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EVALUATING THE EFFECTIVENESS OF THE COMMUNITY HEALTH EDUCATION NETWORK POLICY ON DIABETES MELLITUS SELF-MANAGEMENT AND HEALTH OUTCOMES IN BUJUMBURA DISTRICT, BURUNDI

BY

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A DISSERTATION SUBMITTED TO THE AFRICA UNIVERSITY IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER IN PUBLIC POLICY AND GOVERNANCE IN THE COLLEGE OF BUSINESS, PEACE, LEADERSHIP AND GOVERNANCE

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Abstract

The purpose of this study was to explore the extent of diabetics' self-management in reducing the prevalence and severity of diabetes mellitus in Bujumbura District, Burundi. Diabetes mellitus was a non-communicable disease and it was in increase globally. Millions of people were affected by this chronic, metabolic disease characterized by elevated levels of blood glucose or blood sugar. This study adopted a mixed research design method to collect data in order to have in-depth information and a better understanding of the challenges and opportunities of the community health education network policy and diabetes mellitus self-management after their implementation. The population included diabetic patients (type 1 and 2) admitted in -the four hospitals in 2018 and 2019. The sample consisted of 185 participants. The study found that diabetes was a chronic medical issue with obliterating, yet with preventable problems. Diabetes mellitus was a grouping of diseases with the symptom of high blood glucose that resulted from imperfections in insulin activity, insulin creation, or both. Patients were able to test themselves at home with a glycaemia test. Long-term complications incorporated coronary illness and stroke, visual deficiency, nephropathy, neuropathy, and fringe vascular illness resulting in lower limb amputation. Self-management and control of the disease were within individual's capacity. It was found that daily decisions involved what to eat, levels of physical activity, how stress will or will not be managed, and if or when to perform self-monitoring of blood glucose. It was concluded that treatment of diabetes included changes in lifestyle, most of which patients with diabetes provided for themselves on a daily basis. In this manner, self-management of diabetes was firmly associated with oneself considerations, which was identified with the act of exercises that people started and performed for their own benefit in maintaining life, health, and well-being. The study recommended people to lead active lifestyle that included good diets and regular physical exercises. It was also recommended that the government was to ensure public awareness of diabetes mellitus. More information on the causes and effects of the diseases were to be provided to the people. It was also recommended that the government was to work with partner organisations in health to provide essential services to the people and diabetic patients.

Keywords

Health policy, Diabetes mellitus, self-management

Declaration Page

I declare that this dissertation is my original work except where sources have been cited and acknowledged. The work has never been submitted, nor will it ever be submitted to another university for the award of a degree.

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Dedication

I dedicate this piece of work with love and happiness to my beloved wife to be. I also dedicate this project to my siblings. You are and will always be my source of inspiration, hope, courage and support.

May God bless you!

List of acronyms and abbreviations

AADE	American Association of Diabetes Educators
ADA	American Diabetes Association
ADknowl	Audit of Diabetes Knowledge
AUREC	Africa University Research and Ethics Committee
BC-ADM	Board Certified Advanced Diabetes Management
BME	Black and Minority Ethnic
BNCDA	Burundi non-communicable Diseases Alliance
CDC	Centers for Diseases Control and Prevention
CDE	Certified Diabetes Education
CHEMP	Community Health Education Network Policy
CS-PAM	Clinician Support-Patient Activation Measure
DAFNE	Dose Adjustment For Normal Eating
DM	Diabetes Mellitus
DMSM	Diabetes Mellitus Self-Management
DMSME	Diabetes Mellitus Self-Management Education
DRC	Democratic Republic of Congo
DRCP	Diabetes Research and Clinical Practice
DSMES	Diabetes Self-management Education and Support
EST	Ecological Systems Theory

FGDs	Focus Group Discussions
GBD	Group Based Discussion
GBDMSM	Group-Based Diabetes Mellitus Self-Management
HIV/AIDS	Human Immunodeficiency Virus/Acquired Immunodeficiency Syndrome
IDF	International Diabetes Federation
JANFSA	Joint Approach to Nutrition and Food Security
LR	Literature Review
NCDs	Non-communicable diseases
NIDDKD	National Institute of Diabetes and Digestive and Kidney Diseases
PBF	Performance-Based Financing
SDGs	Sustainable Development Goals
SEM	Social-Ecological Model
SEN/D	Special Educational Needs/Disabilities
SESs:	Social-Ecological Systems
T1D	type 1 diabetes
T2D	type 2 diabetes
T2DM	type 2 diabetes mellitus
TF	Theoretical Framework
US	United States

USAID United States Agency for International Development

WFP World Food Program

WHO World Health Organization

Table of contents

Table of Contents

List of tables

Table Title Page

List of figures

List of appendices

CHAPTER 1: INTRODUCTION

1.1. Introduction

Diabetes mellitus is among non- communicable diseases and it is in increase globally. Millions of people are affected by this chronic, metabolic disease characterized by elevated levels of blood glucose or blood sugar. According to (Diabetes Research and Clinical Practice, 2019) report, 463 million people (9.3%) live with diabetes globally. Moreover, this report states that diabetes prevalence is projected to rise to 578 million people (10.2%) by 2030 and to 700 million people (10.9%) by 2045. There is a disparity between urban, rural, high-income and low-income countries. The prevalence is higher in urban areas (10.8%) and in high-income countries (10.4%) than in rural areas (7.2%) and in low-income countries (4.0%). WHO (2020) states that people with type 1 diabetes mellitus are individuals whose pancreas produces little or no insulin by itself. In contrast, people with type 2 diabetes mellitus are people whom their body becomes resistant to insulin or do not make enough insulin.

The purpose of this study was to explore the extent of diabetes' self-management in reducing the prevalence and severity of diabetes mellitus in Mutumba District, Bujumbura, Burundi. In this regard, this chapter started with the background information on the phenomenon of diabetes' self-management in reducing the prevalence and severity of diabetes. The chapter dealt with the statement of the problem, the significance of the study, the research objectives, and questions, the delimitations and limitations of the study.

1.2. Background of the study

One in two (50.1%) people living with Diabetes Mellitus (DM) do not know that they have DM. IDF (2019) stated that the prevalence of impaired glucose tolerance was estimated to be 7.5% (374 million people) in 2019 and projected to rise up to 8.0% (454 million) by 2030 and 8.6% (548 million) by 2045. Consequently, practically 50% of a billion people are living with DM worldwide and the number is extended to increment by 25% in 2030 and 51% in 2045.

Diabetes is a chronic medical issue with obliterating, yet preventable problems. It is portrayed by high blood glucose levels coming about because of imperfections in insulin creation, insulin activity, or both. According to the Center for Disease Control (CDC, 2005), and American Diabetes Association (ADA, 2009), diabetes mellitus, is a grouping of diseases with the symptom of high blood glucose, results from imperfections in insulin activity, insulin creation, or both. A variety of metabolic conditions produce this effect, thus the different types of diabetes, yet all share the common symptom of elevated blood glucose. Type 2 diabetes, which comprises 90 to 95% of all cases of diabetes, is the most common form of the disease and is strongly associated with obesity and a sedentary lifestyle and is typically associated with increasing age (Ogden, & Johnson, 2002). According to the International Diabetes Federation (2019), 19.4 million people aged 20-79 are living with diabetes mellitus. This diabetes rate represents 3.9% in Sub- Saharan Africa with an extreme proportion (60%) of adults with undiagnosed diabetes (or unaware of their condition). The International Diabetes Federation (IDF) is an umbrella affiliation made out of 230 public diabetes movements in 170 countries and spots among which 49 are African countries. It speaks to the interests of the rising number of individuals with diabetes and those in danger. The organization has been heading the worldwide diabetes

network since 1950. However, the Diabetes Research and Clinical Practice report (DRCP, 2019) state that 463 million people (9.3%) live with diabetes globally. Moreover, this report states that diabetes prevalence is projected to rise to 578 million people (10.2%) by 2030 and to 700 million people (10.9%) by 2045. There is a 2disparity between urban, rural, high-income, and low-income countries. The prevalence is higher in urban areas (10.8%) and in high-income countries (10.4%) than in rural areas (7.2%) and in low-income countries (4.0%).

Recent studies have shown that there are 23.6 million people with diabetes in the United States (U.S.), a number expected to double by 2050 (National Institute of Diabetes and Digestive and Kidney Diseases [NIDKD], 2007).

Hence diabetes mellitus is the sixth leading cause of death by disease in the U.S (and also ranks high globally) and contributes to higher rates of morbidity such as heart disease, blindness, kidney failure, lower-extremity amputations, and other chronic conditions. In the U.S. the leading cause of adult blindness is attributed to diabetes, accounting for approximately 8% of all new cases. In Africa as well studies have shown that diabetes has also contributed to similar ailments. On an annual basis, 12,000 to 24,000 people in the U.S. lose their sight due to diabetes (NIDDKS, 2005). However, Africa and particularly Burundi is no exception to this scourge. Burundi is one such country that has alarming levels of diabetes with the crude mortality rate being 15 per 1000 (2008 Population Census) and has already started implementing a free healthcare policy for under 25 diabetes patients (WHO, 2015). In 2015 diabetes and hypertension existed together in 30% of cases, as per an investigation done at the Kamenge University Hospital Center, and were answerable for 73.17% of degenerative complications (WHO, 2015). Thus, researches show that diabetes is still

the third cause of mortality and morbidity in Burundi after Malaria and HIV/AIDS (MOH, 2018).

In addition, Diabetes is among the leading causes of death with 23.45 persons per 100.000 persons. Therefore, it shows that whilst government expenditure in health policies is ideal there is a compelling need to promote and advocate for self-management systems for diabetes so that the scourge is addressed from the root and not symptoms. Araoz & Douglas; (2005) admit that diabetes requires complex individual long-term self-management. These complex self-care tasks involve diet, medications, blood glucose testing, exercise, and symptom management. Self-management requires an awareness of the symptoms for both hypoglycemia and hyperglycemia and knowledge of how to treat each of these conditions (Boyle et al., 2001). Individuals with diabetes are responsible for self-managing their disease. This responsibility involves making decisions for controlling blood glucose that, if left unchecked, may result in the consequence of long-term complications.

Long-term complications may incorporate coronary illness and stroke, visual deficiency, nephropathy, neuropathy, and fringe vascular illness resulting in lower limb amputation (Araoz and Douglas, 2005). The decisions about self-management are within the control of the persons who have diabetes, not by the health care professionals who prescribe treatment for them. Brandle et al., 2003, show that these daily decisions may involve what to eat, levels of physical activity, how stress will or will not be managed, and if or when to perform self-monitoring of blood glucose. The consequences of developing long-range complications and reduced quality of life are based upon the person's diabetes self-management decisions (Anderson & Funnell, 2005).

On 14 November each year, the world celebrates the diabetes day. When Burundi was celebrating the diabetes day on November 18th 2016, in her speech, Doctor Josiane Nijimbere the Minister of Health said,

" In Burundi, diabetes is the third driving reason for dreariness and mortality after malaria and HIV/AIDS."

As per WHO projections, the number of deaths brought about by diabetes will twofold by 2030, and over 80% of them happen in developing nations. "Also, it causes 60% of amputation in developing nations", adds the Minister. According to the World Health Organisation (WHO), the number of deaths caused by diabetes will double by 2030, and more than 80% of them will occur in developing countries such as Burundi. Statistics in Burundi's health sector reveal a continuous increase rate of diabetic patients. In Ruyigi Province 38 out of 767 people had diabetes (4.9%) while 50 out of 2817 people screened tested positive (1.77%) in Cankuzo province. In Gitega province 58 out of 1670 people screened tested positive (3.4%) while in Kayanza province out of 430 people screened, 14 people tested positive for diabetes (3.2%). Note that those are statistics in only one commune in each province. Thus, diabetes statistics in Burundi show an alarming level of diabetes prevalence. Besides, diabetes has many complications. Diane (2016) states that diabetes is a leading cause of cardiovascular disease, blindness, and kidney failure, and lower-limb amputation.

" These difficulties can be averted or postponed by keeping up blood glucose, hypertension, and cholesterol levels as near typical as could reasonably be expected. It is significant that all individuals with diabetes are regularly screened for diabetic retinopathy so as to avert the movement and advancement of diabetes-related loss of sight, given that 1,8 out of 38 million individuals on the planet are visually impaired because of diabetes. If the patient's test is positive, s/he may allude to an

ophthalmologist for convenient treatment with laser photocoagulation and/or the utilization of the counter VEGF medicines (intraocular administration of vascular endothelial growth factor inhibitors). It can prevent loss by stabilizing it. ", said ophthalmologist doctor Lévi Kandele.

Theoretically, this study was also supported by the theory of change which is based on a participatory process whereby groups and stakeholders are both involved in planning and implementing an activity for their benefits (Dana & Heléne, 2012). Moreover, researchers have confirmed that a group-based education in self-management strategies improves clinical and lifestyle outcomes in patients with type 2 diabetes mellitus (Deakin, Mcshane, cade, et al., 2005).

Carrying out this study contributed significantly to the attainment of Sustainable Development Goals (SGDs) particularly SGD3: good health and wellbeing; SGD8: decent work and economy growth and SGD10: reduced inequality (United Nations, 2015).

Based on both national and global statistics of diabetes, there was an emergency to fully involve diabetes patients for their inputs in combating this health condition.

1.3. Statement of the problem

Experiences the world over have seen governments and health policy experts committing resources and scaling up efforts to combat the scourge of diabetes but all these have been primarily focused on the provision of public health care services that are accessible, efficient, and reliable. However, this study held the view that such interventions alone cannot successfully address the problem at hand especially in developing countries like Burundi where resources to support the health system were subject to availability depending on government capacity and level of resourcefulness

from time to time. Thus the researcher wanted to explore and determine how self-management by diabetic people was of significance especially in reducing the prevalence and severity of diabetes. Studies have also shown that somehow public expenditure in health programs may not directly impact a positive outcome but other factors can also play a role. Hence fighting diabetes started with the individual before looking at a broader perspective to address the scourge at the macro policy level. According to (Weiner, 2004), influencing factors in addressing diabetes included cognitive abilities, emotional state, cultural background, spiritual beliefs, economic situation, ability to access care, social support, caretaker responsibilities, attitude about the disease, physiological status, and relationships with health care providers. More so, diabetes was described as a process that involves a complex interplay between social, contextual, and personal factors that evolve over time (Paterson & Thorne, 2000). Thus, diabetes self-management focused on educating the patient about the disease, medications, diet, and self-monitoring of blood glucose with a meter. Current diabetes self-management programs placed a strong emphasis on knowledge acquisition.

Public health policies often lacked the acknowledgement that treatment of diabetes included changes in lifestyle, most of which patients with diabetes provided for themselves on a daily basis. In this manner self-management of diabetes was firmly associated with oneself considerations, which was identified with the act of exercises that people started and performed for their own benefit in maintaining life, health, and well-being. Burundi is one such country that has alarming levels of diabetes with the crude mortality rate being 15 per 1000 (NPC, 2008). The Burundi non-communicable diseases (NCDs) Alliance (BNCDA), World Health Organization, and other national associations have been working hand in hand with the government to improve the

health sector. Burundi has already started implementing a free healthcare policy for under 25 diabetes patients (Egide, 2018). However, this policy only grants access to free medication (insulin) for type 1 diabetes mellitus and there is only one place it is administered nationally. Thus, under 25 and type 2 diabetes mellitus staying far from the medication administration area, are left behind without any assistance. In addition, diabetic patients may also be having challenges related to diabetes self-management factors which are also not covered by the current policy. Despite the efforts of the Burundian Ministry of Public Health and international organizations to fight against non-communicable diseases (NCDs), diabetes mellitus is still the third cause of mortality and morbidity in Burundi after malaria and HIV/AIDS (Ministry of Public Health and Fight Against AIDS, 2018). Actually, 5 out of 5 people admitted in Bujumbura, 2 suffer from DM. Thus, most Burundians have DM without them knowing due to a lack of awareness. This situation may also be explained by the problem of food insecurity in Burundi (Iwacu, 2020).

1.4 Research objectives

The research objectives were as follows:

1. To evaluate the effectiveness of the Community Health Education Network Policy in improving diabetes self-management practices among patients in Bujumbura District.
2. To analyze the relationship between patients' knowledge, attitudes, beliefs, and their level of diabetes self-management.
3. To determine the impact of diabetes self-management on the prevalence and severity of diabetes-related complications.

4. To assess the role of healthcare providers and community stakeholders in supporting the implementation of the Community Health Education Network Policy.
5. To examine the opportunities promoting diabetes self-management education through community-based interventions.

1.5 Research questions

The study was guided by the following research questions:

1. To what extent has the Community Health Education Network Policy influenced the diabetes self-management practices of diabetic patients in Bujumbura District?
2. What is the relationship between diabetic patients' knowledge, attitudes, beliefs, and their level of engagement in diabetes self-management practices?
3. How do diabetes self-management practices affect the prevalence and severity of diabetes-related complications among patients in Bujumbura District?
4. What role do healthcare providers and community stakeholders play in supporting and strengthening the implementation of the Community Health Education Network Policy for diabetes self-management?
5. What opportunities and strategies exist to improve diabetes self-management education through community-based interventions in Bujumbura District?

1.6 Hypotheses

H0: There was a correlation between diabetes self-management skills and practices and the Community Health Education Network Policy engagement in Bujumbura District.

H1: There was no correlation between diabetes self-management skills and practices and the Community Health Education Network Policy engagement in Bujumbura District.

1.7 Significance of the study

The study was to explore the factors associated with diabetes self-management in Bujumbura District, Burundi. This study also helped public health policymakers to craft appropriate policies on diabetes self- management. It provided added knowledge and skills to diabetic patients and health care professionals regarding diabetes self-management. The author believed that the study findings were useful in academia as scholars used the information to shape their ideas in their researches. The study brought knowledge and skills to Burundians regarding group-based diabetes self-management. The study also encouraged group-based diabetes self-management practices among diabetic patients. It significantly reduced diabetes mellitus prevalence and severity in Burundi. It also cut down the cost of medication as the rate of diabetics will be going down. It safeguarded the health of diabetic patients as the rate of death due to diabetes diminished. The study significantly reduced the burden of both the Ministry of Public Health and Fight Against AIDS in Burundi, health professionals, diabetic patients, and their families.

1.8 Delimitation of the study

The main constraint of this study were difficulties to get relevant information. It involved government departments. Some participants in this study were afraid to be interviewed on the policy implemented as it involved government policy criticisms. The researcher mitigated this study challenges using a letter of consent from the Africa University Research and Ethics Committee (AUREC). An informed consent letter

from the Ministry of Public Health and Fight Against AIDS was also used to mitigate constraints in this study. The researcher gave the participants assurance about confidentiality issues as well.

1.9 Limitation of the study

While diabetes self-management was a general concern in the whole country, this study only focused on four different hospitals in Bujumbura District. The study also focused on the Community Health Education Network Policy (CHENP) or Association for the Promotion of Health network (APSA), introduced in 2007 in Burundi. This policy was introduced to address Non-Communicable Diseases that were in the rise in developing countries, particularly in Burundi. The study involved patients with both type 1 and 2 diabetes mellitus in four hospitals in Bujumbura District. The unit of analysis was exclusively men and women between the age of 18 to 50 years.

1.10 Definition of key terms

The key terms below had the same meaning throughout the study unless otherwise indicated:

Diabetes: involves an interminable, metabolic sickness described by raised degrees of blood glucose (or glucose), which leads after some time to genuine harm to the heart, veins, eyes, kidneys, and nerves (WHO, 2020).

Self-management: Self-management was defined as surveying, arranging, and executing fitting consideration to help the patient to be given the way to manage their disease or its effects.

Supported self-management in advanced disease, by health professionals, enabled individuals to recognize the effect of their condition on their life, and empowered them, where conceivable, to confront the scope of difficulties they had, and

distinguished zones where they needed further help, or care. In this way, for people it was tied in with being given the way to manage issues instead of surrendering them to other people (Johnston, Rogerson, Machijausk, et al. 2014).

Health policy: Referring to both health and policy, Niederdeppe (2014) highlights that ". . . Policy can be defined as rules, procedures, principles, or activities enacted by organizations with the vested authority to implement them. Implicit in this definition is the idea that policies are more than laws enacted by governments. Combined, health policy can then be defined as rules, procedures, principles, or activities that are enacted by organizations and have the potential to shape physical, mental, and spiritual well-being. Implicit in this definition is the idea that health policy includes policies that could influence health both intentionally and unintentionally."

CHAPTER 2: REVIEW OF RELATED LITERATURE

2.1 Introduction

According to the Bloomsburg University (2020), the literature review (LR) refers to a comprehensive summary of previous research on a given research topic. It discusses books, articles, and other sources by various scholars relevant to the research topic. Thus, the LR comprises the work of previous researchers and ensures the reader that the researcher work has been well perceived. A literature review displays a picture for the reader on a topic by providing him/her its crucial developments, strengths as well as weaknesses (Bloomsburg University, 2020). The chapter comprised the theoretical framework (TF) identified by the researcher and discussions on related LR based on the identified research objectives of the study.

2.2 Social-Ecological Model (SEM)

The study adopted the Social Ecological Model (SEM).

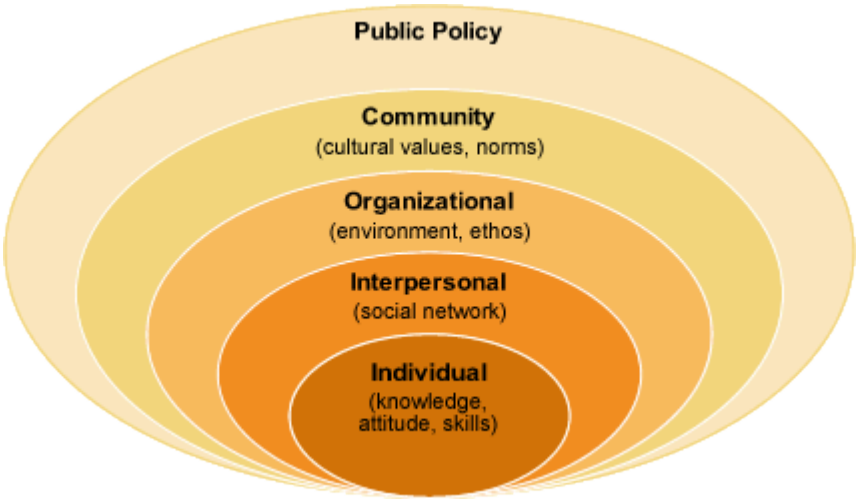

Figure 1: Social-Ecological Model

Source: Centers for Diseases Control and Prevention. (2018). *the social ecological model.*

The Social-Ecological Model (SEM) addresses behavior change at various levels and highlights the inter-relationship between behavior and the environment. Thus, the theory shows how different factors have an influence on individual behavioral change. This model/theory is composed of five levels/stages of influence on health behavior, they include the individual/intrapersonal factors, interpersonal processes and primary groups, institutional or organizational factors, community factors and public policies (Vicki, 2015). On its occasion, from a global campaign addressing violence prevention and the Social Ecological Model. The ecological framework treats the association between factors at various levels with equivalent significance to the impact of factors inside a solitary level. For instance, longitudinal investigations recommend that complications related with pregnancy and delivery, maybe in light of the fact that they lead to neurological harm and mental or personality disorder, appear to foresee violence in youth and young adulthood principally when they happen in the mix with different issues inside the family, for example, poor parenting practices. The ecological framework assists to clarify the result-violence later in life- as the communication of an individual risk factor, the results of inconveniences during birth, and the related risk factor, the experience of poor parenting (WHO, 2018).

2.3 Relevance of the theoretical framework to the study

According to the Centers for Diseases Control and Prevention (CDC, 2020), the Social Ecological Model (SEM) is a framework introduced in order to understand the multifaceted levels within a society. It also explains the association between people and the environment within a social system. The SEM considers both the individuals and their affiliations to people, organizations, and their community at large so as to be effective when addressing issues. The determinants and factors exist at all levels of health to ensure control, prevention, and interventions are effective when the model is

addressed from all levels. In addition, the SEM has various designs so that the different levels overlap, showing how one level of the model influences the next. The Centers for Diseases Control and Prevention (CDC, 2018) highlighted that it is very necessary to take action with multiple levels of the model at the same time in order to prevent certain risk factors. Thus, when addressing a problem, evidence emphasizes that in order to successfully sustain prevention efforts, the action should be taken at multiple levels of the model at the same time (CDC, 2020).

Further, this theory is relevant to this study in the sense that it allows us to develop programs and interventions based on how health behavior is affected in societies. Thus, there are five various levels (the individual/intrapersonal factors, interpersonal processes and primary groups, institutional or organizational factors, community factors, and public policies factors) of influence to ensure positive outcomes of programs and interventions implemented to address the matter, unlike using one approach to solve the problem.

Individual/intrapersonal factors refer to individuals' knowledge, beliefs, and self-concept. In this case of diabetes self-management, we assume that it is not everyone who is empowered with knowledge and skills to cope with this health condition. In addition, there are some beliefs from societies that have an impact on health. For example, some religions such as the Apostolic sector do not believe in Western medicine, so you find that they more rely on spiritually guided help (Vicki, 2015).

Interpersonal processes and primary groups are other types of factors affecting health. It has to do with a person’s relationships with other people. They include friends, family, peers, and workmates. Thus, relationships between people have an influence on one’s health behavior (National Cancer Institute, 2005). Therefore, both friends, family, peers, and workmates should have a positive influence that ensures diabetes

self-management to people living with the disease. For instance, at this level, parents of the individual can be involved in regular talks with their children about sex and for health screening from time to time (Open Educational Resources, 2020).

Health is also affected by institutional/organizational factors. The institutional/organizational level has the chance to contact more individuals in various sectors of the community. These factors include workplaces, schools, churches, and other various institutions. Institutions have got set rules and regulations that guide how people do things and behave. The organization's structures have a direct influence on health as well. Institutional rules and regulations can be formal or informal policies and can affect societies' health (Glanz, Rimer & Viswanath, 2008). For example, the Seventh Day sector does not eat fish and this can deprive a diabetic patient of having nutritious food which can lead to slow recovery or other health problems. On the other hand, if health facilities are not enough diabetic patients may end in a situation whereby they cannot access medication. For instance, the Ministry of Public Health and Fight Against AIDS in Burundi recently introduced a free healthcare policy for under 25 diabetic patients with type 1 diabetes mellitus, but the challenge is that there is only one location for insulin injection in the whole country. So, many young people with type 1 diabetes mellitus are deprived of medication due to the long distances between where they live and where to get their medication (Open Educational Resources, 2020).

Community factors can also influence individuals' health. In this regard, a community is defined as the culmination of the various institutions in a given area within a country. These institutions can gather ideas and resources together with the aim of improving community health. For instance, a hospital or health center may agree to send some of its nurses to teach sex education in nearby schools. Institutions could as well

coordinate health events designed to educate and equip affiliates with knowledge and materials in order to prevent the spread/development of diabetes in the community (Open Educational Resources, 2020).

Public policies are also among health determinants. At the public policy level, there are governing bodies that are in charge of the prevention effort. They establish policies or regulations and agencies within the health sector and at every level of government. They govern programs or activities that are to be carried out (Glanz, Rimer & Viswanath, 2008). They can also influence positively or negatively the individual health behavior (Open Educational Resources, 2020).

This theory was very useful as it seek to address humans' health behaviors from their multiple cause roots. The SEM can be also viewed as a group-based approach. A group-based self-management was proven by researches to be effective in managing diabetes mellitus (Odgers, Ball, Kelly, Isenring, Reidlinger, & Thomas, 2017).

This was an approach whereby both the patient's behavior and his/her surroundings are evaluated to ensure they are dealt with if they are found contributing to the patients' health conditions. In addition, this approach was great as it offered a new way which can be used by healthcare professionals when giving health education. In contrast with the routine way of having a one to one health education, patients were educated in a group that opens doors to patients to influence each other and adopted positive health behavior. Furthermore, there were multiple levels of influence from communities, families, friends that also have greater power over health behavior change. Therefore, everyone's inputs were the best option in addressing society's health behaviors. In this regard, the Social-Ecological Model (SEM) was used as it provided a broad and useful approach to deal with health behavior. Thus, group-based diabetes mellitus self-management (GBDMSM) needed to be taken into consideration as it offered durable

solutions to address individuals' health behaviors. However, the targeted individual had a greater part to play in behavior change since s/she was the one with the final decision. So, the Social-Ecological Model had limitations in the sense that it did not take the final decision rather it was used to put pressure on targeted individuals for their health behavior change (Odgers, Ball, Kelly, Isenring, Reidlinger, & Thomas, 2017).

2.4 Criticisms of the Social Ecological Model

Social-Ecological Models were made to encourage the appreciation of the dynamic interrelations among various individual and natural variables. They were introduced to urban studies by sociologists associated with the Chicago School after the first world war. The development of these models came in as a reaction to the narrow scope of most research conducted by developmental psychologists. Introduced as a conceptual model in the 1970s, the Social Ecological Model (SEM) was formalized as a theory in the 1980s. Later on, the SEM was revised by Urie Bronfenbrenner. Bronfenbrenner concocted his Ecological systems theory to clarify how everything in a kid and the kid's environment influences how a kid develops and creates (Howe, 2009).

(Jonas, 2016, p. 2), in his academic paper confirmed that there are several different theories of human development and most of them focus on the study of child development. Theories involving the child development process are crucial as the most significant changes take place from infancy through adolescence. Some of the most influential theories include (Sigmund Freud, 1856-1939), (Erik Erikson, 1902-1994), and (Psychodynamic theory, 2008).

(Leda, 2012) highlighted that it is very crucial to be sensitive to social inclusion and participation of young people in the mainstream environment. The main goal of his/her

study on young people's inclusion and participation was to explore to what extent the young people were socially included in the mainstream environment and to identify any barriers to their participation. In 2016, the author based on his discussion in the study he conducted in 2012 to critically analyze and discuss some of the benefits and limitations of using Ecological Systems Theory (EST). (Leda, 2016) argued that the conceptual framework of EST is a valuable tool for research exploring inclusion in the education of learners with Special Educational Needs/Disabilities (SEN/D). His/her argument is based on the fact that the EST helps the researcher focus on the crucial interplay between the individual and the context in which s/he is embedded (Leda, 2016). Bronfenbrenner centers around the person's drive and capacity to impact comparative with their particular environment and not strong on the person's sphere of influence. He insisted that the Development Ecology model comprised of four systems (the micro, the meso, the exo, and the macro) which help to understand the complex inter-relationship between individuals and society. (Anderson, 1986) states that the difference between development ecology and social-psychology or sociology or anthropology is that development ecology focuses on development within a given context. Thus, there are 2 critical things to look at or analyze to be able to understand the individuals. It is very important to describe individuals in the context of their family (micro context) and consider all the various systems which interact with individuals and with each other (meso context). The full-scale setting framework at that point is vital for putting another significant factor in the formative biological viewpoint. Both the individual and the environment change over time and Bronfenbrenner highlights that these changes are crucial to our understanding of how the different systems influence the individual and his/her development.

Social-Ecological Systems (SESs) are surrounded by a mounting critique from different fields. Critiques generally originate from fields such as conservation science, sociology, geography, anthropology, human and political ecology, as well as planning. But it is important to consider all the critiques in their broad themes since they are often part of the broader critique of resilience theory. Scholars realized that there are four broad themes that can be categorized from the critiques of the SESs. They include the adequacy of the depth of conceptualization, antinaturalism, adequacy of explanatory power and scope as well as critical theory.

Adequacy of the depth of conceptualization is a broad theme referring to the critique that the systems approach inadequately conceptualize social-ecological complexes. Systemic approaches are unable to capture certain realms of social reality which results in failure to use related methodological strategies. Concerning the force elements and regularizing questions, SES approaches neglect to deliver standardizing questions and to catch how control and contending esteem frameworks are not outside, but instead essential to the development and functioning of SES (Nightingale & Cote, 2012, p. 475). (Crane, 2010) posits that this failure has effects on material change on certain cultural groups that are not well investigated. The mortality of individuals is not considered as well, added (Crane. Glaeser & Glaser, 2011) argue that the decision to systematize social dynamics rather than rendering the social in other comprehensive ways has made unclear certain social issues such as inequity or economic marginalization. Thus, these issues only become apparent at certain scales of investigation. In addition, (Turner, 2014) sees social variables under consideration as a challenge since SES approaches failed to sufficiently problematize their choice. For example, material, asset extraction, and population benefits get more prominent thought than equity, nonmaterial, values, and mental parts of prosperity. Further, many

scholars underlined inconsistency or vagueness in the practice of defining social components and setting functional and spatial boundaries (Walker et al., 2012). Thus, there is still an ongoing debate on whether the challenges of applying the approach is practical or conceptual (Tim, Hilda, Paul, et al., 2016).

Antinaturalism- this refers to the critique made by antinaturalists. They believe that applying a system approach demands a methodological determinism. There is a need to choose an approach that matches the requirements of systems modeling rather than an accurate representation of social entities. (Armitage et al.; 2012) highlight that systems approaches are unable to show how the social systems differ from ecological systems basing on concepts like structures, behavior, and processes. There is a priority in a systems approach (Coulthard, 2012) as the focus is more on material causes, rules, and influence in collective situations rather than reconstructing intention from a subject point of view (Tim, Hilda, Paul, et al.; 2016).

Adequacy of explanatory power and scope is another broad theme of critics. It is mainly based on the lack of explanatory power as well as bias in explanations. These critique concerns originated from preceding assumptions. Thus, there is a misunderstanding of certain aspects of social reality which may lead to mistranslation into the ways in which the social-ecological is problematized (Crane, 2010). (Glaeser & Glaser, 2011) state that a systems ontology may steer analytical preferences toward collaboration with disciplines that have quantifiable dynamics, highly aggregated data with little insight into the realm of the subjective, and theories of society that avoid questions of power (Tim, Hilda, Paul, et al., 2016).

Critical theory is a broad theme of critics on the SES of scholars that have a background in critical theory. The researchers set that frameworks approach depoliticize the circumstance being spoken to (Welsh, 2014). (Evans, 2011: p 232)

contends that political dispossession happens in light of the fact that SES outlines the administrative decisions that are accessible, regularly in input components that are apparently nonpartisan.

The use of a systems metaphor leads to existing social relations being taken for granted as natural (Derickson & MaccKinnon, 2013). (Habermas, 1987: p 376) realized that a ″systems approach alone is obtuse toward social pathologies on the grounds that lifeworld is only absorbed to disequilibria in return relations.‟ Habermas' decision is in line with all arguments of scholars in this critical analysis. In other words, a systems approach can explain governance pathologies, for instance, how a lack of adaptive learning mechanisms in command and control structures prevent knowledge of the dynamic change in ecosystems (Krantzberg & McLaughlin, 2012). However, it is oblivious in regards to pathologies of society brought about by collaborations of cultural, financial, and social domains, for example, the breakdown of connections between the individual and network. (Stirling & Smith, 2010); and (Fabinyi et al.;2014) add that the above questions need one more question of what analysis aims for because sustainable futures almost always involve questions of politics and power (Tim, Hilda, Paul, et al., 2016).

2.5 Network systems in self-management of a disease

Chronic disease management at both national and global levels needs to be supported by effective self-management assistance in its different forms. The disease self-management support may come from either international organizations such as the World Health Organization or private or state-owned institutions. It may come as well from healthcare professionals, communities, and families. The evidence for the success of self-management support mainly focused on individually centered outcomes through behavioral change. However, there is a need to shift to group-

centered self-management support since it is currently clear that there a gap in knowledge concerning what type of support, who provides it, and under what circumstances. Thus, a patient with a chronic illness such as diabetes mellitus needs a very effective set up of group-based self-management to prevent complications. Globally, it is very challenging to achieve this great initiative as it needs more investments. This explains the reason why in developing countries such as Burundi there is high prevalence as compared to the rest of the whole world (Ivaylo, Anne, Christian, et al., 2013).

In their views, Ivaylo, Anne, Christian, et al. (2013) state that it is very crucial to have the labor division so as to meet the needs of individuals living with long term health conditions. They highly score the network approach to provide self-management support and frame it like types of disease "work" which originate from people' social networks.

A survey conducted on chronic diseases in 2010 in the North West of England shows that 2544 network members contributed to the disease management of 300 patients. The findings highlight that the network system significantly contributed to illness management and this network system was referred to as a network with partners. The network with partners (or group-based network) many people give their input to ensure the patient's disease is well managed. Unlike in the network with partners, in the network with no partner only the patient manage his/her health condition and this may lead to failure to disease management. Individuals with diabetes mellitus may develop complications due to a lack of social support. So, the level and type of input of network members depend on the circumstances. Thus, the network with partners provides an opportunity to fill in the gap between individual/patient-based self-management and the group based self-management of diseases (Ivaylo, Anne, Christian, et al., 2013).

2.6 Factors associated with diabetes self-management

2.6.1 Social support

Self-management is an essential strategy for people with type 2 diabetes (T2D) to obtain glycaemic control and prevent diabetes-associated complications. They are strategies recommended for successful self-management aim at empowering patients. They include diabetes self-management education and support from healthcare providers, friends, family, and peers. These strategies are expected to be very effective in promoting patients' ability to make decisions regarding the management of their disease. A diabetic patient is responsible for his/her disease self-management at a large degree. The diabetic is expected to manage and monitor various aspects of the disease such as blood glucose, diet, physical activity, and regular check-ups with healthcare providers as well as adherence to treatment. Individuals with T2D are also expected to stay motivated and develop skills such as problem-solving, decision-making, and the ability to translate knowledge into practical routines that enhance glycaemic control. Although adapting and maintaining a healthy lifestyle is necessary for self-management, it is a big challenge for the majority of the people with T2D. In addition, an individual understanding of attitudes, perceptions, and beliefs regarding T2D affects their decisions regarding self-management. Researchers reveal that people with T2D who perceive their disease as not serious are often less likely to engage in self-management than those who take their condition seriously. A few other known factors that impede patients' commitment in self-management are the absence of comprehension of treatment regimens and frustration related to the absence of glycaemic control and continued illness progression despite adherence to recommendations, limited support from healthcare providers in terms of knowledge and guidance on making specific self-management plans. These difficulties are

probably going to be more articulated among underprivileged populations especially the migrants and financially impeded in view of social and etymological hindrances during clinical experiences. Further, healthcare professionals are expected to ensure that patients adhere to the recommended lifestyle advice which includes proving care that is tailored to the needs of the patient. Patients' families and friends, the community, and government support is also needed, particularly to help address the socio-economic challenges that people living with T2D may be encountering (Yolanda, David, Philip, et al., 2019).

A study carried out in the United States in 2019 states that 29 million people are affected with type 2 diabetes mellitus (T2DM). A quantitative approach was used in this study and 474 people with type 2 diabetes mellitus (T2DM) were administered online surveys. The first group included 263 participants from the Qualtrics panel who had T2DM, the second group included 120 Amazon Mechanical Turk participants with T2DM and the third group included 91 participants with T2DM identified through Facebook group and personal social media connections. The sample population comprised of over age 18 diagnosed with type 2 diabetes. The investigation assessed provider characteristics that influence adherence to type 2 diabetes mellitus regimens and hoped to understand the phenomena of provider characteristics, treatment adherence, and their relationship to coping ability and treatment outcomes. Findings indicate that there were significant bivariate relationships between self-management and optimism, compassion, coping, and treatment satisfaction. Amazingly, self-management was negatively affected by gender and age. However, there was no significant difference in treatment satisfaction by gender or age. Thus, perceived provider compassion and optimism positively affected coping ability. In addition, full

mediation effects were revealed with coping ability positively mediating the effect of compassion on self-management and the effects of optimism on self-management.

Moreover, full drug impacts were found for treatment satisfaction with adapting capacity decidedly intervening the impact of empathy on treatment satisfaction and the impacts of good faith on treatment satisfaction. This study clearly shows that there are implications for both healthcare professionals, patients, and leaders in diabetes mellitus self-management (DMSM). It highlights that providers who manage to communicate with compassion and optimism positively affect coping ability. Thus, healthcare providers and professionals have an opportunity to enhance self-management adherence by helping their patients cope with all burdens of DM. It is also an occasion to improve provider communication tools aimed at assessing patients' coping capacity and increasing compassionate communication (Yolanda, David, Philip, et al., 2019).

Generally, there are very few studies on the provider and patient views and experiences of self-management within primary healthcare in disadvantaged settings. In Stockholm (Sweden) in 2018, four group interviews and twelve individual interviews were conducted. These interviewees included healthcare providers and patients. Both the healthcare provider and patient impression of self-administration were researched in five socio-financially underprivileged in Stockholm. The inquiries on semi-structured interview guide focussed on the view of diabetes care services accessible at primary health care centers, patient and provider collaborations, diabetes diagnosis, and self-management support. Research findings showed that there were dilemmas which explained confusions and conflicts that both providers and patients experienced in their daily life or practice. Healthcare providers knew that patients needed support to change behavior and well manage DM but realized that they were not adequately equipped to

deal with different social and cultural issues of self-management. On the other hand, patients to adapt information and lifestyle advice that fits with DMSM. These were two dilemmas discovered in this study that influence the collaboration and interaction between healthcare providers and patients. The study findings underline that there is a need for two interventions to fill in the above-mentioned gap. They include adopting and maintaining new routines through practical and appropriate lifestyle choices (patients) and to balance expectations and pre-conceptions of self-management (providers) [Juliet, Jeroe, Pilvikki, et al., 2018].

2.6.2 Attitudes related to diabetes self-management

In the urban population in South London, United Kingdom 1622 adults with self-reported type 1 diabetes mellitus were identified in a screening database. 1484 were invited to participate and an additional 118 individuals were invited from either specialist or primary care. One hundred and ten detailed ineligibility and 97 quitted. Four hundred and ninety-six surveys were included in the analysis and forty-seven percent (47%) were completed online (59% by men). Participants were compared with non-participants and were representative of gender and age ($p=0.25$ and 0.74 respectively). On contrary people from black minority ethnic (BME) were under-represented (non-white people 18%, non-participants 42%, $p< 0.001$).

Respondents were contrasted with non-respondents and were illustrative of sexual orientation and age ($p = 0.25$ and 0.74, respectively), yet individuals from black and minority ethnic (BME) bunches were under-represented (non-white respondents 18% vs. non-respondents 42%, $p < 0.001$).

The analysis findings showed that of the 496 analyzed responses, 263 (53%) had attended some form of Diabetes Mellitus Self-Management Education (DMSME), the majority (93%) attended Dose Adjustment For Normal Eating (DAFNE) course or

another course lasting >25hours. 70% of non-attender participants had heard of DMSME and only 4% had been referred but not attended. In the United Kingdom, courses are delivered by a diabetes nurse specialist and dietitian educators within specialist services. Courses are delivered by a diabetes nurse specialist and dietitian educators within specialist services. The courses last five days and are taught in groups of up to 10 adults with Type 1 diabetes. Non-attenders were more likely men (67% vs 50%, $p<0.001$).

Overall 17% of participants reported receiving a less than positive message about DMSME from their healthcare providers. In addition, 88% of attenders and 76% of non-attenders have received positive messages about it. Thus, social determinants of health, particularly gender and education attainment increase health inequalities by influencing decisions to attend evidence-based education courses. Further, healthcare professionals' communication is crucial to encourage attendance, and observation of a course may facilitate this. Therefore, attitudes towards DMSME are directly influenced by education attainment, gender, and health care provider behaviors and knowledge particularly how they collaborate with patients (Harris, Joyce, Miller, et al., 2018).

2.6.3 Knowledge towards diabetes self-management

Diabetic patients must be able to make food choices that optimize metabolic self-management and quality of life. Therefore they need to be educated on how they can choose food to eat. It is in this same regard that a study on nutrition and knowledge and skills was carried out at St Columcille's Hospital that included 124 with T2DM over 18 years of age. Audit of Diabetes Knowledge (ADknowl) questionnaires were used to collect data. There was no pregnant or lactating woman. The findings of the study indicated that the normal of ADKnowl dietary subscale score was 59.2%. Lower

diabetes-related nutrition information was related to lower sugar and organic product/vegetable admission and higher dietary. Thus, dietary education integrated throughout the lifespan of T2DM may improve nutrition knowledge and skills and promote more balanced approaches to dietary self-management of T2DM (Cathy, Miriam, Michael, et al., 2015).

In-depth interviews were conducted in Iraqi on DSM behaviors in 2018. 25 participants took part in the study and 13 of them were females. Participants' age ranged from 38 to 73 years. The mean estimation of illness length was 8.41 years and 19 of the respondents announced a positive family background of T2DM. Five of the participants were smokers (1 ex-smoker and 4 current smokers). Regarding the education of the participants, 2 had a diploma, 7 got a BSc degree, 2 were PhD qualified and 6 were secondary school graduates. 7 participants were using insulin and metformin, 9 were using oral anti-diabetics and 9 were using insulin only. In addition, health institutions in Iraqi are weak in terms of healthcare services. The interview findings stated that Iraqi diabetic patients had inadequate self-management behaviors. Further, the main barrier to self-management practices was the lack of knowledge due to the absence of DSM educational programs (Ehab, Mohamed, Saad, et al., 2018).

2.6.4 Beliefs related to diabetes self-management

In DSM there are different roles by different individuals that must be taken into consideration. All these individuals (diabetic patients, healthcare providers, family, and community) work together to ensure the effectiveness of diabetes management. One's beliefs as well have an impact on his/her input in DSM. In their very recent study, the American Association of Diabetes Educators (AADE) highlighted that diabetic patients' role is crucial in DMSM. Participants in this study were diabetes mellitus educators, registered dietitians, registered nurses, pharmacists with training

and experience pertinent to Diabetes Self-management Education and Support (DSMES) or other professionals with certification in diabetes mellitus care and education such as Board Certified Advanced Diabetes Management (BC-ADM) and people who were Certified Diabetes Education (CDE). All participants provided DSMES to individuals with diabetes and worked in AADE-accredited outpatient programs. The study excluded healthcare professionals who did not possess training and experience with DSMES and did not work in accredited diabetes education programs. The study focus was to evaluate diabetes' beliefs about the importance of patients' role in self-management and the relationship between educator reported strategies used to support patients with diabetes. A clinician self-management scale was used to assess support strategies and diabetes educators' beliefs towards self-management. Cross-sectional study design was applied as well. Findings reflected that the Clinician Support-Patient Activation Measure (CS-PAM) was between 56.1 to 100.0. The self-management scale ranged from 2.44 to 5.00. In conclusion, the AADE study revealed that the majority of diabetes educators highly support and embrace patients' participation in their own care. In addition, it was discovered that educators who are more supportive of patients' self-managing are more likely to use effective support strategies. Such educators foster a sense of patient ownership in their own care and promote behavioral change that may lead to improved health outcomes (Julie, John; Dawn, et al., 2019).

2.6.5 Challenges/trends in diabetes mellitus self-management

DSM is very complex and involves challenges related to medication, food, and exercise. Diabetic patients must monitor their blood glucose within both the short and long term even when current blood glucose levels are normal. Prescriptions and advice by health care providers must be followed as well to prevent long term complications.

Further, activities such as making decisions based on information gathered from authentic sources and selecting and preparing daily meals to constitute a barrier to DSM (Cecilia, Kerstin, Michel, et al., 2018).

Several studies show that individuals living with diabetes mellitus face various self-management problems (Robin, Mireya, Selene, et al., 2019; Cecilia, Kerstin, Michel, et al., 2018; Justine, Margaret, Jacqui, et al.; 2005; Neesha, Niobe, Gail, et al., 2019).

These problems differ from one another as people do not have the same attitudes, knowledge, and beliefs regarding DSM. In addition, sociodemographic characteristics of societies such as income, level of education, and age influence the DSM practices (Cecilia, Kerstin, Michel, et al., 2018).

A study conducted in Sweden in 2018 involved recently diagnosed diabetic patients and more experienced diabetic patients. The study focussed on challenges related to DSM and the authors wanted to provide a foundation for the future development of a person-centered information and communication service. Everyday life challenges such as understanding, developing skills and abilities, and mobilizing strengths were discovered in both groups. Participants highlighted that they had challenges in understanding the causes of fluctuating blood glucose and in developing and mobilizing skills for choosing healthy food and eating regularly. Patients recently diagnosed were more challenged by learning to accept the diagnosis and becoming motivated to change habits. In opposite, the more experienced patients were more challenged by issues about complications and medication. Thus, adults with diabetes have different needs for support during different phases of the health condition. From a person-centered perspective, it is advisable to meet individual needs for self-management on people's own terms through a technological service that would reach and connect a large number of people (Cecilia, Kerstin, Michel, et al., 2018).

Mexico is one of the countries with the highest prevalence of type 2 diabetes (T2D). The prevalence is characterized by high morbidity and mortality and difficulty meeting glycaemic targets. With the purpose of identifying the challenges for T2D, researchers carried out a study in 2019. The study focussed on challenges perceived by both the healthcare professionals and adults with T2D in primary health clinics from Seguro Popular in Mexico City. 20 adults with T2D [52.5 years old (SD=9.9)], diagnosed with T2D for 12.3 years (SD=6.3), and 19 health providers were interviewed in this study. Females were 80% and 90% of participants had financial insecurity.

The study results revealed that personal challenges included lack of family support/competing demands, cultural beliefs, challenges to lifestyle modification, lack of resources, and mental health issues. The institutional level challenges included patient engagement barriers, lack of resources, and perceived quality of care. Thus, Mexicans need to improve the evidence-based diabetes self-management programs so as to become more accessible through considering the social determinants of health and building upon current initiatives to improve early diagnosis and treatment of T2D. In addition, Low health literacy, personal control, and cultural beliefs influence DSM in adults with T2D with limited resources. Further, the psychological wellness and money related difficulties of adults with T2D will require multidisciplinary group-based care (Robin, Mireya, Selene, et al., 2019).

2.7 Brief history of the health sector in Burundi

The socio-political crisis in Burundi (from 1993 to 2003) negatively affected all sectors of life including the health system which was deeply disrupted. In 2012, the World Bank confirmed the prevalence of malnutrition to be still high, and according to the Human Development Report 2013, the incidence of infectious diseases was on the rise. There were some improvements during the postwar period through the Millenium

Development targets for maternal and child health were still far out of reach. According to the Institute for Health Metrics and Evaluation (2014), the epidemiological profile of Burundi was dominated by communicable, maternal, neonatal and nutritional causes of illness. These were major factors of health in Burundi. In 2010, these factors caused 76% of deaths which represented a small reduction from 82% in 2000. Diseases related to HIV/AIDS and tuberculosis increased and nutritional decline. However, almost 58% (in 2010) were still chronically malnourished with approximately half of them suffering from severe malnutrition (World Bank, 2012).

The high-Level Forum on Health Commission was appointed by the government of Burundi to investigate the challenges faced by the health sector in 2004. The challenges discovered by the commission included the following:

- Poorly propelled staff with high turnover and wearing down rates
- Excessive authoritative centralization
- Lack of contribution of the community in the administration of health services
- Insufficient and inadequately prepared staff with 80% of medical professionals and half of clinical professionals and nurses situated in the capital
- Weak segment coordination
- Poor nature of health services
- Frequent stock-outs of fundamental medications
- Lack of solid health information

Based on the commission report, the government of Burundi undertook several reforms and policies to address the challenges. Among others, there are the free healthcare services to patients with tuberculosis, HIV/AIDS, pregnant women, and

children under 5 years. The Performance-Based Financing (PBF) was introduced as well by the state to ensure the motivation and competence of health professionals. However, the government of Burundi's efforts are still lower as compared to problems encountered by its health sector. Further, there is also a need for other sectors of government to work hand in hand with the health sector to redress the situation (Seleus, Marc, Hera, et al., 2015).

2.8 Health sector financing and economy in Burundi

Burundi's economy is based on agriculture as 90% of the population depends on it for their livelihood. USAID intensified efforts in Burundi since 2007 to diversify economic opportunity, improve rural income, and strengthen the competitive commodity-based value that link producers to markets. Together with the World Bank, USAID facilitated negotiation reforms commercializing Burundi's most lucrative value chain ″coffee.‟ After these reforms were made the United States and European companies now buy coffee legitimately from makers because of the arrangement changes upheld by USAID. In addition, a complementary initiative to strengthen sanitary and phytosanitary controls put in place boosted Burundi's agricultural trade within the East African Community was introduced by USAID in 2011. Body of the United Nations, USAID also supported applied agriculture research and educational activities, and this increased access to improved seeds and promoted agribusiness entrepreneurship (USAID, 2019).

An analysis of the chronologic national budget of Burundi stated that resources allocated to health have been improving. In local currency (the Burundi Franc), the country budget allocated to the Ministry of health increased by 17% from 2012 to 2013 mainly for programs, investments, and Performance-Based Financing. From 2000 onwards the total health expenditure shifted from US$22 to US$ 45 in 2012. However,

the commitments to health are still very lower while challenges are huge. The total health expenditure is above the World Health Organization norm which is US$44. In addition, the percentage of the government budget allocated to health is higher than 15% recommended by the 2001 Abuja Declaration. Out of pocket expenditures through user charges at the point of services decreased from 51% (2000) to 28% (2012) of total health expenditure. However, this decrease does not give details about inequalities in access to health. It does not capture the situation of different families facing catastrophic healthcare costs that are actually pushing already poor people into extreme poverty. A recent study of agricultural workers stated that more than 80% of the rural population could not afford to pay more than US$16 per year. In addition, several development partners, and international organizations such as Japan, United Nations agencies also contribute to the financing of health in Burundi (Seleus, Marc, Hera, et al., 2015).

2.9 Food insecurity in Burundi

Burundi's economy is based on agriculture as 90% of the population depends on it for their livelihood. Being the 9th food security crisis and having the highest prevalence of chronic malnutrition globally, Burundi has the highest hunger score according to World Food Security Report (2018).

The country is weak in terms of addressing crises and emergencies due to a lack of capacity to resist challenges like floods, droughts, and epidemics. Human Development Index states that Burundi ranks 185 out of 189 countries. In 2019, 15% of the population were confirmed needing emergency and crisis levels of food insecurity. According to the Joint Approach to Nutrition and Food Security (JANFSA) implemented in December 2018, 44.8% of the population were affected by food insecurity with 9.7% being severely food insecure. In the total of 18 Burundian

provinces, those affected by food insecurity were Karusi (18.8%), Gitega (17.5%), Muramvya (16.0%), Kirundo (14.3%), and Mwaro (12.5%). Factors contributing to food insecurity in Burundi include refugees from the Democratic Republic of Congo (DRC) living in Burundi, the new influx of returnees from Tanzania, and the high-density population. These returnees fled the country during civil wars from 1993 to 2003. Vulnerable populations and the poorest people are only given peripheral land due to the demand for land. The national prevalence of stunting 2016/2017 was 56% which was above the emergency threshold (40%) [WFP Burundi & USAID, 2019; WFP, 2020].

2.10 Community Health Education Network Policy in Burundi

In developing countries, there is an epidemiological transition of infectious diseases to non-communicable diseases (NCDs). These health conditions are badly affecting state economies and human resources especially in developing countries (Greenberg, Raymond, & Leeder, 2005). Reddy (2006) states that Non-Communicable Diseases are mainly linked to industrialization, urbanization, and malnutrition. Like several developing counties, the republic of Burundi is faced with a major emerging problem of Non-Communicable Diseases that are rising. An analysis shows that the Burundian health sector is weak due to the socio-economic crisis and that it is essential to implement prevention programs to redress the issue. It is in this same regard that the government implemented the Community Health Education Network Policy (CHENP) or Association for the Promotion of Health network in Burundi (APSA) in 2007. The CHENP is a well-structured prevention program for cardiovascular diseases and diabetes mellitus based in Bujumbura the capital city of Burundi. It is made up of 10 urban or peri-urban structures of Bujumbura: 3 hospitals, 1 health center, 3 local associations of diabetics, and 3 Non-Governmental Organizations (NGOs) as partners.

The network is coordinated by a dietician, a doctor, a patient association member, and a secretary. The local team works in close collaboration with an international project manager, consulting endocrinologist, and a consulting ethnosociologist (Xavier, Maryvette, Nelly, et al., 2010).

It focuses on educating people at high risk to develop NCDs so as to reduce morbidity and mortality due to the conditions. In addition, prevention programs should focus on food, tobacco, lifestyles, and physical activity as well.

To implement the policy the Ministry of Public Health and Fight Against AIDS worked in collaboration with 10 above-mentioned structures in 2007. The implementation took place in 7 of the 10 structures: 2 hospitals, 1 health center, 2 NGOs, and 2 associations.

The first results show that from June 2007 to December 2008, 377 group sessions for 1318 people (69%) at risk and 2457 participants (1 to 3 sessions per person on a cycle comprising 3 themes) were carried out by 19 nurses and peer educators trained by a diabetologist and an ethnosociologist. During the 7 months, 61 sessions with 567 patients at risk were performed with continuous involvement of both educators and health professionals. 99% of participants were people living in Bujumbura and the program is improving.

The policy focuses on the implementation of an educational cycle (training) for patients, training in the screening of people with DM or at risk of cardiovascular diseases, and monitoring of risk of complications in synergy with doctors taking part in the training. Educative sessions last from 1hour 30 minutes to 2 hours and bring together 6 to 10 people and peer educators are being paid for each session.

However, access to laboratory tests remains reduced and expensive. So, the screening is based on a blood sugar level capillary and clinical symptoms that define a high risk of complications, such as mass index body, waist circumference age, existence or not of diabetes known or detected on capillary glycaemia, and smoking. People at risk are advised to participate in risk learning sessions. The education sessions are conducted outside of the service hours because of a shortage of health professionals and their workload (Xavier, Maryvette, Nelly, et al., 2010).

2.11 Summary

Chapter two covered the Social Ecological Model and its relevance as well as criticisms. The network systems in self-management of disease were also discussed. This chapter had highlighted the factors associated with diabetes mellitus, brief of the health sector in Burundi, and the health sector financing and economy in Burundi. Food insecurity in Burundi and Community Health Education Network Policy in Burundi had been explained as well.

CHAPTER 3: METHODOLOGY

3.1 Introduction

This chapter highlighted how the research was conducted, taking into consideration all the activities and procedures that were undertaken during the study. It gave an insight into the research methodology that was adopted in this research to evaluate the community health education network policy and diabetes mellitus self-management provisions in the Burundian health sector. Other components of this chapter such as research design, population and sampling, data collection instruments, data collection procedure, analysis, and organization of data and ethical consideration were covered.

3.2 The Research Design

This study utilized a mixed-methods design. Johnson, Onwuegbuzie, and Turner (2007) view mixed methods as "the type of research in which researchers combine elements of qualitative and quantitative research approaches for the broad purposes of breadth and depth of understanding and corroboration". They reveal that public health research needs both narrative depth and numerical precision. In addition, Tashakkori and Teddlie (2010) confirm that the mixed research approach "employs both qualitative and quantitative approaches in types of questions, research methods, data collection, and analysis, and integrates inferences drawn from both." Using this research design in this study improves understanding of how diabetes self-management is influenced by the community health policy provisions.

Furthermore, Creswell (2003) defines mixed methods research as "the process of collecting and analyzing data, integrating the findings, and drawing conclusions using both qualitative and quantitative approaches within a single study." This research

methodology choice gives a well-balanced framework able to address the study's objectives from different perspectives.

The researcher used a mixed-methods research design to investigate the relationship between the Community Health Education Network Policy and diabetes mellitus self-management in Bujumbura District, Burundi. This data collection approach was chosen because the study is multifaceted and involved both numerical information and respondents' experiences. The combination of both qualitative and quantitative data helps to identify statistical trends while providing insight into the cultural and social dimensions that shape diabetes self-management practices.

The study's four main objectives are the foundation for the choice to use mixed methodologies. Both qualitative and quantitative data are advantageous for each of these goals. Applying triangulation (using one form of data to support or clarify another), a mixed-methods approach enhances validity. Additionally, it guarantees an in-depth understanding of how policies are implemented and how they affect community health practices.

For example, the number of diabetics who attend health education programs, take their medications as prescribed, or show better blood glucose control can be ascertained using quantitative data, which is gathered through questionnaires or medical records. Measurable trends and patterns are evident in these data. However, qualitative information obtained from focus groups, interviews, and analysis of policy documents offers a clearer understanding of the reasons behind these trends and patterns. They identify elements that may influence diabetes self-management practices. These elements include attitudes, social support groups, and responses about the Community Health Education Network Policy.

On one hand, understanding participant attitudes, beliefs, experiences, and views regarding diabetes self-management and policy implementation was the aim of the qualitative phase. Both interviews and focus group discussions with diabetic patients (under 25 and others),

medical professionals, government officials, and community health educators were used to gather qualitative information.

On the other hand, the goal of the quantitative phase was to measure the degree, frequency, and correlation between factors, including self-management practices, policy exposure, and health outcomes. Prevalence and adherence rates were evaluated using questionnaires and information from medical records.

The researcher adopted a mixed research design method to collect data in order to have in-depth information and a better understanding of the challenges and opportunities of the community health education network policy and diabetes mellitus self-management after the policy implementation. At the beginning of the study, the researcher carried out a systematic review of documents, legislature texts, and studies on the community health education network policy and diabetes mellitus self-management in the Burundian health system. This involved the identification, analysis, and synthesis of studies, legislative texts, and other documents published on community health education network policy and diabetes mellitus self-management. This helped to get a picture that is much more reliable than if only one source was used.

Step two was one to one interviews with key decision-makers to explore the framework of community health education network policy and diabetes mellitus self-management and their implementation. The last step of the study was an opportunity to assess the impact of the community health education network policy and diabetes mellitus self-management through a face to face survey with the aim to find out whether they had an impact on diabetes management. Furthermore, the study was an opportunity to explore people's opinions on community health education network policy and diabetes mellitus self-management.

3.3 Population and Sampling

3.3.1 Population

The target population of the study comprised of diabetic patients from four different hospitals in Bujumbura. The study was conducted in two private and two state hospitals in Bujumbura Sanitary District. The choice of the district was because it was where many people with diabetes are being admitted. Participants in this research were diabetic patients from the above-mentioned hospitals from 18 years old and above. This formed the basis of a balanced research population that guided the researcher in getting results that was essential to this research. The population included diabetic patients (type 1 and 2) admitted in the four hospitals in 2019 and 2020. According to the patients'register, there were 2074 diabetic patients who have been admitted for the past two years (2019 and 2020) in Bujumbura Sanitary District.

3.3.2 Sampling

The researcher used simple random sampling by Balloting for quantitative data collection. Purposive sampling was used for qualitative data collection. In non-probability sampling, the probability of any particular subject of the population being chosen was unknown (Mitchell 2003:70). Purposive sampling technique relied mainly on personal judgment hence the selection of the sample was quite arbitrary. This was used to sample participants from the four different hospitals in the Bujumbura district. Officials of the Ministry of Public Health and Fight Against AIDS, government officials such as those working in the Ministry of agriculture, Ministry of Finance, and the Ministry of social welfare were interviewed as well to evaluate their inputs since a multi-sectoral approach led to the effectiveness of policies implemented.

Participants were diabetic patients from 18 to 50 years old from four state hospitals. There were 2074 diabetic patients who have been admitted for the past two years (2019

and 2020) in the whole Bujumbura Sanitary District. Therefore, the selection of respondents in this study was based on both hospitals as well as government departments (multisectoral approach as pillars to successfully implement policies). Four state owned hospitals as well as one ward in each hospital were recruited using simple random technique. Thus, four health facilities with four wards were randomly selected. They included Centre Hospitalo Universitaire de Kamenge, Hopital Militaire de Kamenge, Hopital Prince Regent Charles, and Clinique Prince Louis Rwagasore. In deriving the sample size for this study, the researcher used Slovin's formula (also known as Sloven's formula). Slovin (1960) highlighted that this sampling technique was used to compute the sample size in a study given the total population and the margin of error. The level of confidence that the researcher used was 95% (0.05).

The formula given as:

$$n = \frac{N}{1 + Ne^2}$$

Where:

n= Sample size

N= Total population= 2074

e= Margin of error= 5%= 0.05

Thus,

$$n = \frac{2074}{1 + Ne^2}$$

$$n = \frac{2074}{1 + 10.1833196945}$$

$$n = \frac{2074}{11.1833196945}$$

$n = 185.4547716292$

$n = 185$

Approximately, n= 185 (Sample size).

Table of sampled health facilities/government sectors, wards and number of respondents

Names of health facilities/government sectors	Number of ward	Number of respondents
Centre Hospitalo Universitaire de Kamenge	1	50
Hopital Militaire de Kamenge	1	35
Hopital Prince Regent Charles	1	35
Clinique Prince Louis Rwagasore	1	35
Government sectors	-	30

Table 1: Sampled health facilities/government sectors, wards and number of respondents

Thus, this study used a sample size of 185 participants; 155 for the survey, 30 for three focus group discussions.

3.3.2.2 Purposive sampling

Purposive sampling is about the selection of people based on the researcher's judgment that relevant information can be sought from the chosen people (Neville 2005). Key informants for the study were selected using purposive sampling. It is to be used to

gather important information for the research from government officials, health workers, and the Ministry of Health in Burundi. Key informants in this study were from the Ministry of Health, Ministry of agriculture and Ministry of Finance will be purposefully chosen will be interviewed. A letter of invitation which explained the purpose of the study was sent and they were invited to participate in the study.

3.3.2.3 Convenience Sampling

In a convenience sample, a researcher simply collected data from those individuals or other relevant elements to which he/she had the most convenient access. This method, also sometimes alluded to as random sampling, is generally valuable in an exploratory study. It is also often used by those who need quick and easy access to people from their population of interest. Because convenience sampling is quick and simple, investigators can quickly assemble their information and start to extrapolate theories from the information. This type of sampling considers a quicker investigation, allowing investigators to concentrate on the more significant parts of their investigation as opposed to computing the most ideal approach to acquire a population sample. Because this type of data collection is literally done at the convenience of the researcher, it is perfect for quick studies, and is often used in preliminary surveys to demonstrate a need for a better understanding of the research material. Thus, this method was used by the researcher to interview participants available during data collection. This method was used during interviews of both diabetic patients, health practitioners as well government officials.

3.4. Data Collection Instruments

The researcher used both the quantitative and qualitative tools to gather information.

Quantitative instruments

The researcher used structured questionnaire. The questionnaire comprised two sections such as the section for demographic data of diabetic patients (Section A), and the section for questions related to the objectives of the study (Section B).

Qualitative instruments

3.4.1 Focus Group Discussions (FDGs)

Focus group discussions involved interviewing several people discussing and commenting on personal experiences about the subject of the research (Bryman 2004:346). The focus group discussions enabled researchers to examine people's different perspectives as they operated within a social network" argued Seale (2004:181). Focus groups, typically bring together a small group of people to participate in a carefully planned discussion on a defined topic" (Morgan 1998), in this case, the impact of Community Health Education Network Policy and diabetes self-management. Focus group discussions were used when collecting data from diabetic patients.

3.4.2 Key informants interview guide

As Robertson (2009) explains this is a type of discussion that should be initiated by the interviewer designed for the purpose of acquiring research pertinent information. As favored and upheld by Bogdom and Taylor (1999) as highlighted by Williams (2011: Pge 161) this is a direct contact between the investigator and the respondent's knowledge and their life experience.

The conversation in interviews was based and focused on the interviewer's research objectives, predictions, or explanations. As a person to person interaction interviews had one purpose in mind that was gaining the perspective of an insider or expert within

the field of study. Interviews were conducted on government departments and healthcare providers from the four hospitals.

3.5 Secondary Data source

This data with no exemption incorporates the use of data that was utilized before by different researchers and various scientists identifying with a similar point. This may not essentially be examined or published sources but actually significant secondary data sources that were employed considering statistical counting of individuals with diabetes in Burundi. In fact, secondary data used ranges from published or unpublished sources. The researcher made use of sources that include books, dissertations, journals, newspapers, reports, minutes, and relevant records relating to the health care systems in Burundi.

The basis of secondary data analysis was to support time consciousness that sometimes can be spent gathering data and predominantly in the case of primary methods.

3.6 Pilot Study

The pilot of the study is referred to as the pretesting of research instruments. Pretesting for research instruments was done to determine the validity, sustainability, and reliability of the instruments that were used by the researcher. There was a preliminary survey using a few instruments for a convenient test of instrument viability and reliability (Clough and Nudbrown 2008:23).

3.7 Data collection procedure

3.8 Analysis and Organization of Data

It is very crucial to note that Blanks (2007:22) identify data presentation and analysis as a way of making sense out of large amounts of raw data. The researcher adopted

descriptive data analysis methods, frequency distribution, graphic analysis such as bar charts and pie charts for quantitative analysis, and thematic analysis was used for qualitative analysis. Excel and SPSS were used for coding and transcriptions.

3.9 Ethical Consideration

The approval of the study was obtained from Africa University Research and Ethics Committee (AUREC) which is a body department. Approval to conduct the study in Burundi was obtained from the registrar. Permission to pretest the research instruments was obtained from the medical superintendent at Military Hospital in Bujumbura. Privacy and confidentiality during the study were maintained. Participation in this study was voluntary. Participants were free to withdraw when they want without being victimized. There was no coercion throughout the study.

No names was captured on the Group Based Discussion (GBD) guide and interviews. Only the investigator got to know what your respondent number was and he/she secured that data with lock and key. It was not shared with or given to anyone except the research supervisor and school board. This study did not bring any risk to the participants. The topic was very important to understand Community Health Education Network Policy and diabetes self-management provisions. Names of participants were kept in files.

3.10 Summary

Chapter three had discussed the research design, the population, and sampling. The data collection instruments and the pilot study were covered. The analysis and organization of data as well as ethical considerations were highlighted.

CHAPTER 4: DATA PRESENTATION, ANALYSIS AND INTERPRETATION

4.1 Introduction

Chapter four provides presentation, analysis and interpretation of the data collected using the instruments given in chapter three. The data was presented using tables, graphs, bar charts and pie charts. Data from interviews and focus group discussions was presented using mainly the narrative format. It is also crucial to inform the reader that the questionnaires were distributed to 185 respondents (100%).

5.2.Data presentation, analysis and interpretation from questionnaires

5.2.1. Sociodemographique information

Table 4.1. Age group and marital status of participants

N=185

Variable	Male	Female	Frequency N= 185	Percentage (%)
Age Group				
18-25	30	18	48	25.9
26-35	22	29	51	27.5
36-50	15	37	52	28.1
51 and above	21	13	34	18.3

Marital Status				
Single	36	25	61	32.9
Married	52	72	124	67

Table 1: Age group and marital status of participants; Source: field data

The table 4.1 illustrates that the participants are in four various age groups: 18-25, 26-35, 36-50 and 50 and above. The participants in the age group 18-25 were 48 9 (25.9%) n=185 participants (30 males and 18 females) while those in the age group 26-35 were 51 (27.5%) n=185 participants (22 males and 29 females). It also shows that the age group 36-50 was made of 52 (28.1%) n=185 participants (15 males and 37 females) while the age group of 50 years and above consisted of 34 (18.3%) n=185 participants (21 males and 13 females).

Regarding marital status, this table reveals that 61 (32.9%) n=185 participants (36 males and 25 females) were single while 124 (67%) n=185 participants (52 males and 72 females) were married.

The data indicated a balanced distribution of respondents by gender and age which is supported by Creswell's study. Creswell (2016) argued that it is important to conduct research using both female and male participants because gender identity can influence a participant's perspective on a topic. In addition, age group diversification provided different views from different age groups. This implied that the research results would indicate the true values concerning the population under study.

Pie chart 4.1. Gender of participants

N=185

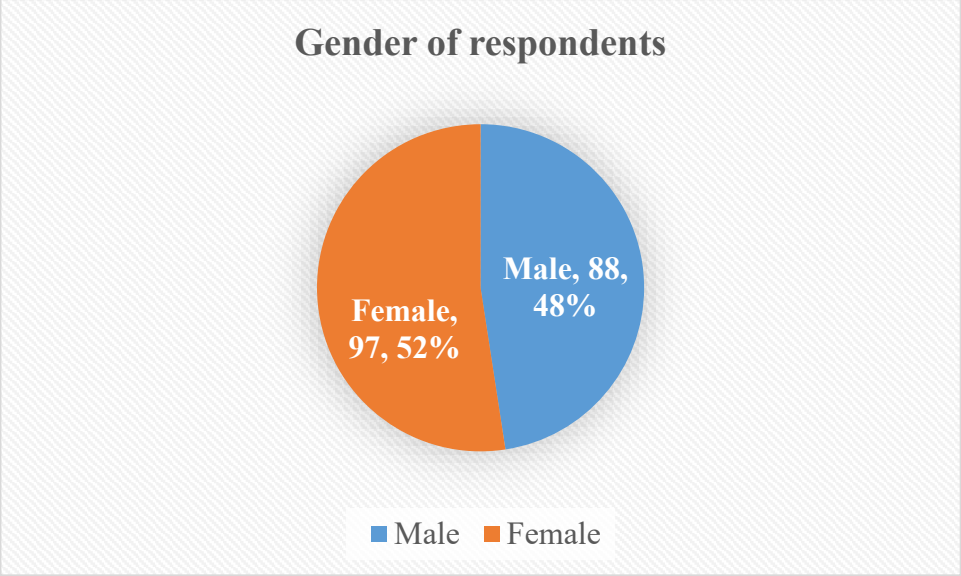

Figure 1: Gender of participants; Source: field data

The researcher captured the gender of participating respondents. The data was presented on the pie chart above. The pie chart above shows the gender of participants. The data shows that there were 88 (47.5%) n=185 males participants and 97 (52.4%) n=185 females participants.

Bar chart 4.1. Education of participants

N=185

The researcher went on to enquire of the level of education of respondents. The aim of asking the question on level of education was to explore the influence of education on community health education network policy and diabetes mellitus self-management. The information on the question was presented on the bar chart below;

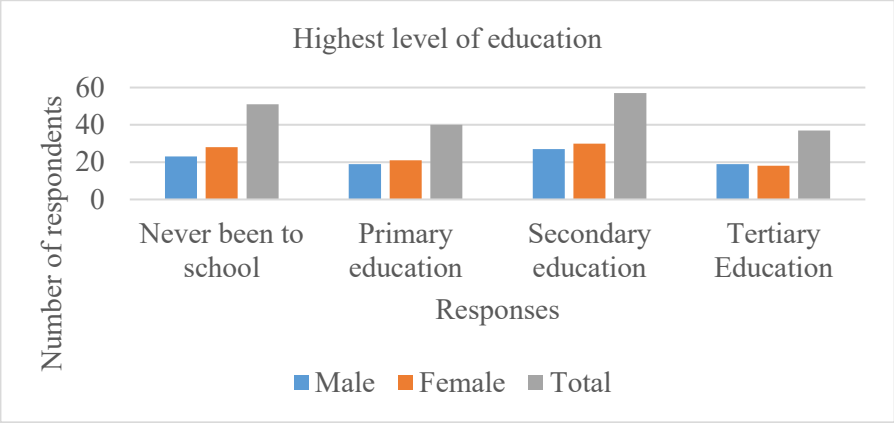

Figure 2: Level of education of participants; Source: field data

The bar chart 4.1 above represents data collected on the highest level of education attained by participants. It reflects that 23 (12.4%) n=185 males and 28 (15.1%) females had never been to school. This represented a 27.5% of the total participants. 19 (10.2%) n=185 males and 21 (11.3%) n=185 females which is 21.5% of the participants) had only attended primary school. 27 (14.5%) n=185 males and 18 (9.7%) n=185 females which is 24.4% of the participants had attended secondary school. 19 (10.2%) n=185 males and 18 (9.7%) n=185 females (37) which is 19.9% of the participants had attended tertiary education. The data shows that generally, the level of education attained by both males and females was equal among participants. Cathy, Miriam, Michael and Donal et al (2015) states that recognises education as a right for all. As such, the data implies that respondents were educated save a few that had not been to school. This trend can be owed to the civil war.

Table 4.2. Monthly income in Burundian Francs (BIF)

N=185

The researcher enquired respondents on their monthly income. The data on the question was presented on the table below;

What is your monthly income in Burundian Francs (BIF)	Male	Female	Frequency	Percentage
a)1-50000 BIF	27	29	56	30.2%
b)50000-100000 BIF	12	12	24	12.9%
c)101000-150000 BIF	11	10	21	11.3%
d)151000-200000 BIF	4	9	13	7%
e)201000-250000 BIF	11	13	24	12.9%
f)251000 BIF and above	23	24	47	25.4%

Table 2: Monthly income of participants; Source: field data

The table 4.2 displays the monthly income in Burundian Francs (BIF) of the participants in this study.

Bar chart 4.2. Monthly income in Burundian francs

N=185

The information on the above table was also presented on the bar chart below;

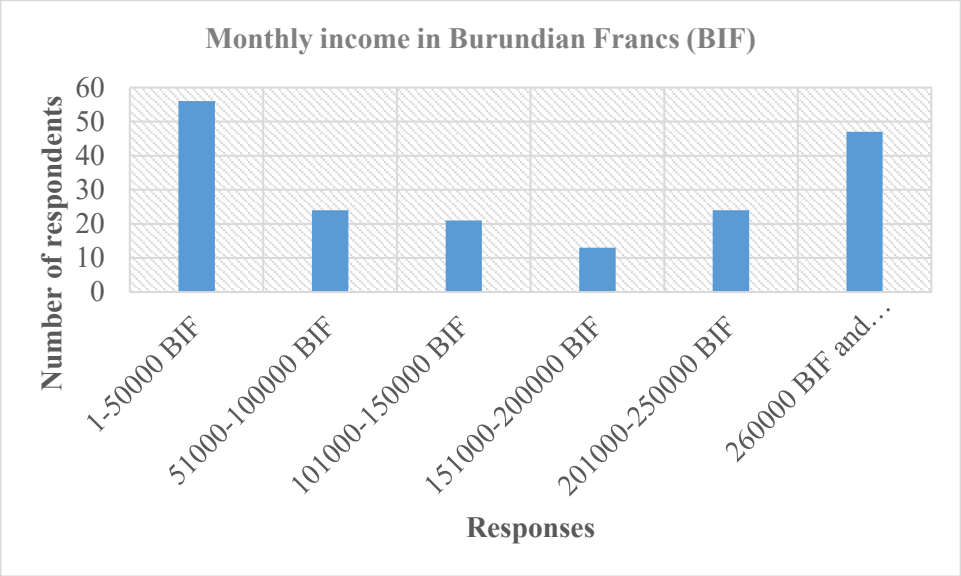

Figure 3: Monthly income in Burundian francs; Source: field data

The bar chart 4.2 how's data gathered on the monthly income of respondents in Burundian Francs (BIF). It shows that 56 (30%) of the respondents earned between 1-50000 BIF, 24 (13%) of the respondents earned between 51000-100000 BIF, 21 (11%) of the respondents earned between 101000-150000 BIF, 13 (7%) of the respondents earned between 151000-200000 BIF, 24 (13%) of the respondents earned between 201000-250000 BIF and 47 (25%) of the respondents earned between 251000 BIF and above. According to Cecilia, Kerstin, Michel, et al (2018 income of respondents is important as proxy measure for socio-economic status or living standard. It this case, the data captured on respondents' income was an important variable when modelling human decision-making processes. Situations are likely to be exaggerated in low income homes as compared to communities which have higher income.

Doughnut chart 4.1. Participants' religion

N=185

The researcher asked of participants' religion.

The data captured revealed that there were two dominant religions, Christianity and Muslim faith. The data was presented on the doughnut chart below;

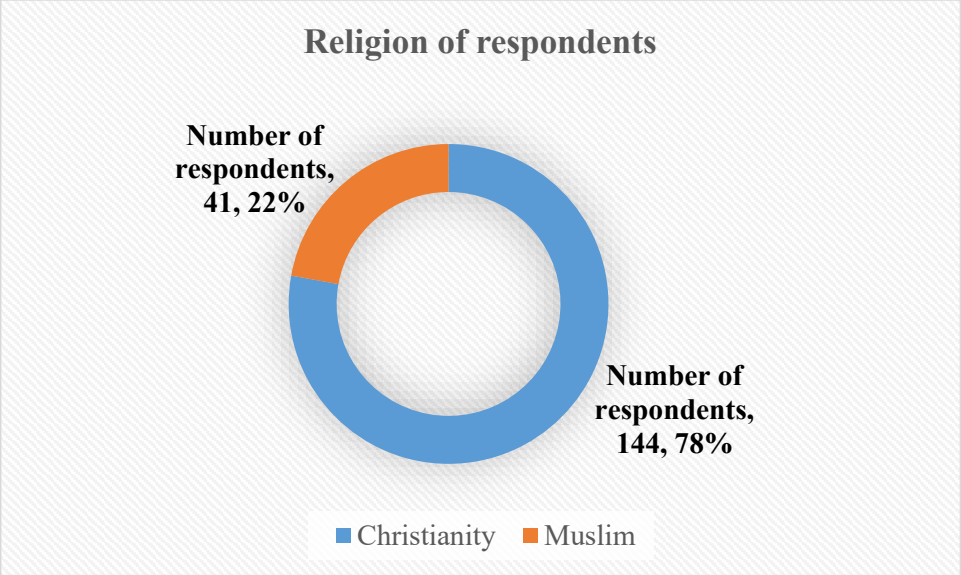

Figure 4: Religion of participants; Source: field data

The doughnut chart 4.1 above demonstrates the data captured on religion of participants. It illustrates that 41 (22.1%) n=185 of the participants were Muslims and 144 (77.8%) of the participants were Christians. According to Swihart, Yarrarapu & Martin (2021),“ religion and spirituality are important factors in a majority of patients seeking care. Religion and spirituality can impact decisions regarding diet, medicines based on animal products, modesty and the preferred gender of their health providers.” This therefore, places religion in the study as an important determinant of community health education network policy and diabetes mellitus self-management. Religion influences perceptions and attitudes of people's health education.

5.2.2. Section Two: Information about diabetes mellitus self-management and the Community Health Education Network Policy

Graph 4.1. History of diabetes mellitus in family

N=185

The researcher enquired from participants whether there was any history of diabetes in their families. The data was presented on the graph below;

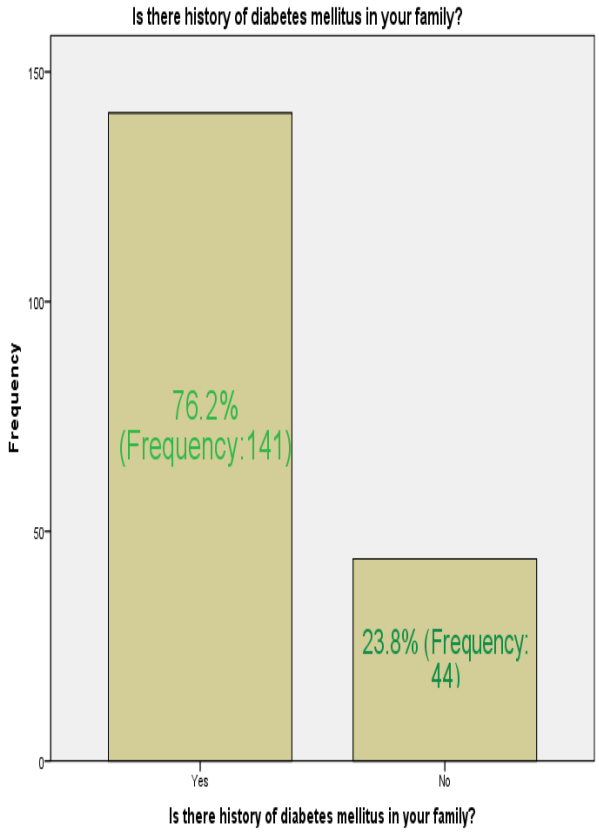

Figure 5: History of diabetes mellitus; Source: field data

The graph 4.1 illustrates 141 (76.2%) n=185 of the participants stated had history of diabetes mellitus in the family. It also indicates that 44 (23.8%) n=185 of the participants did not have history of diabetes mellitus in the family. The data indicates a high prevalence of diabetes mellitus signalling the importance of community health

education network policy and diabetes mellitus self-management. Rafael (2019) argues that health conditions are better managed when communities are informed. In most African societies where traditions and religious beliefs are dominant many people could lose their lives to health conditions that can be managed with simple procedures and treatments. As such, the importance of a community health education network policy and diabetes mellitus self-management cannot be undervalued.

Bar chart 4.3. Are you aware of the policy Community Health Education Network Policy which was introduced by the Burundian Government since 2007?

N=185

The researcher wanted find out from participants whether they were aware of the policy called **"Community Health Education Network Policy"** which was introduced by the Burundian government since 2007. The data was presented on the bar chart below;

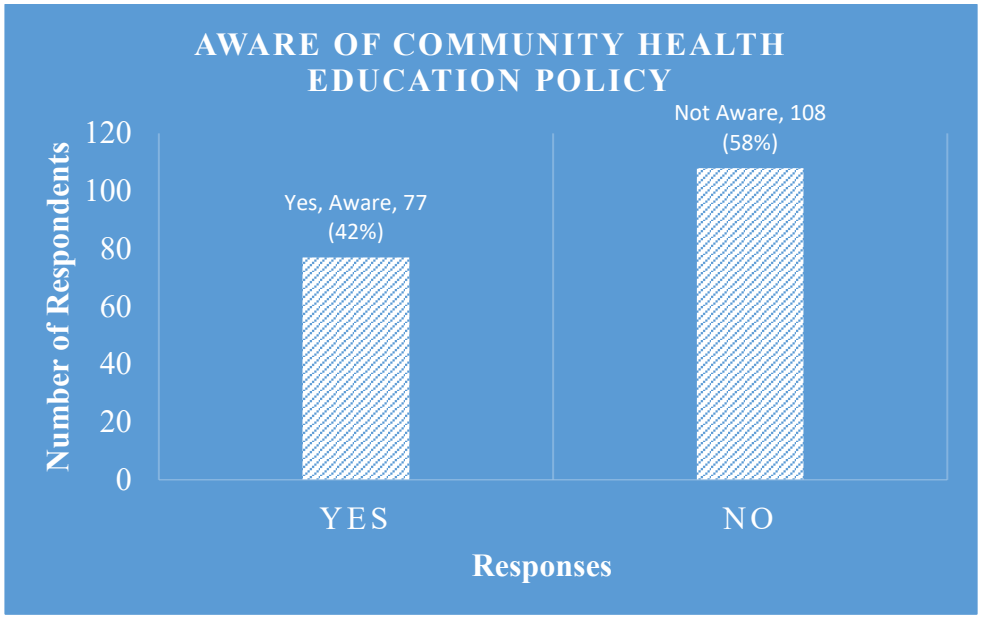

Figure 6: Awareness of the Community Health Education Network Policy; Source: field data

The bar chart 4.3 above indicates data on respondents' knowledge of Community Health Education Policy. The graph shows that 77 (41.6%) n=185 of the participants were aware of the Community Health Education Policy. However, the majority 108 (58.3%) n=185 of the participants were not aware of the Community Health Education Policy. Self-management education of diabetes which is one of the most important non-communicable diseases worldwide involves facilitating knowledge, skills and ability required for self-care in the patients (Rafael, 2019). As such, if the majority of people are not aware of the policy it also translates to many of them not knowing how to administer important self-care.

"Nous ne savons pas si la politique du réseau communautaire d'éducation à la santé a été introduite au Burundi. We do not know that the Community Health Education Network Policy was introduced in Burundi (Focus Group Discussion with diabetic patients at Hopital Militaire de Kamenge)."

Table 4.3. Is the Community Health Education Network Policy nationally implemented?

N=185

The researcher found out from respondents whether the community health education Policy was nationally implemented. The responses were given on the table below;

Is the Community Health Education Network Policy nationally implemented?

		Frequency	Percent	Valid Percent	.Cumulative Percent
Valid	No	84	45.4	45.4	45.4
	Unaware	101	54.6	54.6	100.0
	Total	185	100.0	100.0	

Table 3: Community Health Education Network Policy implementation; Source: field data

The table 4.3 above demonstrates the data collected from participants on the question of whether Community Health Education Network Policy was nationally implemented. Participants were given choices ‘yes, No and unware’. 84 (45.4%) n=185 of the participants said ‘No’ Community Health Education Network Policy was not nationally implemented and 101 (54.6%) n=185 of the participants said that they were ‘Unaware’ whether Community Health Education Policy was nationally implemented. This information shows a clear lack of knowledge about the implementation of the Community Health Education Network Policy by participants. It implies that authorities or government officials responsible did not implement and also disseminate well vital information on the Community Health Education Network Policy to the communities in Burundi.

In addition, the key informant from Centre Hospitalo Universitaire de Kamenge posited that:

Il est difficile de parler de la politique du réseau communautaire d'éducation en santé. Cependant, la vérité est que sa mise en œuvre a échoué faute de fonds suffisants. Malheureusement, le gouvernement burundais n'a pas fourni toutes les ressources et l'argent nécessaires pour que cette politique soit fonctionnelle. Par conséquent, il est nécessaire que le gouvernement burundais implique d'autres parties prenantes telles que les organisations internationales pour disposer des financements nécessaires à la mise en œuvre de cette politique. It is hard to talk about the Community Health Education Network Policy. The truth is that it’s implementation failed as a result of lack of enough funds. The Burundian government did not afford to all the necessary resources and money for this policy to be functional. There is a need for the Burundian government to involve other stakeholders such as international organizations to have the funding necessary for this policy implementation

(Interview with an NGO neurologist at Centre Hospitalo Universitaire de Kamenge, 2021)

Table 4.4. Main factors associated with diabetes mellitus / What are the challenges of diabetes self–management are diabetic patients facing in Burundi? / How can you prevent complications of diabetes mellitus

N=185

The researcher sought an understanding of the main causes of diabetes mellitus. He also went on to enquire of the challenges of diabetes self–management are diabetic patients facing in Burundi. Additionally, the researcher went on to enquire of the challenges of diabetes self–management are diabetic patients facing in Burundi. The data was presented in the table below;

Variable	Male	Female	Frequency	Percentage
What are the main factors associated with diabetes mellitus?				
a) Industrialization	10	15	25	13.5
b) Not resting well				
c) Malnutrition	29	25	54	29.1
d) Urbanization				
e) a, c & d	49	57	106	57
What are the challenges of diabetes self–management are diabetic patients facing in Burundi?				
a) Not being able to buy food and pay for medical care	18		18	9.7
b)Insufficient number of healthcare providers				
c)Lack of social assistance				
d)Insufficient medication				
e)Lack of knowledge		6	6	3.2
f)Patients and healthcare providers relationships				
g)a, c, e & f	70	91	161	87
How can you prevent complications of diabetes mellitus?				
a) Take medication correctly				
b) Sleep well and rest well every day				

c) Follow advices given by the healthcare providers				
d) Eat a balanced diet	12	8	20	10.8
e) Do physical exercises	7	2	9	4.8
f) a, c & e	69	87	156	84.3

Table 4: Factors, prevention and self-management of diabetes mellitus; Source: field data

The table 4.4 above reflects the main factors associated with diabetes mellitus as given by participants. It affirms that 25 (13.5%) n=185 of the participants thought that industrialisation was associated with diabetes mellitus. It also shows that 54 (29.1%) n=185 of the participants believed that malnutrition was associated diabetes mellitus. The table also highlight that 106 (57%) n=185 thought that the main factors in association with diabetes mellitus were industrialisation, malnutrition and urbanisation. While the above were factors to be considered, Yolanda, David, Philip, et al (2019) state that diabetes mellitus can be caused by inactivity, family history, age, high blood pressure and weight gain among other things. The data indicates a link however that there is a correlation between industrialization, malnutrition, and urbanisation and diabetes mellitus. Thus, industrialization, malnutrition, and urbanisation were the main factors associated with diabetes mellitus and 106 (57%) n=185 participants got this correct. This means that there is a certain level of knowledge regarding factors associated with diabetes mellitus.

In addition, the table 4.4 above illustrates the data on challenges of diabetes self-management. It shows that 18 (9.7%) n=185 participants argue that one of the challenges is not being able to buy food and pay for medical care. Therefore, the situation in socio-economic conditions in Burundi impacts negatively on livelihoods. It also states that 6 (3.2%) n=185 participants pointed to lack of knowledge as another

challenge of diabetes self-management. The table also points out that 161 (87%) n=185 participants agreed on not being able to buy food and pay medical care, lack of social assistance, lack of knowledge as well as patients and health care providers' relationships as challenges and this was the correct answer. Araoz and Douglas (2005) emphasize that knowledge is critical in health care management. Therefore, the data implied that there was need to ensure more knowledge of diabetes mellitus among people in the district of Bujumbura and in the whole nation.

Nos défis incluent l'incapacité d'acheter de la nourriture et des médicaments, le manque d'assistance sociale, le manque de connaissances et la relation brisée entre les prestataires de soins de santé et les patients. Our challenges include inability to buy food and medication, lack of social assistance, lack of knowledge and broken relationship between healthcare providers and patients (Focus Group Discussion with diabetic patients at Hopital Prince Regent Charles).

Furthermore, the table 4.4 above represents the data on the prevention of complications of diabetes mellitus. The table shows that 20 (10.8%) n=185 participants stated that one of the strategies to prevent complications of diabetes mellitus was to eat a balanced diet. A balanced diet is of significant value to diabetes mellitus patients (ADA, 2009). This indicates the need for diabetic patients to ensure balanced diets in their daily meal regimes. It also demonstrates that 9 (4.8%) n=185 participants revealed that physical exercises help to prevent complications of diabetes mellitus. The data related well with information given in other questions were physical exercises were noted as important in the management and control of diabetes mellitus. The table also reflects that 156 (84.3%) n=185 participants gave taking of medication, following advices given by healthcare providers and doing exercises as the ways to well prevent the complications of diabetes mellitus and this was the correct answer. Therefore, taking medication, following advices given by the healthcare providers and doing physical exercises were important in the prevention of complications of diabetes mellitus. This implied that

there is a long way to go to ensure diabetic patients are fully informed about the prevention of the complications of diabetes mellitus.

Pie chart 4.2. Heard from healthcare providers or specific people about the Community Health Education Network Policy

N=185

The researcher asked whether respondents had heard from healthcare providers or specific people about this program. The data was provided on the pie chart below;

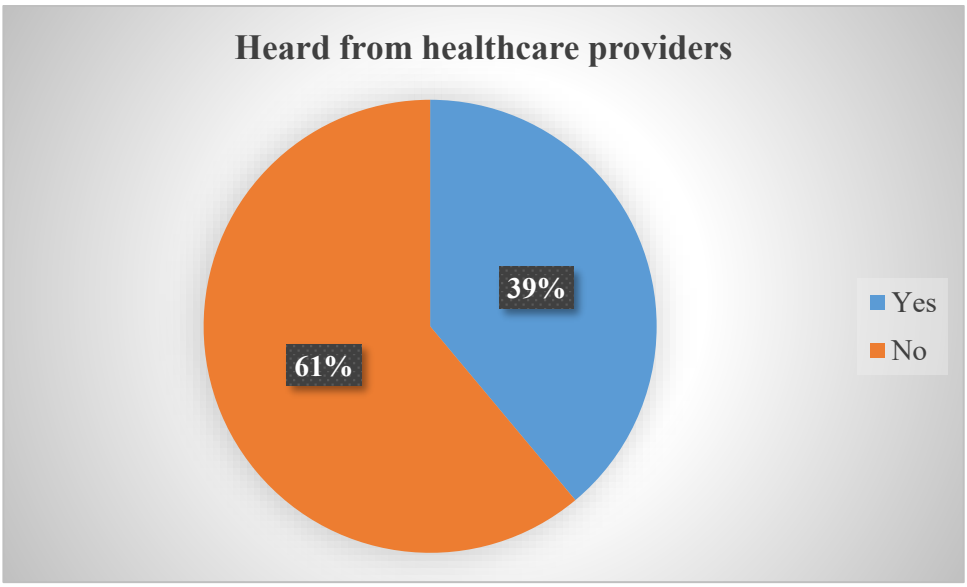

Figure 7: Source of information; Source: field data

The pie chart 4.2 above represents the data collected on whether participants had heard from healthcare providers or other people about diabetes self-management through the Community Health Education Network Policy. The data shows that the majority of the participants 113 (61%) n=185 had not heard about this program from the health care providers. Only 72 (38.9%) n=185 of the participants had heard of diabetes mellitus self-management program from health care providers. According to Araoz and Douglas (2005) complications may incorporate coronary illness and stroke, visual

deficiency, nephropathy, neuropathy, and fringe vascular illness resulting in lower limb amputation. This implies that the information dissemination on diabetes mellitus has not be carried out effectively. Information is being passed from individual to individual. This can lead to unverified information and misinformation on the part of diabetic patients or people in the communities.

Bar chart 4.4. Challenges related to the implementation of the "Community Health Education Network Policy"

N=185

The researcher found out the challenges in the implementation of the Community Health Education Network Policy. The data was captured and presented below;

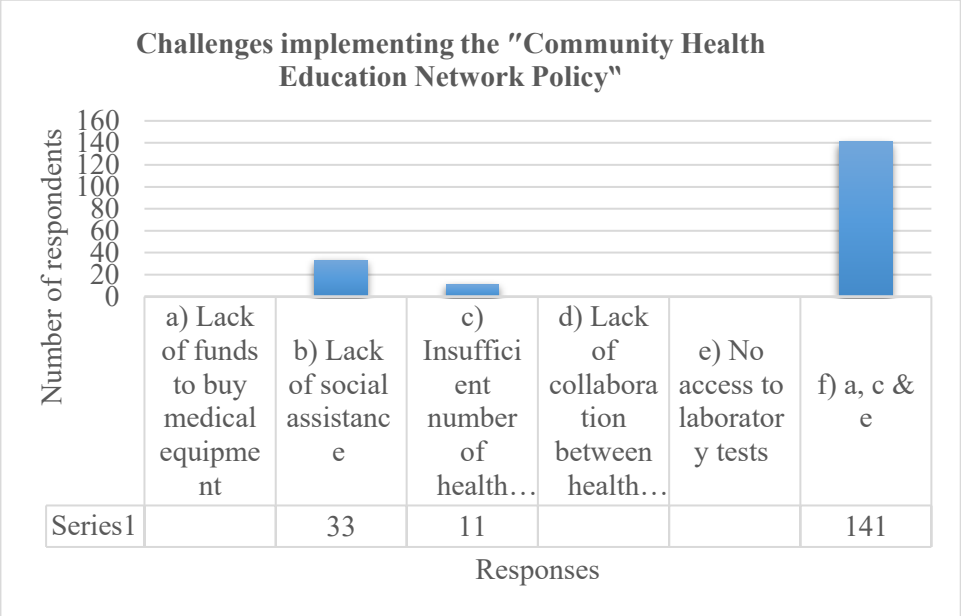

Figure 8: Challenges of the Community Health Education Network Policy implementation; Source: field data

The bar chart 4.4 illustrates responses on the challenges related to implementation of the Community Health Education Network Policy. The participants believed the

government had enough funds to acquire medical equipment. It indicates that 33 (17.8%) n=185 participants thought that lack of social assistance hindered the implementation of the Community Health Education Network Policy. The findings also confirm that 11 (5.9%) n=185 participants pointed out that the insufficient number of healthcare providers hindered the outcomes of this policy. Yolanda, David, Philip, et al (2019) also agree that social assistance involves the means by which communities can access resources. As such the lack of it can result in people not entirely accessing the provisions of the policy. Furthermore, 141 (76%) n=185 participants believed that lack of medical funds to buy medical equipment, insufficient number of healthcare providers and no access to laboratory tests were a challenge. The government stated in a report on that there were challenges in the health sector which were further challenged by COVID 19 pandemic (Rafael, 2019). This implied that the implementation of the Community Health Education Network Policy was met with various challenges.

Le manque de financement, le nombre insuffisant de prestataires de soins de santé et l'inaccessibilité aux tests de laboratoire sont les principaux obstacles à la mise en œuvre de la politique au niveau national. Lack of funding, insufficient number of healthcare providers and inaccessibility to laboratory tests are the main obstacles to the policy implementation nationally (Interview with NGO psychologist at Clinique Prince Louis Rwagasore).

Table 4.5. What are the benefits of diabetes mellitus self-management? / What are the provisions of the "Community Health Education Network Policy"? / What are the strategies that can be used to promote the Community Health Education Network Policy?

N=185

The researcher used the first question to find out the opinion of participants on the benefits of diabetes mellitus self-management. He also asked participants to explain

their understanding on the provisions of the “Community Health Education Network Policy”. The researcher additionally enquired to find strategies to promote the Community Health Education Network Policy. The data is represented is the table below;

Variable	Male	Female	Frequency N=185	Percentage (%)
What are the benefits of diabetes mellitus self-management?				
a)Promote health				
b)Reduce mortality and morbidity due to diabetes mellitus	15	20	35	18.9
c)Improvement of the social assistance system				
d)Prevent complications	10	6	16	8.6
e) a, b & d	63	71	134	72
What are the provisions of the "Community Health Education Network Policy"?				
a)Educate people at high risk of developing Non-Communicable Diseases (NCDs)				
b)Reduce mortality and morbidity due to NCDs	21	25	46	24.8
c)Curing diabetic patients				
d)Social assistance for diabetic patients	18	21	39	21
e) Promote the health of diabetic patients	7	13	20	10.8
f)Educate diabetic patients	11	9	20	10.8
g)a, b, d & e	31	29	60	32.4
What are the strategies that can be used to promote the Community Health Education Network Policy?				

a)Look for more funds from international organizations	54	62	116	62.7
b)Increase the number of healthcare providers within the health sector	14	9	23	12.4
c)Encourage citizens to entrepreneurship and innovation to improve their welfare.	20	26	46	24.8

Table 5: Benefits of diabetes mellitus self-management, Provisions of the policy and strategies to promote the policy: field data

The table 4.5 above illustrates the data captured on benefits of mellitus self-management. It shows that participants were aware of the benefits of diabetes mellitus self-management. They agreed that self-management helped to promote health, reduce mortality and mobility. According to Cathy, Miriam, Michael and Donal et al (2015) diabetes mellitus self-management is critical in the management of diabetic patients' health. The data implies that the participants were aware of the significance of diabetes mellitus self-management as the majority 134 (72%) n=185 participants provided the correct answer. However, more efforts are needed to reach 100% coverage in terms of knowing the benefits of diabetes self-management as few diabetic patients 51 (27.5%) n=185 participants were not fully aware of the benefits of diabetes self-management.

Nous informons simplement les patients diabétiques des dispositions de la politique sans mentionner s'il s'agit ou non d'une politique, car nous n'avons pas le temps d'entrer dans les détails en raison de la charge de travail. We just tell diabetic patients about the policy provisions without mentioning whether or not it's a policy as we do not have time to go into details due workload (Interview with a medical doctor at Hopital Prince Regent Charles)

The table 4.5 also highlights that 46 (24.8%) n=185 participants said that the Community Health Education Policy seeks to reduce mortality and morbidity due to NCDs. It also states that 39 (21%) n=185 participants thought that the Community Health Education Network Policy provided social assistance for diabetic patients. The data also confirms that 20 (10.8%) n=185 participants believed that the Community Health Education Network Policy was meant to promote the health of diabetic patients. Regarding the policy provisions, the data further illustrates that 20 (10.8%) n=185 participants indicated that the Community Health Education Network Policy educates diabetic patients. It table finally concludes that 60 (32.4%) n=185 participants believed that the Community Health Education Policy sought to reduce mortality and morbidity due to NCDs, provide social assistance for diabetic patients, promote the health of diabetic patients and educate diabetic patients. Thus, participants were all correct in that the Community Health Education Policy seeks to provide for all the above.

The data in table 4.5 indicate that 116 (62.7%) n=185 participants thought that one of the strategies to promote the Community Health Education Network Policy was to look for more funds from international organizations. Indeed, international organisations such as WHO, UNICEF, and Plan International among others can be effective in assisting the promotion of the health policy. Results also justify that 23 (12.4%) n=185 participants believed that there is need to increase the number of healthcare providers within the health sector. Findings additionally reflect that 46 (24.8%) n=185 participants stated that in order to promote the health policy, there is need to encourage citizens to entrepreneurship and innovation to improve their welfare. According to ADA (2009) the government has a role to play in the promotion of the health policy through engaging citizens and other stakeholders. Therefore, this

indicates the need for the government to work with all stakeholders in the promotion of the Community Health Education Network Policy.

Nous recommandons fortement plus de financement, le recrutement de plus de prestataires de soins de santé et l'esprit d'entreprise et l'innovation pour promouvoir cette politique. We strongly recommend more funding, recruitment of more healthcare providers and entrepreneurship and innovation to promote this policy (Interview with a doctor at Hospital Militaire de Kamenge)

Bar chart 4.5. Ability to do capillary glycaemia test without any help

N=185

The researcher asked respondents if they were able to do glycaemia test without help. The data was captured and presented on the graph below;

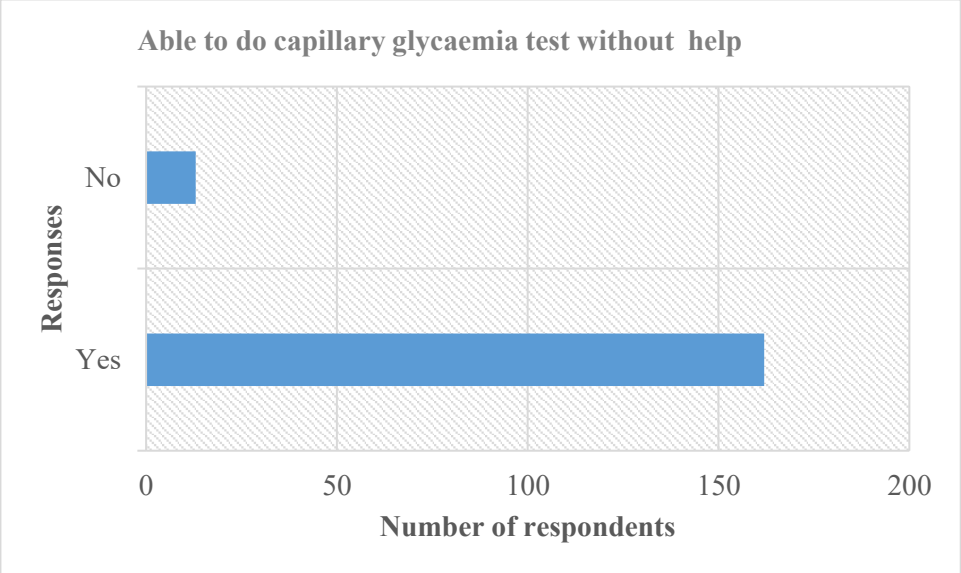

Figure 9: Ability to do capillary glycaemia test without any help; Source: field data

The bar chart 4.5 demonstrates that 162 (87.5%) n=185 participants were able to do a self-test on glycaemia. This means that the majority of participants were able to carry out a self-diagnosis of blood sugar levels at health facilities/home for themselves. It also highlights that 23 (12.4%) n=185 participants stated that they could not carry out a glycaemia test on their own. Cathy, Miriam, Michael and Donal et al (2015) explain that the glycaemia tests can be carried out with a small test kit at home. The individual

testing pricks the side of the finger with the lancet provided. They gently squeeze or massage the finger until a drop of blood forms. They then touch the edge of the test strip to the drop of the blood. The meter will display the blood glucose level on a screen after a few seconds. Therefore, individuals can easily carry out the glycaemia test at home or elsewhere on their own.

Bar chart 4.6. Measures that can be taken to improve diabetes self-management N=185

The researcher requested respondents to provide suggestions for means to improve diabetes self-management. The responses were given on the graph below;

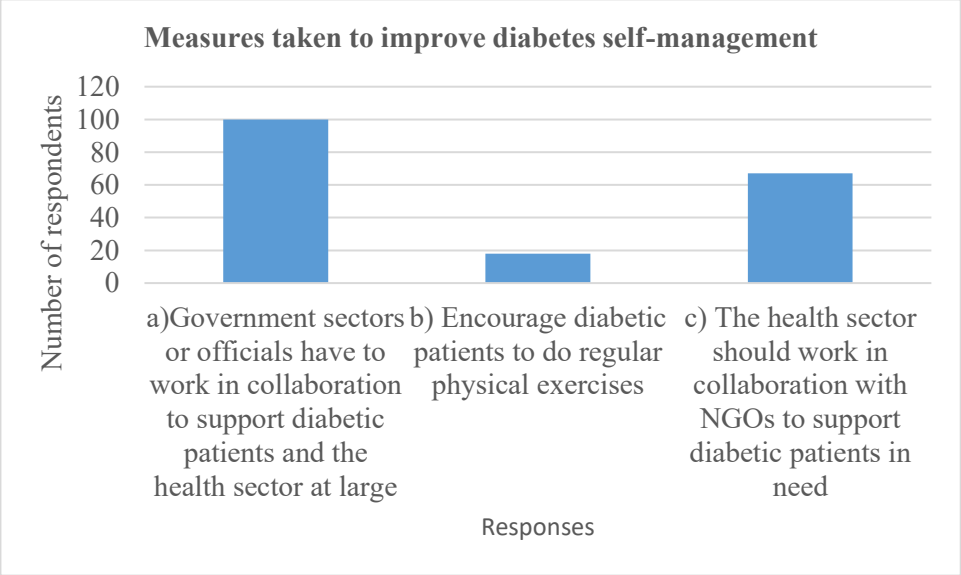

Figure 10: Measures to improve diabetes self-management; Source: field data

The bar chart 4.6 above reflects data on the measures taken to improve diabetes mellitus self-management. It states that 100 (54%) n=185 participants stated that the government sectors or officials have to work in collaboration to support diabetic patients and the health sector at large. This information was also given in the responses of strategies to promote the Community Health Education Network Policy. Participants cited the government as a key player in the promotion of awareness of the

policy. Results also show that 18 (9.8%) n=185 participants believed that there is need to encourage diabetic patients to do regular physical exercises. According to ADA (2009), exercise is important in the promotion of health. ADA (2009) also agrees that exercise is beneficial in psychological and physical wellbeing of individuals. Therefore, it implies that physical exercises should be prioritised among patients of diabetes mellitus. The findings also affirm that 67 (36.2%) n=185 participants stated that the health sector should work in collaboration with NGOs to support diabetic patients in need. Rafael (2019) believes that collaboration and partnership can help to resolve the challenges in the health sector. This therefore, implies that there is need to ensure networking and collaboration in the health sector.

Nous pensons que le travail en collaboration avec d'autres parties prenantes (secteurs gouvernementaux et ONG) et des exercices réguliers amélioreront l'autogestion du diabète. We believe that working in collaboration with other stakeholders (government sectors and NGOs) and regular exercises will improve diabetes self-management (Focus Group Discussion with diabetic patients at Clinique Prince Louis Rwagasore).

4.3 Findings of the study

The study found out that;

Diabetes is a chronic medical issue with obliterating, yet with preventable problems. Diabetes mellitus, is a grouping of diseases with the symptom of high blood glucose, results from imperfections in insulin activity, insulin creation, or both. Patients can easily test themselves at home with a glycaemia test. Long-term complications may incorporate coronary illness and stroke, visual deficiency, nephropathy, neuropathy, and fringe vascular illness resulting in lower limb amputation. Self-management and control of the disease are within individual's capacity. It was found that daily decisions may involve what to eat, levels of physical activity, how stress will or will not be managed, and if or when to perform self-monitoring of blood glucose. Treatment of diabetes should include changes in lifestyle, most of which patients with diabetes must

provide for themselves on a daily basis. In this manner self-management of diabetes is firmly associated with oneself considerations, which can be identified with the act of exercises that people start and perform for their own benefit in maintaining life, health, and well-being.

Additionally, knowledge, attitudes, and beliefs of diabetic patients toward diabetes self-management and the Community Health Education Network Policy need to be promoted. It is also essential to work in collaboration with other stakeholders (government sectors, NGOs) to successfully implement the Community Health Education Network Policy. More healthcare providers need to be recruited to promote both diabetes mellitus self-management and the policy awareness and implementation.

4.4 Summary

Chapter four of this study presented, analysed and interpreted data collected in the study. The data was presented mainly using table, graphs and pie charts. A narrative analysis and interpretation was also given. The next chapter which is chapter five, provided the study summary, conclusions and recommendations.

CHAPTER 5: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter gave a summary of the study, research findings, conclusions and the recommendations. Conclusion come from the findings discussed in chapter four and recommendations come from the conclusions.

5.2 Summary of the study

The study focused on an investigation of Community Health Education Network Policy and Diabetes Mellitus Self-Management in Bujumbura District, Burundi. It main objectives were to assess the provisions of the Community Health Education Network Policy for diabetic patients in Burundi, to determine how self-management helps reduce the prevalence and severity of diabetes in the Bujumbura District, to explore the attitudes, beliefs, knowledge, and social support towards diabetes self-management in the Bujumbura District and to assess the challenges/trends and opportunities related to diabetes self-management in Burundi.

In chapter one, the researcher showed the background of study, statement of the problem and purpose of study. The objectives from which research questions were formulated were also indicated. Key terms found in the study were defined. Limitations of the study which included finance, COVID 19, time, and lack of resources were identified and tackled. The significance of the study to various stakeholders was stated. Key terms to be found in the study were also defined.

In chapter two, review of related literature was done in chapter two to put the research into context. Detailed reference was made to researches made by other prominent scholars. The review of related literature helped to put the study into perspective.

Chapter three showed the methodology. The target population of the study was comprised of diabetic patients from six different hospitals in Bujumbura. The study will be conducted in four state hospitals in Bujumbura Sanitary District. The choice of the district is because it is where many people with diabetes are being admitted. Participants in this research were diabetic patients from the above-mentioned hospitals from 18 years old and above. Purposive sampling was used for qualitative data collection. Participants were diabetic patients from 18 to 50 years old from 4 state hospitals. There were 2074 diabetic patients who have been admitted for the past two years (2019 and 2020) in the whole Bujumbura Sanitary District. Thus, this study used a sample size of 185 participants; 155 for the survey; 30 for three focus group discussions.

Chapter four highlighted the presentation, analysis and interpretation of data. The data obtained through the questionnaire was presented using tables and figures. The last chapter, chapter five gave the summary of the project, conclusion and recommendations.

5.3 Conclusions of the study

From the findings reached in this study, it was concluded that;

- Citizens find out information about diabetes mellitus from unofficial sources. This information could be misleading and can result in more people contracting the diabetes mellitus.
- The Burundian government has a role to play in the promotion of the Community Health Education Network Policy through engaging citizens and other stakeholders (Ministry of health in Burundi, various sectors/ departments within the Burundian government, international organizations or NGOs). The

government needs to work with all stakeholders in the promotion of the health policy.

- Self-management is an essential strategy for people with diabetes mellitus. Therefore, diabetes self-management education and support from healthcare providers, friends, family and peers must be ensured.
- Diabetic patients must be able to make food choices that optimize metabolic self-management and quality of life. Therefore, they need to be educated on how they can choose food to eat.
- All these individuals (diabetic patients, healthcare providers, family, and community) should work together to ensure the effectiveness of diabetes management.
- Diabetes mellitus is very complex and involves challenges related to medication, food, and exercise. Diabetic patients must monitor their blood glucose within both the short and long term even when current blood glucose levels are normal. Prescriptions and advice by health care providers must be followed as well to prevent long term complications.

5.4 Recommendations of the study

From the conclusions reached in this study,

- It was recommended that citizens should lead active live styles that include good diets and regular physical exercises.
- It was also recommended that the government should ensure public awareness of diabetes mellitus. More information on the causes and effects of the disease should be provided to the people.

- It was also recommended that government should work with partner organisations in health to provide essential services to the people and patients of diabetes mellitus.
- The study also recommended that health services should be well staffed to ensure that there are health personnel to educate and attend to diabetic patients.
- It was also recommended that health institutions should be well resources with equipment to enable service delivery for patients with diabetes mellitus.

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List of appendices

Appendix 1: Informed consent in English

My name is **Jacques Manirakiza**, a Master student in Public Policy and Governance at Africa University in Zimbabwe. I am conducting an academic research project on **"COMMUNITY HEALTH EDUCATION NETWORK POLICY AND DIABETES MELLITUS SELF-MANAGEMENT IN BUJUMBURA DISTRICT, BURUNDI"**. I am going to give you the information and invite you to be part of this project. You do not have to decide today whether or not you will participate in the study. Before you decide, you can talk to anyone you feel comfortable with about the research. There may be some words that you do not understand. Please ask me to stop as we go through the information and I will take time to explain.

Purpose of the research

To determine how self-management helps reduce the prevalence and severity of diabetes in Bujumbura District.

Procedures and duration

If you decide to participate in this study, you will be required to complete the questionnaire or answer interview questions. It is expected that this will take only about 10 to 15 minutes. To avoid work disruptions, you will be given three days to complete the questionnaire form so that you can fill it in your spare time. A short interview will be conducted upon placing an appointment.

Risks and discomforts

No risk or discomforts associated with this study.

Benefits and/or compensation

There will be neither direct benefit nor any incentive to you to take part in the research, but your participation is likely to help us find out more about how self-management helps reduce the prevalence and severity of diabetes in Bujumbura District.

Confidentiality

Given the sensitivity nature of this research, the researcher shall protect the participants making sure that their contributions will be treated with utmost anonymity/confidentiality and will be used purely for academic purposes. No names will be captured on the questionnaires and interviews. Only the researcher will know what your number is and we will lock that information up with a lock and key. It will not be shared with or given to anyone except the research supervisor and school board.

Voluntary participation

Your participation in this research is entirely voluntary. It is your choice whether to participate or not. Whether you choose to participate or not, all your rights as a citizen will continue to be observed and nothing will change. You may change your mind later and stop participating even if you agreed earlier.

Offer to answer questions

Before you sign this form, please ask any questions on any aspect of this study that is unclear to you. You may take as much time as necessary to think it over.

Authorization

If you have decided to participate in this study, please sign this form in the space provided below as an indication that you have read and understood the information provided above and have agreed to participate.

---------- ----------

Name of Research Participant Date

Signature of Research Participant or legally authorised representative

If you have any questions concerning this study or consent form beyond those answered by the researcher including questions about the research, your rights as a research participant, or if you feel that you have been treated unfairly and would like to talk to someone other than the researcher, please feel free to contact the Africa University Research Ethics Committee on telephone (020) 60075 or 60026 extension 1156, email aurec@africau.edu

Name of the researcher: Jacques Manirakiza

Appendix 2: Informed consent in French

Je m'appelle Jacques Manirakiza, étudiant à la maîtrise en politique publique et gouvernance à l'Université d'Afrique au Zimbabwe. Je mène un projet de recherche universitaire sur la ***"POLITIQUE DU RÉSEAU D'ÉDUCATION EN SANTÉ COMMUNAUTAIRE ET L'AUTO-GESTION DU DIABÈTE MELLITUS DANS LE DISTRICT DE BUJUMBURA, BURUNDI".*** *Je vais vous donner les informations et vous inviter à faire partie de ce projet. Vous n'avez pas à décider aujourd'hui si vous allez participer ou non à l'étude. Avant de vous décider, vous pouvez parler à toute personne avec laquelle vous vous sentez à l'aise de la recherche. Il peut y avoir des mots que vous ne comprenez pas. Veuillez me demander d'arrêter pendant que nous parcourons les informations et je prendrai le temps de vous expliquer.*

But de la recherche

Déterminer comment l'autogestion contribue à réduire la prévalence et la gravité du diabète dans le district de Bujumbura.

Procédures et durée

Si vous décidez de participer à cette étude, vous devrez remplir le questionnaire ou répondre aux questions d'entrevue. Il est prévu que cela ne prendra que 10 à 15 minutes environ. Pour éviter les interruptions de travail, vous aurez trois jours pour remplir le formulaire de questionnaire afin que vous puissiez le remplir pendant votre temps libre. Une courte entrevue sera effectuée lors de la prise de rendez-vous.

Risques et inconforts

Aucun risque ou inconfort associé à cette étude.

Avantages et / ou compensation

Il n'y aura ni avantage direct ni incitation à participer à la recherche, mais votre participation est susceptible de nous aider à en savoir plus sur la façon dont l'autogestion contribue à réduire la prévalence et la gravité du diabète dans le district de Bujumbura.

Confidentialité

Compte tenu de la nature sensible de cette recherche, le chercheur protégera les participants en s'assurant que leurs contributions seront traitées avec le plus grand anonymat / confidentialité et seront utilisées uniquement à des fins académiques. Aucun nom ne sera enregistré sur les questionnaires et les entretiens. Seul le chercheur saura quel est votre numéro et nous verrouillerons ces informations avec un verrou et une clé. Il ne sera ni partagé ni donné à quiconque, sauf au directeur de recherche et au conseil scolaire.

Participation volontaire

Votre participation à cette recherche est entièrement volontaire. C'est votre choix de participer ou non. Que vous choisissiez de participer ou non, tous vos droits en tant que citoyen continueront d'être respectés et rien ne changera. Vous pouvez changer d'avis plus tard et cesser de participer même si vous avez accepté plus tôt.

Offrir de répondre aux questions

Avant de signer ce formulaire, veuillez poser des questions sur tout aspect de cette étude qui n'est pas clair pour vous. Vous pouvez prendre autant de temps que nécessaire pour y réfléchir.

Autorisation

Si vous avez décidé de participer à cette étude, veuillez signer ce formulaire dans l'espace ci-dessous pour indiquer que vous avez lu et compris les informations fournies ci-dessus et que vous avez accepté de participer.

---------- ----------

Nom du participant à la recherche *Date*

Signature du participant à la recherche ou du représentant légalement autorisé

Si vous avez des questions concernant cette étude ou ce formulaire de consentement au-delà de celles auxquelles le chercheur a répondu, y compris des questions sur la recherche, vos droits en tant que participant à la recherche, ou si vous pensez que vous avez été traité injustement et que vous souhaitez parler à une personne autre que le Chercheur, n'hésitez pas à contacter le Comité d'éthique de la recherche de l'Université africaine au téléphone (020) 60075 ou 60026 poste 1156, email aurec@africau.edu

Nom du chercheur: Jacques Manirakiza

Appendix 3: Research instrument (Questionnaire) in English

QUESTIONNAIRE FOR DIABETIC PATIENTS

My name is **Jacques Manirakiza**, a Master student in Public Policy and Governance at Africa University in Zimbabwe. I am conducting an academic research project on **"COMMUNITY HEALTH EDUCATION NETWORK POLICY AND DIABETES MELLITUS SELF-MANAGEMENT IN BUJUMBURA DISTRICT, BURUNDI"**. I am going to give you the information and invite you to be part of this project. You do not have to decide today whether or not you will participate in the study. Before you decide, you can talk to anyone you feel comfortable with about the research. There may be some words that you do not understand. Please ask me to stop as we go through the information and I will take time to explain.

Instructions

1. No name should be written on any of these papers

2. Answer as many questions as possible

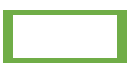
3. Provide the correct answer in the box or space provided

Section one: Sociodemographic information

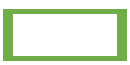
1. Group age

a) 18-25

b) 26-35



c) 36-50



d) 50 and above

2. Gender

a) Male 

b) Female 

3. What is your highest level of education?

a) Never been to school 

b) Primary education 

c) Secondary education 

d) Tertiary education 

4. What is your marital status?

a) Single 

b) Married 

c) Widowed 

d) Separated 

e) Cohabited 

6. What is your monthly income in Burundian Francs (BIF)?

a)1-50000 BIF

b)50000-100000 BIF

c)100000-150000 BIF

d)150000-200000 BIF

e)200000-250000 BIF

f)250000 BIF and above

6. What is your religion?

a) Christian

b) Muslim

c) Traditional

d) Others (Specify)

……...

Section two: Information about diabetes mellitus self-management

7. Is there history of diabetes mellitus in your family?

a) Yes

b) No

8. Are you aware of the program called **"Community Health Education Policy"** which was introduced by the Burundian government since 2007?

a) Yes

b) No

9. Is the Community Health Education Network Policy nationally implemented?

a) Yes

b) No

10. What are the benefits of diabetes mellitus self-management?

a) Promote health

b) Reduce mortality and morbidity due to diabetes mellitus

c) Improvement of the social assistance system

d) Prevent complications

e) a, b & d

11. Have you heard from healthcare providers or specific people about this policy?

a) Yes

b) No

12. What are the provisions of the Community Health Education Network Policy?

a) Educate people at high risk of developing Non-Communicable Diseases (NCDs)

b) Reduce mortality and morbidity due to NCDs

c) Curing diabetic patients

d) Social assistance for diabetic patients

e) Promote the health of diabetic patients

f) Educate diabetic patients

g) a, b, d & e

13)What are the provisions of the **"Community Health Education Policy"?**

a) Educate people at high risk of developing Non-Communicable Diseases (NCDs)

b) Reduce mortality and morbidity due to NCDs

c) Curing diabetic patients

d) Social assistance for diabetic patients

e) Promote the health of diabetic patients

f) Educate diabetic patients

14. What are the challenges related to the implementation of the **"Community Health Education Network Policy"**?

a) Lack of funds to buy medical equipment

b) Lack of social assistance

c) Insufficient number of healthcare providers

d) Lack of collaboration between healthcare providers

e) No access to laboratory tests

f) a, c & e

15. What are the main factors of diabetes mellitus?

a) Industrialization

b) Not resting well

c) Malnutrition

d) Urbanization

e) a, c & d

16. What are the challenges of diabetes self –management are diabetic patients facing in Burundi?

a) Not being able to buy food and pay for medical care

b) Insufficient number of healthcare providers

c) Lack of social assistance

d) Insufficient medication

e) Lack of knowledge

f) Patients and healthcare providers' relationships

g) a, c, e &f

17) Are you able to do capillary glycaemia without any help?

a) Yes

b) No

17) How can you prevent complications of diabetes mellitus?

a) Take medication correctly

b) Sleep well and rest well every day

c) Follow advices given by the healthcare providers

d) Eat a balanced diet

e) Do physical exercises

f) a, c & e

18. What are the measures that can be taken to improve diabetes self-management?

……
……
……
……
……
…….

19) What are the strategies that can be used to promote the Community Health Education Network Policy?

……
……
……
……
……
……....

Appendix 4: Research instrument (Questionnaire) in French

QUESTIONNAIRE POUR LES DIABETIQUES

*Je m'appelle **Jacques Manirakiza**, étudiant à la maîtrise en politique publique et gouvernance à l'Université d'Afrique au Zimbabwe. Je mène un projet de recherche universitaire sur la **"POLITIQUE DU RÉSEAU D'ÉDUCATION EN SANTÉ COMMUNAUTAIRE ET L'AUTO-GESTION DU DIABÈTE MELLITUS DANS LE DISTRICT DE BUJUMBURA, BURUNDI".** Je vais vous donner les informations et vous inviter à faire partie de ce projet. Vous n'avez pas à décider aujourd'hui si vous allez participer ou non à l'étude. Avant de vous décider, vous pouvez parler à toute personne avec laquelle vous vous sentez à l'aise de la recherche. Il peut y avoir des mots que vous ne comprenez pas. Veuillez me demander d'arrêter pendant que nous parcourons les informations et je prendrai le temps de vous expliquer.*

Instructions

1. Aucun nom ne doit être écrit sur aucun de ces papiers

2. Répondez à autant de questions que possible

3. Fournissez la bonne réponse dans la case ou l'espace prévu

Section un: Information sociodémographique

1. Age du groupe

a) 18-25

☐

b) 25-35

☐

c) 35-50

d) 50 et plus

2. Que lest votre sexe?

a) Masculin

b) Feminin

3. Quel est votre niveau d'éducation le plus élevé?

a) Je n'ai jamais été à l'école

b) Enseignement primare

c)Enseignement secondaire

d) Enseignement superieur

4. Que lest votre état civil?

a) Ne pas marié

b) Marié

c) Veuf

d) Separé

e) Cohabité

5. Quel est votre revenu mensuel en francs burundais (BIF)?

6. Quelle est votre religion?

a) Chrétien ☐

b) Musulman ☐

c) Traditionnel ☐

d) Autres (Préciser)

……

7. Y a-t-il des antécédents de diabète sucré dans votre famille?

a) Oui ☐

b) Non ☐

Section deux: Informations sur l'autogestion du diabète sucré

8. La politique relative au réseau d'éducation sanitaire communautaire est-elle mise en œuvre à l'échelle nationale?

9. Depuis combien de temps offrez-vous des services en vertu de la politique du réseau d'éducation en santé communautaire?

10. Quelles sont les dispositions de la politique du réseau d'éducation sanitaire communautaire?

11. Dans quelle mesure la politique du réseau d'éducation sanitaire communautaire a-t-elle aidé les patients diabétiques?

12. Quels sont les défis de la politique du réseau d'éducation sanitaire communautaire?

13. Quelles sont les stratégies qui peuvent être utilisées pour promouvoir ou mettre correctement en œuvre la politique du réseau d'éducation sanitaire communautaire?

14. En quoi l'autogestion du diabète est-elle importante pour les patients diabétiques au Burundi?

15. Quels sont les défis de l'autogestion du diabète auxquels sont confrontés les patients diabétiques au Burundi?

16. Quelles sont les mesures qui peuvent être prises pour améliorer l'autogestion du diabète?

Appendix 5: Research Instrument (Focus Group Discussion) in English

FOCUS GROUP DISCUSSION GUIDE FOR DIABETES PATIENTS

My name is **Jacques Manirakiza**, a Master student in Public Policy and Governance at Africa University in Zimbabwe. I am conducting an academic research project on **"COMMUNITY HEALTH EDUCATION NETWORK POLICY AND DIABETES MELLITUS SELF-MANAGEMENT IN BUJUMBURA DISTRICT, BURUNDI"**. I am going to give you the information and invite you to be part of this project. You do not have to decide today whether or not you will participate in the study. Before you decide, you can talk to anyone you feel comfortable with about the research. There may be some words that you do not understand. Please ask me to stop as we go through the information and I will take time to explain.

Instructions

1. No name should be written on any of these papers

2. Answer as many questions as possible

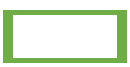
3. Provide the correct answer in the box or space provided

Section one: Sociodemographic information

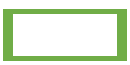
1. Group age

a) 18-25

b) 25-35



c) 35-50



d) 50 and above

2. What is your sex?

a) Male 

b) Female 

3. What is your highest level of education?

a) Never been to school 

b) Primary education 

c) Secondary education 

d) Tertiary education 

4. What is your marital status?

a) Single 

b) Married 

c) Widowed 

d) Separated 

e) Cohabited 

5. What is your monthly income in Burundian Francs (BIF)?

6. What is your religion?

a) Christian 

b) Muslim

c) Traditional

d) Others (Specify)

……...

7. I s there history of diabetes mellitus in your family?

a) Yes

b) No

Section two: Information about diabetes mellitus self-management

8. Have you heard about the Community Health Education Network Policy?

9. What services do you receive under Community Health Education Network Policy?

10. What are the provisions of the Community Health Education Network Policy?

11. To what extent has the Community Health Education Network Policy helped diabetic patients?

12. What are the challenges of the Community Health Education Network Policy?

13. What are the strategies that can be used to improve or properly implement the Community Health Education Network Policy?

14. Are you aware of diabetes self-management? How is it important to you?

15. How is diabetes self-management important to diabetic patients in Burundi?

16. What are the challenges of diabetes self –management are you facing?

17. What are the challenges of diabetes self –management are diabetic patients facing in Burundi?

18. What are the measures that can be taken to improve diabetes self-management?

Appendix 6: Research Instrument (Focus Group Discussion) in French

GUIDE DE DISCUSSION EN GROUE POUR LES PATIENTS SOUFFRANT DU DIABÈTE SUCRÉ

*Je m'appelle **Jacques Manirakiza**, étudiant à la maîtrise en politique publique et gouvernance à l'Université d'Afrique au Zimbabwe. Je mène un projet de recherche universitaire sur la **"POLITIQUE DU RÉSEAU D'ÉDUCATION EN SANTÉ COMMUNAUTAIRE ET L'AUTO-GESTION DU DIABÈTE MELLITUS DANS LE DISTRICT DE BUJUMBURA, BURUNDI".** Je vais vous donner les informations et vous inviter à faire partie de ce projet. Vous n'avez pas à décider aujourd'hui si vous allez participer ou non à l'étude. Avant de vous décider, vous pouvez parler à toute personne avec laquelle vous vous sentez à l'aise de la recherche. Il peut y avoir des mots que vous ne comprenez pas. Veuillez me demander d'arrêter pendant que nous parcourons les informations et je prendrai le temps de vous expliquer.*

Instructions

1. Aucun nom ne doit être écrit sur aucun de ces papiers

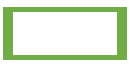
2. Répondez à autant de questions que possible

3. Fournissez la bonne réponse dans la case ou l'espace prévu

Section un: Information sociodémographique

1. Age du groupe

a) 18-25



b) 25-35

c) 35-50

d) 50 et plus

2. Que lest votre sexe?

a) Masculin

b) Feminin

3. Quel est votre niveau d'éducation le plus élevé?

a) Je n'ai jamais été à l'école

b) Enseignement primare

c) Enseignement secondaire

d) Enseignement superieur

4. Que lest votre état civil?

a) Ne pas marié

b) Marié

c) Veuf

d) Separé

e) Cohabité

5. Quel est votre revenu mensuel en francs burundais (BIF)?

6. Quelle est votre religion?

a) Chrétien

b) Musulman

c) Traditionnel

d) Autres (Préciser)

…….

7. Y a-t-il des antécédents de diabète sucré dans votre famille?

a) Oui

b) Non

Section deux: Informations sur l'autogestion du diabète sucré

8. Avez-vous entendu parler de la politique du réseau d'éducation sanitaire communautaire?

9. Quels services recevez-vous en vertu de la politique du réseau d'éducation en santé communautaire?

10. Quelles sont les dispositions de la politique du réseau d'éducation sanitaire communautaire?

11. Dans quelle mesure la politique du réseau d'éducation sanitaire communautaire a-t-elle aidé les patients diabétiques?

12. Quels sont les défis de la politique du réseau d'éducation sanitaire communautaire?

13. Quelles sont les stratégies qui peuvent être utilisées pour améliorer ou mettre correctement en œuvre la politique du réseau d'éducation sanitaire communautaire?

14. Connaissez-vous l'autogestion du diabète? En quoi est-ce important pour toi?

15. En quoi l'autogestion du diabète est-elle importante pour les patients diabétiques au Burundi?

16. Quels sont les défis de l'autogestion du diabète auxquels vous êtes confronté?

17. Quels sont les défis de l'autogestion du diabète auxquels sont confrontés les patients diabétiques au Burundi?

18. Quelles sont les mesures qui peuvent être prises pour améliorer l'autogestion du diabète?

Appendix 7: Research Instrument (Interview Guide) in English

INTERVIEW GUIDE FOR GOVERNMENT DEPARTMENTS

My name is **Jacques Manirakiza**, a Master student in Public Policy and Governance at Africa University in Zimbabwe. I am conducting an academic research project on **"COMMUNITY HEALTH EDUCATION NETWORK POLICY AND DIABETES MELLITUS SELF-MANAGEMENT IN BUJUMBURA DISTRICT, BURUNDI"**. I am going to give you the information and invite you to be part of this project. You do not have to decide today whether or not you will participate in the study. Before you decide, you can talk to anyone you feel comfortable with about the research. There may be some words that you do not understand. Please ask me to stop as we go through the information and I will take time to explain.

Instructions

1. No name should be written on any of these papers

2. Answer as many questions as possible

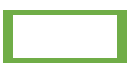
3. Provide the correct answer in the box or space provided

Section one: Sociodemographic information

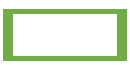
1. Group age

a) 18-25

b) 25-35



c) 35-50



d) 50 and above

2. What is your sex?

a) Male 

b) Female 

3. What is your highest level of education?

a) Never been to school 

b) Primary education 

c) Secondary education 

d) Tertiary education 

4. What is your marital status?

a) Single 

b) Married 

c) Widowed 

d) Separated 

e) Cohabited 

5. What is your monthly income in Burundian Francs (BIF)?

6. What is your religion?

a) Christian 

b) Muslim

c) Traditional

d) Others (Specify)

……...

7. I s there history of diabetes mellitus in your family?

a) Yes

b) No

Section two: Information about diabetes mellitus self-management

8. Is the Community Health Education Network Policy nationally implemented?

9. For how long have you been offering services under the Community Health Education Network Policy?

10. What are the provisions of the Community Health Education Network Policy?

11. To what extent has the Community Health Education Network Policy helped diabetic patients?

12. What are the challenges of the Community Health Education Network Policy?

13. What are the strategies that can be used to promote or properly implement the Community Health Education Network Policy?

14. How is diabetes self-management important to diabetic patients in Burundi?

15. What are the challenges of diabetes self –management are diabetic patients facing in Burundi?

16. What are the measures that can be taken to improve diabetes self-management?

Appendix 8: Research Instrument (Interview Guide) in French

GUIDE D'ENTREVUE POUR LES MINISTÈRES DU GOUVERNEMENT

*Je m'appelle **Jacques Manirakiza**, étudiant à la maîtrise en politique publique et gouvernance à l'Université d'Afrique au Zimbabwe. Je mène un projet de recherche universitaire sur la **"POLITIQUE DU RÉSEAU D'ÉDUCATION EN SANTÉ COMMUNAUTAIRE ET L'AUTO-GESTION DU DIABÈTE MELLITUS DANS LE DISTRICT DE BUJUMBURA, BURUNDI".** Je vais vous donner les informations et vous inviter à faire partie de ce projet. Vous n'avez pas à décider aujourd'hui si vous allez participer ou non à l'étude. Avant de vous décider, vous pouvez parler à toute personne avec laquelle vous vous sentez à l'aise de la recherche. Il peut y avoir des mots que vous ne comprenez pas. Veuillez me demander d'arrêter pendant que nous parcourons les informations et je prendrai le temps de vous expliquer.*

Instructions

1. Aucun nom ne doit être écrit sur aucun de ces papiers

2. Répondez à autant de questions que possible

3. Fournissez la bonne réponse dans la case ou l'espace prévu

Section un: Information sociodémographique

1. Age du groupe

a) 18-25

b) 25-35

c) 35-50

d) 50 et plus

2. Que lest votre sexe?

a) Masculin

b) Feminin

3. Quel est votre niveau d'éducation le plus élevé?

a) Je n'ai jamais été à l'école

b) Enseignement primare

c) Enseignement secondaire

d) Enseignement superieur

4. Que lest votre état civil?

a) Ne pas marié

b) Marié

c) Veuf

d) Separé

e) Cohabité

5. Quel est votre revenu mensuel en francs burundais (BIF)?

6. Quelle est votre religion?

a) Chrétien ☐

b) Musulman ☐

c) Traditionnel ☐

d) Autres (Préciser)

……

7. Y a-t-il des antécédents de diabète sucré dans votre famille?

a) Oui ☐

b) Non ☐

Section deux: Informations sur l'autogestion du diabète sucré

8. La politique relative au réseau d'éducation sanitaire communautaire est-elle mise en œuvre à l'échelle nationale?

9. Depuis combien de temps offrez-vous des services en vertu de la politique du réseau d'éducation en santé communautaire?

10. Quelles sont les dispositions de la politique du réseau d'éducation sanitaire communautaire?

11. Dans quelle mesure la politique du réseau d'éducation sanitaire communautaire a-t-elle aidé les patients diabétiques?

12. Quels sont les défis de la politique du réseau d'éducation sanitaire communautaire?

13. Quelles sont les stratégies qui peuvent être utilisées pour promouvoir ou mettre correctement en œuvre la politique du réseau d'éducation sanitaire communautaire?

14. En quoi l'autogestion du diabète est-elle importante pour les patients diabétiques au Burundi?

15. Quels sont les défis de l'autogestion du diabète auxquels sont confrontés les patients diabétiques au Burundi?

16. Quelles sont les mesures qui peuvent être prises pour améliorer l'autogestion du diabète?

Appendix 9: Approval for AUREC Proposal Submission

COLLEGE OF BUSINESS, PEACE, LEADERSHIP AND GOVERNANCE

……05…/……10……/2020

Africa University Research Ethics Committee

Ref: Approval for AUREC Proposal Submission

……Jacques Manirakiza…… has worked on the proposal with the assistance of the supervisor and I confirm that it is ready for reviewed by your esteemed committee.

Respectfully submitted,

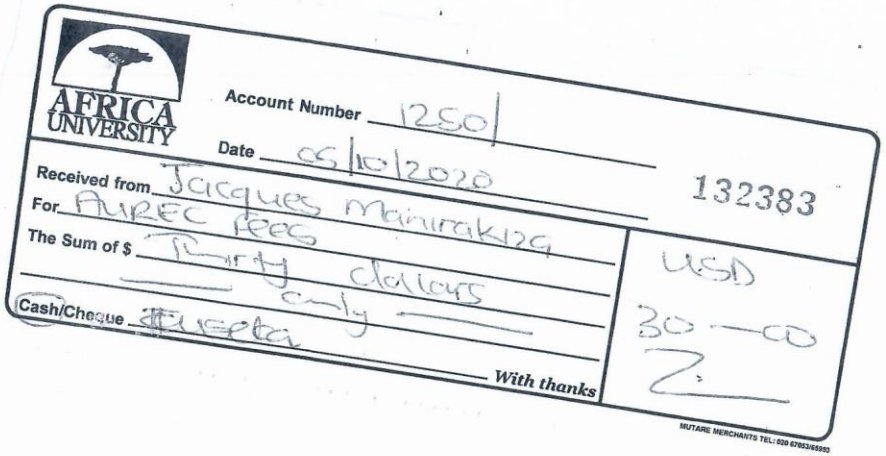
Doctor Iris Shiripinda

---------- ----------

Supervisor's Name Supervisor's Signature

---------- ----------

H.O.D's Name H.O.D's Signature



AFRICA UNIVERSITY

Account Number 1250

Date 05/10/2020

132383

Received from Jacques Maniraka29

For AUREC FEES

The Sum of $ Thirty dollars only

USD 30-00

Cash/Cheque Swipe

With thanks

MUTARE MERCHANTS TEL: 020 67853/66993

Appendix 10: Africa University Research and Ethics Committee

For office use only	Office stamp
Protocol no.	
Type of review: F	

AFRICA UNIVERSITY

RESEARCH ETHICS COMMITTEE (AUREC)

APPLICATION FOR INITIALREVIEW

NB: This form must be completed by all persons/teams applying for ethical review by AUREC. Upon completion by the investigator (s/researcher(s)) it should be submitted to AUREC, Africa University, Fairfield Road, Old Mutare, P.O. Box 1320, Mutare. Application fees (to cover the costs of reviewing material submitted) should be paid to the Africa University Business Office, and proof of payment should accompany each application. Please complete all sections of this application form. If there is insufficient space on the form you may use additional pages.

Check list

This checklist is meant to aid researchers in preparing a complete application package and to help expedite review by the AUREC. Please tick all boxes as appropriate (Indicate **N/A** where inapplicable).

CONTACT PERSON'S NAME : **Contact address:**	Jacques Manirakiza Africa University
E-mail address :	manirakizaj@africau.edu
Contact cell/ tel. :	0778877915

	One copy of application form duly completed.

	Three paper based copies of research proposal (see guidelines on page 2).
	Electronic version of research proposal (on CD or submission by e-mail to aurec@africau.edu
	Three copies of consent forms in English and local language of the study population.
	Three copies of advertisement or letter or card used for recruiting participants and any supplementary information (if applicable).
	Three copies of data collection tools being administered during the study in English and local language of study population (if applicable) included in the proposal.
	Budget and timeframe included in the proposal.
	Approval letter from your academic supervisor/Faculty or institution (if you are a student)
	Approval letter from authorities where study will be conducted
	Application fee paid at AU Business Office and receipt (or copy) attached to application form.

----------Jacques manirakiza----------08/10/2020----------

--

Signature: Investigator/Researcher Name Date

1. General information

1.1. Study title: Community Health Education Network Policy and Diabetes Mellitus Self-Management in Bujumbura District, Burundi.....

1.2. Name of Principal Investigator(PI)/ Researcher Jacques Manirakiza

1.3. Nationality of Investigator/Researcher: Burundian

1.4. Proposed date of start of study: _(dd/mm/yyyy)_15/11/2020_____

1.5. Expected duration of study: ____Two weeks_____

1.6. Study site(s) in Zimbabwe: Bujumbura District (6 hospitals)_____

1.7. Sites outside Zimbabwe: Bujumbura District

1.8. Study budget:_____$2103.20_____ Source of Funding: _____N/A_____

1.9. Is the researcher a student? Yes/No

1.10. If Yes, indicate the following:

1.10.1. Name and address of institution: Africa University

1.10.2. Faculty: College of Business, Peace, Leadership, and Governance (CBPLG)_____

__

1.10.3. Level of study Undergraduate/Master's/PhD

__Master_____

1.10.4. Name of Supervisor: _____Doctor Iris Shiripinda_____

1.11. If No to question 1.10, then indicate the following:

1.11.1. Name and address of institution:

_____

1.11.2. Academic Title of PI:

_____

1.11.3. Existing Qualifications:

_____

1.11.4. Co Investigators:

Names: Qualifications

Institution

N/A	N/A	N/A

2. Statement by the investigator

I _Jacques Manirakiza_____certify that the information in this application document and the accompanying documents is true and complete in all respects. I confirm that the application has NOT been rejected by any other ethics review committee.

Signature_  _____Date: _08/10/2020_____

3. **<u>Guidelines for the proposal</u>**: (not more than 6 pages, Times New Roman, 1.5 line spacing, font size 12)

3.1. **Background**:

Burundi has already started implementing a free healthcare policy for under 25 diabetes patients (Egide, 2018). However, this policy only grants access to free medication (insulin) for type 1 diabetes mellitus and there is only one place it is administered nationally. Thus, under 25 and type 2 diabetes mellitus staying far from the medication administration area, are left behind without any assistance. In addition, diabetic patients may also be having challenges related to diabetes self-management factors which are also not covered by the current policy.

3.2. **Aim(s) and objectives**: The purpose of this study is to explore the extent of diabetics' self-management in reducing the prevalence and severity of diabetes mellitus in Bujumbura District, Bujumbura, Burundi.

3.3. Research participants/subjects

3.3.1. State the total number of human participants to be enrolled

One hundred and ten participants diabetic patients who were admitted in six hospitals in Bujumbura district may participate in this study.

3.3.2. State the source(s) of recruitment (e.g. hospitals, schools, etc.)

Private and state owned six hospitals in Bujumbura district

3.3.3. Age range and sex of participants to be recruited.

Participants in this study will be men and women between 18 to 50 years old

3.3.4. Special or vulnerable populations (state if vulnerable populations e.g. pregnant women, adolescents, children, prisoners, refugees etc are involved) None among vulnerable people will take part in this study

3.3.5. Payment (if any) to be paid to each participant

There is no payment for this study participation.

3.3.6. Informed Consent Procedure(describe how this will be carried out)

An informed consent form will be provided to participants. Only participants who agree to take part in this study will be interviewed.

3.4. Summary of Literature Review

3.4.1. Provide a brief summary of the literature reviewed for this study (only the key ones)

The literature review covers the factors associated with diabetes self-management. The sociodemographic information is also highlighted.

3.5. Research Design

3.5.1. Research Design (briefly describe how the research will be carried out including plans for data analysis and dissemination.)

This study will adopt a mixed research design method to collect data in order to have in-depth information and a better understanding of the challenges and opportunities of the community health education network policy and diabetes mellitus self-management after their implementation. Data analysis will be done using a descriptive method. Data will be then presented in the form of charts and graphs. Statistical Package for Social Scientist (SPSS) will be used to generate frequency distribution tables for interpretation. A hard copy of the research report will be sent to Africa University library and another hard copy will be sent to the College of Business, Peace, Leadership, and Governance (CBPLG) at Africa University.

3.5.2. Study population and sampling procedure(give details of the study population and how you will carry out the sampling procedure and NOT general meanings of population and sampling methods)

This study will be conducted using data collection questionnaires and interviews. The data collection question is composed of both open-ended and closed questions.

3.5.3. Inclusion/exclusion criteria(state who qualifies for selection and who does not)

Only hypertensive farm workers at Africa University who were attended at Africa University clinic will participate in this study. Farm workers at Africa University with other conditions will be excluded in this study.

Other staff members at Africa University will not participate in this study as well.

3.5.4. Devices, Tests, Questionnaires, and Interview Guides:

N/A

3.6. **Potential Benefits of the research** (Describe the benefits of the study both to the participants and to the community)

The study will bring knowledge and skills to Burundians regarding group-based diabetes self-management. The study will also encourage group-based diabetes self-management practices among diabetic patients. It will significantly reduce diabetes mellitus prevalence and severity in Burundi. It will also cut down the cost of medication as the rate of diabetics will be going down. It will safeguard the health of diabetic patients as the rate of death due to diabetes will diminish.

3.7. Potential Risks

3.7.1. Describe any potential risks, discomforts or harms that may be experienced by the participants. These may be physical,

psychological, social, legal, economic or other and state procedures to minimise these.

N/A

3.7.2. **Management of Risks**(describe how these risks will be managed/mitigated)

N/A

3.8. **Confidentiality/privacy** (give details of how these will be maintained)

Information collected from the study will be confidentially saved to the investigator's locked cupboard.

3.9. **Investigator Experience/qualifications** (describe any experience or training/courses that the investigator has/has taken that put him/her in good stead to carry out the study)

The researcher has skills in research methodology and has experience in research as he conducted a research study on hypertension at undergraduate.

3.10. **Attachments**

3.10.1. **Approval letter from Faculty Supervisor** (Include a letter (on letterhead) showing that your Faculty supervisor knows about your research proposal and gives his/her permission to submit to AUREC.)

Attached

3.10.2. Data collection instruments (Include paper copies of anything you will be using to gather data from human subjects e.g. Tests/Questionnaires/Observation Checklists/interview guides/ FGDs guides etc.)

Attached.

3.10.3. **Information Letters/Consent Forms** (informed consent form guide is available from AUREC) Include copies of informed consent forms/assent forms that you will use.

I will get the approval letter from the registrar soon after my research proposal is approved by Africa University Research and Ethics Committee.

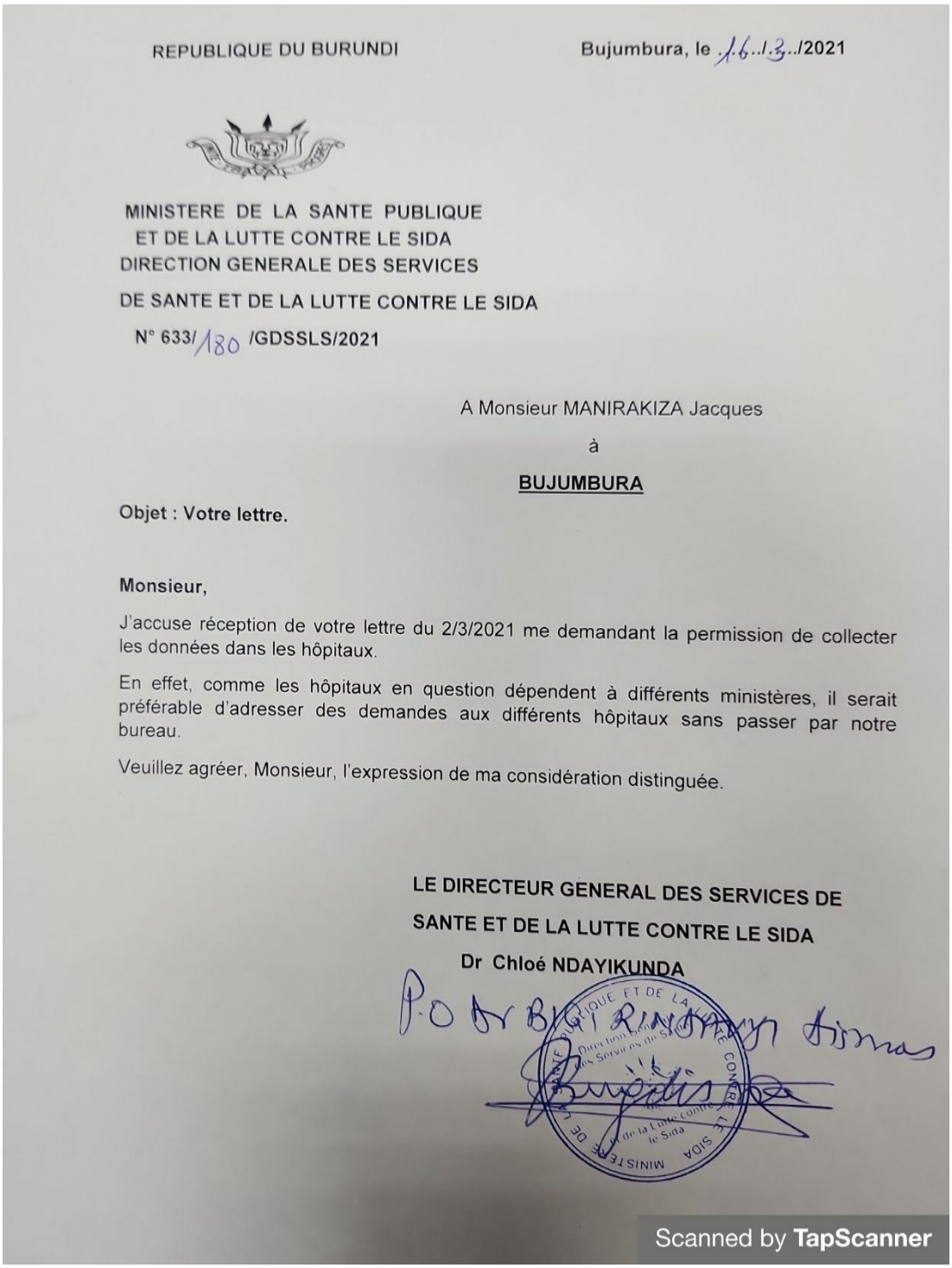
3.10.4. Budget and timeframe

Budget is outlined

3.10.5. Proof of payment of the review fees.

Attached.

Appendix 11: Research Permits



REPUBLIQUE DU BURUNDI

Bujumbura, le 16/3/2021

MINISTERE DE LA SANTE PUBLIQUE
ET DE LA LUTTE CONTRE LE SIDA
DIRECTION GENERALE DES SERVICES
DE SANTE ET DE LA LUTTE CONTRE LE SIDA
N° 633/180 /GDSSLS/2021

A Monsieur MANIRAKIZA Jacques

à

BUJUMBURA

Objet : Votre lettre.

Monsieur,

J'accuse réception de votre lettre du 2/3/2021 me demandant la permission de collecter les données dans les hôpitaux.

En effet, comme les hôpitaux en question dépendent à différents ministères, il serait préférable d'adresser des demandes aux différents hôpitaux sans passer par notre bureau.

Veuillez agréer, Monsieur, l'expression de ma considération distinguée.

LE DIRECTEUR GENERAL DES SERVICES DE
SANTE ET DE LA LUTTE CONTRE LE SIDA
Dr Chloé NDAYIKUNDA

P.O Dr BIGIRIMANA Thomas

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RÉPUBLIQUE DU BURUNDI
MINISTÈRE DE LA SANTÉ PUBLIQUE
ET DE LA LUTTE CONTRE LE SIDA

HÔPITAL PRINCE RÉGENT CHARLES

N° 634/HPRC 889 /CE/A/2021

Bujumbura, le 08/4/2021

A Monsieur Jacques MANIRAKIZA

Objet : Votre demande d'autorisation de collecte de données

Monsieur,

Faisant suite à votre correspondance du 31/3/2021 par laquelle vous demandez l'autorisation de collecte de données sur la « **politique du Réseau communautaire d'éducation sanitaire et autogestion du diabète sucré dans le district sanitaire de Bujumbura, au Burundi** » j'ai l'honneur de porter à votre connaissance que je marque mon accord.

Toutefois, à la fin, vous devez déposer une copie de votre travail au Secrétariat de Direction.

Veuillez agréer, **Monsieur**, l'expression de ma considération distinguée.

Le Médecin Directeur de l'HPRC

Dr NIMPAYE Oscar

C.P.I A :

- Madame le Médecin Directeur Adjoint Chargé de la Coordination des services de Soins;
- Madame le Directeur-Adjoint chargé de l'Administration et des Finances;
- Monsieur le Médecin Président du Conseil Médical
- Madame le chef du Nursing et Coordinatrice des stages

Commune Mukaza, Zone Buyenzi, Avenue de l'Hôpital N°9 / B.P. 570 Bujumbura-Burundi T

REPUBLIQUE DU BURUNDI
MINISTERE DE LA DEFENSE
NATIONALE ET DES ANCIENS
COMBATTANTS
HOPITAL MILITAIRE DE KAMENGE
B.P. 5117 MUTANGA I

Bujumbura, le 19 Mars 2021.

N°520/HMK/609/01.22.0

Objet: Accès aux données
V/Réf: Lettre du 19 février 2021.

A Monsieur MANIRAKIZA Jacques.
à
B U J U M B U R A

Monsieur,

Me référant à votre correspondance ci-haut référencée, relative à votre demande d'accès aux données dans le cadre d'élaborer une thèse de fin d'études intitulée : « **POLITIQUE DU RESEAU COMMUNAUTAIRE D'EDUCATION SANITAIRE ET AUTOGESTION DU DIABETE SUCRE DANS LE DISTRICT SANITAIRE DE BUJUMBURA** », j'ai l'honneur de porter à votre connaissance que votre demande est acceptée.

Veuillez agréer, Monsieur, l'expression de ma considération distinguée.

Le Directeur Général de l'Hôpital Militaire de KAMENGE.

REPUBLIQUE DU BURUNDI
Dr NIMBURANIRA Marc
Général de Brigade
Ministère de la Défense Nationale et des Anciens Combattants
Hôpital Militaire de KAMENGE

C.P.I.à :
Monsieur le Directeur Chargé des Soins
Monsieur le Directeur Administratif et Financier
à
B U J U M B U R A

Jacques Manirakiza

Africa University

Zimbabwe

Email: manirakizaj@africau.edu

Tel: +263778877915

Le 31 Mars 2021

C.P.L. RWAGASORE
Date: 01/04/2021
N°: 404.
Visa Direction

A Madame/Monsieur le Directeur de la Clinique Prince Louis Rwagasore

OBJET: DEMANDE DE PERMISSION POUR LA COLLECTE DES DONNÉES

Chère Madame/Monsieur le Directeur de la Clinique Prince Louis Rwagasore, je vous salue au nom de Jésus-Christ notre Seigneur et Sauveur.

Je m'appelle Jacques Manirakiza, un étudiant burundais à Africa University. Je poursuis une maîtrise en politique publique et gouvernance et je dois faire une recherche comme l'une des conditions requises pour obtenir un certificat à la fin du programme. Mon sujet de recherche est **«Politique du Réseau Communautaire d'éducation Sanitaire et Autogestion du Diabète Sucré dans le District Sanitaire de Bujumbura, au Burundi.»**

En effet, Monsieur/Madame le Directeur, je mènerai mes recherches dans votre Clinique Prince Louis Rwagasore pour collecter les données. C'est pourquoi je fais appel à votre honorable bureau pour demander la permission d'interroger les patients diabétiques et quelque prestataires de soins de votre hôpital pour faire la collecte des données pour mon enquête.

CENTRE HOSPITALO-UNIVERSITAIRE DE KAMENGE

V/Réf.:
N/Réf.: 2021/DGCHUK.873/11.5

Bujumbura, le 09/04/2021

A Monsieur MANIRAKIZA Jacques
Tél : +263778877915

Objet : Accès aux données

Monsieur,

Faisant suite à votre correspondance du 01/04/2021 je voudrais vous informer que je marque mon accord à votre demande d'accès aux données du CHUK dans le cadre de votre thèse intitulée:**« Politique du Réseau Communautaire d'Education Sanitaire et Autogestion du Diabète Sucré das le District Sanitaire de Bujumbura, au Burundi ».**

Je tiens à vous informer également que les usagers des archives de l'hôpital doivent tenir compte de la confidentialité des dossiers médicaux.

Veuillez agréer, Monsieur, l'assurance de ma considération distinguée.

LE DIRECTEUR GENERAL,

Pr Stanislas HARAKANDI

COPIE POUR INFORMATION A :
-Monsieur le Directeur chargé des Soins
-Madame le Directeur chargé des Finances
-Monsieur le Chef de Département de Chirurgie
-Madame le Chef de Service du Nursing

CENTRE HOSPITALO - UNIVERSITAIRE DE KAMENGE
DIRECTION GENERALE

B.P.2210 Bujumbura, Tél: (257) 22236062; (257) 22236060; Fax: (257) 22232267;

REPUBLIQUE DU BURUNDI
MINISTERE DE LA DEFENSE
NATIONALE ET DES ANCIENS
COMBATTANTS
HOPITAL MILITAIRE DE KAMENGE
B.P. 5117 MUTANGA I

Bujumbura, le 19 Mars 2021.

N°520/HMK/609/01.22.0

Objet: Accès aux données
V/Réf: Lettre du 19 février 2021.

A Monsieur MANIRAKIZA Jacques.
à
BUJUMBURA

Monsieur,

Me référant à votre correspondance ci-haut référencée, relative à votre demande d'accès aux données dans le cadre d'élaborer une thèse de fin d'études intitulée : « **POLITIQUE DU RESEAU COMMUNAUTAIRE D'EDUCATION SANITAIRE ET AUTOGESTION DU DIABETE SUCRE DANS LE DISTRICT SANITAIRE DE BUJUMBURA** », j'ai l'honneur de porter à votre connaissance que votre demande est acceptée.

Veuillez agréer, Monsieur, l'expression de ma considération distinguée.

Le Directeur Général de l'Hôpital Militaire de KAMENGE.

REPUBLIQUE DU BURUNDI

Dr NIMBURANIRA Marc
Général de Brigade

Ministère de la Défense Nationale et des Anciens Combattants
Hôpital Militaire de KAMENGE

C.P.I.à :
Monsieur le Directeur Chargé des Soins
Monsieur le Directeur Administratif et Financier
à
BUJUMBURA

Département de MI
pr recherche des données