n=388

Variable/ Diet practice	By week	Frequency	Percentage %
Eating cooking oil	Every day	257	66.2
	Not every day	127	32.7
	Never	4	1.0
Eating vegetables	Not every day	182	46.9
	Every day	206	53.1
Eating fruits	Never	257	66.2
	Not every day	108	27.8
	Every day	23	5.9
Eating excessive table salt in food	Every day	103	26.5
	Not every day	115	29.6
	Never	170	43.8

The results of this table below showed participants 'responses to the diet practice in prevention of cardiovascular disease. Majority 66.2% of the respondents eat cooking oil every day, 53,1% eat vegetables every day, 26.5 % of participants use excessive table salt every day while only 5.9% eat fruits every day. Comparing these results to the minimum recommended intake, all of the respondents did not consume adequate amount of fruits and vegetables per day.

**Table 10 .Monitoring and screening among participants in prevention of CVDs
n=388**

Last time	Blood pressure		Blood glucose		Body weight		Blood cholesterol	
	Frequency	%	Frequency	%	Frequency	%	Frequency	%
Never	258	66.5	350	90.2	180	46.4	384	99.0
More than one year	65	16.8	21	5.4	81	20.9	3	.8
Within the last 6 months	21	5.4	8	2.1	57	14.7	1	.3
Within the last 3 months	44	11.3	9	2.3	70	18.0	.00	.00

The results from this table below showed participants' responses to their screening practice in prevention of cardiovascular disease. Majority of them were not engaged in health monitoring. Regarding health monitoring, 99.0% reported not to have blood cholesterol monitoring, 90.2% reported never blood glucose screening, 66.5% didn't blood pressure monitoring. These results showed that most of participants are not engaged in health monitoring.

**Table 11. Last time for check up as identified by the participants
n=388**

Last time for check up	Frequency	Percentage %
Never	233	60.1
This year 2017	32	8.2
Last year 2016	32	8.2
Over 2 years	65	16.8
Cannot remember	26	6.7

The results from this table illustrate the proportion of respondents about their last time visited health facility or hospital for check up. The table 4. the results showed that 34.5%

had self reported palpitation in the past 4 weeks, 22.4% of the respondents had self reported chronic headache, 14.9% had swelling around ankles and 10.8% had breathlessness or fail to lie flat. The results of this table 11. only 8.2% have visited a clinic for check up.

Most of participants 16.8% have visited a clinic for check up over 2 years ago and 6.7% of participants cannot remember having attended a health facility for check up. The majority 60.1% of participants have never visited a clinic for check up. Regarding within 3 months, less 11.3% have performed test for blood pressure, 2.3% have performed test for blood glucose level, 18.0% have performed body weight and no one have performed for blood cholesterol. Among 388 participants 99.0% have never performed test for blood cholesterol, 90.2% of participants have never performed test for blood glucose, 66.5% have never performed blood pressure and 46.4% have never performed body weight.

Table 12. Level of practice among participants in prevention of CVDs n=388

Practice level	Frequency	Percentage %
Moderate practice level	5	1.3
Poor practice level	383	98.7

The above table illustrates the proportion of respondents about practice level. Majority 98.7% had poor practice level while only 1.3% had moderate practice. The practice score of 388 respondents revealed that mean practice score =8.7191 and Std.Deviation =5.31158.

Table 13. Association between practice, socio-demographic and health status of participants.

Demographic and health status	Asymp.sig	Pearson correlation	Chi-square	Significance
		Beta		P value
Age	.000	-250**	38.325	0.01
Gender	.209	-144**	1.577	0.01
Education level	.000	.499**	99.866	0.01
Current professional	.000	.430**	78.501	0.01
Marital status	.000	.043	48.334	
Awareness of having any disease condition	.113	-56	12.295	
Family history	.819	-008		

According to the results above there is association between practice and four variables such as educational level, professional, age, and marital status. The findings showed association between level of education and practice with significant level of 0.01. There was no association between having any disease condition; family history and preventive practice.

Table 14. Association between knowledge and socio-demographic status of participants

Variable	Grouping variables	Test used	Asymp. Sg	Z	df	Chi-square
Total knowledge	Age	Kruskall Wallis test	.000	-	4	35.960
	Gender	Mann-Whitney U	.027	-2.218	-	-
	Educational level	Kruskall Wallis test	.000	-	3	202.614
	Professional	Kruskall Wallis test	.000	-	4	180.675
	Marital status	Kruskall Wallis test	.000	-	4	56.578
	Family history	Mann-Whitney U	.234	-1.189	-	-

According to the table 14. Association between knowledge and socio-demographic was calculated using Kruskall Wallis test for a variable with more than two variables (educational level, professional, age and marital status), and Mann-Whitney U test was used for two variables like (gender and family history). The results showed that there is association between knowledge with age, level of education, professional and marital status.

Table 15. Relationship between knowledge and practice among participants

		Total knowledge	Total practice
Total knowledge related CVDs risk factors	Pearson Correlation	1	.435**
	Sig. (2-tailed)		.000
	N	388	388
Total practices in prevention of CVDs	Pearson Correlation	.435**	1
	Sig. (2-tailed)	.000	
	N	388	388
**. Correlation is significant at the 0.01 level (2-tailed).			

The third objective of this study was to examine the relationship between knowledge and preventive practice among participants. Data analysis used Pearson Correlation showed that the correlation is significant at the $p=0.01$ level. The results showed a positive relationship between knowledge of cardiovascular disease risk factors and preventive practices. Pearson Correlation is .435** which is considerable and Sig = .000 which is also significant at 10%.

CHAPTER 5. DISCUSSION

The purpose of this study was to assess knowledge and preventive practice regarding cardiovascular disease risk factors among rural population at Rwamagana District. This chapter focuses to the results from the study and focus on the objectives of the study.

5.1. Socio-demographic information and health status

The findings showed that the majority of the respondents had primary level of education due to the dominance of primary level in Rwanda. (MINISTRY OF EDUCATION, 2013, p. 13). This may influence health status of population as showed by the study done on the prevalence and awareness of CVD risk factors among the Lebanese population; study comparing Urban to Rural population (Fahs *et al.*, 2017) that showed that urban population were more educated, more able to seek medical care. A considerable number 13.7% of participants had family history of heart disease which is similar to the study conducted in Kathmandu by (Shrestha and Gautam, 2016, p. 4) where 17.7% of participants had family history of heart disease. This is probably due to the increasing of CVD worldwide and in developing countries (Meena *et al.*, 2015; Foundation, 2015, p. 1).

According to table 2, this study revealed that health status of the respondents, around 10% identified living with hypertension and diabetes respectively while 1% had heart disease. The findings are similar to the study conducted at Kathmandu by (Shrestha and Gautam, 2016, p. 4) on knowledge on risk factors of coronary heart disease among middle aged administrative staff which showed that 16.2% had hypertension and 5.9% had diabetes. The findings showed that another study is needed among this population for screening.

5.2. Discussion of knowledge regarding cardiovascular diseases risk factors (CVDRFs) among rural population at Rwamagana district.

This study assessed the knowledge of CVDRFs among rural population. The applied questionnaire allowed verification of the level of knowledge on CVD RFs. The participants were asked to give their answer “yes or no”. Based on the findings of the study, the participants who reported the correct answers related to risk factors of CVD were very low, while the majority 85.8% of the respondents did not answer correctly the risk factors of CVD. This findings are similar with the study conducted by (Waśniowska *et al.*, 2017) in residents of Malopolska to evaluate knowledge on CVD RFs which revealed that knowledge on CVD RFs is insufficient.

This study revealed that education level contribute to level of knowledge of participants (P=0.01), which is similar than the study conducted by (Waśniowska *et al.*, 2017) which revealed that more educated people have better knowledge on CVD RFs.

According to the table 5. More than two third of participants mentioned high blood pressure as a risk factor for CVD. Nearly more than half were able to identify tobacco smoking, excessive and being overweight as risk factors of CVD. Among various modifiable risk factors most of respondents were less able to identify excessive alcohol consumption, followed by low fruits and vegetables consumption and physical inactivity as risk factors of CVD. Regarding various biological risk factors most of participants didn't know diabetes and blood cholesterol as risk factors of CVD. Also the respondents were less able to identify non-modifiable risk factors of CVD like increasing age and family history of CVD as the risk factors.

The findings are similar to the study conducted among rural Kazakh population by (Kulkayeva *et al.*, 2012, p. 3) on cardiovascular disease risk factors among rural Kazakh

population which revealed that level of knowledge for identifying those RFs were very low. Although another study shows inverse. The study conducted in Kathmandu by (Shrestha and Gautam, 2016, p. 8) revealed that most of participants recognized alcohol drinking 78.5%, followed by excessive salt consumption, hypertension and diabetes as the risk factors of CVD. The level of knowledge of the respondents was associated with educational level, occupational status, marital status and age with (P=0.01)

According to table Fig.2, nearly two third of participants mentioned that the radio is main source of information about CVD RFs. A little number indicated having information from health providers, at school and from internet. The findings are similar to the study conducted in Kenya by (Temu *et al.*, 2015, p. 6) which revealed that main source of information about CVD RFs were television and radio 44%, internet 4%. So this study revealed that radio can be used as a good source of information for providing knowledge about CVD RFs.

5.3. Preventive practices regarding CVD RFs in prevention of CVD among rural population.

According to table.8, the findings revealed that most of participants didn't engage in exercise. Regarding at least 30 minutes of exercise by week, it is observed that the exercise activity most frequently done is walking with by less than half of participants followed by playing (football/volleyball and basketball) and around ten percent were involved in bicycling. The results are in contrast with the study done in Kathmandu (Shrestha and Gautam, 2016, p. 6) which revealed that most of respondents (73.8%) were involved in some form of exercise, where majority (80.2%) were involved in walking, while more than half of the respondents 57.3% did 3-4 times exercise regarding at least 30 minutes of exercise per week.

According to Fig.3, most of participants 309(79.6%) were engaged in alcohol consumption followed while 92(23.7%) were smokers. This finding are similar than the study done in Rwanda by (WHO, 2014b, p. 1) which showed that 12,9% are tobacco use and 23.5% were engaged in alcohol drinking which are considered as modifiable risk factors.

Table 9 showed that around than half reported eating vegetables every day while 5.9% only recognized eating fruits every day by week. The average of daily fruits consumption was very low, but the average daily vegetable intake was better than the fruits intake. These results are similar than a study conducted in Nepal by (Krishna Kumar Aryal *et al.*, 2014, p. 26) which revealed that 98.9% of the respondents did not consume adequate amount of fruits and vegetables. Average of vegetables consumption was on 4.8% in typical week. The minimum requirement for adults is five or more serving of fruits or vegetables a day as revealed by a study done by (Krishna Kumar Aryal *et al.*, 2014, p. 26).

However, more than half of respondent identified excessive cooking oil consumption which is modifiable risk factor, while more than two third didn't consume fruits which is bad habit and modifiable risk factor. There is therefore, the need effort for health education about CVD RFs among this population and such health education should use adequate source of information in order to maximize the effect of the message on knowledge and preventive practice regarding CVD RFs.

5.4. The relationship between knowledge and preventive practice regarding CVD RFs among rural population.

According to table 6. knowledge score were calculated from 14 questions. The poor knowledge level was categorized between 0-8.4 (0-59.99%), the moderate level categorized between 8.54-11.2 (60%-79.99%) of knowledge represents the respondents

who were able to answer correctly on 8-11 questions among 14, while 11.34- 14 (80%-100%) were categorized as high level of knowledge who were able to answer correctly 11-14 questions among 14.

The level of knowledge in present study was reported to be associated with age, level of education and current profession where correlation is significant at the 0.01 level.

The findings also revealed that level of practice was associated with level of knowledge (P=0.01)

CHAPTER 6. SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

6.1. Summary

In this study, the researcher assessed the population to their knowledge and preventive practice regarding CVD RFs. The findings revealed that more than half of participants revealed to have poor knowledge about CVD RFs. Some of socio-demographic such as age, level of education, current professional and health status were found to be associated with level of knowledge. The association was found between level of preventive practice and level of knowledge. In addition, majority of respondents for this study was made up of relatively young adults where only 35.3% were older than 45 years. Future studies need to plan health education in prevention of CVD among this population.

Knowledge alone is not sufficient to prevent CVD, but it is a vital pre-requisite for improving behaviors and practices towards cardiovascular disease prevention. Although the majority of the participants reported negative health behavior related to alcohol consumption, tobacco smoking, physical inactivity, excessive cooking oil consumption, unhealthy diet of fruits and vegetables which are modifiable risk factors of CVD.

Since majority of the participants reported using radio as source of medical information, these could be powerful tool for dissemination information on CVD RFs.

6.2. Conclusions

Cardiovascular disease is a global problem. Common CVD RFs in rural population still unknown. The findings of the study were concluded that poor knowledge of CVD RFs among rural population at Rwamagana district was found. Knowledge of CVD RFs is essential in prevention of CVD and promoting general wellness. However, more than half 85.8% of the respondents had poor knowledge on CVD RFs. Most were unable to identify risk factors of cardiovascular disease. A considerable number of the respondents identified

High blood pressure, smoking, excessive stress and being overweight as risk factors of CVD RFs. But more participants were less able to identify family history, physical inactivity, increasing age, cholesterol, excessive alcohol consumption, fatty food and excessive salt consumption as CVD RFs. Attention need to be paid in health education program for prevention of cardiovascular disease risk factors.

Appropriate health education is needed to increase knowledge and preventive practice of CVD RFs among rural population at Rwamagana District.

Promotion of knowledge at the primary health care level with emphasis on CVD RFs can reduce CVD related morbidity and mortality. Also, early screening programs targeting rural population are important to detect the risk factors in earliest stage and take appropriate action.

This study can provide information for further research in related issues.

6.3. Recommendations

Basing on these findings the following recommendations can be used to increase the level of knowledge and skills among rural population.

a) To the research

-Further research in this population is needed to evaluate incidence of NCD among this population

-Different studies on screening programs related to CVD RFs should be conducted and can be promoted at the community level.

-A similar study can be conducted in different settings, i.e. in community setting in both rural and urban areas.

b) To nursing practice

-Different educational programs should be planned emphasis rural population for prevention of CVD.

-Health care providers working in rural area should play a big role in health education about CVD RFs.

-Routine and early screening should be planned for this population emphasizing on CVDRFs

c) To the education

Findings revealed that knowledge of CVDRFs increase with level of education.

Health education should be given at all schools in order to improve knowledge about NCDs

d) To the local government

Health education about the diseases, especially about CVDRF must be given during the local meetings.

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APPENDIX

INFORMATION SHEET & INFORMED CONSENT FORM

I am NYIRAHABIMANA Marie Vestine, a nurse student at University of Rwanda, College of Medicine and Health Sciences(UR/CMHS), in Maters Program of Medical Surgical Nursing. I am conducting a research study whose the title is “Knowledge and practices regarding risk factors of cardiovascular diseases”.

The purpose of the study is to assess the knowledge regarding risk factors of cardiovascular and to assess the practices taken by community members in prevention of cardiovascular diseases.

What we will ask you to do :If you agree to participate in this study, questionnaires will be distributed to each participant. The questions will only cover the content related demographic, knowledge and practices regarding risk factors of cardiovascular diseases among adult community members. Answering questions will take about 45 minutes to complete.

Taking part is voluntary: I would like to inform you that your participation is entirely voluntary, and if you wish to withdraw from the study, you may do so at any time. You will not be requested to give reasons for withdrawing from the study, and it will have no effect on you or on any relative in your family.

Your answer will be confidential: .Research findings will be kept in a locked file; will be kept confidential to the extent permitted by law. Only the researchers will have access to the data.

Risks and benefits: There will be no direct benefits from participating in this study, but your participation will help to increase the knowledge and practices of community members, in order to prevent cardiovascular diseases. Your participation will help to conduct other studies in the future. You are allowed to read enough and understand this information before you agree to take part in this study and be made to sign this consent.

If you have questions or hesitations, feel free to contact the researcher on +250786681545 or nyiramavestine1@yahoo.fr

INFORMED CONSENT FORM

I have read the above information, and have received answers to any questions I asked.

I consent to take part in the study.

Signature of the participant:.....Date:...../...../.....

Signature of the researcher:.....

Date:...../...../.....

Name of the researcher:.....

INYANDIKO ISABA KANDI YEMEZA KWITABIRA UBUSHAKASHATSI

Nitwa NYIRAHABIMANA Marie Vestine, umunyeshuri muri Kaminuza y'u Rwanda, Koleji y'Ubuvuzi n'Ubuzima. Nkaba ndi umunyeshuri mu cyiciro cya 3 cya Kaminuza, aho ndi gukurikirana ibijyanye no kwita ku ndwara zo mu mubiri n'izibagwa. Ndi gukora ubushakashatsi ku **bumenyi n'imyitwarire y'abantu ku birebana nimpamvu zitera indwara z'umutima.**

Intego y'ubu bushakashatsi ni ukureba ubumenyi abaturage bafite ku bitera indwara z'umutima, no kureba uburyo bitwara mu kwirinda izo ndwara.

Icyo tubifuzaho ni iki? Mu gihe waba wemeye kugira uruhare muri ubu bushakashatsi, buri wese arahabwa ibibazo. Ibyo bibazo birareba ahanini ku bijyanye n'umwirondoro muri rusange, birebe ubumenyi buri muntu afite ku bitera indwara z'umutima, birebe kandi imyitwarire n'ibikorwaby'abantu mu kwirinda izo ndwara. Gusubiza ibi bibazo bitwara iminota itarenze 45'.

Kugira uruhare muri ubu bushakashatsi ni ubushake: Nifuzaga kubamenyesha ko kugira uruhare muri ubu bushakashatsi ari ubushake busesuye, kandi ko igihe cyose bibaye ngombwa wemerewe kuva mu bushakashatsi, kandi nta zindi ngaruka byakugiraho; haba kuri wowe cg ku muryango wawe, kandi nta busobanuro bundi wasabwa gutanga.

Amakuru muduha azabikwa mu ibanga. Azabikwa ahabugenewe hizewe; mu ibanga rikomeye uko amategeko abaigena. Ukora ubu bushakashatsi wenyine niwe wemerewe kumenya amakuru yavuyemo.

Inyungu cg ibibazo wagira: ubu bushakashatsi nta bibazo buzagutera. Nta n'inyungu y'ako kanya uzakuramo, ariko uruhare rwawe rurakenewe kugirango hongere ubumenyi ku ndwara z'umutima, hafatwe n'ingamba mu kuzirinda; bizafasha kandi mu ubushakashatsi bundi bwakorwa mu bihe biri imbere. Wemerewe gusoma neza witonze aya makuru mbere yo kwemera uruhare rwawe muri ubu bushakashatsi.

Ufite ikibazo, wabaza uri gukora ubushakashatsi kuri +250786681545 cyangwa kuri nyiramavestine1@yahoo.fr

KWEMEZA KWITABIRA UBUSHAKASHATSI

Nasomye neza aya makuru nahawe hejuru, kandi nabonye ibisubizo ku bibazo byose nagize. Nemeye kugira uruhare muri ubu bushakashatsi.

Umukono w'ugize uruhare mu bushakashatsi:.....Date:...../...../.....

Umukono w'ukora ubushakashatsi..... Itariki:...../...../.....

Amazina y'ukora

ubushakashatsi:.....Itariki:...../...../.....

Nomero ya telephone y'Umuyobozi w'Agashami gashinzwe Ubushakashatsi muri Kaminuza y'u Rwanda: **0788 490 522**

Nomero ya telephone y'Umuyobozi Wungirije w'Agashami gashinzwe Ubushakashatsi muri Kaminuza y'u Rwanda: **0783 340 040**

Uru rupapuro ruzabikwa n'uwakoze ubushakashatsi mu gihe nibura cy'imyaka irindwi uherye igihe ubushakashatsi bwakorewe.

Questionnaire

STUDY: Knowledge and preventive practices regarding risk factors of cardiovascular disease (CVD) among rural population.

SECTION A: SOCIO DEMOGRAPHIC CHARACTERSTICS AND HEALTH STATUS

CODE:	DATE:
1. Age: 18-25 <input style="width: 40px; height: 20px;" type="text"/> 36-45 <input style="width: 40px; height: 20px;" type="text"/> 56-65 <input style="width: 40px; height: 20px;" type="text"/> 26-35 <input style="width: 40px; height: 20px;" type="text"/> 46-55 <input style="width: 40px; height: 20px;" type="text"/>	
2. Sex: 1. Female <input style="width: 40px; height: 20px;" type="text"/>	2. Male: <input style="width: 40px; height: 20px;" type="text"/>
3. Weight: <input style="width: 60px; height: 25px;" type="text"/>	4. Height: <input style="width: 60px; height: 25px;" type="text"/>

5. Educational level (*Please check ✓ only one box*)

No formal education Primary Secondary
 University/College

6. Current professional? (*Please check ✓ only one box*)

Unemployed; farming; student; professional;
 self employed;

7. Marital status. (*Please check ✓ only one box*)

Married Single Divorced Separated widowed

8. Are you aware if you have any disease condition? Yes No

9. If you have any disease, please indicate below which disease condition(s) you have?

1. Diabetes 2. High blood pressure
 3. Overweight 4. Kidney disease
 5. Heart disease
 6. Other chronic condition? Specify:.....Arthritis Gastritis

7. I don't have any disease

10. If you have any of the diseases in Q5, do you take any medications for the disease(s)?

1. Yes

2. No

:

3. I don't have it.

11. If NO in Q6 specify the reason for not taking medications:

1. No insurance to go to the Health center

2. I don't feel very sick

3. Other reasons: Specify.....(I take traditional medicine

4. I'm not sick.

12. Have any of your immediate family members been diagnosed with a cardiovascular disease? (*Please check ✓ only one box*)

(Mother, father, sisters, brothers, own child): 1. Yes ;

2. No

In the past 4 weeks, did you ever have any of the following symptoms? Put ✓ on the appropriate answer.

N	Symptoms	Yes	NO
13	Pounding of heart (Palpitation)	0	1
14	Chronic headache	0	1
15	Swelling around ankles	0	1
16	Breathlessness or fail to lie flat	0	1

SECTION B. KNOWLEDGE ABOUT RISK FACTORS OF CARDIOVASCULAR DISEASES

Which of the following conditions are the risk factors for cardiovascular diseases?

(Tick “✓” on the appropriate answer)

		Yes	No / I don't Know
17.	Diabetes is a risk factor for developing cardiovascular diseases	1	0
18.	High blood pressure is a risk factor for cardiovascular diseases	1	0
19.	Smoking is a risk factor for cardiovascular diseases	1	0
20.	Being overweight increase a person's risk for cardiovascular diseases	1	0
21.	Alcohol consumption increase a person's risk for cardiovascular diseases	1	0
22.	Excessive stress increase a person's risk for developing cardiovascular diseases	1	0
23.	Physical inactivity (lack of exercises) will increase a person's risk of getting cardiovascular diseases	1	0
24.	Unhealthy diet such as diets with high fats and table salt increase a person's risk for cardiovascular diseases	1	0
25.	If you have a family history of cardiovascular diseases, you are at risk for developing cardiovascular diseases	1	0
26.	High blood cholesterol is a risk factor for cardiovascular diseases	1	0
27.	Walking is considered exercise that will help lower a person's chance to develop cardiovascular diseases	1	0
28.	If a person stop smoking will decrease their risk of developing cardiovascular diseases	1	0
29.	The older a person is, their risk of developing cardiovascular disease increase	1	0
30.	Regular blood pressure control will reduce a person's risk for developing cardiovascular diseases	1	0

SOURCE OF INFORMATIONS

31. How did you get information about cardiovascular diseases? (Please check ✓ only one box)

- 1. -On the Radio /Television
- 2. -During the meeting in community
- 3. -By health providers
- 4. Other. Specify:....Internet..........At school..........

SECTION C: PRACTICES FOR PREVENTION OF CVDs

BEHAVIOR PRACTICES

Fill in or tick " ✓ "on the appropriate answer

Behavior practices		Yes	No
32	Do you smoke?	0	1
33	Do you take alcohol	0	1

PHYSICAL ACTIVITIES

**During the last 4 weeks , how much time (for the entire week) did you spend on each of the following?
(Please circle one number for each question)**

	Activities	None	Less than 30min/week	30-60 min/week	1-3 hrs per/week	More than 3 hrs/week
34	Walk for exercise	0	1	2	3	4
35	Bicycling	0	1	2	3	4
36	Running	0	1	2	3	4
37	Playing(football; volley ball; basketball)	0	1	2	3	4

DIET

How often do you eat by week

		Every day	Not every day	Never
38	Cooking oil	0	1	2
39	Vegetables	2	1	0
40.	Fruits	2	1	0
41	Table salt	0	1	2

MONITORING/SCREENING TESTS

Fill in or tick (√) on the appropriate answer

When was the last time you checked your blood pressure, blood glucose, blood cholesterol and weight?

		Checked within the last 3 months	Checked within the last 6 months	Checked more than 1 year	Never
42	Blood pressure	3	2	1	0
43	Blood glucose	3	2	1	0
44	Body weight	3	2	1	0
45	Blood cholesterol	3	2	1	0

46. When was the last time you visited the Health center or /hospital for your health check-up?

1. This year (2017)

4

2. Last year (2016)

3

3. ≥ 2 years

2

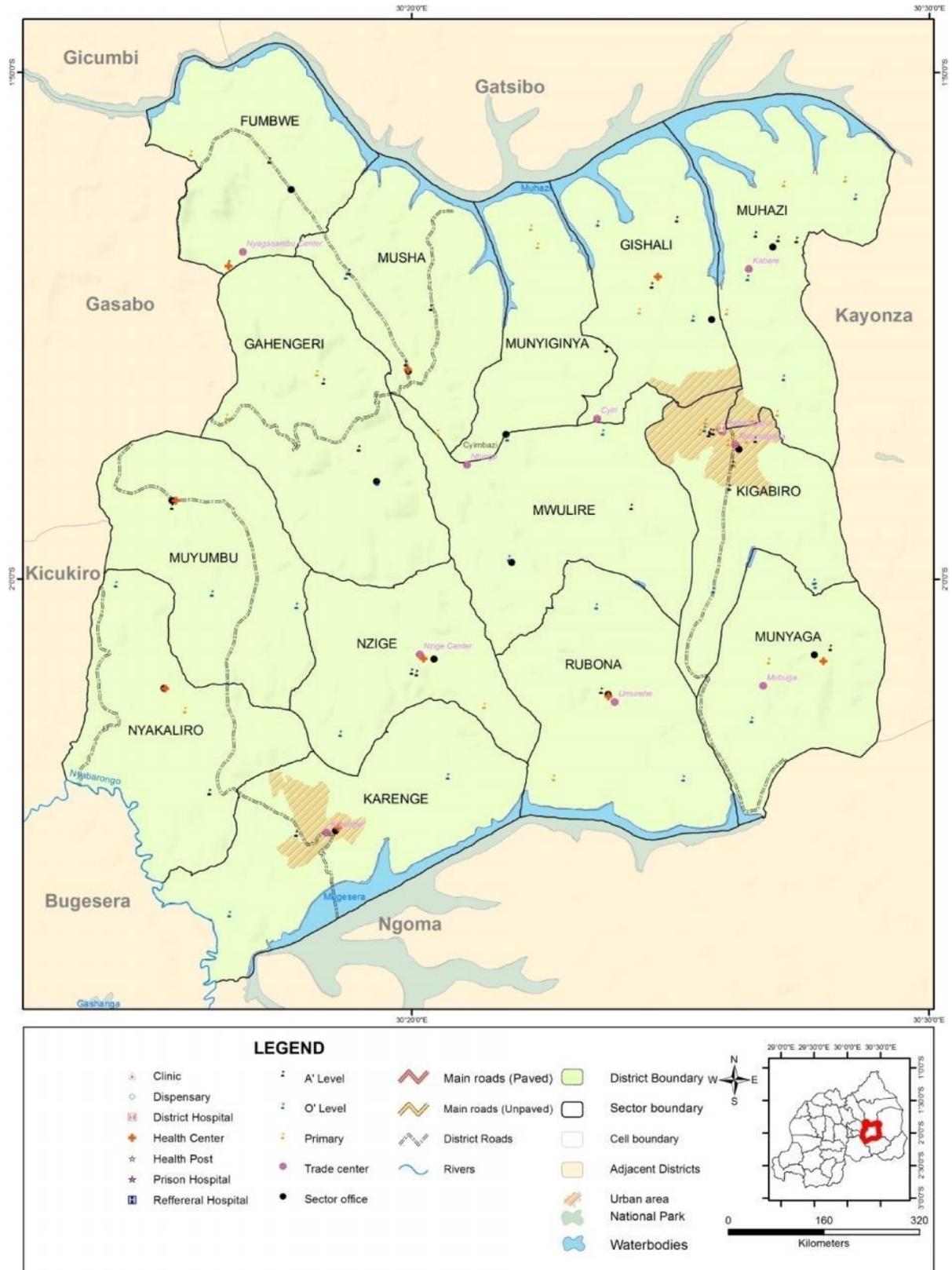
4. Cannot remember

1

5. Never

0

Rwamagana District





Certificate of Completion

The National Institutes of Health (NIH) Office of Extramural Research certifies that **Marie Vestine NYIRAHABIMANA** successfully completed the NIH Web-based training course "Protecting Human Research Participants".

Date of completion: 11/19/2016.

Certification Number: 2240797.

SCHOOL OF NURSING AND MIDWIFERY

Kigali, on 6th / 02 / 2017

Ref. No: ~~124~~ UR-CMHS/SoNM/17

TO WHOM IT MAY CONCERN

Dear Sir/Madam,

Re: Request to collect data

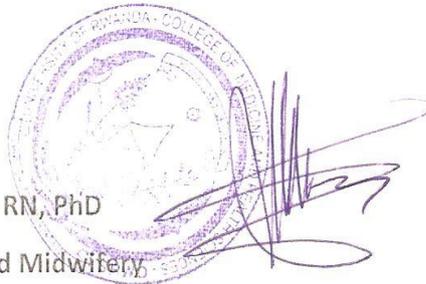
Referring to the above subject, I am requesting for permission for **NYIRAHABIMANA Marie Vestine** a final year student in the Masters of Science in Nursing at the University of Rwanda/College of Medicine and Health Sciences to collect data for his/her research dissertation entitled "Knowledge and practices regarding risk factors of cardiovascular diseases among rural population at a selected district in Rwanda".

This exercise that is going to take a period of 2 months starting from 13th February 2017 to 12th April 2017 will be done at Rwamagana District/Rubona sector

We are looking forward for your usual cooperation.

Sincerely,

 Dr. Donatilla MUKAMANA, RN, PhD
Dean, School of Nursing and Midwifery
College of Medicine and Health Sciences



REPUBLIC OF RWANDA

Rwamagana 7./3/2017
N°...924./05.01/15



**EASTERN PROVINCE
RWAMAGANA DISTRICT
B.P: 24 RWAMAGANA**

Dear NYIRAHABIMANA Marie Vestine

RE: Permission to conduct the research in Rwamagana District

Dear,

Reference is made to your letter “**Requesting for Permission to conduct the research at Rubona Sector/ Rwamagana District on Knowledge and practice regarding risks factors of cardiovascular disease among rural population**” to fulfill your study in master of sciences in nursing, Medical-surgecal track. Your request is accepted. You will be required to conduct your research working hand in hand with our population after contacting the local leaders.

We wish you success in this important study.

A handwritten signature in purple ink, appearing to read 'Mbonyumuvunyi Radjab'.

**MBONYUMUVUNYI Radjab
Mayor of Rwamagana District**



Cc:

- Exective secretary of Rubona Sector

[victor maduabuchi <veokernson@yahoo.co.uk>](mailto:veokernson@yahoo.co.uk)

À

[Marie Vestine NYIRAHABIMANA](#)

jan 25 à 5h11 AM

Hello Marie,

Sorry I don't check this email often, reason why your request took this long.

Please find the questionnaire attached. This questionnaire was developed out of the Stanford Patient Education Research Centre questionnaire which you can also find via this link <http://patienteducation.stanford.edu/research/cdquest.pdf>

I hope this helps.

Best of wishes in your study.

Regards,

Victor

CMHS INSTITUTIONAL REVIEW BOARD (IRB)

Kigali, 09/01/2017
Ref: CMHS/IRB/043/2017

NYIRAHABIMANA Marie Vestine
School of Nursing and Midwifery, CMHS, UR

Dear NYIRAHABIMANA Marie Vestine

RE: ETHICAL CLEARANCE

Reference is made to your application for ethical clearance for the study entitled "*Knowledge And Practice Regarding Risk Factors Of Cardiovascular Diseases(CVDS) Among Rural Community At A Selected District In Rwanda.*"

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

We wish you success in this important study.

 Professor Kato J. NJUNWA
Chairperson Institutional Review Board,
College of Medicine and Health Sciences, UR


Prof. J. B. Bakute
Vice-Chair


Cc:

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