

UNIVERSITY OF KWAZULU NATAL

**A FOCUSED ETHNOGRAPHIC STUDY ON MANAGEMENT OF
CHRONIC COMORBID (DIABETES AND HYPERTENSION)
CONDITIONS AMONG ADULTS IN SELECTED PRIMARY HEALTH
CARE SETTINGS IN KENYA**

BY

Immaculate Nyaseba MARWA

2016

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CHRONIC COMORBID (DIABETES AND HYPERTENSION)
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CARE SETTINGS IN KENYA**

**A Thesis Submitted to the School of Nursing and Public Health: College of Health
Sciences: University of KwaZulu-Natal, in the Fulfilment of the Requirement for the
Degree: Doctor of Philosophy (Nursing)**

BY

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March 2016

DECLARATION

I declare that the thesis titled: *A focused ethnographic study on the management of chronic comorbid (Diabetes and Hypertension) conditions among adults in selected primary health care settings in Kenya* submitted for the degree of Doctor of Philosophy (Nursing) in the College of Health Sciences, University of KwaZulu Natal-Durban is my own independent work. All material quoted has been acknowledged and referenced. The thesis has not been submitted previously for any degree or for any examination at any other University.

STUDENT

DATE

SUPERVISOR

DATE

DEDICATION

I dedicate this thesis to all health care providers working in primary health care settings in Kenya for their efforts and determination to give the community much needed health care services. I also dedicate this to all patients with comorbid conditions, living one day at a time with hope of better days to come.

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The journey of this project has not been easy. It was sometimes filled with discouragement and despair, but with the help of others, and with dedication, the journey has finally reached its destination. I would like to acknowledge those who have made the journey worth travelling.

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ABSTRACT

Background to the study: Non-Communicable Diseases (NCDs) have become a global concern, despite the efforts of the World Health Organization to integrate management of NCDs into primary health care (PHC). Most developing countries' PHC systems are not adequately equipped to handle the double burden of communicable and NCDs. Literature and evidence-based studies reveal that people with diabetes mellitus type 2 usually have more than one co-existing condition (comorbid conditions), hypertension being the leading one. Consequently they require more comprehensive long-term and coordinated care by health care providers, which they seldom have access to. Health systems lack context-specific models to handle chronic conditions to fulfil health needs of patients with comorbid conditions.

The purpose of the study: The purpose of this study was to analyse the current management strategies available to comorbid diabetes and hypertension patients, in selected PHC settings and further to develop a context-informed model for the management of comorbid conditions in primary care levels in Kenya.

Methodology: The study adopted a constructivist, qualitative approach and a combination of focused ethnography and grounded theory research design towards the development of a context-informed model. The ethnographic design was used basically during data collection, employing the following triangulated data collection methods: participant observation; unstructured interviews; document analysis; and focus group discussions. During data collection, a constant comparative method was used to ensure rich information collection. Seven health facilities were purposively selected and in total there were 40 informants in this study. The data analysis process entailed three phases, following Strauss and Corbin (1990): open, axial and selective coding.

The Results: The findings of this study revealed that the phenomenon of managing comorbid diabetes and hypertension conditions in PHC settings involved four core specific characteristics which need to be fulfilled for effective management of patients. These include being collaborative in nature, using culture-sensitive care, maintaining continuity of care, and self-management focused care. The study findings further revealed that the action and interaction strategies were contextually influenced by strong governance and leadership together with international initiatives and partnerships towards health systems for the management of chronic comorbid conditions. The context of care is based on health policies,

legal document strategies, clinical guidelines the international initiatives and partnerships which form the basis for health care delivery and management of comorbid conditions. The actions and interactions in this study were based on the political commitment to provide and support health care organisations with resources for chronic care both at the strategic and operational levels at the county and national level of management. The process of management of chronic conditions involves a set of key players with different roles towards effective management of comorbid conditions based on the integrated care approach, through the three levels of disease prevention and control. Intervening conditions to management of chronic comorbid conditions emerged to be both facilitative, and barriers to effective management of comorbid diabetes and hypertension. Government commitment was seen to be cutting across health service delivery, through provision of essential supplies in the face of high poverty levels among patients, determined health seeking, the health belief system and patient provider factors, and centralisation in decentralised health systems. These were the outstanding intervening conditions cutting across providers, patients and health organisations. Lastly the consequences of chronic management can be both intended and unintended to both health systems, health organisations, the community and patients, and can include improved quality of life, reduced cost of care, and an empowered community, improved quality of service delivery to chronic comorbid patients, improved self-efficacy and determination for self-management. The whole process of management emerged into the management of chronic comorbid conditions model.

Conclusion and recommendations: Management of chronic comorbid conditions, especially is in resource constrained communities and health systems is based on integration of health care service, while looking at the patients as the most important partner in health care. Self-management allows shift of health promotion and care to the patients and the community for sustainability and continuity along the disease process.

The study made the following recommendations for effective management of chronic comorbid conditions in PHC settings: collaboration between the national and county government should focus on implementation of the already existing policies and strategic plans at the contextual level where chronic care is crucial. Team work and collaboration was emphasised to ensure improved quality of care, sustainable chronic care which is person-centred through the implementation and evaluation of the context-specific model to other divisions within the Kenyan health system. These aim to improve research facilities and to provide support for management of comorbid or multimorbid conditions among NCDs. This will help to cut health care costs as the result of improved health care. The study recommends

health systems to consider integration and collaboration between traditional herbal medicine, the private sector and public health sector services, to allow for continuity across settings and providers.

LIST OF ABBREVIATIONS

ADA:	American Diabetes Association
CCM:	Chronic Care Model
CHWs:	Community Health Workers
CVD:	Cardiovascular Diseases
DM:	Diabetes Mellitus Type 2
GOK:	Government of Kenya
HPTN:	Hypertension
ICCC:	Innovative Care for Chronic Care Conditions
IDF:	International Diabetes Federation
KEPH:	Kenya Essential Package of Health
KMOH:	Kenya Ministry of Health
MOMs:	Ministry of Medical Services
MOPHS:	Ministry of Public Health and Sanitation
NCDs:	Non-Communicable Diseases
NHSSP:	National Health Sector Strategic Plan
PHC:	Primary Health Care
TCM:	Transitional Care Model
TMP:	Traditional Medicine Practitioners
WHO:	World Health Organization

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CHAPTER ONE

STUDY BACKGROUND

1.1 Introduction

Chronic non-communicable diseases (NCDs) remain of global concern, despite the efforts of the World Health Organization (WHO) to integrate management of NCDs into primary health care (PHC) (WHO, 2010b). Health care systems in most developed countries are not adequately equipped for chronic disease management. Comorbidity has been defined severally, but the agreed upon definition according to (Valderas et al., 2009), is the existence of more than one medical condition, independent of or dependent on one another. Comorbid conditions are generally sub-optimally managed in PHC and develop severe complications and poor health outcomes (Islam et al., 2014, Piette and Kerr, 2006).

Comorbidity of diabetes and hypertension is common in the majority of patients globally, and shows a high risk for cardiovascular diseases (Long and Dagogo-Jack, 2011). In Kenya just like other sub-Saharan Africa countries, the prevalence of comorbidity of diabetes and hypertension is high and poses management challenges, as 65 per cent of patients with comorbid conditions are poorly controlled despite being on treatment and follow up care (Otieno et al., 2005). Most health systems in developing countries are ill-equipped with appropriate strategies to manage the conditions in PHC settings (Mendis et al., 2012). Faced with the double burden of diseases, this necessitates the need to develop context-informed intervention models, appropriate for comorbid conditions in PHC to improve care outcomes.

1.2 Background to the Problem

Global statistics indicate an increasing trend of NCDs, and they remain, as pointed out above, of global concern despite the efforts by WHO to integrate the prevention and control of NCDs into PHC, with the pace remaining slow (WHO, 2010b). According to (WHO, 2008b) world statistics, it is projected that NCDs will cause 59 per cent of annual deaths and lead to 46 per cent of the global disease burden by the end of 2030. The WHO (2013a) report highlights the global concern of diabetes and hypertension being high risk factors for cardiovascular diseases, which tend to coexist in patients commonly seen in PHC settings (Mohan et al., 2013, WHO, 2013a). The International Diabetes Federation (IDF) estimates that the number of adults (between 20 and 79 years of age) with diabetes in the world will increase by 54 per cent from the current 371 million globally to 438.4 million by 2030, with

the sub-Saharan region projected to report an increase of 98 per cent from the current 12.1 million to reach 23.9 million by 2030, with 81.2 per cent being undiagnosed and living in Africa (International Diabetes Federation[IDF], 2012). The high prevalence of NCDs is attributable to globalisation, adoption of westernised lifestyles and urbanisation. Most of the mortality cases, at 80 per cent, occur in low and middle income countries, and kill the most economically productive in the community leading to increased poverty, compared to developed countries (Mathenge et al., 2010). The increase is of concern in developing countries, with the Sub-Saharan region experiencing the highest increase in mortality of 52 million per year by 2030, surpassing mortality caused by communicable conditions (WHO, 2013a, Buowari, 2013). Fortunately, despite the high mortality and devastating effects of NCDs, they are preventable at community and individual household levels. Most NCDs have similar risk factors, which then highlights the consideration for common management strategies, starting with health promotion and illness prevention among those at risk and unaffected groups (Mohan et al., 2013).

Chronic conditions pose a challenge to the health organisations in terms of care and service delivery due to its comorbidity nature (Valderas et al., 2009). Comorbidity has been conceptualised to be the existence of more than one medical condition concurrently in one patient. A further step to clarifying the comorbidity concept (Valderas et al., 2009) states that it is the co-existence of two or more medical conditions in one patient, which may differ in terms of their direct cause, independence, heterogeneity and associated risk factors. Similarly, (Lugtenberg et al., 2011) have echoed the definition of comorbidity in terms of chronic conditions being concordant to each other or discordant conditions which exist in one patient, with one condition being the index disease, which is usually the main concern for seeking medical attention. However the origin of comorbidity and comorbid conditions dates back to the work of Feinstein (1970) who defined comorbidity as “*any distinct clinical entity that has co-existed or that may occur during the clinical course of a patient who has the index disease under study*”(Feinstein, 1970:456-7). Clinicians are generally accustomed to single disease management, and current clinical guidelines are more one-condition orientated (Lugtenberg et al., 2011), thus creating a need to investigate the concept of comorbidity and management of comorbid conditions such as diabetes, depression, HIV and cancer among other chronic conditions.

Comorbidity of diabetes and hypertension is associated with severe complications and high mortality rates, as risk factors for cardiovascular diseases, which are the leading cause of

death among the major NCDs (Katte et al., 2014). Comorbidity of diabetes and hypertension is associated with poor health outcomes, severe complications and productive years lost due to disability (Long and Dagogo-Jack, 2011). Diabetes is an endocrine disease which is defined by high blood glucose levels in an individual, but is mainly determined by vascular components. Diabetes is a major cause of death in most patients with cardiovascular disease at 70 per cent, followed by renal complications at 10 per cent (Anakwue et al., 2013). Hypertension is common in developing countries although it is normally not diagnosed early or missed out, leading to it being referred to as the ‘silent killer’. It is one of the most common risk factors for cardiovascular disease, which is the leading cause of death in developing countries (Bloomfield et al., 2011a).

Several studies done on different ethnic groups show that one-in-four adult with chronic conditions have more than two chronic conditions, and hypertension has a prevalence of up to 70 per cent in individuals with diabetes. It is projected to be two fold, common in individuals with diabetes as in those without diabetes, or vice versa, both in developed and developing countries (Boyd and Fortin, 2010, Mohan et al., 2013). Findings from studies indicate that the burden of comorbidity of diabetes and hypertension vary across the world; in America and Thailand it ranges from 75 per cent to 78.4 per cent respectively, to mention but a couple of countries (Long and Dagogo-Jack, 2011, Lee et al., 2013). In America, 23, 6 million and 74.5 million adults have diabetes and hypertension respectively, with 75 per cent of all diabetics type 2 having hypertension. Similar results, although percentages are below 50 per cent, have been reported in Cameroon, Tanzania and Kenya (Bovet et al., 2008, Katte et al., 2014, Otieno et al., 2005). In India the comorbidity of hypertension among diabetic patients showed that out of 294 individuals with diabetes, 139 had hypertension representing 47.28 per cent (Joshi et al., 2012), while the prevalence of comorbid diabetes and hypertension in Nigeria, as estimated by Enugu (Anakwue et al., 2013) was reported to be 60 per cent, slightly lower than the prevalence in USA and United Kingdom. These local and international statistics indicate that comorbidity of diabetes and hypertension is common and should be given priority in PHC to prevent the onset of severe complications among the ever-growing affected population. However, based on these statistics, the context of prevention and management of comorbid diabetes and hypertension should be receiving greater consideration. The difference in rural, urban, developed and developing countries’ management strategies cannot be grouped together and generalised for all conditions.

Control of blood pressure and blood glucose among patients with comorbid diabetes and hypertension is the main goal of management, led to the reduction of mortality and improved quality of life (*United Kingdom Prospective Diabetes Study Group (UKPDS)* (1998), *The Hypertension Optima Treatment (HOT)* study has also indicated that the mortality of CVDs is reduced by 43 per cent when blood pressure was reduced to 130/80mmHg in diabetics with hypertension (Hansson et al., 1998). Strict adherence to anti-hypertensive and hypoglycaemic prescriptions for patients has been shown to be effective in the management of comorbid diabetes and hypertension in a Nigerian diabetes clinic (Anakwue et al., 2013). However there is lack of information on the availability and adherence to the prescription of the drugs in clinical guidelines for the management of comorbid conditions in PHC, seeing that most studies were conducted at a tertiary hospital (Atieno-Jalang'o et al., 2015).

Ample evidence also exists that most patients in the sub-Saharan regions with comorbid diabetes and hypertension, including in Kenya, are sub-optimally managed and rarely attain the optimal level of either blood glucose or blood pressure in the course of management. In Tanzania control of greater than 1 per cent at the level of 140/90mmHg, was achieved and in South Africa 7 per cent and 15 per cent was achieved among black men and women respectively (Edwards et al., 2000, Mayosi et al., 2009). Kenya presented a higher level of suboptimal management of comorbid diabetes and hypertension as risk factors for cardiovascular conditions, achieved less than 30 per cent of the required HbA1c levels, while 65 per cent did not achieve the required blood pressure level (Otieno et al., 2005). Similar results have also been reported by (Mugure et al., 2014) still in urban settings, but with no determination of comorbidity of diabetes and hypertension. There is lack of adequate information on the management of comorbid diabetes and hypertension, and little is known about patients' perceptions of their condition or about reasons for poor outcomes. In the Kenyan context cardiovascular diseases are the leading cause of deaths among adults at 27 per cent (WHO, 2011). High levels of prevalence of diabetes and hypertension have been reported in Kenya as single conditions or correlates of other risk factors for diabetes and for hypertension (El-busaidy et al., 2014). There are few studies which have been done to understand the reasons for low rates of control, and which endeavour to design context-specific interventions to manage comorbid conditions in the country.

Despite an early notion of risk factors being common in urban and rich populations, rural and ethnic groups are now at risk. These studies in various parts of Kenya mirror findings from other countries on the ethnicity and exposure to risk factors (Mathenge et al., 2010,

Christensen et al., 2008). Literature has confirmed that most people are unaware of the existence of comorbid diabetes and hypertension (Maina et al., 2011), similar higher levels have been reported in Malawi, with 95% being unaware (Msyamboza et al., 2014). The double burden of managing comorbid conditions exerts a high pressure on the already fragile economy of most families in developing countries (Boutayeb et al., 2013). This leads to poor adherence and follow up care affecting quality of life and care outcomes (Woodard et al., 2011), as patients fail to return for check-ups, medicine refills due to lack of funds, lack of significant symptoms following community based screening or lack of follow up mechanisms being in place (van de Vijver et al., 2013). Similarly, comorbidity also affects the quality of life, impaired self-management ability and increases disability especially when there is limited knowledge on the part of the care provider and patients (*Action to Control Cardiovascular Risk in Diabetes (ACCORD) study group*, 2010). Patients with comorbid conditions usually face psychological burdens, adverse side effects from multiple drugs and care breakdowns (Long and Dagogo-Jack, 2011, Vogeli et al., 2007, Piette and Kerr, 2006), necessitating the need for patient-centred care as opposed to condition-based care which is commonly practiced in most clinical settings (Hudon et al., 2012).

Experts strongly recommend preventive care as opposed to secondary prevention and epidemiological surveillance studies (de-Graft Aikins et al., 2010a). Primary prevention (health promotion programmes) have been shown to be effective in delaying the onset of complications for CVDs by 90 per cent, diabetes type 2 by 80 per cent, and a third of cancer cases can be prevented (Boutayeb et al., 2013, Miranda et al., 2008). Mass community-based screening has been shown to be effective (Pastakia et al., 2013). There is lack of well-organised health promotion and mass screening programmes in most developing countries, including Kenya (Bloomfield et al., 2011b, Miranda et al., 2008).

Despite the availability of several intervention models from developed countries on chronic care, developing countries' health system context has not embraced them into practice, due to a myriad of challenges linked to lack of resources, policies, infrastructure and political interferences in the healthcare sector. Additionally, models developed in different contexts have variations based on the levels of development and preparedness in chronic care management in other socio-economic contexts (Ploubidis et al., 2013, Olmen et al., 2012b). For instance, among the many intervention models available and advocated for use in PHC is the Chronic Care Model (CCM) which emphasises clinical and self-management strategies

for chronic care, especially diabetes (Pilleron et al., 2014, Si et al., 2008). The Collaborative Care Model (CCM) utilises different cadres of health professionals to manage patients through the use of care managers for patients who need comprehensive chronic care (Unützer et al., 2013). Prior to the intervention models, chronic patients were being managed as acutely ill patients with no self-management strategies. Most health facilities in Kenya do not practice coordinated care, neither is there currently a cadre of managers to draw on.

Further, high levels of poverty in most countries and in rural settings and affordability of and accessibility to health care is an issue for most people living below 1 USA dollar a day (Nduo et al., 2013), who are faced with having to pay for the health care costs. Only a small group of the population are insured as in the case of Kenya, where only 10 per cent of the rural communities are insured (Turin, 2010). Management of chronic comorbid conditions requires understanding from a broad perspective of different stakeholders involved in delivery of chronic care services, including lay people operating at community level (Samb et al., 2010).

The health system in Kenya, just like others in developing countries, is still faced with an acute shortage of health care workers (Wakaba et al., 2014), and fragmentation of health care services among private, public and the traditional medicine practitioners. This then raises issues of medical ethical implications which affect the practice of health care providers (Githui, 2011). Lack of interest and knowledge among health providers and lack of basic health infrastructure continue to obstruct progressive intervention towards chronic condition care particularly in PHC settings (Parker et al., 2012). Failure to implement the health policies reforms designed by the national government in devolved health sectors continues to affect the service delivery in regions of the country. This is evident in the national survey on risk factors for NCDs toward meeting the objectives of the health policies (Muchomba 2015, Wamai, 2007, Turin, 2010). According to Williams and others (2010), grouping together of sub-Saharan region countries misses out the special contexts which are unique to each country, based on unique health needs.

Research from various ethnic groups such as African-American and Latinos, black African among other groups, has highlighted that people have varied practices and behaviours in different social contexts and cultural orientations (Fongwa et al., 2008, Gross et al., 2013).

Healthcare providers similarly have varied cultures in their work environment and organisations, based on their training and type of working environment (Speziale et al., 2011). Research has proven that cultural beliefs, religion and social practices have a direct

influence on lifestyle modification, health-seeking behaviour and adherence to treatment (Fongwa et al., 2008), concepts which have been explained explicitly in the social learning theory and the health belief models (Rosenstock et al., 1988). Integration of culture and use of culture-sensitive health promotion and culture-tailored intervention models can have a positive impact on management of comorbid diabetes and hypertension among other chronic conditions (Gross et al., 2013). This enhances sustainability and participation at household and community levels (Betancourt et al., 2003). Lack of communication within the culture of management of chronic comorbid conditions can lead to negative health outcomes. Therefore this study envisages opening the channels of communication and conflict resolutions between the two crucial groups in chronic care, namely the patients and health care providers, through initiation of patient support groups based on the context of care.

Kenya, like most developing countries, is experiencing a double burden of chronic NCDs and communicable infectious conditions, cardiovascular disease (CVD) (13 per cent), cancer (7 per cent), diabetes (4 per cent), and communicable conditions, at a (62 per cent) death rates (WHO, 2011). According to the Ministry of Health annual report the prevalence of diabetes is 3.3 per cent and hypertension is 27 per cent (MOMs and MOPHs, 2011a). Other studies in Kenya have shown the prevalence to be higher at 6.6 per cent to 50.1 per cent respectively (Mathenge et al., 2010, Pastakia et al., 2013). According to the Ministry of Health annual report, diabetes accounted for 27.4 per cent hospitalisations and a mortality rate of 2.2 per cent, while hypertension accounts for 14 per cent mortality, while 50 to 70 per cent of all hospital admissions are due to NCDs (MOMs and MOPHs, 2011a). There is lack of conclusive statistical evidence in the country on the comorbidity of diabetes and hypertension. The burden is evident from studies conducted to confirm that the prevalence is high, with 50 per cent of patients with diabetes having hypertension, and a poor control rate of 65 per cent (Otieno et al., 2005).

Several studies done in Kenya, indicate prevalence based on rural and urban settings, where rural population report a prevalence of 16 per cent (El-busaidy et al., 2014), 50.1 per cent in multi-ethnic communities (Mathenge et al., 2010) and in urban slums it is 5.3 per cent to 10.5 per cent, which increased with age and exposure to risk factors (Ayah et al., 2013). These studies clearly show that the prevalence is not only high in urban areas, but also high in rural communities. In their study, Ongeti and colleagues concluded that to curb the growing epidemic, a combination of health promotion and control of diabetes and hypertension across care levels may be a solution to the problem (Ongeti et al., 2013). In another study conducted

in rural western Kenya, advocates were for regular mass screenings at community-based facilities and home-based screening (Pastakia et al., 2013). Similar recommendations have emanated from studies in other countries like Cameroon and Iran (Labhardt et al., 2010, Heidari et al., 2012). However, none of these studies looked into the management aspects from the cultural practices and their implications on management outcomes.

1.3 Problem Statement

Globally the increasing burden of NCDs remain a concern (WHO, 2013a). There is compelling evidence that most patients in rural communities are unaware of their conditions, particularly diabetes and hypertension (Muchira et al., 2015). Further the percentages of patients with comorbid diabetes and hypertension with poorly controlled conditions are alarmingly high in the country, despite them being on regular follow-up care, leading to high mortality cases (Otieno et al., 2005). However, little is known about the management of comorbid diabetes and hypertension in PHC settings in Kenya as the country continues to record high mortality rates due to chronic conditions, mainly with diabetes and hypertension, being among the risk factors for cardiovascular disease (KMOH, 2011).

Human health resource shortage is a global concern, and Kenya like many developing countries, faces an acute shortage of health-care workers, especially nurses (Wakaba et al., 2014). Additionally, lack of adequate supply of essential drugs to PHC and lack of essential diagnostic tools and skills lead to poor control of comorbid diabetes and hypertension, which leads to poor patient outcomes and quality of life. Currently all clinical guidelines are single-condition oriented; leaving out people with comorbid conditions. Further the available intervention models are not context-specific to resource limited settings and comorbid conditions (Fortin et al., 2013). As a result implementation becomes a challenge for most PHC systems, specifically in a devolved health care system (Turin, 2010). Health system fragmentation further contributes to poor management and health outcomes and increased use of traditional medicine practitioners. Economic burdens and lack of empowerment of health professionals and general populations further worsens the management of chronic conditions (Kirigia et al., 2009, Turin, 2010). These challenges in primary healthcare create the urgency to develop interventions which are context-specific based on available resources and skills to suit patients' needs at community level, for effective management of comorbid diabetes and hypertension.

Few studies have been conducted that actually understand what is happening in primary healthcare settings in Kenya regarding management of chronic conditions, where the majority of the Kenyan population live and access health services. This includes chronic care. This study aims to understand the management of chronic comorbid diabetes and hypertension in a selected context of Nandi County in Kenya, and to lead this towards the development of a context-informed model for the management of chronic comorbid diabetes and hypertension in PHC settings in Kenya.

1.4 Purpose of the Study

The purpose of this study was to explore and analyse the current management systems of chronic comorbid conditions in PHC settings in order to develop a context-informed model of chronic comorbid diabetes and hypertension management in Nandi County in Kenya.

1.5 Research Objectives

The objectives of this study were:

- 1.5.1 To analyse the systems of managing chronic comorbid conditions in the Nandi County health system in Kenya.
- 1.5.2 To analyse the management of chronic comorbid conditions across the three levels of care in the Nandi County health system in Kenya.
- 1.5.3 To describe and analyse intervening conditions in the management of chronic comorbid conditions in PHC settings.
- 1.5.4 To develop a context-informed model for management of chronic comorbid conditions emerging from data on systems of management in PHC settings in Nandi County, Kenya.

1.6 Research Questions

For readability purposes research questions have been aligned with respective research objectives.

1.6.1 Research question for objective 1.5.1

1.6.1.1 What is the current system of managing chronic comorbid conditions across the PHC levels in Nandi County?

1.6.1.2 What are the beliefs, experiences and practices of both health care workers and patients with regard to the management of chronic comorbid conditions across the three levels of care?

1.6.2 Research questions for objective 1.5.2

1.6.2.1 How are chronic comorbid diabetes and hypertension conditions managed at the PHC level?

1.6.2.2. How do health care workers daily plan and implement health promotion and follow-up care across care settings?

1.6.2.3. How is medical management of chronic conditions implemented within the County health system?

1.6.3. Research questions for objective 1.5.3

1.6.3.1. What are the roles of patients and health care workers involved in the management of chronic comorbid conditions in the Nandi County health system?

1.6.3.2. What factors facilitate and/or hinder the comprehensive management of chronic comorbid conditions within the County's health care system?

1.6.4. Research question for objective 1.5.4

1.6.4.1 What factors led to the initiation of the management of chronic comorbid conditions in Nandi County health system?

1.6.4.2 How can a context-informed model be developed for comprehensive management of chronic comorbid diabetes and hypertension in the County?

1.7 Significance of the Study

1.7.1 Policy Implementation

The Government of Kenya is endeavouring to achieve health for all and to attain universal coverage by the year 2030. This study will provide baseline information to the County government on the integration of management of chronic care in all levels of healthcare services. This information should inform revision of the present system with the objective of reversing the escalating trends of NCDs in the country and to reduce cost of care (Atun et al., 2013). The findings of this study will help in strengthening the referral system in the devolved government health system particularly towards achieving the health policy objectives of halting and reversing the increasing trend of NCDs, through opening links with the community and increasing community awareness of the context-informed model (MOMs and MOPHs, 2011a).

With the use of this model, the patient-nurse relationship should improve through the encouragement of active patient participation in self-management and this should also encourage community participation in prevention and control of NCDs through the use of

positive cultural practices (Schillinger, 2011, Leininger and McFarland, 2006). For effective improvement of healthcare service delivery, user views are very significant.

1.7.2 Nursing Practice

This study will enhance evidence-based research among nurses and this should increase knowledge of the nursing discipline especially in community health nursing (Walker and Avant, 2011). Nurses play an integral role in PHC service delivery and rural settings. Literature and the researcher's own experience confirm that nurses have an upper hand in the patient interaction and follow-up services to patients with chronic conditions (Bergh et al., 2012, Coetzee et al., 2013). Task shifting of care to lay personnel has also proven to be effective and cost-friendly (Petersen et al., 2014), with collaborations between lay and health care providers in primary healthcare settings. Further evidence indicates that nurse-led diabetes management effectiveness is favourable even in hospitalised and complex conditions in need of follow-up. For instance, with kidney disease patients (Wong et al., 2012). Sustainability of nurse-led general practices has positive indicators including healthcare stakeholders, as in the case of Australia (Hegney et al., 2013). In Kenya nurses' involvement in the management of chronic disease in the hospital and community setting has been effective in screening (Mutea and Baker, 2008, Muchira et al., 2015). Similarly the study will encourage the use of the nursing process in community health assessment and comprehensive assessment of the patients, especially those with chronic comorbid diabetes and hypertension.

1.7.3 Research

It is believed that change in the community and healthcare will only be achieved through research and interventions from the community, to meet their specific health needs (Williams et al., 2010). This study is one way of knowledge construction and is significant for research development especially with regard to the diverse measures which need to be implemented in the management of chronic comorbid diabetes and hypertension among other chronic condition cases in Kenya.

1.7.4 HealthCare Professional Education

Despite the fact that there is an acute shortage of healthcare workers in Kenya, it does not mean that quality care needs to be compromised. Professional training and retraining through refresher courses are the recommendation of the Nursing Council of Kenya (NCK), as highlighted in the *Nurses Continuous Professional Development* (CPD) framework, section

2.2; all nurses are required to put in 40 hours per year (Government of Kenya(GOK), 2012), just like all other regulatory bodies in Kenya for other cadres of health professionals. Empowerment of healthcare providers with adequate and relevant knowledge and skills is at the core of chronic care management and improved health outcomes. This study is intended to encourage healthcare workers to go for training to ensure that they have current, adequate knowledge on the management of chronic comorbid diabetes and hypertension to begin with, being the most commonly seen in the primary healthcare settings (El-busaidy et al., 2014).

1.8 Operational Terms

In this study the following terms will operationalized as follows:

Management System: It is the care organisation and coordination between different levels of health systems for effective service delivery (Egger et al., 2005). In this study the management system will mean all services and resources available for care provision to patients with chronic comorbid diabetes and hypertension conditions. It includes medical management/treatment plans, nursing care, decision-making, follow-up care, drug therapy, patient education, risk assessment, patient data records referral systems and care coordination from one level of care to another and from different health care providers (Samb et al., 2010). The healthcare providers are to include all cadres of health care providers. The healthcare service providers will further include private and public service facilities, homemade remedies, to include traditional herbal medicine, used by the patients for health maintenance purposes.

Model: In this study the ‘model’ refers to the course of action or plan for comprehensive management of patients with more than one chronic condition within the regional health system, with reference to diabetes and hypertension. The context-informed model is derived from the lived and experienced conditions of both healthcare workers, patients and the healthcare organizational factors which influence management of chronic comorbid conditions system available resources, including the community policies and resources, to maintain continuity of care across care settings. The devolved healthcare system will be the central point of reference (Atun et al., 2013).

Diabetes: This is a metabolic disorder which occurs when the pancreas ceases to produce enough insulin or when the body cells fail to use the available insulin, leading to increase in blood glucose in the blood (*American Diabetic Association*, 2012). There are several types of diabetes; in this study ‘Diabetes’ means diabetes mellitus type2 among adult patients with

confirmed diagnosis and at risk of complications, as defined in *Kenyan Ministry of Health (MOPHS, 2010d)*.

Primary Health Care Settings: Health facilities which offer health services to patients as their first line of entry, in terms of health promotion, preventive curative and rehabilitative service. In this study PHC settings include: community services, primary health services and primary hospital outpatient services and alternative care providers used by the patients within the community settings.

Health Care Providers: According to the Kenyan health policy framework, these are health care professionals (workforce) responsible for service delivery irrespective of their organisation (MOMs and MOPHS, 2011a, Hegney et al., 2013). On the other hand a health care worker is a person with proper training in their line of specialisation who provides health care services to the people in need. In this study health care providers included doctors (physicians and medical officers among other specialists), clinical officers, nurses, pharmacists, nutritionists, laboratory technicians, trained and currently in diabetic care provision.

Community Health Worker (CHW): This is a lay or a community member who is not a medical professional who plays the role of linking individuals and families to health care systems for their health care needs and follow-up care or rehabilitation. However, in this study this term will be used in the sense of ‘healthcare provider’ at the community services level.

Chronic Comorbid Conditions: According to Lugtenberg et al. (2011) these are two or more chronic conditions which affect one person at the same time, due to some association of risk factors or as a complication from another chronic condition. Chronic comorbid conditions can either be discordant: those which do not share risk factors or line of management: or concordant for those that share major risk factors and line of management. In this study, diabetes and hypertension are concordant comorbid conditions and tend to affect the majority of patients seen in primary health care settings. Although there are other chronic comorbid conditions associated with diabetes and hypertension and have an edge in the management, these other conditions will not fall within the scope of this study.

1.9 Thesis Outline

The chapters contained in this study report are outlined as follows:

Chapter 1:- Contains the introduction and background to the study, problem statement, purpose and study objectives, research questions, significance of the study and operational definition.

Chapter 2:- Constitutes the literature review related to the phenomena of the study. Relevant models of medical management were also reviewed in the context of chronic care.

Chapter 3:- Constitutes the research methodology, the paradigm and research design, research approach, study setting, study population, sampling and sample size. It also describes the process of data collection in ethnographic studies, data analysis, trustworthiness and ethical considerations used in the study.

Chapter 4:- Describes the study findings which emerged from data, through the use of grounded theory as a data analysis method guided by the paradigm model.

Chapter 5:- Presents the discussion and interpretation of the study findings.

Chapter 6:- Presents the substantive context informed middle range theory model of the management of chronic comorbid diabetes and hypertension in primary healthcare settings as it has been highlighted in results and the discussion in chapter 4 and 5. It also provides the conclusion, study limitations, recommendations and the reflections of the researcher arising from the study.

1.10 Summary of Chapter One

This chapter presented the background information on the need to improve the services to patients with chronic comorbid diabetes and hypertension. It has given an overview of the current situation in Kenya and the problem statements, purpose and study objectives, research questions and the significance of the study. It has defined operationalized terms in this study. The following chapter presents the literature review.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

Management of chronic conditions can be stressful and a challenge to both health care systems and health care professionals. Mostly it is a challenge to patients and families with comorbid chronic conditions, which need not only prolonged, but doubly complicated management. It is therefore imperative to consider varied measures and evidence-based interventions, which are context-specific and acceptable to the health services users.

The literature review was conducted through the use of primary sources and secondary sources, like books and printed articles. An online literature search was conducted by use of Google Scholar, Science Direct, Pub-Med, Ebscho-host, Medline and other databases were consulted from time to time. Also Kenyan government documents have been consulted in this literature review, specific ministries of health strategic plans, treatment protocols and guidelines have been reviewed towards the development of the study. The following search words were used for the literature search: primary health care (PHC), primary care, health systems, health care, diabetes, hypertension, risk factors, lifestyles diseases, cultural/traditional practices, comorbid/comorbidity, comorbid diabetes and hypertension, self-management, non-communicable diseases (NCDs), chronic conditions, chronic care, nurse lead interventions and community health care. The following topics will be covered in this literature review as background information to the study:

Health systems, determinants of health, Kenyan health care system, conceptualization of primary health care, integration of non-communicable chronic diseases (NCDs) into primary health care diabetes mellitus and hypertension , comorbidity of diabetes and hypertension, risk factors for diabetes and hypertension, empirical evidence on management of chronic comorbid diabetes and hypertension, self-management, traditional herbal medicine, utilization of complimentary alternative medicine in management of diabetes and hypertension, continuity of care for comorbid diabetes and hypertension, innovative care models in primary care, theoretical frameworks applicable to chronic care in primary health care, Neuman-system's theory, King's Goal Attainment Theory and roles of community health nurses in the management of chronic comorbid conditions.

2.2 The Health Care System

Health concept is global; however health is influenced by a number of factors. Among the many factors is the health care system. According to the WHO (2007), the health system is a collection of all organisations, institutions and resources, which need to be coordinated in order to improve health of the population (WHO, 2007). Health systems need a collaborative effort from all sectors in order to improve health care delivery, quality of health to the majority at the lowest cost possible and to make health services available to most people who need health services, and this needs to be socially acceptable to the people (WHO, 1978). These concepts were later consolidated into what is currently known as the PHC approach. According to Olmen et al. (2012a), the health system is an amalgamation of efforts from all health stakeholders affecting health directly or indirectly and the contribution of legal, environment, users and the general population. Health financing and inequality affect the health system efforts towards achieving universal health coverage goals (Chuma and Okungu, 2011). The health concept, according to the WHO during the *Alma Ata declaration*, looked at the basic assumptions on health not being only physical, but also to include psychological and social perspectives which need to be addressed within the health system (Olmen et al., 2012a).

2.2.1 Determinants of the Health System

The health system is an open system which interacts with other systems, within an environment where it is situated (Olmen et al., 2012a). The health system is influenced by the way various resources are incorporated into the system. On the other hand the health system affects the environment in terms of the output and health outcomes or services rendered to the community (Olmen et al., 2012a). The health system being an open system is influenced by many factors commonly known as health determinants, as they interact between different levels of the system. These include:

2.2.2 Natural or Physical Factors

The health system being an open system has a tendency to be affected by natural factors like the location of the health facility and the infrastructure of accessing the hospital for services. In Kenya the geographical location of the health facilities, especially in the rural areas, determines the services and the availability of drugs. The distance recommended by the WHO for medical services and public health service should be 5km and 2.5km respectively (Ministry of Health and Government of Kenya, 2014). Poor distribution of health services in

the country affects the health system functioning. For instance according to the report by the Ministry of Health on health service provision in 2010, some counties or regions have more health facilities than others, and for instance Nairobi County has around 80 per cent health facility coverage, compared to 4 per cent in Marsabit (MOMs and MOPHs, 2011a). Further natural factors can be tagged as the cost implications affecting the accessibility to the health care available. An important factor is the low income of many clients who find it difficult to spare money for health care services (van Wyk, 2011). In other instances there may be no income at all.

2.2.3 Demographic Factors

Demographic distribution of a country affects the health system in various ways. A country with a larger aging population spends more on health for multiple chronic diseases, compared to young people. The longer the life expectancy the higher the cost of care, need for social service allocation within the country and constant needs to scale-up health services to meet demands in terms of diagnostic tools, chronic care and emergency services (KMOH, 2011). A health system is further determined by population growth in the country, urbanisation, overcrowding and poverty levels among the population, leading to inequality and poor distribution of health care services (Chuma et al., 2007). The Kenyan government's current priority is to provide health care services for all Kenyans in a responsive manner by bringing health care services nearer to the people through a devolved health system of care and governance, in an affordable format (MOMs and MOPHs, 2011a).

2.2.4 Political System

The Kenyan health policy is aligned with the current legal framework of the new constitution (Turin, 2010). The political system in the county affects health service delivery and how finances are distributed based on the sitting government. With Kenya being a multiparty state, the ruling party is always under check by opposition parties. Health system reforms and devolution of health services in the county's government entirely depends on the political system in the country, and decentralisation of health services are impacted by political stability (Wamai, 2009). Further, Olmen and colleagues posit that the political system in a country is responsible for policy making and decision-making processes. Moreover national government is responsible for the coordination of inter-ministerial planning, donor coordination and international planning and policy regulation which always has a direct influence on the health of the county (Olmen et al., 2012a). Due to political and legal

alignment, service delivery and the general health sector is affected both negatively and positively. For instance the change from the six tier health system to a four tier system and devolution of health from Ministry of Health to County governments, has left many health facilities in shock and with prolonged transitions (MOMs and MOPHs, 2011a, Wakaba et al., 2014).

2.2.5 Users of the Health System

The users, patients or clients of the health system determine what services the health system will offer to them. Kenya has a large young population between the ages of 15 and 49. Moreover, with improved living standards and health care the elderly population is on the rise. Usually old age sets in with an increase of chronic disease, which needs comprehensive and long-term care (Boyd and Fortin, 2010). Utilisation of health services is determined by health conditions of the population, which further determine the type of health services to be offered, either as preventive, curative or rehabilitative services (Turin, 2010).

Accordingly, Wakerman and Humphrey (2011) argue that community members require services which are responsive to health needs within the community, compared to regional health facilities. As in most cases, primary health facilities fail to be sustained, due to residents' factors and geographical locations of the community, and availability of health services to meet community needs (Wakerman and Humphreys, 2011). Similar determinants have been reported by (Chuma et al., 2007) in their study of communities and health care utilisation in the Kenyan Coast communities and their health-seeking behaviours.

According to Goudge et al. (2009), accessibility and affordability of the health services among the rural population are seen as a barrier to chronic care. These authors indicate that interaction between the health care providers with the household members, improves accessibility and utilisation of the health care services. Limited social network and high consultation fees for chronic illness leads to default and dropout from follow-up care at facility levels (Goudge et al., 2009). Geographical location of the health facility and community is vital when planning service delivery to a particular community in rural areas. The pluralistic nature of health services in the community influence the utilisation of the public health services in primary care settings (Mamo et al., 2007). Most health services in the community are divided in terms of care providers in the private and public health sector, and this leads to lack of continuity of care among health care users and even confusion regarding health information in self-management, medication orders and even

communication on use of traditional medicine as remedies, private clinics and public health services (Izugbara et al., 2009). Sato, in a study on equitability of health services, maintains that the availability of both private and public health services in the community does not mean that everybody can access the services equally (Sato, 2012a). Accessibility goes beyond the service provision to include meaning attached to the care given, the holistic nature of the service of alternative medicine and economic factors of the family making it more affordable compared to modern public or private health services (Kigen et al., 2013, Sato, 2012b). A Study done in Tanzania attests to the above facts on the use of traditional medicine compared to modern health facilities (Stanifer et al., 2015).

2.2.6 Socio-Cultural Factors

Social determinants of health include the level of education of the population using the health care systems and the religious affiliation of people and their cultural beliefs on health, which usually affect the health care systems right from the community to the national levels (Turin, 2010).

Consequently, lifestyle, diet and physical activities have a direct impact on the health of an individual, household and on the health care system. Further the quality of life of an individual, pattern of living and available resources determines the type of service required. Patients with comorbid chronic health problems will require more health services compared to those with less risk factors or with one chronic condition. Several studies have shown that there is a direct link between lifestyles, diet, age, gender, ethnic groups and chronic disease. Studies on African and Asian ethnic groups have found that they are more prone to diabetes and hypertension among other chronic conditions compared to other groups like whites (Fongwa et al., 2008). In a study undertaken in Uganda on modifiable human social behavioural factors in a population of 1656 aged 35 to 60 years, it was found that being overweight and hypertensive is directly influenced by age, sex, residence in rural or urban areas, physical activity and the level of socio-economic status. The percentage of overweight women was found to be 18 per cent compared with 9.7 per cent in men (Mayega et al., 2012). The residence has the effect on both hypertension and being overweight, as with those living in peri-urban areas, being hypertensive is affected by diet and level of physical activities engaged in. The study concluded that health promotion materials for chronic disease control need to be context-specific to have an impact in the community. Another study by Christensen and others on the prevalence of diabetes among some ethnic groups in Kenya, found that one ethnic group, the Luo, had a high prevalence of glucose intolerance compared

to other ethnic groups and the risk factors involved cut across the ethnic groups and geographical region, cultural practices and food intake (Christensen et al., 2009). Similar findings have been reported in rural urban ethnicity in regard to cardiovascular risk factors among the rural and urban ethnic groups (Mathenge et al., 2010).

A lifetime follow-up study of the relationship between lifestyle and heart failure among men for 22.4 years indicated that there is a direct relationship between risk factors like smoking, alcohol consumption, lack of activity and diet among men and incidences of heart failure. Adjusting lifestyle factors can lower the risk of chronic conditions like diabetes and hypertension, commonly seen in rural health care settings in primary health services (Djoussé et al., 2009).

The cultural belief and perceptions held by a community is that their superstition, knowledge, skills and values determine how they react to health matters. The values are shared by all members of the community, the meaning attached to health, disease and care provision has a direct impact on their health behaviour, utilisation of health services, and illness behaviour (what people do in their natural setting when they are faced with a challenge)(de-Graft Aikins, 2005). Cultural beliefs held by the community affect how they utilise the health services and follow-up care for chronic conditions in local medical settings, adherence to treatment plans, communication with health care providers and taking health actions for change towards adherence (Fongwa et al., 2008). However, these factors cannot be generalised across all communities. Thus health promotion needs to be tailored to the culture in the region of the users of health services. With culture being dynamic, chronic conditions management requires continual study of culture and cultural intervention innovations of diverse communities (Rooney and Arbaje, 2012).

2.2.7 Economic Factors

An integral part of the health systems is determined by financing of the programmes, the pooling of resources and purchasing of health utilities. The national health system and decentralised governments depend on availability of funds to provide health care services worldwide (McIntyre et al., 2008). Health system financing is the responsibility of the government to ensure that there is quality care which is accessible and affordable to the population. The WHO maintain that, health care systems need to ensure a constant supply of drugs to health facilities and to clientele, as well as well-staffed health facilities to ensure adequate service delivery to the community, though proper financial planning (WHO, 2007).

Decentralisation of health services to the lower levels of care is important; it forms channels for people to take control of their own health. For instance Kenya, with the current strategic plan, aims to increase the health system budget from 6 per cent to 15 per cent, which was the target of the *Abuja Declaration on Health* budget (Chuma and Okungu, 2011). The affordability of the health services by the household determines service delivery and health outcome. According to the *Ministry of Health Report on Health System Assessment*, it is estimated that 80 per cent of the Kenyan population live in rural areas, have no access to medical insurance and live below the poverty line of \$1 per day (Luoma et al., 2010).

Olmen et al. (2012a) maintain that health financing needs to deal with three important issues, the funding of the health care services, based on the population and demand of health care by the people, the resource allocation should be based on priority and decision-making in a strategic manager to ensure continuity of health services, and lastly management of finances to ensure sharing of risks involved, where insurance schemes are available to pay for the services and the tax involved in providing health care services (Olmen et al., 2012a). Economic factors determine the demand, supply, utilisation, cost implications based on availability, distribution and the quality of health care services. Other authors have expressed the view that inequality in health financing should be a priority to redress if any health system reforms have to take place to accommodate chronic conditions, towards the achievement of universal health coverage (Rabkin et al., 2012, Turin, 2010). The economic implications in Kenya have affected the health care system negatively especially with user fees charges, as the economy in most developing countries dwindles. Some households cannot afford to pay for consultation, transport to the clinic or to buy insulin or anti-hypertensive drugs even especially at the secondary level clinics. At the primary health facilities, health services are free for all patients, but the quality of services needs to be improved for chronic care levels (Wamai, 2009, McFerran, 2008).

2.2.8 Technological Factors

The use of technology affects the current health system immensely, for instance the screening of many patients with chronic diseases requires the use of technology and treating cancer patients with chemotherapy and radiotherapy requires expertise and technology. Technology makes health care services expensive to run and affects access for the large population who are too poor to afford the treatment plans. According to WHO, any health system needs minimum available health equipment to manage chronic conditions in PHC settings (WHO,

2010b). Although this had been put in writing, implementation of the PEN strategies has not taken place yet in most developing countries (WHO, 2010b, Olmen et al., 2012b).

Lack of trained personal and improved technology in chronic care hampers service delivery in rural and poor urban areas, in both developing and developed rural settings. In the case of Kenya, the level of training of CHWs to deliver chronic care services, especially diabetes and hypertension, is still low at 7 per cent national coverage among CHWs within rural communities (KMOH, 2010). There are similar reports in the review of literature on utilisation of CHWs across health systems, especially on the use of modern medical technology for screening diabetes and hypertension in primary care and community levels, with positive results (Herman, 2011). Most public health services may lack essential diagnostic tools for screening, or when present are not utilised for the same purpose; health promotion materials are also missing in most health facilities (Tibazarwa and Damasceno, 2014).

2.3 Health Care System in Kenya

The Kenyan health care system serves a total population of close to 40 million people within the five cohort divisions. The health system is governed by the *Kenya Health Policy Framework* (KHPF, 1994-2010) through the *Kenya Essential Package of Health* (KEPH) which was developed and adopted since 1994 by the government of Kenya, although currently there is a new KHPF (2012-2030). The policy has been implemented through the *National Health Sector Strategic Plan* (NHSSP-I, 1999-2004), with an aim of reaching all the population and to offer improved health services and quality health care and system management, as indicated from a system analysis by (Muga et al., 2005). Through the years several health reforms have been made to the health system, and equity and accessibility has survived all health reforms.

The Ministry of Health reviewed the strategic plan and developed another new strategy in order to correct the short coming of the first strategic plan *NHSSP II 2005-2010* (KMOH, 2006). The main objective of the NHSSP II has been to increase health care service delivery and to introduce the community level one (1) services to the health system, with the aim of bringing health services closer to the people (KMOH, 2006). This strategic plan adopted the decentralization approach to reach the community. In 2006 *the Ministry of Health* added to KEPH, community health service level one as a strategy to reduce the inter-phase gap

between the health system and the people, and to encourage community participation in matters of their own health (KMOH, 2006).

With the launch of the new constitution in 2010, the new KHPF 2012-2030 was developed, in line with the Government's development agenda of steering Kenya into a middle income country by the year 2030; the National Government development agenda *Vision 2030* (MOMs and MOPHs, 2011a). Before the new constitution in 2010 the country's health sector was under the National Government within the joint stewardship of Ministry of Health and Ministry of Public Health and Sanitation, now under one Ministry of Health (Anyona and de Courten, 2014, Wakaba et al., 2014). The Kenyan constitution gave birth to the devolved County Government to ensure access to health services by all Kenyans in the region where they live for equal distribution of resources (Turin, 2010, MOMs and MOPHs, 2012). The Health Policy of 2012-2030 is cognisant of the NCDs burden amidst the problem of acute communicable diseases in the country. The policy overall objective two (2) has recognised the burden of chronic diseases in the country. This being a global concern, Kenya, like all countries, needs an urgent intervention to address the epidemic. The main objective of the health policy is to halt and reduce the rising burden of NCD conditions in the country through various means like decentralisation of the screening of NCDs to the lowest level and to encourage integration of various services aimed at providing chronic care to the existing health services (MOMs and MOPHs, 2012).

2.3.1 Kenyan Health Care Organization

The current Kenyan health sector is organised in four tiers or levels of care: the national level, the county level, the sub-county level and the community level, managed under the coordination of national, county and sub-county management teams and the community health committees respectively. These tiers cannot operate as a single unit, but complement one another through effective referral systems right from the community health services to the national referral health services (MOMs and MOPHs, 2011a). The Ministry of Health hopes that through decentralised chronic care and treatment of chronic comorbid conditions at regional levels, the country can achieve 25 per cent reduction in prevalence of NCDs (NACC and NASCOP, 2012), which is in accordance with the WHO set goals of 25 per cent reduction by the year 2025.

2.3.2 The National Health Services

As mentioned above, the health services at the national levels will be under the national government and under the leadership of the permanent Secretary of Health to the cabinet. The national health services include the Ministry of Health headquarters and parastatals responsible for health services in the country. The national health services are responsible for governance of the health care system in the country to include research and regulation of policies and international cooperation for donor funding. The health system structure is in the following format, starting from the highest level to the lowest level (MOMs and MOPHs, 2012):

National Referral Hospitals-Levels 5-6

These hospitals are responsible for national referral health services from several regions for general and specialised cases and training and research in all areas of health care services. The facilities in this category comprise all secondary, provincial or regional hospitals and tertiary level hospitals or national specialised hospitals, both private and public hospitals in the country. According to the current national health strategic plan and the new organisation of the health care system in the country, there are 12 national hospitals and seven provincial hospitals in the country, offering specialised care like the national spinal injury hospital (MOMs and MOPHs, 2012). Despite these hospitals being national hospitals, they still provide outpatient services to ambulatory patients and emergency care to accident and trauma patients.

County Referral Services-Level 4

This level includes all level 4 (primary) or district hospitals and sub-district hospitals in public or private sectors within the municipalities contained in the county. They offer comprehensive inpatient and outpatient services; medical and surgical services, curative, preventive and rehabilitative care, and facilitate and receive referrals from the lower levels and other referrals from the county. According to the current constitution and the health policy, the county health system will be under the leadership and governance of the county executive director of health (CEDH) and the director of health at the county level to provide clinical services both at the county hospitals and at primary care facilities. The second arm of care is the preventive and promotion health services to include the environmental health, family health, disease control and community health services. According to the latest survey in the country, currently there are a total of 489 hospitals in Kenya including both public and

private and sub-district hospitals in the country (Ministry of Health and Government of Kenya, 2014).

County Hospital

Hospitals at this level form the primary health care facilities; the district hospital forms the hub of all other levels of health services in a community. The district hospital now referred to as the county hospital provides the management and planning of the health care service delivery (English et al., 2004). In Kenya the district hospital receives patients both directly from home as the first contacts with the health system, or referrals from the health centres, sub-district hospitals or private clinics within the county. The user fee in the district hospital, although subsidised by the government, is still high for the majority of the poor people in the community (Chuma and Okungu, 2011). Most district hospitals at this level have few medical doctors compared to level 5 and 6 hospitals. At this level, clinical services for both acute care and rehabilitation are offered by clinical officers and nurses, and occasionally medical doctors for surgical and specialised cases like surgery, obstetrics and gynaecological cases when the need arises. Patients who cannot be helped at this hospital need specialised care or review by medical specialists other than a general medical practitioner or consultant at the next level of secondary and tertiary level 5 and 6. With decentralization and the emergence of NCDs as a major threat in the health service, district hospitals have diabetes clinics under the clinical officers or medical officers where they are available for scheduled check-ups or follow-ups (MOPHS, 2010b). A district is responsible for about 300 to 500,000 people within the county or more.

Primary Care Services

This level includes all level 2 and level 3 facilities (dispensaries and health centre facilities), offering disease prevention and health promotion services, diagnostic services for all conditions, surgical and medical, minor cases and rehabilitation services and observation inpatient services, facilitating referrals to the county referral hospital or other health facilities and receiving referrals from the community levels of care or from units. The primary health facilities are mainly run and managed by nurses and/or a clinical officer (CO), with no doctor allocated to these levels of care, yet they receive the largest population of people. The managerial team in the primary centre is directly answerable to the county referral management team (MOMs and MOPHs, 2012). These levels are deemed to serve a population of between 10 and 25,000 people in one health centre. Services at this level are free for all, as a gesture to meeting the goal of universal health coverage.

Community Health Services

This level includes individuals, families or households in the community. Encouragement is given to individuals to take health behaviour seriously and to be responsibility for their own health. This is the first contact the person makes in an attempt to link up with the health care system. This level provides agreed health services, recognises signs and symptoms and facilitates community management and referrals to the next level of care (MOMs and MOPHs, 2012). Currently at the national level, the community strategy was launched, and established 439 community units in 2006. However the use of CHW and village health workers has not been integrated well in health systems in the country and this still lowers the output from the household in terms of their health indicators (KMOH, 2010). According to the *Strategic Plan for 2013-2017*, the government intends to strengthen the community services and encourage health facilities to take the initiative to motivate the CHW and reduce their attrition (KMOH, 2011). The community service level or level 1 will service 5,000 community units in the county health system. However this is still projected to reach a limit of 8,000 community units. Further the community level 1 service is divided into villages under the care of village health workers who report to the Community-Owned Resource Person (CORP)(KMOH, 2006). However the CHWs service in Kenya for the public health service is voluntary and this does not favour the sustainability of their services (Takasugi and Lee, 2012). A report by a division of community health on community service strategy implementation showed 7 per cent country coverage has been achieved under non-

governmental organisations and community-based organisations, especially on immunization and water and sanitation. However the NCD health promotion and prevention has not been emphasised (KMOH, 2010). According to the report, CHW knowledge on NCD care and referrals to health facilities is low and lacks support from the district levels (Takasugi and Lee, 2012). The report recommended that community units' linkages to primary care levels should be strengthened and roles of CHWs defined clearly, with regard to chronic care and patient follow-up within the units (KMOH, 2010).

2.3.3 Health Service Delivery in Kenya

In Kenya, health care service delivery is largely through the public or government-funded health facilities. According to the *Kenya Demographic Health Survey of 2008/2009*, the majority of the population at 80 per cent rely on public health services which support 51 per cent of health services compared to 29 per cent private health services and 20.1 per cent provided by faith-based organisations in the country (KNBS, 2010). The County hospital plays an integral role in health care provision, as it is the link between primary care services and the secondary referrals for all conditions, both acute and chronic. The County hospital is usually situated in the rural-urban centres where they can be easily accessible by the people who need the care (Nzinga et al., 2013). The Kenyan health system adapted the county hospital model just like many other countries in the developing countries and European health systems from the early 1980s. *The District Management Health Teams or Board (DMHT/B)* were adapted for empowerment of local communities in the country. Each administrative region has a district hospital or sub-district hospital (Nzinga et al., 2013). However the health care deliveries in primary health services face the aforementioned challenges, which cut across developing countries. These factors largely determine the health outcome of chronic care and the entire population (Tibazarwa and Damasceno, 2014, Olmen et al., 2012a). However, with the limited resources in Kenya and other similar-context countries, health care services for chronic care must be improved if the mortality rates from chronic conditions are to be contained.

2.4 Conceptualization of Primary Health Care Approach

The WHO first international conference on PHC was held in 1978 in Alma Ata or what is commonly known as the *Alma Ata Declaration of 1978*. Ever since, it has remained as the turning point of PHC policy worldwide. Although the concept of PHC started way before the WHO adopted it towards achieving Health For All (HFA), from the *Dawson Report of 1920*

(Frenk, 2009). PHC was defined as the “Essential health care based on practical, scientifically sound and socially acceptable methods and technology, made universally acceptable to individuals and families in the community through their full participation and at a cost that the community and country can afford to maintain at every stage of development in the spirit of self-reliance and self-determination” (WHO, 1978:6). The *Alma Ata Declaration* was a follow-up conference after the Thirtieth WHO Health Assembly held in 1977, to discuss how to achieve HFA. Thus PHC strategy was one way of achieving the HFA by the year 2000 (WHO, 2008). PHC forms the integral part of the country’s health system in terms of ensuring overall social and economic development of the community. PHC is the first level of contact of individuals, family and community within the national health system, bringing health care closer to the people where they live and work and as the first element of continuing care process for the population (WHO, 2008d). While considering the principles of PHC which propel the achievement of HFA, the philosophy of PHC based on universality, equality, equity, efficacy and sustainability of health services were well elaborated in the Alma Ata Declaration (WHO, 1978).

2.5 Integration of Chronic Care into Existing Primary Health Care Services

The Integration of chronic care into PHC is a global concern, and has been discussed at length and strategies laid down, with special considerations for low income countries (WHO, 2010b, WHO, 2008c), and the need for reorienting PHC to accommodate NCDs and to strengthen the health system for the same (WHO, 2007, United Nation, 2011). This can be done through the use of CHWs and reducing their attrition. However, despite the national strategic plans for individual chronic conditions in member states, integration of chronic care into PHC has not picked up, as intended by the high level meetings.

Integration does not necessarily mean an amalgamation of the chronic care services into the existing primary care services; it means the interrelationship between health structures, communities and populations, towards the improvement of health care services. According to (Frenk, 2009), integration will be fruitful when it is intervention-focused, particularly with distinct vertical health programmes. Further integration should focus outside the routine health system structures, to include the population, as they are the ultimate consumers of health care services. Not only do individuals and families use health services, they contribute by paying out of pocket, tax for every drug bought, and thus they are the majority health care financiers and they demand access and accountability from public health officers (Frenk, 2009). Thus populations are an essential part of integration of chronic care into PHC; their

views and contributions count. There is ample evidence on the integration of HIV and diabetes management at primary health levels in several developing countries where the urge and the need for strengthening of the health system is urgent (Samb et al., 2010). Chronic care integration with HIV in Cambodia has been successful (Janssens et al., 2007). Although diabetic and hypertensive patients pay for services, the integration of retained patients on treatment shows a less than 3 per cent drop-out rate for the first three months. This is attributed to negative perceptions of sharing health facilities with HIV patients, alternative care providers as private practitioners with no direct link to public health services and as patients' perceptions on the seriousness of diabetes and hypertension is still limited. These factors have not been explored with regard to integration of chronic care into PHC and HIV/AIDS services. Other case studies on integration of diabetes and HIV/AIDS have shown promising results in Malawi, Ethiopia, and South Africa (Rabkin et al., 2012, Allain et al., 2011, Govindasamy et al., 2013). Despite the promising results of integration of diabetes and HIV, the process is confronted with funding for diabetes and other chronic conditions as vertical programmes, as in the case of HIV and accountability to donors for the same (Olmen et al., 2012b).

2.6 Non-Communicable Diseases (NCDs): Diabetes and Hypertension

Chronic NCD is a medical condition or disease, which is non-infectious and non-transmissible from one person to the other (WHO, 2002b). These conditions have long duration and slow progression and require chronic care management or prolonged need of medical care. The group of conditions include: diabetes mellitus type 1 and 2, cancer, asthma, cardiovascular diseases, mental illness, among others (WHO, 2008b). Alternatively, they are referred to as chronic diseases of lifestyles, associated with prolonged practice of unhealthy lifestyles. The unhealthy lifestyles include alcohol consumption, smoking, sedentary and inactive lifestyles, high saturated diets, high sugar and salt consumption, among others (Ebrahim, 2011). Research has also confirmed that ethnicity and genes are responsible for the onset of diabetes mellitus type 1 and 2 (Hitman and Niven, 1989).

Globally NCDs are a threat to humanity as they continue to increase, despite all efforts being put in place to avert the upsurge. These conditions lead to high mortality and morbidity in all countries, with both developed and developing countries equally affected. It is projected that by the year 2030 mortality due to NCDs will have increased three fold especially in the sub-Saharan region and other low income regions (Bloomfield et al., 2011b). According to the

WHO report in 2008, which was the last comprehensive report, out of 57 million deaths in the world, 36 million were due to NCDs, with CVDs causing 17 million (48 per cent) and diabetes causing 1.3million deaths (WHO, 2013b). The number of people with diabetes and other NCDs is projected to increase by 54 per cent and by 2030, 438 million will be diabetics (International Diabetes Federation[IDF], 2012). The sub-Saharan region will experience an increase of 98 per cent from the current 12.1 million to 23.9 million people by 2030. It is also known that 81.2 per cent of people in Africa have undiagnosed diabetes mellitus, which leads to an increase in prevalence rate to 7.7 per cent from the current 6.6 per cent by 2030 (International Diabetes Federation[IDF], 2012). Similarly, a worldwide analysis in 2005 indicated that hypertension affects 1.56 billion adults and raised blood pressure alone is estimated to cause 7.5 million deaths and 57 million disability-adjusted life years (DALYs) (Kearney et al., 2005). The population of people in developing countries with hypertension could rise by 60 per cent by the year 2025.

A recent regional study on diabetes and hypertension shows that hypertension is a major risk factor for CVDs and the risk is directly affected by increase in age (Mohan et al., 2013). In Kenya these NCDs are a concern as shown in the country profile by the WHO, reports and country levels, NCDs lead to 50 per cent mortality of all patients admitted to hospital and lead to 50 per cent to 70 per cent admission in the country (GOK, 2012). Yet in most health facilities for patients with NCDs management strategies and services are poor, especially those in rural areas and at primary care levels. To date statistics in the country on NCDs are scarce and not reconciled to give a full picture of the country's burden. Lack of locally generated relevant data on NCDs, especially diabetes and hypertension leads to poor planning and resource allocation at health facilities. This coupled with lack of awareness of NCDs among the populations, leads to poor management of the conditions which require long-term care (Pastakia et al., 2013).

According to a NCD alliance meeting held in Nairobi, Kenya on the 1st December 2011, CVDs are the leading cause of death at 13 per cent, cancer at 7 per cent and diabetes at 4 per cent, among other conditions, which increase the mortality, while communicable conditions still account for 62 per cent of all the deaths, which tallies with the Kenyan NCDs Profile from the WHO on the distribution of NCDs (WHO, 2011). Despite NCDs being the growing burden and becoming a public health concern, they are preventable through health promotion, behaviour and lifestyle modification. Although these statistics are available on the

international context, data from local relevant sources in the country are still not comprehensive enough for national planning on preventive management of NCDs.

Consequently, according to Azevedo and Alla (2008), management of chronic diseases requires multifaceted action from all stakeholders in the health systems and outside. Efforts from all stakeholders are in the form of advocacy, promotion of awareness and public health policies to empower patients to take action for self-management, empower health providers with knowledge, skills and tools (Olmen et al., 2012a), development of health promotion materials, provision and procurement of essential medicine and equipment for the management of NCDs, funding to start vertical programmes in decentralized primary care facilities. This is in line with the UN declaration on improving NCDs management and its implications (Hogerzeil et al., 2013). Chronic care effectiveness and sustainability requires health system redesign, health reform in supplying of medicines and uptake of informational technology for interactive communication and exchange of information between providers and health care users (Olmen et al., 2012a).

Furthermore, NCDs affect the individual person and family in terms of health and illness, life expectancy is shortened, family income for medical needs is affected, and work output is reduced, leading poverty to blossom in affected families. Evidence shows that most patients with chronic conditions spend three thirds of their monthly working day's earning on health, and out of pocket is the highest funding for health systems (Samb et al., 2010). There is urgent need for efforts to avert the risk factors early, and to treat and control the onset of those complications through health promotion and lifestyle changes (Di Cesare et al., 2013, Zhang et al., 2010). Preventive care needs to be given priority in primary care, to ensure that risk factors are averted earlier by appropriate means. Evidence indicates that PHC presents the best platform to handle preventive care, compared to hospital-based care (Harris and Lloyd, 2012).

Management and control of NCDs requires active participation of patients, family, community and the health care professionals with multiple skills and backgrounds (Alleyne et al., 2011). Worthy to note is that management of chronic conditions requires efforts in creating awareness in the public through massive screening, information in the media and at schools, evidence-based clinical guidelines and protocol, improving referral systems and follow-up care, and training of health care workers (Mendis et al., 2012). Literature has shown that NCDs with no complex episodes can be managed in PHC to achieve maximum

control and to prevent the onset of complications (Twagirumukiza and Van Bortel, 2011). Despite the limited resources and expertise in developing countries, better results have been reported in primary and community-based practices.

2.6.1. Diabetes Mellitus Type 2

As the world experiences the increase in NCDs, diabetes mellitus stands to pose strong health and socio-economic challenges in the 21st century. Diabetes mellitus is a chronic disease which occurs when the pancreas does not produce enough insulin or when the body cannot effectively use the insulin it produces (WHO, 2008b). Diabetes is grouped into two main types, but there are other types of diabetes mellitus not of interest to this study, type1 diabetes or juvenile diabetes and diabetes type2 or adult onset diabetes. Diabetes mellitus type2 is the focus of this study, and occurs when the body is not able to use effectively the insulin being produced. Diabetes is directly likely to occur when people have excess body weight and lead a sedentary life, although it can occur due to genetic inheritance, and aging (Otieno et al., 2005, Whiting et al., 2011). Significant to note is that diabetes type2 affects 90 per cent to 95 per cent of all diabetics and has the most diverse group of complications, which pose a threat to health and socio-economic functioning of an individual and a community (Tuei et al., 2010).

Diabetes is known to be one of the many predisposing factors to other chronic conditions like CVD, to include stroke, heart failure, myocardial infarctions, among others. Diabetes is known to be a multi-organ disease, with complications which cut across several body organs to lead to retinopathy, nephropathy and affecting the nerves to develop neuropathy (Long and Dagogo-Jack, 2011), amputation, blindness, wounds which don't heal in time, hypertension which leads to CVDs, causing most deaths in developing countries (Rudasingwa et al., 2012). Diabetes leads to increased poverty, poor quality of life and disability (Ploubidis et al., 2013). Diabetes mellitus has gained a lot of interest worldwide, although it is widely researched; there is still a paucity of data on various aspects of diabetes especially in developing countries. Most studies have focused on epidemiological aspects and risk factors of diabetes, leaving behind most crucial parts of prevention and management to include chronic care to those who are already affected (Maher et al., 2010). According to Williams et al. (2010), Africa, especially the sub-Saharan region, is different from the rest of the world, thus with unique needs and challenges, which need contextualized research and professional training. Studies on clinical trials, educational models, nursing interventions (rare), patient education on self-care, and traditional medicine inputs should all be focused towards finding a context-

based solution to comprehensive management of diabetes especially in public sector health facilities, and more specifically in PHC (Beran and Yudkin, 2006, Rudasingwa et al., 2012). Diabetes care requires constant adjustment and willingness to change social behaviour and regular check-ups from health care providers at primary care settings.

The knowledge of health workers on the management of diabetes leads to sub-optimal quality of care, for both primary levels. Quality and knowledge of health care providers is important, as noted by the World Bank in Kenya on the quality of health services, 58 per cent of health care providers could provide a correct diagnosis of four to five cases presenting in the facility (Martin and Pimhidzai, 2013). Most diabetic clinics are still organised and run in hospital settings, thus making accessibility hard for the rural-based population, due to transport issues and even costs (Bourbonnais, 2013). Lack of insulin and attitudes for use among patients still hinders comprehensive management of diabetes especially in developing countries, if maintained this intervention can save more lives (McFerran, 2008). According to the diabetic leadership forum in Africa, report, Novo Nordisk Pharmaceutical supply insulin to 33 of the poorest developing countries at a lower price compared to the rest, to increase its availability to diabetic patients (Motala, 2010). However, despite this move to lower prices of insulin, its accessibility and affordability is a struggle in these countries. Literature indicates the pivotal role played by nurses in primary care settings in the management of diabetes through education, support and follow-up care in primary care and community-based care services (Kengne et al., 2009). However this role has been less documented in the prevention and control of diabetes and other chronic conditions.

The main goal of diabetes management is control of the blood sugar and delay of onset of complications. According to (American Diabetes Association, 2012), diabetes blood glucose levels of greater than 7 per cent is the standard of control for blood sugars, which has been proved to be effective in reducing onset of complications and quality of life for diabetics. Research has shown that with medium-term glycaemic control, diabetic patients without complications and relapse of ketosis emergencies can survive up to 12 years on oral medication. A study done in Jordan also confirmed the above result, that with adequate control of blood glucose levels in primary care patients and continuity of care, this prolongs their life. Fifty-six percent of 337 patients in primary care had their HA1c at less than 7 per cent (Al Omari et al., 2009).

2.6.2 Hypertension (High Blood Pressure)

Hypertension has been defined as an increase of blood pressure in a previously normal person measuring 140mmHg for systolic and above 90mmHg, measured more than twice within a period of five minutes apart (Damasceno et al., 2009, Edwards et al., 2000). There are two types of hypertension based on its onset and cause: primary hypertension and secondary hypertension. Primary hypertension, also known as essential hypertension, is an increase in blood pressure with no known cause or idiopathic hypertension. Essential hypertension prevalence increases with age of the patient and genetic inherited factors, thus it runs within the family and has been found to be the most common type of hypertension affecting 95 per cent of all patients seen in PHC settings (WHO, 2013b).

Essential hypertension is as a result of close interaction between the environment and the genetic factors of most patients. Hypertension may also be secondary due to other medical conditions, which contribute to increase in blood pressure of the patients (Daskalopoulou et al., 2015). Other causes of high prevalence of hypertension among the rural community and urban population include obesity, being overweight, diabetes and physical inactivity, which contribute to poor control in blood pressure among adults (Edwards et al., 2000).

Recent literature (Damasceno et al., 2009, Gaziano et al., 2014) on hypertension in developing countries identified several factors attributed to poor control of blood pressure. These include low awareness levels in patients and the general population on hypertension, lack of proper means of lifestyle modification intervention, failure of health care providers to adhere to clinical guidelines, lack of screening services and basic equipment, among other factors which are ethnic related (Tibazarwa and Damasceno, 2014). These authors argue that despite the fact that most patients in rural populations may seek medical attention, blood pressure testing is rarely done, as routine for outpatient visits or even inpatients. Adherence to clinical guidelines is a practice attributed to loads of work among clinicians, government policy and lack of medical equipment for high blood pressure monitoring and screening (Tibazarwa and Damasceno, 2014).

Another cross-sectional survey conducted in both urban and rural populations in Kenya, Tanzania, Uganda and Namibia, to determine the prevalence and determinants of hypertension as a risk factor for CVD among young adults of 18 years and above, reported that hypertension is poorly controlled, despite the fact that patients are aware of their condition, and that the prevalence of hypertension is increasing both in rural and urban settings. Among the rural communities in this study, controlled hypertension ranged from 2.6

per cent in Kenya to 17.8 per cent in Namibia. The prevalence of hypertension in Kenya ranged between 19.8 per cent and 23.0 per cent, while that of Nigeria was at 17.3 per cent to 21.3 per cent. Other risk factors including diabetes, obesity and body mass index dependently predicated the blood pressure of an individual across all study populations (Hendriks et al., 2012). This study mirrors the results from other studies on hypertension in developing countries. A study undertaken in India to determine the prevalence of hypertension in Kerala State shows a high prevalence of 21 per cent to 24 per cent which increased with age, and was high in urban areas, compared to rural communities (Thankappan et al., 2010). Another study in China, through a community based survey undertaken in 1991 and 2011 in the same community, reported an 11.8 per cent increase in the prevalence of hypertension from 39.9 per cent to 51.7 per cent in a time span of 20 years. The prevalence was more in younger women (35 to 44 years of age). Despite the improvement in awareness, hypertension control was way below the acceptable levels (Wang et al., 2014).

Despite clinical guidelines and pharmacotherapy availability for the management of hypertension both in outpatient and emergency cases, the use of these clinical guidelines has been low, particularly in PHC settings and in rural communities. In a study on the control and management of hypertension in a rural community health centre in Cape Town, 39.8 per cent of all patients had blood pressure of $>140/90$ mmHg control and most of them were on poly therapy at 2.4 number of drugs per patient (Edward et al., 1998). The same picture is painted in another study on the health promotion of NCDs in Cape Town, where blood pressure monitoring was found to be the most commonly used diagnostic method at 96.7 per cent representing 42.1 per cent of controlled hypertension in PHC (Parker et al., 2012). However lack of teaching materials, staff shortage and lack of individualised time, space and equipment lead to suboptimal management of NCDs. Patients' preferences to be seen by doctors, low education levels and non-compliance to treatment led to poorly controlled blood pressure or other chronic conditions (Parker et al., 2012). Patients' participation in setting goals and teaching towards behaviour change may prove helpful compared to paper work management (Brown et al., 2007). Time allocation for each patient and adequate teaching for patients in self-management and lifestyle modification by health workers may yield positive results (Bodenheimer and Handley, 2009).

Patient and provider collaborations in care and treatment plans may be helpful towards hypertension control and behaviour change. However, most patients with hypertension and

other chronic diseases are non-compliant to medical instructions on treatment plans and lifestyle modification. This has been attributed to lack of involvement right from the start in setting care goals and targeting blood pressure. For instance the *Integrated Diseases Management Model(ICDM)* developed and implemented in South Africa, directs the start of management right at the community level and encourages assisted self-management for patients through the nearest level of care and the district health services (Asmall and Mohamed, 2013).

In a study in Tanzania that focused on control of hypertension by (Bovet et al., 2008), only 1 per cent of hypertensive patients had their blood pressure reading at 140/90mmHg. In Gabon the level of control of hypertension among patients is rarely over 5 per cent, which is still low. In Kenya the level of control of hypertension among urban ethnic groups still remains similar to other countries despite being on treatment for the same but there was failure to return for follow-up appointments (Otieno et al., 2005, Mathenge et al., 2010). The Population-based Stepwise initiative recommended by the WHO and government policies may be used to increase awareness and empower patients' level of awareness in seeking treatment and control of hypertension; similar reports on poor control and low levels of awareness among patients have been reported extensively (Dalal et al., 2011, Damasceno et al., 2009, Miranda et al., 2008).

Patient education using different approaches has been found to be effective in increasing awareness among patients and the general public. Among health care workers, comprehensive assessment of the patient status to include culture, literacy, environment and other circumstances may be of help in containing the increasing burden of hypertension and other NCDs like cardiovascular conditions (Tibazarwa and Damasceno, 2014). Studies have also confirmed that health care providers' inertia contributes to poor control of blood pressure and general patient outcome; most patients' prescriptions are not reviewed, even when the target blood pressure is not achieved (Rayner and Schoeman, 2009). A recent comprehensive review in the African region and Asian region found that chronic conditions, especially diabetes and hypertension, are poorly controlled, and have poor compliance rates among the population due to social circumstances affecting both patients and health care systems. There is an asymptomatic nature of hypertension and low level of awareness of the conditions, high cost of management, especially treatment costs for more than one drug regimen, low levels of health care utilisation even after diagnosis and poor states of infrastructure in the health care facilities in most low income countries (Mohan et al., 2013).

However, literature on hypertension care has shown that if nurses and other health care workers participated in the holistic assessment of the patient and did constant patient follow-up, home visits and training of the patients on self-management basic skills, patient outcome would improve (Mutea and Baker, 2008, Nguyen et al., 2011). Further time spent in consultation enhances communication between the patient and the provider; nurses' involvement in care and group patient teaching is effective in hypertension management (Mutea and Baker, 2008, Nguyen et al., 2011, Twagirumukiza and Van Bortel, 2011). Nurses form the bulk of health care providers in Kenya, especially in rural and community-based settings.

2.7 Comorbidity of Diabetes and Hypertension

Comorbidity is the occurrence of two or more conditions in one person at the same time. In this study comorbid conditions as earlier mentioned are diabetes and hypertension, as high risk factors for CVDs (Valderas et al., 2009). Chronic comorbid conditions have been grouped into two main categories: discordant comorbid conditions and concordant comorbid conditions. Discordant conditions are those conditions which do not have pathological or epidemiological association in terms of risk factors and cause. On the other hand, concordant comorbid conditions are those conditions which share similar clinical pathology and share similar management and risk factors (Lugtenberg et al., 2011).

Diabetes and hypertension are concordant conditions in that they have similar clinical risk factors. Diabetes tends to increase the chances of one person having CVD, through the narrowing of blood vessels which leads to atherosclerosis, which later increases high blood pressure among diabetic patients (Islam et al., 2014). Hypertension and diabetes are intertwined in various ways, which requires that the two conditions be screened together at every opportunity that the health care providers get with the patient. Diabetes and hypertension as noted earlier, have a tendency to occur together in one patient, however hypertension being a silent killer, can go unnoticed in most clinical settings.

Studies have confirmed that diabetes is a major risk factor for CVDs, and so is hypertension among adults with diabetes, increasing the risk factors for CVDs (Choukem et al., 2007, Damasceno et al., 2009, Tibazarwa and Damasceno, 2014). Complications due to comorbid diabetes and hypertension can either involve microvascular or macro-vascular complications. Macro-vascular complications include coronary artery disease, myocardial infarctions,

congestive heart failure, stroke and peripheral vascular disease. On the other hand, the microvascular disorders include retinopathy, neuropathy and nephropathy, and these lead to blindness and end stage renal failure (Long and Dagogo-Jack, 2011, Otieno et al., 2005). Globally there is strong evidence to indicate how concordant diabetes and hypertension should be managed; studies on a larger scale indicate that intensive control of hypertension among diabetics can reduce the chance of developing vascular complications. A clinical trial, entitled the *United Kingdom Prospective Diabetes Study (UKPDS)*, indicated that each reduction of systolic blood pressure by 10mmHg was associated with 12 per cent decrease in the onset of risk for complications related to diabetes, reduction of deaths by 15 per cent and reduced myocardial infarction by 11 per cent, while microvascular complications reduced by 13 per cent (*United Kingdom Prospective Diabetes Study Group (UKPDS), 1998*). Similar results have also been reported in other clinical trial studies in India on the hypertensive diabetics for those diagnosed and undiagnosed (Joshi et al., 2012).

The main goal of management of the comorbid diabetes and hypertension in treatment protocols and guidelines is to control blood glucose (glycaemic control), blood pressure control and modification of lifestyles; the former being through pharmacological means and the latter through diet, exercise and weight reduction. In a systematic review study on diabetes management and its association with nutrition in Ethiopia, malnutrition is a comorbid condition with diabetes; management of diabetes stubbornly remaining suboptimal, as in only a third of all patients with acute or chronic diabetes is it controlled (El-Saharty et al., 2009).

Studies have shown that weight reduction of up to 7 per cent, diet change and walking for 150 minutes per week reduces blood pressure and lowers chances of getting a CVD (Long and Dagogo-Jack, 2011). Lifestyle change and behaviour modifications like smoking cessation and alcohol consumption reduction also helps to control blood glucose. There is evidence from clinical trial studies and systematic reviews that comorbidity of diabetes and hypertension complicates clinical management of the two conditions with other conditions (Azodo, 2009). In the US, it is estimated that 3 million people have both diabetes and hypertension and globally 35 per cent to 75 per cent of patients with diabetes have hypertension, and that hypertension is more common among diabetics compared to non-diabetics (Long and Dagogo-Jack, 2011).

Studies undertaken recently in Cameroon, Tanzania, South Africa and USA show that there is a high prevalence of coexistence of the two conditions, reported prevalence of between 68.9 per cent among women and 64.7 per cent among men; although lower rates were found in Tanzania and South Africa, the trend is conclusive (Choukem et al., 2007, Edwards et al., 2000, Mayosi et al., 2009). For instance in the US, 75 per cent of diabetics have hypertension (Long and Dagogo-Jack, 2011), in South Africa the prevalence of comorbid diabetes and hypertension is expected to be above 40 per cent like all other Sub-Saharan countries (Mohan et al., 2013), an indication for urgent intensive measures for prevention and control of comorbid diabetes and hypertension.

In Africa patients with diabetes have the highest prevalence of microvascular complications, which is attributed to irregularities and lack of access to quality health care (Mbanya et al., 2010), compared to those in developed countries which have access and long life expectancy, which has been found to be one of the causes leading to comorbidity and multiple conditions like depression in older patients (Piette and Kerr, 2006).

In Kenya the migration from rural to urban areas has contributed to the comorbidity of hypertension and diabetes, although the statistics are not all conclusive. This is attributed to weak data collection from the primary health and community services, which needs to be linked to the national information system for data collection and planning (Mathenge et al., 2010). Although there is no golden standard of managing hypertension especially in people with diabetes, multiple interventions are necessary to ensure adequate control of the two conditions (Tibazarwa and Damasceno, 2014). Health care providers' factors need to be considered, especially those working in rural settings, to update their knowledge on management of diabetes and hypertension and use of clinical guidelines both local and international. The significance of patient education and adherence to treatment is important to ensure control of blood sugar and blood pressure (Ntusi, 2011).

2.8 Risk Factors Associated with Comorbid Diabetes and Hypertension

Due to the comorbidity of these chronic conditions and all other NCDs, they have common risk factors. The risk factors fall into two main categories, the modifiable factors and the non-modifiable factors. The modifiable risk factors include: diet, sedentary lifestyle or inactive lifestyle (lack of physical activity), smoking, alcohol consumption and obesity. On the other hand, the non-modifiable factors include: age, gender/sex, race or ethnicity and family history of diabetes or hypertension. The susceptibility and behaviour change is in the hands of an

individual, who is governed by the social logic in the decision-making process. The control of high prevalence of comorbid conditions stems from the prevention of the risk factors associated with them.

Studies have shown that health promotion is very important towards the prevention of chronic conditions such as diabetes and hypertension (Edwards et al., 2000, Maher et al., 2010, Mbanya et al., 2010) and communities in rural and urban areas need to be sensitised to preventive measures in dealing with chronic conditions. The WHO in its effort to curb the escalating prevalence of all NCDs has launched the Stepwise intervention for NCDs through the promotion, prevention and treatment of NCDs in PHC settings. The socio-economic factors, where self-reported behaviour is analysed for surveillance of risk factors in the community, has proven to be effective and low intake of fruits and vegetable among adults has been found to be a factor for consideration when providing health education in the population, for behaviour change (Mehan et al., 2006). Another new means of fighting the risk factors for NCDs is through training of clinicians, research of the risk factors and forming academic and clinical collaboration towards halting the increase of NCDs in the community; such new models are improving the life of the high risk population through regular screenings and follow-ups in Kenya (Bloomfield et al., 2011b). Whilst there is a remedy for modifiable risk factors, non-modifiable risk factors still remain a challenge to the management of chronic comorbid conditions. The question is what needs to be done for modifiable risk factors in controlling the burden of chronic comorbid conditions. The next section discusses the risk factors associated with comorbid diabetes and hypertension.

2.8.1 Overweight and Obesity

Studies undertaken in Kenya have shown that there is a relationship between hypertension, obesity and HIV positive patients who are on ARVs (Bloomfield et al., 2011a, Ongeti et al., 2013). Being overweight and obesity are among the contributing factors of CVD, which is the leading cause of mortality in low income countries. A person with high body mass index (BMI) of more than 30 is considered obese, while one with BMI of or equal to 25 is considered overweight. These measures translate to the amount of fat one has in the body, which increases the risk factor for NCDs, especially diabetes and CVDs. In a study conducted in Kenya on the fat distribution and obesity among the general population, the prevalence of overweight people was found to be at 39.8 per cent and 15.8 per cent in urban and rural groups respectively. On the other hand, obesity was 15.5 per cent in the urban population and

5.1 per cent in the rural population (Christensen et al., 2009). On the same note, obesity especially in urban areas, is attributed to high consumption of processed foods rich in high calories especially in cities with less fruit and vegetable intake. A cross-sectional survey study conducted in Kenya's Kisumu Lake basin found that 13.2 per cent and 9.1 per cent of overweight and obese people were the elderly living in urban areas (Cheserek et al., 2012). This clearly indicates that migration from rural to urban areas leads to an increase in prevalence of NCDs among the general population. However, facts indicate that being overweight among the young generation exposes them to CVDs, where diabetes and hypertension are high risk factors. Further obesity directly contributes to poor control of hypertension (Colosia et al., 2013). Similar results have been reported in a ground-breaking population-based survey in the urban poor population in Kenya, which reported being overweight and obesity as correlates of diabetes prevalence; obese people were 16.3 per cent and 29 per cent were overweight in a study population of 2061, these correlates were higher in women of a younger age (Ayah et al., 2013). However obesity among the poor population was viewed positively as a sign to conceal the negativity of poverty and lean and slim body associated to suffering and illness.

2.8.2 Physical Inactivity

One of the risk factors attached to NCDs is lack of physical activity. Most people currently tend to walk less and use public or personal transport for movement and this increases their risk of cardiovascular conditions. According to the (WHO, 2013a) *Action Plan for Global Action on NCDs*, physical activity is one way of reducing the risks factors. Accordingly member states are urged to put measures in place to reduce inactivity by 10 per cent and reduce incidences of hypertension by 25 per cent, through active physical activities among the population at risk and affected groups. In a study conducted in India on high risk factors using the WHO Stepwise method on physical activity in the work place, the majority of the workers (61 per cent of n=220) were not fully participating in any heavy physical activities, they did normal tasks and computer work, 38.6 per cent did brisk walking and lifting light loads, while twenty-one of the executives used motor vehicles to report to work and had to sit all day long (Mehan et al., 2006). This clearly shows that people in all levels of work are equally exposed to developing one or more NCDs. Despite the awareness and the importance of physical activities in prevention of hypertension and diabetes, national policies and regional development do not create the forums for the implementation of the same. According to Tibazarwa and Damasceno (2014), the growth of small urban centres and

adoption of more ‘civilized’ lives, even in rural centres, hinders physical activities through encroachment on playing fields by developers and the provision of easily accessible modes of transport, which take the place of walking.

In a population-based survey in Kenya on the effects of urbanisation, ethnicity and cardiovascular risk, the two communities involved in the study had different orientation to physical activities, diet and exposure to modern lifestyles. The study concluded that further studies based on ethnicity would provide more insight into the management of NCDs (Mathenge et al., 2010). According to Matheson and colleagues, sports medicine and exercise should be put in the forefront of the prevention of chronic conditions. Prevention of chronic conditions should be handled through health-based care models rather than approaching them from a disease-based model, void of prevention modalities and skills (Matheson et al., 2011).

2.8.3 Smoking and Alcohol Consumption

Africa like other developing countries shares the burden of NCDs and of the main challenges in the prevention and control of chronic conditions, is alcohol intake among the population. The trend of smoking and drinking affects both at risk and the affected groups. The WHO advocates for stringent measures against tobacco use among the general population and the manufacturing companies of tobacco products (WHO, 2013a). The survey studies conducted in most parts of sub-Saharan Africa have not really concentrated on the risk factors in community and rural settings; instead they have looked at the urban and HIV-related risk factors. Thus the evidence of risk factors for most chronic conditions is still very limited (Negin et al., 2011). Failure to quantify risk factors in both the young and older population leaves a lot to be desired. As a result the burden and effects cannot be planned for ahead of the occurrence by the policy makers and donors (Samb et al., 2010). Studies have shown that if alcohol intake is reduced early and smoking stopped, advancement to complications of most chronic conditions reduces significantly (Negin et al., 2011).

In a cross-sectional study in three sub-Saharan countries, Malawi, Tanzania and Rwanda, on risk factors in people older than 50 years of age in rural areas and NCDs development, the study examined five most prevalent risk factors common to all NCDs. Smoking was found to be high among women and men aged 50 and older at 21 per cent versus 36.6 per cent respectively and it was 23 per cent versus 19 per cent among women and men below the age of 50 years. Similarly, alcohol consumption was 45 per cent versus 49.5 per cent among

women and men at the age of 50 and above, while those under the age of 50 years had a slightly lower percentage of 27.6 per cent for both sexes. Overall findings concluded that in the population of study each had two or more risk factors at 52 per cent among the older generation compared to younger people at 21.4 per cent (Negin et al., 2011).

Comparatively, developed countries have strict measures and control on tobacco, which is enacted by the government; the opposite is being witnessed in developing countries. The current prevalence of tobacco use indicates that in sub-Saharan Africa it could be higher than 36 per cent in men and 11 per cent among women (Kengne and Anderson, 2006). Reduction in alcohol intake has been found to be effective in controlling blood pressure and blood glucose levels among diabetic patients and even in comorbid conditions (Mbanya et al., 2010). Patient education on alcohol and smoking cessation has been found to provide positive control and improved quality of life for smokers, through the use of 5As services at primary care levels. The 5As stands for ask, assess, advise, assist and Arrange for follow-up (Hung and Shelley, 2009). This can be a bold step towards prevention of NCDs in developing countries. All clinicians should be encouraged to review patients' habits of smoking and alcohol intake during primary health reviews and in routine patient health education (Parker et al., 2012). The current statistics in the sub-Saharan region may not reflect the real picture on the ground, due to the transition of chronic communicable diseases into chronic conditions and NCDs among the low income countries in Africa; there is need for constant update of data (van de Vijver et al., 2013). With comorbidity between NCDs and communicable diseases such as HIV/AIDS, pneumonia and infections, patients with diabetes and hypertension are at a higher risk of not being able to control the blood glucose and blood pressure (Olmen et al., 2012b).

2.9 Determinants of Health-Seeking Behaviour among Comorbid Diabetes and Hypertension Patients

According to Anwar et al. (2012), health-seeking behaviour or health care-seeking behaviour is the manner in which individuals monitor their bodies, define and interpret symptoms, take remedial actions and utilise other sources of help as well as engage with formal health care systems. It can also be concerned with how people monitor and respond to symptoms and symptom changes over the course of illness and how it affects behaviour, remedial or intervention taken and response to treatment (Hjelm and Mufunda, 2010).

Accordingly, health care-seeking behaviour comprises all that the patients need to do to avoid assuming the sick role; it holds the key to sound health (Anwar et al., 2012). However, when the opposite happens, then utilisation of health care services becomes only a dream for many patients and their families and to a certain extent the health care givers. A study in India Lambert (1996) highlights a number of factors which determine either positively or negatively the health care-seeking behaviour among patients suffering from chronic diseases or even minor ailments; the author asserts that sick people and their families are generally highly pragmatic in selecting types of treatment. The practical reasons include socio-economic considerations, availability and accessibility of the different types of treatment, prior experiences and evaluation of the previous therapy sought from a particular source (Chuma et al., 2007). These factors exert a considerable influence on treatment-seeking behaviour. Human behaviour and practices always determine which strategy to be employed in the prevention of chronic conditions within the community.

Despite this, the behaviours towards seeking treatment, self-awareness and knowledge about the ill-health and the consequences of the disease do not necessarily mean improved disease outcome (Miranda et al., 2008). However, awareness and engagement of the patient in planning and decision-making on their care can have a positive influence on the health outcome of the patient, thus allowing a healthy transition into living with chronic comorbid conditions (Weis et al., 2007).

According to Muller and Steyn (1999) in their study on culture and feasibility of collaboration and integration between traditional and modern medicine systems of care, they note that culture is one of the main determinates of health-seeking behaviour among the African people, and culture determines the illness practices and behaviour towards the illness. Literature shows that traditional medicine is culturally acceptable to the people who use it and value it as their own compared to modern or biomedicine (Chacko, 2003, Duma et al., 2007, Edward, 2011).

The holistic care given to patients by providers encourages health-seeking behaviour. The patient-centred care, as opposed to disease-centred care, favours chronic care. Patient ethnicity and culture need consideration in care (Lanting et al., 2008). In PHC settings, patients should be managed comprehensively and in a socially, culturally acceptable environment. The culturally sensitive and competent clinical practice aligns itself with holistic care (Leininger and McFarland, 2006). Despite that, health-seeking behaviour is a

common area of research, with the emergency of chronic conditions. Further research needs to be undertaken especially in PHC settings with regard to prevention and management of chronic conditions like diabetes and hypertension, in that patients only seek medical care with the onset of complications (MOPHS, 2010b).

2.10 Empirical Evidence on the Management of Chronic Comorbid Diabetes and Hypertension

2.10.1 Management of Comorbid Diabetes and Hypertension in Primary Health Care Settings

Despite the availability of national and international clinical guidelines, patients with two or more chronic conditions face enormous challenges in managing their conditions. For instance in the US most patients with chronic conditions are not adequately treated and their condition is poorly controlled (Bodenheimer et al., 2002); only one third of hypertensive and diabetic patients achieve the recommended level target of greater than 7 per cent (Sanz et al., 2010, Long and Dagogo-Jack, 2011). In Kenya, 68 per cent of diabetes patients are on treatment, but only 30 per cent achieve the required target of greater than 7 per cent (Otieno et al., 2005). These results reflect the findings of the review of clinical practices in United Kingdom, Australia and New Zealand health care systems' responses to chronic conditions, where most patients did not receive the standard care required (Nolte and McKee, 2008).

Health care systems are equally challenged especially in rural and resource-limited settings in developing countries to handle the double burden of acute and chronic conditions (Samb et al., 2010). Chronic conditions require three levels of disease prevention and care, and further require clinical settings which are improved and integrated to ensure continuity of care for patients with the double burden of comorbid diabetes and hypertension (Greenfield et al., 2009, Schroeder et al., 2012).

A recent systematic review on the rising burden of comorbid diabetes and hypertension in the Asian and African region (Mohan et al., 2013) asserts that health care systems need to be enhanced in order to prevent and control the escalation of diabetes and hypertension in rural and urban settings. This can be done through primary care, secondary care and tertiary care in a system which is well aligned and coordinated. Strengthening of health care systems has been advocated by the (WHO, 2007), and other highly ranked global organisations, although the process has been moving at a snail's pace.

Among the many interventions for strengthening health care systems in rural settings and developing countries are: the shift from acute orientation to chronic care (Maher et al., 2010), provision of essential medicine for treatment of diabetes and hypertension, training of health care workers on chronic care management, especially nurses and CHWs, purchase and distribution of essential equipment for screening of diabetes and hypertension and other NCDs (Hogerzeil et al., 2013), and basic laboratory services which are inadequately equipped to handle the variables necessary for comprehensive care of hypertension and diabetes (Mendis et al., 2012, Mendis, 2003).

Nevertheless, most low-income countries have challenges meeting the aforementioned requirements in chronic care provision. Olmen and colleagues maintain that for effective management of long-term care, providers' factors need to be brought into consideration, based on the context of the country's health systems (Olmen et al., 2012b), This was also noted by (Nam et al., 2011).

2.10.2 Lifestyle Modification in the Management of Hypertension in Diabetes Type 2

Health lifestyle modification is crucial in the management of diabetes and hypertension in primary-level care settings either as a stand-alone or in combination with other intervention strategies. According to *American Diabetes Association (2012)*, the goal of lifestyle modification is to maintain blood pressure at 130/80mmHg and blood glucose at less than 7.0 per cent or even better. Conclusively, clinical guidelines if adhered to have shown significantly positive results, which can be replicated even in under-resourced countries.

The Diabetes Prevention Program (DPP) in the USA and the *Finnish Diabetes Prevention Study* have shown that the use of lifestyle modification and the use of Metformin can reduce the prevalence and the onset of diabetes by over 58 per cent for those who have impaired glucose intolerance (Tuomilehto et al., 2001), and reduction of body weight by at least by 7 per cent of the initial body weight can significantly reduce risk factors for hypertension and diabetes mellitus (*Diabetes Prevention Research Group, 2005*). These studies indicate that increase in physical activities in the general population and those at risk, reduces the incidences of diabetes and hypertension significantly.

In a clinical study conducted in Finland among 8302 men and 9139 women aged between 25 and 64 years with no previous history of stroke, showed that people involved in constant physical activity and reduced body weight had low prevalence of hypertension in the general population (Hu et al., 2004). Physical activities, which include brisk walking for 30 to 60

minutes or 150 minutes per week for three times a week, and a low calorie diet, reduce the risk factors for most NCDs in the general population.

Further studies indicate that weight control is the most effective in the prevention of diabetes and hypertension among the general population. A sodium restricted diet has been found to be effective among diabetics and hypertensives as compared to non-diabetics and non-hypertensives (Hall et al., 2011, Tibazarwa and Damasceno, 2014). These findings are similar to those recorded in clinical trials in India and China among diabetes patients. The Da Qing Study among the Chinese general population found that modification of lifestyle reduced the risks of developing diabetes, including exercise 46 per cent diet 31 per cent and a combination of exercise and diet 42 per cent (Li et al., 2002).

On the other hand, the results from Indian diabetes prevention program study also indicated that the progress to full diabetes in patients with impaired glucose tolerance can be delayed through lifestyle modification alone by 28.5 per cent and use of Metformin alone by 26.4 per cent among younger patients with insulin resistance (Ramachandran et al., 2006). In the same study however, there was no significant result from the combination of lifestyle modification and Metformin. However, there is paucity of information in most of the clinical trial studies on the quality of care for patients with comorbid chronic conditions in PHC health care systems across care settings in resource-limited areas. These are compounded by the fact that most clinical trial studies are conducted in urban settings and academic settings as compared to community and rural settings. Lack of resources and personnel in primary care settings continues to hinder proper management of diabetes and hypertension among other chronic conditions (Nduo et al., 2013).

2.10.3 Blood pressure control among diabetic patients with hypertension

Hypertension is one of the risk factors for CVDs, such as stroke. However, suboptimal control of blood pressure among patients is well established through clinical trials studies as a means of averting CVDs complications either among patients with diabetes or essential hypertension. Significant to note is the benefit of blood pressure control among diabetic patients as compared to non-diabetic patients. The UKPDS clinical trial study found that systolic blood pressure dropped by 10mmHg and reduced the risk of all diabetic complications by 24 retinopathy by 34 per cent, stroke by 44 per cent heart failure by 56 per cent and mortality due to diabetes by 32 per cent (*United Kingdom Prospective Diabetes Study Group (UKPDS), 1998*). Other clinical trials have reported similar results in closely-

related studies. For instance, the *Hypertension in Diabetic Study-II* reported that hypertension increases the risk factors for macrovascular and microvascular complications among patients with diabetes type2; these include angina, myocardial infarction and stroke. Additionally hypertensive patients have a high incidence of complications when in coexistence with diabetes type2 as compared to non-diabetic groups of patients. Globally this remains a landmark study indicating the comorbidity of hypertension and diabetes type 2 (*Mohan et al., 2013, Hypertension in Diabetes Study (HDS), 1993*).

Despite the recommended blood pressure of 135/85mmHg or a 24 hour average at 130/80mmHg (Daskalopoulou et al., 2015), among diabetics, most clinical controlled studies show that it is achievable, however maintenance after the studies is not guaranteed in most patients, especially in community based PHC settings. The *Action to Control Cardiovascular Risks in type2 Diabetes Mellitus Study*, found that strict control of systolic blood pressure at 120mmHg as compared to 140 mmHg did not have significant reduction in risk factors, but noted a decrease in incidence of stroke by 40 per cent. Similarly, the same study also found that excess control of blood glucose levels to less than 6.0 per cent can increase mortality among diabetes patients with hypertension (*Action to Control Cardiovascular Risk in Diabetes (ACCORD)* study group (2010)). Considering the challenges involved in the control of blood glucose and blood pressure (suboptimal control of these parameters), comorbidity of diabetes and hypertension requires extra special consideration compared to patients with a single chronic condition. However, recent studies on the control of blood pressure among diabetes patients have shown that a combination of pharmacological therapy with Angiotensin inhibitors lead to adequate control compared to single therapy (Jamerson et al., 2008).

2.11 Non-adherence to Treatment by Comorbid Diabetes and Hypertensive Patients

Adherence is the ability of someone to comply with a specific treatment regimen required. Adherence can also mean compliance to a treatment regimen by the patient. Benefits of adherence cut across patients and the health system. Adherence can reduce the utility of health resources through reduced number of admissions (Jansen, 2008, Foust, 2007), reduced relapse of patients, postponement of heart attacks in heart failure patients, delay in the onset of complications among diabetics, and control of blood pressure and coronary heart diseases among hypertensive patients (Krueger et al., 2005, Renders et al., 2000, Wang et al., 2014).

Several factors hinder the ability of patients with chronic conditions to adhere to their long-term treatment regimen. In a systematic review on adherence among chronic patients, several factors were highlighted; adherence usually ranges from 17 per cent on the lower side to 80 per cent among chronically ill patients (Krueger et al., 2005).

In a comprehensive review of barriers and factors that affect adherence among patients with heart failure, the following were among the common: age of the patient, as age increases the level of adherence reduces especially from the age of 70 years (reduced mental process due to aging) and the household size, where the larger the size, for some patients, enhanced their adherence, while for others it negatively affected the adherence. They also found that patients who receive support from the health care providers usually have a positive response to adherence; those who had no support both at home and in hospital had the worst experiences. Lastly among other factors are the patients' psychological status and their ability to adjust to a disease and embrace self-care and behaviour change. The same results are reported by (Krueger et al., 2005). However Krueger and colleagues warn that patients' adherence to treatment is directly affected by the relationship between the patient and the provider, prior to initiation of treatment, the number of drugs the patient has to take at a time, the doses to be taken, and the patient's level of knowledge of the disease, among many factors (Krueger et al., 2005).

Other studies undertaken regarding non-adherence among chronically ill patients mainly show a lack of sufficient knowledge about the conditions and complications, poor accessibility to health facilities, availability of drugs, affordability of the drugs and the cultural beliefs of the society to which the patients belong (Jordan and Jordan, 2010, Lee and Lin, 2009). However, with the high incidences reported of non-adherence, patients with chronic conditions need constant reminders which can be done in various ways to ensure control and continuity of care, for instance the use of mobile phones, sending short messages as a reminder and tracing of defaulters (Lester et al., 2010). Lack of consistency of care provision from different care providers throws the patients and their families into confusion during the continuum of care and disease progression. Noteworthy is failure on the part of health care providers to plan, communicate and involve patients in decision-making, which leads to non-adherence and poor control (Roumie et al., 2011). These are achievable through patient centred care and cordial interpersonal relationship between health care providers and the patient (Orem, 2001, Meleis, 2010). Routinely, adherence cannot be a perfect per cent, to ensure that chronic care is achieved both in primary and secondary health care services and

amalgamation of several intervention models is inevitable. According to Krueger et al. (2005), a combination of theory-based interventions on knowledge and medication administration skills and disease-based interventions will increase knowledge of danger signs and simplification of drug dosages for comorbid diabetes and hypertensive patients (Krueger et al., 2005).

A study conducted in America on Africa-American and anti-hypertensive adherence, found that adherence was 75 per cent on drugs taken once a day compared to those of four times a day at 50 per cent, with a margin error of + or – 20. This shows that patients will adhere more to a simple dose than complex doses and it is also based on their health literacy levels (Fongwa et al., 2008). In the African context, with special reference to sub-Saharan Africa, misconception about insulin use and polypharmacy nature of hypertension fuels the non-adherence habits. The confusion that once blood sugar levels are under control or blood pressure resolves after attaining greater than 7 per cent and BP of 140/90mmHg, add up to non-adherence and many defaulters (Hall et al., 2011).

Evidence has shown that the use of telephones to remind the patient is efficient enough for patients to adhere to treatment and clinic follow-ups in PHC (Lester et al., 2010, McManus et al., 2010). Home visits from CHWs and community health nurses have shown great improvement for hypertensive patients, as a social support and increased accessibility to care in terms of service and cost- effectiveness of the model for self-management (Gaziano et al., 2014).

2.12 Human Resources Effects on Management of Chronic Comorbid Conditions

One of the main challenges in the management of diabetes and hypertension in the sub-Saharan region and other developing countries includes acute shortage of health care workers (Crisp and Chen, 2014). The WHO acknowledges the shortage of health care workers as compared to the disease burden. Africa has a shortage of 2.4 million health care workers in all cadres and they are poorly distributed, the majorly being in urban settings (WHO, 2006). According to the WHO, *Human Health Resource Report*, out of 193 member states, 57 countries including Kenya have an acute shortage of doctors, nurses and midwives, which falls below the recommended 2.5 in 1000 population health worker density (WHO, 2006). The sub-Saharan region is one of the affected regions, for instance there are 15.5 doctors in a 100,000 population as compared to 311.0 in developed countries and 73.4 and 737.5 nurses in the same population in developed countries (Lekuobou et al., 2010). In a more recent study

on nurses in Kenya, the shortage is acute especially in rural counties/regions where the ratio is 0.48 nurses in 1,000 population compared to 0.30 nurses working in two national referral hospitals in two counties in major towns in the country (Wakaba et al., 2014). However, distribution of health care workers remains a challenge, to ensure equity in health care delivery, especially to patients in need of long-term care. Nurses worldwide remain the frontline health care professional for essential health service delivery and noticeable health outcomes (Propp et al., 2010).

Multidisciplinary professional teams' involvement in the management of diabetes and hypertension, both informal and formal groups, is crucial. For effective chronic care, the patients' environment and personal factors have to be considered, as well as the health-care providers; these factors may be seen as self-management, lifestyle adjustment, diet change and use of multiple medications including insulin injections (Olmen et al., 2012b). The health care providers' professional advice is important in the continuity of care, selection of medication, diet planning, foot care and counselling of patients and families, and general follow-up care. A study conducted in South Africa on use of CHWs has shown positive results on adherence and cost-effectiveness in the management of hypertensive patients at home through home visits. Despite a 42 per cent awareness among patients with hypertension, 15 per cent of the patients' blood pressure was not controlled, and did not adhere to a medication regimen (Gaziano et al., 2014). The use of CHWs was found to be cost-effective in improving adherence. It reduced DALYs burden to \$320, as compared to the WHO proposed cost of \$10,000 in South Africa's Gross Development Profit and \$2154 for the WHO African Region (Gaziano et al., 2014). Although this study did not include diabetes patients due to complexity in the management and the cost-effectiveness of the CHWs, intervention reported differed between urban and rural settings. These findings concur with findings of studies from Ethiopia, India and Brazil (Herman, 2011). An evaluation report on the effectiveness of CHWs in a selected province in Kenya, indicated that only 7 per cent of the country is covered, NCDs are among the least covered community services, and only the nutritional aspects of the training is well implemented (KMOH, 2010).

2.13 Economic Implications of Comorbidity of Diabetes and Hypertension Management

Despite the high prevalence of comorbidity of the two conditions, few studies reported cost implications of managing comorbid diabetes and hypertension and the implications for the patient and the health systems, especially in developing countries. Kenya like most of the

developing countries faces challenges of limited health resources where most of the gross domestic product (GDP) is usually less than 15 per cent for health care compared to high income countries and higher total health expenditures (KMOH, 2015). Comorbidity of diabetes and hypertension has both direct and indirect costs: direct costs include seeking treatment, transport to hospital, cost of drugs, rehabilitation or complication care like amputation, lost work days, psychological trauma and general cost of running the health care system. On the other hand, indirect cost may take longer to be noticed, but this includes: productive years which are cut short as a result of disability, loss of earning for treatment of chronic conditions (Boutayeb et al., 2013). Comorbid conditions among diabetic conditions have been found to increase the cost of out-of-pocket expenses for individuals and families leading to lack of adherence to treatment plans (Piette and Kerr, 2006). Studies have shown that patients who cannot afford to pay for health care have poorly controlled blood glucose levels and blood pressure.

In studies done in the sub-Saharan countries, the economic implications of diabetes and hypertension are enormous, as most of the countries' national budget for health is still below the *Abuja Declaration* of 15 per cent and there is a low supply of essential medicine for diabetes and its comorbid conditions (Azevedo and Alla, 2008, Kirigia et al., 2009). Similarly Ploubidis et al. (2013), in their study of the socio-economic factors in the prevalence of hypertension, diabetes and visual impairment in Kenya, found that being socially and economically stable had a positive relationship with diabetes and hypertension, as compared to education levels. In the same study they found that available resources and level of education were negatively related to the health outcome of visual impairment, contrary to other studies done in developed countries especially with health behaviour like smoking and alcohol intake (Ploubidis et al., 2013).

2.14 Factors Related to Poor Diabetes and Hypertension Control in Health Care Systems

Healthcare systems in both developed and developing countries are not adequately equipped to handle the growing burden of chronic conditions. However, in most developed countries, the health system response to chronic disease is swift and is patient-centred (Samb et al., 2010). On the contrary, developing countries' health systems are faced with the double burden of acute and chronic conditions. As earlier mentioned, most health care systems especially in developing countries are acute-care based, with little evidence of chronic care,

especially in rural settings or in PHC; they do not have the capacity to last for long because of the demand for chronic conditions such as diabetes, hypertension and other chronic conditions (Olmen et al., 2012b). Lack of context-specific models of chronic care in most countries' health systems makes it hard to integrate chronic and acute care. Despite the presence of the CCM and the adapted *Innovative Chronic Care Conditions*, the models are complicated to implement in clinical practical settings with limited resources and human resources, all being labour intensive (Olmen et al., 2012b). On the other hand, Samb and colleagues maintain that for health systems to be proactive they need to be redesigned to suit the chronic care management (Samb et al., 2010).

Lack of proactive trained and motivated health care providers at the primary and secondary levels of care to provide chronic care services, has remained and continues to be a challenge in most developing countries (de-Graft Aikins et al., 2010b). Understaffing at the PHC facilities leads to poor communication between patients and providers due to lack of time for individualised care, and the long queues waiting for the services, inadequate and constant supply of medicine for diabetes and hypertension, increased cost of drugs or accessibility to the majority of the patients. Despite this, recommendations have been made by the *American Diabetes Association* for a multi-disciplinary team approach to diabetes care; it is also acceptable to have a single trained diabetes educator, as long as they refer patients to other team members as the need arises (*American Diabetes Association, 2015*). Yet in most African countries, chronic conditions like diabetes and hypertension are still second-line priorities as compared to acute communicable diseases.

2.15 Complications of Comorbid Diabetes and Hypertension

Comorbidity of diabetes and hypertension is well known and epidemiological causative factors are well established. Studies on diabetes and hypertension, either as comorbid or single conditions, indicate the complexity of managing these conditions; mostly the high prevalence of complications attributed to them, either being macro-vascular or microvascular (Long and Dagogo-Jack, 2011). Retinopathy is a common complication associated with diabetes and hypertension. In the *Wisconsin Epidemiology Study on Diabetic Retinopathy (WESDR)*, retinopathy was found to be common among patients with diabetes within five years of being diagnosed with the condition; specifically 14 per cent of diabetes type 1 and 33 per cent of diabetes type 2 patients (Verma, 2008). The co-existence of hypertensive retinopathy and diabetes further magnifies the problem leading to complete loss of vision

among many patients (Long and Dagogo-Jack, 2011). In Africa, diabetes retinopathy is the leading cause of adult blindness and diabetics are six times more prone to cataracts and 1.4 times more prone to open angle glaucoma compared to the general population (Mwale et al., 2008, Tumosa, 2008). In a cross-sectional study in a tertiary hospital outpatient clinic in Kenya, 7 per cent of 100 patients had retinopathy, 66 per cent had obesity, 29 per cent had hypertension, and only 29 per cent had their diabetic blood sugars under control (Mwendwa et al., 2006). In so far as care is concerned, accessibility remains a challenge in most African countries. Complications due to diabetes would not go away; studies reporting on complications are tertiary clinics-based, which only present urban pictures. PHC settings in rural areas are not fully represented in major studies (Azevedo and Alla, 2008).

Nephropathy, which affects close to 40 per cent leading to end stage renal failure, and peripheral neuropathy among diabetic patients is a leading cause of foot amputation and affects approximately 70 per cent of diabetic patients (Long and Dagogo-Jack, 2011). However the mechanism of peripheral neuropathy is poorly understood, with a tendency to lean towards poorly controlled blood glucose levels as the main cause, among others. In a study on foot ulcer prevalence among diabetics attending an outpatient clinic in Kenyatta National Hospital, out of 1788 patients, the prevalence was 4.8 per cent in the tertiary clinic. The following were attributed to be the risk factors for diabetic foot ulcers among diabetics: long duration of diabetes, poor glycaemic control, diastolic hypertension, dyslipidaemia, poor self-care and infection (Nyamu et al., 2003). Diabetic ulcers are the main cause of lower extremities amputations in most developing countries and disability and reduced quality of life (Damasceno et al., 2009). The recommendations made by the *American Diabetes Association* on the optimal goal of glycaemic control is to reach a haemoglobin level of A_{1c} of less than 7 per cent among diabetic patients (*American Diabetes Association, 2012*). This recommendation concurs with findings from the *United Kingdom Prospective Diabetic Study (UKPDS)* and *Diabetic Control and Complication Trials (DCCT)*, which reinforce the importance of glycaemic control in decreasing risks for cardiovascular conditions as indicated in the definition of diabetes in (United Kingdom Prospective Diabetes Study Group (UKPDS), 1998) and DCCT as reported in (Long and Dagogo-Jack, 2011). However, little has been documented on the management of diabetes in rural settings to achieve the recommended blood glucose levels for patients with diabetes in primary care settings especially in Kenya, who receive varied care services from several care providers in different settings.

Whereas the diabetes type 1 main mode of treatment is insulin use, the complexity of diabetes type 2 requires the use of multiple treatment regimens, including insulin in combination with oral drugs. The choice of treatment plans for most patients are directly dependent on efficacy, mode of action, safety and if the patients are able to tolerate the combination of side effects. While in developing countries, availability of drugs is an essential consideration in pharmacological treatment of diabetes and hypertension (Hall et al., 2011). The socio-economic factors have a greater influence in the management of diabetes with or without hypertension; the cost of care and sustainability of long-term supply of medicine such as insulin and multiple drug therapy in hypertension, further hinder comprehensive management of chronic conditions (Ploubidis et al., 2013).

2.16 Innovative Chronic Care Interventions in Primary Health Care

Management of chronic conditions and other comorbid conditions requires interventions which are context-driven to meet the needs of people in need of care. There is consensus that the main goal of management of diabetes and hypertension is to prevent the onset of complications through strict control of blood glucose and blood pressure, through non-pharmacological interventions, health promotion and preventive measures for those at risk, and pharmacological combination treatment for those who are already affected (Motala, 2010). Management of chronic conditions spreads across the care continuum and disease process (Boyd et al., 2007). In developing countries like Kenya where health resources are meagre, the best public health approach interventions to chronic care (Samb et al., 2010) are evidence-based. These approaches are primary prevention, secondary prevention and tertiary prevention. Despite the available interventions for the prevention and management of chronic conditions originating from developed countries, utilisation and implementation in Kenya and the sub-Saharan region is still low as conclusively discussed in systematic reviews and perspectives (Nigatu, 2012a, Olmen et al., 2012b). The next section highlights the most probable models applicable to primary health care and management of chronic comorbid chronic conditions.

2.16.1 Health Promotion Intervention Models

Three models will be reviewed and discussed from the point of view of how applicable they are to management of comorbid conditions, which relate to health promotion and behaviour change among patients with chronic conditions.

2.16.2 Health Belief Model (HBM)

The HBM was designed in the early 1950s by researchers in the field of PHC, to assist in the explanation of the use of preventive health services. The model has since then undergone several modification to suit the situations at hand. The model is mainly used to explain health-related behaviours and how these change when individuals are faced with an illness, which threatens their wellbeing (Kozier et al., 2004).

The health belief model assumes that individuals would take action to change from a behaviour which threatens their health, once they become aware of the effect the said behaviour has on their health (Renuka and Pushpanjali, 2014). Even though change is not a guarantee when it comes to addictive behaviours like smoking and drinking, in the general population this intervention must be put to the test in any event.

2.16.2.1 Components of Health Belief Model

The HBM model has six components which are connected, based on the actions taken in the face of the threat:

Perceived Susceptibility:-The belief that one is susceptible to the condition like diabetes, will prompt people to go for screening, adjust salt intake and adhere to treatment plans.

Perceived Severity:-This refers to how one perceives the condition and its consequences. Once the patient and the population understand how severe the condition is and its complications, all efforts will be put towards making possible changes-the model creates means of creating awareness about consequences of diabetes or hypertension among patients and their family members.

Perceived Benefit:-This refers to the belief that if one takes action it could reduce their susceptibility to the disease or its severity. The main goal of behaviour change is to improve quality of life without chronic conditions by preventing their onset.

Cues to Action:-Exposure to information will influence one to take action. For instance distribution of flyers on diabetes or hypertension, mass media campaigns and school and public health awareness programmes on chronic conditions.

Perceived Barriers:-The belief should be inculcated that the cost of taking action is outweighed by the benefit.

For any change to take place the patient's perceived benefit must be stronger than the barriers. Some of the barriers can be environmental for instance age, distance to health facilities, cost implications to care and cultural influence on health-seeking.

Self-Efficacy:-This refers to the confidence in one's ability to perform an action successfully (National Institute of Health (NIH), 2005, Renuka and Pushpanjali, 2014).

The HBM model is applicable to this study, because when it is used appropriately, it can help in the prevention and cessation of smoking and excessive alcohol consumption (Renuka and Pushpanjali, 2014). This study proved that patients, once motivated by, knowledge of the threat, will take positive actions. With modification it is being used in hypertensive patient retention in care and in developing linkages with different levels of care in Kenya; change of behaviour for both health care providers and patients (Vedanthan et al., 2014). The HBM being cognitive in nature provides the platform for expansion, to include the interaction between emotion, cognition, environment and how it shapes the management of hypertensive patients in certain geographical regions (Vedanthan et al., 2014). Emotions have both direct and indirect effects on behavioural change; these include things like desire to change, fear and personal aspirations to change. Similarly the environment of behaviour may be determined by socio-economic status, political goodwill and cultural orientation which all determine actions. HBM has also been used in different locations and population groups with hypertension as shown in various studies (Newell et al., 2009, Thalacker, 2010) to determine the perception people have and to identify barriers to action and to facilitating factors that prompt adequate management of hypertension in community PHC settings.

2.16.3 Theory of Reasoned Action (TRA)

The theory of Reasoned Action was first developed in 1980 as described in this new version of (Fishbein and Ajzen, 2011). The theory is mainly meant to explain factors and values which are related to behaviour of an individual. The aim of the theory was to show that an individual's behaviour is determined by the intention, which is directly determined by the attitude of the individual towards performing the behaviour. A person's level of belief in the advantages that will result from the change is determined by the relative negativity or positivity towards changing a particular behaviour, as negative belief will obviously deter action towards behaviour change (Glanz et al., 2008).

The theory makes the following assumptions: that all factors including culture and the environment must operate through the constructs of the model and that they do not influence how an individual will act when faced with a situation. People will try harder to behave in a particular manner if they have control over it. If a person with diabetes determines to avoid

drinking or changing the diet in his family, the determination will lead to the action being performed in the long run in the family despite the external determinants (Glanz et al., 2008).

2.16.2.1 Concepts of TRA

The theory is made up of three main concepts which appear to be common: the belief which an individual usually holds and talks about openly, attitudes which denote that what an individual is doing is good or bad and gives supporting views about the same action and lastly the intention in determining the action (Fishbein and Ajzen, 2011).

2.16.3 Community Organization Models Applicable to Health Promotion

Community health interventions entail involving the whole community in taking action and bringing change in the space where people live and work, towards prevention and control of chronic diseases. Community-oriented models are designed to bring change in behaviour among the targeted group and environment. It has been observed that for any effective change in health status of the population, change must start from the community level and from individual households. However, for any intervention to be effective, community structures must be put in place, systems must be evaluated, and resources must be available, before any change can take place (Glanz et al., 2008). Internationally over the years the typology of community organisation as articulated by Rothman has continued to be useful in designing community interventions. According to Rothman, there are three levels or models of community organisation (Rothman, 2001) namely:

Local Development Model: Community development activities are performed broadly through involving a group of community members to set goals and to follow actions for the development of the entire community.

Social Planning/Policy: This mode focuses on substantive problem-solving within the community and requires technical expertise from outside the community giving advice; it does not require community participation, but it is data-driven for social change within the community.

Social Action: Based on increasing problem-solving skills and performing tasks towards bringing change within the community. It is a combination of processes and tasks for social justice within the community.

In order to improve community health, community organisations must ensure certain concepts are fulfilled. These concepts have been highlighted in several ways, but they are clearly defined in (Glanz et al., 2008).

2.16.3.1 Concepts of Community Health Organization

Empowerment: The social action process for people to master skills for their lives and for the community.

Critical Consciousness: Reflection and actions in making change with a conscious mind.

Community Capacity: Community characteristics to identify mobilise and address problems.

Social Capital: The way community members relate among themselves, how trust is maintained, and how civic engagement is achieved.

Issue Selection: Identify attainable and specific targets of change, which unify the community and their strengths.

Community Participation and Relevance: Organising the community, by starting where people live and work, being equal with the community in all engagements-let the community create their own agenda.

2.17 Self-management Intervention Programmes

Self-management is mostly associated with the self-care theory of Orem. However there is no standard world definition of self-management. *The Australian Framework for Queensland Chronic Disease Management Strategy (2005-2015)* defined self-management as: “the engagement of individuals in activities and practices that sustain and promote health and well-being by making and or participating in decisions, building and sustaining partnership with others who are involved in their health, having the capacity (knowledge, resources, confidence) to manage the impact of their health on functioning, emotional and interpersonal relationships and monitoring and managing signs and symptoms of illness and chronic conditions” (Crowther et al., 2007:7). According to the *American Diabetes Association* (2012), self-management education forms central aspects of diabetes management interventions aimed at prevention, control and delay of the onset of complications and of improving quality of life (*American Diabetes Association, 2015*). Self-management is a strategy which requires collaboration from patients and their families together with health care professionals, to ensure positive outcomes and cost effective means of self-care and skill development aimed at diabetes behaviour change (*American Diabetes Association, 2015*).

Self-management Education is evidence-based in that, through education, patients with diabetes have been able to achieve glycaemic control and improved quality of life from the

time they are diagnosed through the continuum of disease progression (Khunti et al., 2012). Although the study did not ascertain the sustainability of positive outcomes after 12 months in the intervention group, results were difficult to sustain after three years for diabetes patients. The study's main focus was goal setting aspects for patients to achieve one at a time emerging from diagnosis (Khunti et al., 2012). Patients with comorbid conditions have received minimum attention, and what patients at home actually do to control and prevent complications is seldom known, particularly in developing countries or among black African clients who are known to have a higher prevalence of diabetes and CVDs compared to other ethnic groups (Newell et al., 2009).

In a study on self-management, Ryan and Sawin (2009) conducted an extensive literature review on inclusion of family members in self-management implementation as chronic care intervention. Their study resulted in the development of a mid-range theory of individual and family self-management theory as an outcome of the intervention. To date implementation of the theory has remained limited to small groups of informed patients and facilities. In another study Nguyen et al. (2011), conducted a study on community-based programmes in the management of hypertension; the result indicated that at community levels, self-management and involvement in care is achievable with the right skills and education. In a systematic review on ways of increasing diabetic self-management in the community settings by Norris and colleagues, findings showed the need to provide diabetes education to community gatherings, homes, schools and faith-based gatherings (Norris et al., 2002). Several strategies have been highlighted as effective during community-based self-management training, and these include group training, or conducting group medical visits for patients with single or comorbid diabetes and hypertension. Consequently with self-management strategies in place, several positive results were reported; these included cost-reduction, physiological improvement, emotional stability and satisfaction of patients and health providers (Riley and Marshall, 2010). Similarly, use of top-bottom and bottom-top approaches in chronic care and education on self-management has been associated with quality of care, reduced mortality and morbidity (Gavriloff, 2008). However the level of implementation is directly determined by self-efficacy and efforts invested in the self-management by the patient and their caregivers, as shown in studies among Turkish patients on insulin therapy (Al-Khawaldeh et al., 2012, Erol and Enc, 2011).

It is believed that self-management originated from Orem's self-care theory of 1985, 1991 and 1995 which asserts that basic conditioning factors influence an individual's engagement in self-care actions to meet his or her own self-care requirements. In order to meet the therapeutic self-care demands, one must exercise self-care agency-which means the ability to perform self-care actions (Liddy et al., 2013). Nevertheless, studies have confirmed that self-care and self-management differ in some aspects like context of care delivery and content. Self-care has been found to be limited to acute conditions as compared to self-management as a strategy used at home, and the level of patient education directed at instilling the skill for self-care (Grønning et al., 2012, Jenhani et al., 2005). Self-management implementation is associated with set goals and efforts, intentions and the desired outcomes, in this case controlled blood glucose and blood pressure (Nadkarni et al., 2011). The study commends the role of health care providers in provision of technical, psychological support of patients and families towards making the decision of lifestyle modification. There exists adequate evidence on the effectiveness of self-management strategy in the management of chronic comorbid condition, even in resource-limited PHC settings (Hegney et al., 2013, Schillinger, 2011, Shah and Booth, 2009). However collaboration between several stakeholders is required for development and implementation of self-management strategies, especially development of contextualized patient teaching materials (Ryan et al., 2011).

2.18 The Chronic Care Model (CCM)

The Chronic Care Model (CCM) is the longest serving model for improving quality of life of people with chronic conditions in PHC settings and community health services (Improving Chronic Illness Care(ICIC), 2014). The CCM was developed by Edward Wagner and colleagues in 1996 as a response to the growing burden of chronic diseases and health care system responses towards the people with chronic conditions *Improving Chronic Illness Care(ICIC) (2014)*. The model was originally designed for comprehensive management of chronic conditions based on clinical evidence- based practices (Si et al., 2008, Glasgow et al., 2001).

The CCM model has for years now been used as a framework for several other intervention models with an aim of improving the care and quality of life for people with chronic conditions. Among the most recognised intervention model based on the CCM is the expanded CCM adopted by the WHO in chronic care management of NCDs in primary care settings (WHO, 2002a, Barr et al., 2003).

The main focus of the model is to link informed patients with chronic conditions, and well-motivated proactive health care providers for improved patient outcome. The model is cognisant of the fact that most of the health care activities usually take place outside of the health care organisation, but Glasgow points out that the services have to be linked together for improved care outcomes (Glasgow et al., 2001). The health system has to be integrated and linked by the community to available resources; services delivered to the patients at the clinical services need to be evidence-based. On the other hand, the patients need to participate actively in their care and to demonstrate adequate skills in self-management. Further patient information needs to be available, and linked to other health care professionals for comprehensive management (Boyd and Fortin, 2010). Patients with chronic conditions need constant support to access and use the health facilities; it is not enough to offer health services which patients cannot access or afford, while at home or at the facility (Tien et al., 2008). Redesigning of the health system to suit chronic care is very important; a strong health system will adapt to the changes to suit patient and community needs, through prevention and health promotion. A fragmented health system is not supportive of chronic care, as patients end up being lost on the way or they receive suboptimal care as seen in Tanzania, South Africa and Ghana (McIntyre et al., 2008, Montenegro et al., 2011).

The inefficiency of the health system can clearly be seen day-in and day-out, due to weak and poorly structured health systems, and non-active health care providers. All this leads to poor implementation and utilisation of the CCM in most developing countries (Nuño et al., 2012). The CCM, being a clinical-based model, asserts that patients have a greater role to play especially with self-care management, medication, diet control and at the same time asserts the need for restructuring of health systems to accept chronic care management through multi-disciplinary team work. The CCM has the following components:

2.18.1 Components of Chronic Care Models

The Health System and Health Care Organization: This forms an integral part of the model, in that several sectors within the health system must be integrated to deliver comprehensive chronic care. According to the Improving Chronic Illness Care (ICIC) (2014), the health system should have strategies and mechanisms in place for comprehensive change in the system to integrate chronic care, and to ensure care coordination within and across health systems for effective communications.

Clinical Informational System: The information system forms an integral part of chronic care management, provides information on patients, statistics and allows regular documentation of

clinical activity and patient care needs, as assessed by the care providers and confirmed by the patient (Si et al., 2008, *Improving Chronic Illness Care(ICIC)*, 2014).

Decision Support System: Patient participation in decision-making is evidence-based on their involvement in their own care. According to *Improving Chronic Illness Care(ICIC)* (2014), decision support promotes clinical care which is consistent with clinical evidence-based care and patient preferences.

Delivery System Design: The health care system must ensure that the service delivery is able to meet the actual needs of the patient, even in the absence of symptoms, and it must actively participate to ensure constant healthy status (*Improving Chronic Illness Care(ICIC)*, 2014).

Self-management Support: According to *Improving Chronic Illness Care(ICIC)* (2014), patients have a responsibility to provide for and maintain their own health by taking appropriate action. Patients' empowerment is through collaboration and active involvement to achieve set health goals and priorities, to identify and define goals, to develop treatment plans and to solve problems as they arise along the continuum of care, with the use of health-care providers, community health workers and family members (Wong et al., 2011).

Community Resource and Policies: According to CCM, community resources and partnership with policy makers need to be mobilised to meet the patients' health needs within the community for sustainability (*Improving Chronic Illness Care(ICIC)*, 2014). Referrals of chronic patients to community services for continuity and follow-up care, and behaviour change programmes should be reinforced in health care facilities and systems. Finding a connection between the community and the health system requires planning, active participation and utilisation of evidence-based resources, and can be the most successful, sustainable solution to a community's health problems (Liddy et al., 2013).

2.18.2 Application of CCM to this Study

The CCM, though clinical-orientation and high income orientation, provides an essential framework in the management of chronic comorbid diabetes and hypertension. Chronic conditions are a challenge to health systems both in developed and developing countries.

The CCM has for years in some countries improved the quality of care for diabetic patients; cessations of smoking programmes have shown positive results from participants. Studies have recorded significant reduction of health care cost and improved quality of life with the use of CCM on chronic care (García-Goñi et al., 2012). The CCM provides a framework to understand the health system factors and how they affect the management of chronic conditions. Literature has shown that in-depth understanding of factors affecting both the

health system, health organisation, patients' factors and available community resources and policies, is important to ensure comprehensive chronic care and restructuring of health systems (Maher et al., 2009). Contextualization of health resources across regions may be the solution to comprehensive management of chronic comorbid conditions, through training and research in health-related needs (Williams et al., 2010, Maher et al., 2010).

There exists adequate evidence on the need to restructure the current acute-oriented health systems to accommodate chronic care which is long-term (García-Goñi et al., 2012, Piette and Kerr, 2006).

Olmen et al. (2012b), argue that shortage of health professionals, inadequate drug supply and non-functional referral systems hinders quality of care for patients who need regular and sustainable monitoring. Patients with chronic comorbid diabetes face a double burden in terms of cost and self-management with their families (Islam et al., 2014). Evidence shows that when chronic care is well organised with adequate participation from patients and the community, the cost of care is greatly reduced both directly and indirectly (Bousquet et al., 2011, Hung and Shelley, 2009). The Chronic Care model has also been shown to improve quality of care and it has ensured continuity of care for diabetes care patients in China (Wei et al., 2008).

In the context of Kenya's health system, like many other developing countries faced with shortage of health professionals, the CCM allows expansion of service delivery to accommodate a multi-disciplinary health care team, including both formal and informal caregivers within and outside the public health sector, like CHWs (Gershon et al., 2010). Chronic care requires and encourages teamwork among health-care providers, and sharing of information across different levels of care (Barr et al., 2003). Teamwork allows for integration of chronic care into PHC, to include health promotion for those at risk or targeted high risk individuals with diabetes and hypertension among other conditions (WHO, 2010b). The CCM remains a relevant framework for the study and chronic care of comorbid conditions due to its practicability in the devolved government in Kenya including a devolved health system with active participation from the community (MOPHS, 2010a). Each devolved government is responsible for strategic planning and implementation of health care services in the region including chronic care (Atun et al., 2013).

2.18.3 Relevant Studies with CCM in Primary Health Care

The CCM has been used extensively especially in outpatient settings, with various chronic conditions, and in a study conducted on how to stop smoking using the 5As, across several health facilities (Hung and Shelley, 2009). In a cross-sectional survey with CCM as a framework, the study found that participants were 25.62 per cent more likely to perform all the 5A services across 497 health care providers in primary care clinics in New York City, with enhanced delivery service system design, working with a clinical information system and patient self-management support. The study recommended full implementation of CCM which was more effective as compared to implementing one or two of its components for positive results in care provision and improved adherence to clinical guidelines.

In another study conducted recently in Davao City in the Philippines on how to decentralize diabetic care, using CCM as the framework (Pilleron et al., 2014), in a clinical control project, out of 1457 participants a final list of 639 subjects were analysed, 503 being in the intervention group and 236 were in a control group. The findings indicated that effective control of blood glucose levels was high in the intervention group as compared to the control group. The study concluded that integration of all components of CCM was more effective in diabetes control at PHC levels. However they did not include patients with comorbid conditions or they were not mentioned in the study. Other studies have also used CCM to evaluate one component of the model like the study in Cameroon, on the use of a nurse-led diabetic and hypertension project (Labhardt et al., 2010).

The use of tablet-based decision-making support has also been developed and used in Kenya based on CCM (Blank et al., 2013). Despite the reported success of CCM in chronic care, it has been proven to be a clinically-based model, with little extension to the community especially with prevention; further the CCM cannot operate without funds, yet in Kenya, vertical programmes in chronic care depend on donor funding, which are still focused on acute diseases (Samb et al., 2010).

The Chronic Care Model Framework

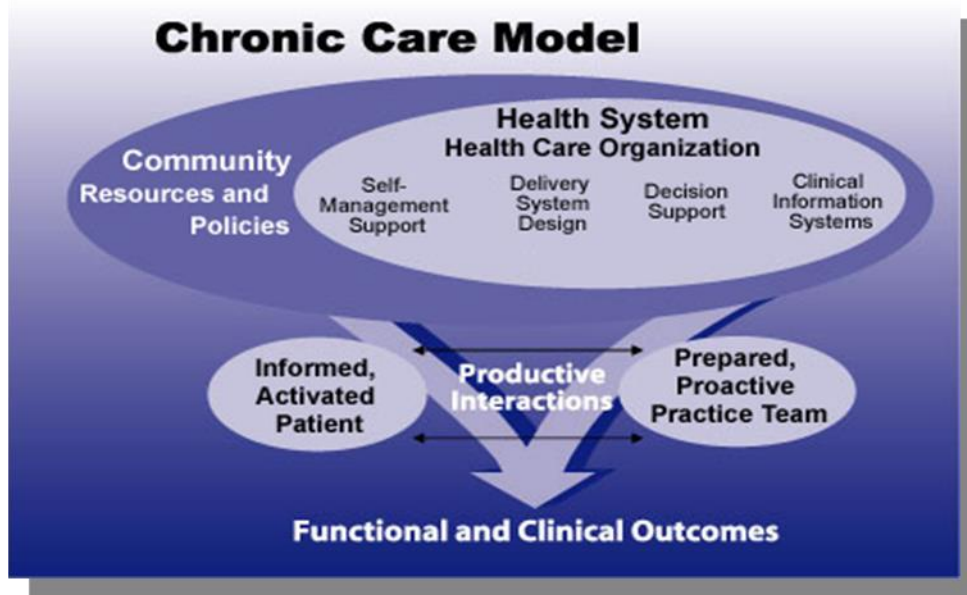


Figure 1: The Chronic Care Model. Adapted from (Boyd and Fortin, 2010) and the McColl Institute for Health Care Innovations and Improving Chronic Illness program (Improving Chronic Illness Care(ICIC), 2014).

2.19 Other Relevant Models in Chronic Condition Management

2.19.1 The Expanded Chronic Care Model

The model is based on the concept of CCM, with more concern for the prevention and health promotion aspects of managing chronic care conditions, not only in the health systems, but in the community, where the majority of the population live, work and seek health care services. The expanded CCM, emerged due to lack of comprehensive explanation of the community involvement in chronic care and the shallow description of the preventive care and health promotion in the management of the chronic conditions (Barr et al., 2003). Accordingly, the expanded CCM advocates for integration of interventions and concepts which apply directly to the group of patients at the community level. Health promotion forms an integral part of chronic care, with an aim of prevention of risk factors to diseases and injuries before they occur and prevention of the onset of complications and disability. Health promotion provides the means for the community to identify strategies and resources to suit their health needs as clearly supported in (Glasgow et al., 2001). To recognise the place of health promotion in PHC is the *Ottawa Charter of Health Promotion* in 1986 (WHO, 1986). The charter had strategies which were directed at achieving disease prevention through: health education and health promotion to the public through their full participation in setting their priorities, planning strategies, and implementation of their plans to make the community a better place to live in and to stay healthy in (Barr et al., 2003).

From a broad definition of health by the WHO, chronic care needs to encompass all aspects of the determinants of health; these include the social, cultural and economic factors, in a comprehensive mode. These factors determine when to respond to a situation before the onset of diseases or injuries (Beaglehole et al., 2008).

2.19.1.1 Components of the Expanded Chronic Care Model

Just like the CCM, the expanded model has components which have added aspects of community to its policies and the available resources in health care service delivery.

Community and Health System: The Expanded CCM has two main circles, the community being the geographical permanent lines and the inner circle is the health system, which are in constant communication across the weak lines, especially on the side of the health system (Barr et al., 2003). Attached to the health system is the information system support, self-management support, decision support and delivery system support; these allow the interaction between the community and the health system, or alternatively can influence the functioning of the two levels (Barr et al., 2003).

The other parts of the expanded CCM are in reference to the *Ottawa Charter* of 1986 which is grouped into five main areas of action. These were merged into the framework of the CCM.

- Development of personal skill
- Re-orientation of the health system
- Build healthy public policies
- Create supportive environment
- Strengthen community action

The Self-management Component: This has been expanded to include the development of personal skills which enhance skills, participation of the individual patients towards self-care and to stay healthy and maintain wellness in the continuum of care. For instance tobacco cessation programmes using the 5As (Hung and Shelley, 2009).



Figure 2: The Expanded Chronic Care Model by Barr et al. (2003); framework from the Chronic Care Model by Wagner et al. (1996).

Delivery System Support: Merged to be a reorientation of the health system, current health systems are acute conditions-orientated with little or no orientation to long-term and multiple conditions. This leads to the opportunity to restructure the health system to offer both preventive and curative measures, and to rehabilitate those affected in the community. Individual patients need to be supported through various programmes of advocacy and not only clinical services, but to a more holistic care of improved quality of life (Barr et al., 2003).

Decision Support: The CCM is based on clinical evidence guidelines which ensure that patients get quality practices of care when integrated into acute-care services. In addition, the development of health promotion guidelines has for years boosted the integration of best practice in the community for disease prevention (de-Graft Aikins et al., 2010a).

Clinical Information System: This stretches beyond the health care system, and provides data which informs policy makers on the health needs of the community, for instance the health demographic data in most developing countries reflects the poverty levels and economic status of the community (KMOH, 2009).

Community Resources and Policies: The expanded CCM was divided into three areas which need to be of concern when it comes to health promotion: building healthy public policies which support the prevention of chronic conditions, this can be through enacting laws on smoking, alcohol and providing subsidies on important meal products like maize, fruits and wheat. Secondly is through creation of a supportive environment both in urban and rural settings, upgrading of the slum areas, to be safe and enjoyable to the community. Lastly is through strengthening community actions, through creation of partnership in the community by other sectors which influence health. For instance community members need to be encouraged to eat a good diet, strive for proper housing and transport to access the health facilities.

Although the expanded CCM is more practical with regard to the community relationship with the health system, its use has not been adapted in most developing countries still battling with the double burden of disease.

2.19.2 The Innovative Care for Chronic Conditions (ICCC)

Still based on the CCM framework, although conceptualised from the PHC point of view, it is more focused on chronic care at community levels and policy development towards improving chronic care. *The Innovative Care for Chronic Conditions (ICCC)* was adapted by the WHO in 2002 as a strategy to combat the swelling burden of chronic diseases such as diabetes and hypertension among others in the group (WHO, 2002a). Framed to operate in PHC settings, the ICCC is focused on providing care to chronic people at three different levels, namely: the micro level (individual and family), the meso level (health care organisations and community) and the macro level (policy environment) (WHO, 2002a, Epping-Jordan et al., 2004). According to WHO (2002), with the emergence of the chronic conditions, the urgency to restructure the health system is very significant to all stakeholders. The ICCC provides the vehicle for redesigning the health system which is flexible, yet detailed enough within the available resources and needs of the community. Restructuring and strengthening of the health system is a major concern for both developing and developed countries to suit the needs of chronic conditions (Samb et al., 2010).

The three levels of the ICCC model of service delivery include: at the micro level of the model is the individual patient, family members who are constantly in touch with the community and the health care organisations, for servicing of the long-term care needs of diseases. Patients are supported by informed health care providers, motivated and willing to

work together for a common goal of improved health outcome. Individual patients learn skills of self-management assisted by family members, regular and timed check-ups at the hospital based on evidence-based protocols and guidelines of individual conditions. Evidence has shown that at micro level improved outcome has been reported, especially with close follow-up and patient teaching (Gaziano et al., 2014, Lekuobou et al., 2010, Schillinger, 2011, Wong et al., 2011).

The second level of ICCC is the meso level made up of the health organisations and the larger community for planning and implementation of the chronic care. The clinical information and delivery system services need to be appropriate and specifically for the chronic care (Epping-Jordan et al., 2004).

The meso level is directly linked to the macro level; policy makers in any organisation determine the survival of the organisation. In as far as health care organisations and the community influence the policy environment; the policy has a major impact on the community and the health system. Arguments exist indicating that negative policy environment jeopardises progress of strengthening health systems especially with integration and funding of chronic care services (de-Graft Aikins et al., 2010a, Harries et al., 2008, Allain et al., 2011), learning from Vertical programmes such as TB prevention programmes may be of value to NCDs.

The main areas of positive policy environment include promotion and consistent financing of chronic care programmes, leadership and advocacy of chronic care, and training and employment of health care workers. Integration of policy supports good legislative models and ensures strong partnership between community and health care organisations (Epping-Jordan et al., 2004). Although evidence from research has shown that all these aspects can be done and achieved, most developing countries lack the support of the national government to enhance chronic care and implementation of policies. Literature confirms that governments must cease depending on donor funding only, they should endeavour to use the scarce available resources to provide chronic care to the ever-growing population (Samb et al., 2010). Diversification and implementation of the ICCC model is still limited especially for NCDs, excluding HIV in most African countries (Samb et al., 2010).

2.20 Chronic Care Service Delivery Models Promising for Developing Countries

To date there is no single model of service delivery for chronic conditions in developing countries especially in the sub-Saharan region. The countries in this region are diverse and have different health needs (Williams et al., 2010). However, chronic conditions cut across

the region; poor, rich, young and old are faced with similar challenges. The sub-Saharan region has not been experiencing the upsurge of NCDs for the past years; it is estimated that by 2025 the region will have a burden of above 60 per cent (Bloomfield et al., 2011b). In a review on the management of chronic disease in sub-Saharan Africa, Van-Olmen and colleagues recommend the cross-fertilization of HIV/AIDS and diabetes type2 management (Olmen et al., 2012b). Without contradiction, they propose that although diabetes is different from HIV, they share service delivery, disease process and the health care organisation or the providers perspectives and the environment of care at home or in the facilities of the Chronic Dimension Framework (Olmen et al., 2012b).

In the same review they recommend the use of the following strategies to manage diabetes and other chronic conditions at primary care levels:

Decentralization and task shifting: Health resource shortage is a well-known issue and cuts across health institutions in low and middle income countries. As earlier highlighted, the shortage is acute and non-responsive to the burden of chronic conditions. Decentralization of vertical HIV programmes can be leveraged for NCDs using the same modalities, putting into consideration the context and factors attributed to weak and fragmented health systems (Nigatu, 2012b). Further Nigatu (2012b), supports integration of HIV and NCDs, but warns that a lot of consideration and planning needs to be in place before integration. In most health systems, chronic care is still hospital-based, secondary level operated or through private providers, leaving an empty space for primary care levels. For decentralisation and integration to be effective, there must be strengthening of the health system, and acceleration of the training of health providers, development of standardised diagnostic and treatment protocols, and supervision, distribute up drug supply to support the lower levels of implementation of chronic care. Evidence shows that decentralisation and integration of NCDs to vertical programmes can succeed, with improved patient health outcomes (Janssens et al., 2007, Mwangemi and Lamptey, 2010). Decentralization of chronic care to lower levels of care has also shown improved outcomes for treatment of diabetes in the Philippines, with support from authorities (Pilleron et al., 2014).

With the scarcity of specialised health professionals, task shifting has been proven beyond measure to be effective in the management of diabetes, hypertension and asthma, among other chronic conditions (Lekuobou et al., 2010). Use of lay people as counsellors, support groups and patient home visits and home interventions have also been shown to be effective in terms of blood pressure control, blood sugar control and improved self-management

(Petersen et al., 2014, Gaziano et al., 2014). The use of CHWs in South Africa proved to be cost-effective compared to patients travelling to health facilities; it also relieved the health facility for the treatment of new patients who need urgent care (Gaziano et al., 2014). Evidence from the review of current practices in most developing countries indicates that 80 per cent of diabetic and hypertensive patients receiving care in district hospitals can be seen optimally at the PHC facilities within a radius of 5km and still achieve the same control of blood glucose and blood pressure levels. In South Africa, studies have indicated an improved level of control with decentralized chronic care into primary health care levels (Coleman et al., 1998, Lalkhen and Mash, 2015). However, most patients in the community are exposed to several other alternative modes of care and management.

2.21 Traditional Herbal Medicine

Globally, it's approximated that two thirds or 50 per cent to 80% per cent of the population from developed and developing countries respectively use traditional medicine (Tilburt and Kaptchuk, 2008). In support of this definition is a study on Chinese traditional medicine which concluded that the utilisation patterns show that patients choose both modalities to manage their chronic conditions, and traditional medicine should be considered with policies for supporting patients with NCDs under the wider PHC and social care systems that support patients' choice (Chung et al., 2012). In Canada, indigenous people of aboriginal communities still hold to their socio-cultural beliefs, and folk medicine is generally sought as a primary source of health care and is often used in conjunction with modern medicine (Obomsawin, 2007).

From the WHO definition of traditional medicine, it is clear that communities cannot exist without the consultation with the traditional healers. Indigenous ways of disease control, and treatment at every stage of the disease development should be taken into consideration (WHO, 2000). The use of herbal remedies is on the rise globally and some have significant and positive effects. In Australia, there is ample evidence of the use of alternative medicine in the treatment of NCDs and the rate of use is increasing rapidly. In 2013 it stood at 69 per cent (Oliver, 2013). However, few people disclose the use of traditional medicine or even remedies to the medical professionals taking care of them concurrently, at the same time very few health care workers discuss the use of alternative medicine with their patients. This could partly be due to lack of sufficient knowledge, fear of being scolded and sent away or being looked down upon by the traditional care practitioners who follow the modern medicine care systems (Bignante and Tecco, 2013, Team et al., 2011). Other reasons for use of alternative

medicine have been highlighted from a study in Tanzania and Uganda (Stanifer et al., 2015, Rutebemberwa et al., 2013).

2.21.1 Utilization of Traditional Herbal Medicine in the Management of Diabetes and Hypertension

Despite the fact that African countries and other developing countries have health services in place to cater for the health needs of the population, the coverage of these services is still wanting (Kale, 1995). In Kenya, the health services are available to most of the Kenyans with coverage of about 65 per cent (KMOH, 2009). Empirical data indicates that patients continue to use both traditional medicine and modern medicine concurrently (Edward, 2011, Stanifer et al., 2015, Rutebemberwa et al., 2013, Chege et al., 2015).

Among the main reasons for the use of traditional medicine being first choice for the majority of people include: it is affordable for the user (can still pay in instalments) or use 'barter trade', acceptability to the community and to the individual users, and it is free of side effects compared to the biomedicine drugs (Goudge et al., 2009, Rutebemberwa et al., 2013, Sato, 2012c). There is sufficient evidence to show that more than 80 per cent of patients with chronic diseases still utilise alternative medicine or Complementary Alternative Medicine (CAM) for prevention, treatment and health maintenance purposes (Kristoffersen et al., 2008, Thorne et al., 2002, Woo and Cho, 2012).

Recognition of traditional medicine by the WHO during the *Beijing Declaration* opens doors for integration at some levels with modern medicine (WHO, 2008a). The safety and efficacy of herbal medicine and the over-sensitisation and attention CAM has received in the media and publications can be fatal to some patients and helpful to others. Thus, urgent regulation of CAM use among diabetes and hypertensive patients needs attention through patient education, communication with the providers/disclosure of use and constant patient follow-up (NCAPD, 2008).

2.22 Nursing Theories Applicable to Chronic Care in Primary Health Care

Nursing as a profession is dynamic as it keeps on changing, based on the needs of the population served. With the onset of chronic conditions, nurses need to be in tune with the changing care needs in the community (Meleis, 2011). Nursing theories provide a framework to guide the practice of nursing and create experts who create new knowledge in the field of nursing (Chinn and Kramer, 2008b). Community health nursing, which is concerned with the care of the entire community in life circles, is concerned with provision of comprehensive

health services within the context of the community. Community nursing with all its components is, from the client to the nurse, offering community services (van Wyk, 2011).

Central to nursing conceptual/theoretical frameworks are four related concepts: the nursing, health, society and environment and the person (Chinn and Kramer, 2008b). These four concepts are also referred to as meta-paradigms.

The Nursing: This is the helping process; characteristics and attributes of the person giving care. It is agreed that the helping process and actions do not differentiate nursing from the other health-related professions (medical professions). However, the interpersonal nature of nursing distinguishes it from medicine which focuses on surgical and pharmacological interventions, with interpersonal interaction being secondary to the intervention (Chinn and Kramer, 2008b). For effective patient care and follow up, especially in the PHC setting, the nursing concept is crucial. The patient-nurse interaction and nurse led interventions have been found to be effective and valuable in chronic care (Bergh et al., 2012, Blank et al., 2013, Fairall et al., 2012).

Nursing is a profession which concentrates on and evaluates the patient or clients in different ways compared to the medical profession and the traditional systems of care.

The Person: The person who receives care from nursing; may be the individual, family members, community or a group of people. The most philosophical component of the person is the dimension of wholeness or holism, the person, even when sick, should be treated as a whole not in parts.

Society and Environment: This refers to all the internal and external conditions; circumstances influencing or affecting a person's health.

Health: This refers to the degree of wellness or illness experienced by the person; health is the goal of nursing care and it is not merely the absence of illness, but is a dynamic process that changes with time and varies with life circumstances or the environment. Nurses need to focus on the totality of a person's situation rather than on typical parameters known as health.

2.22.1 Neuman's Systems Model (1970)

The Neuman's Systems Model was first published in the year 1970, with an aim of helping graduate students to consider patients' needs in an holistic manner (Neuman and Fawcett, 2002). Neuman's philosophy of nursing is based on "helping others live". According to George (2010), Neuman's Systems Model is a synthesis of systems thinking and holism, which provides a comprehensive system approach for wellness-focused nursing care. It is based on open system theory and allows interaction between the person and the environment.

The goal of nursing is to assist the client to achieve system stability through the attainment, retention and maintenance of optimum health. The nurse accordingly creates the connection between the client, the environment, health and nursing which leads to system stability; this can be done through primary prevention, secondary prevention or tertiary prevention interventions (George, 2010, Alligood, 2010).

2.22.1.1 Components of Neuman's Systems Model

Stressors can influence a client's system stability in three different ways:

Intrapersonal: These are stressors which occur within the client's system boundary; an example is hypertension caused by atherosclerosis.

Interpersonal: These occur outside the body boundaries, but are proximal to the system. A good example is the client's caregiver's perception of the patient's condition, the role of the client and friends' relationship.

Extrapersonal: These are stressors that occur distally to the client's physical boundary. These may include community resources, financial status and unemployment. All these stressors may affect an individual client and this requires observation of behaviours in any nursing situation.

The model supports the use of the nursing process during service delivery to various patients in different settings, particularly acute settings. Nevertheless, community and primary care settings create a scenario for the system model, to ensure continuity of care for chronic conditions. The nursing role is to determine the client's perception of his or her condition, after doing an holistic comprehensive assessment of the client, taking note of actual and potential stressors, client variables and boundary impact (Alligood, 2010). The nurse using *Neuman's Systems Model* must first determine her own perception and the perception of the client towards the same situation. The misunderstanding of the perception between the nurse and the client, can affect the client's stability and optimal outcome (Alligood, 2010). The misconception of the perception normally leads to fragmentation of care especially among chronic comorbid patients with diverse health needs, like diabetic patients on the use of insulin and daily injections.

Lastly, the client's system is made up of two lines of defense against the three types of stressors; they are protective means, to try and stabilise the client's system and to restore or maintain wellness, while utilising the support which could be from both external and internal resources which in turn defend the client against illnesses (van Wyk, 2011). These lines of defense, according to (George, 2010), are lines of resistance which protect the basic structure,

and they are activated when the normal line of defense is invaded by environmental stressors. The normal line of defense represents stability over time. Considered to be the usual level of stability for the system or the normal wellness state, it forms the normal response to stimulus that form a protective inner boundary (van Wyk, 2011). It also represents the system's internal and physiological resistance to stressors. The flexible line of defense, it comprises all the factors that protect the person from stressors and help to prevent these stressors from affecting wellness by penetrating the normal line of defense. Examples include family support and immunization. The flexible line is dynamic and not stable and can be altered over a relatively short period by factors such as lack of adequate nutrition and lack of sleep. Thus nursing action is necessary for the client's system to be stable through regaining the stable state, through energy conservation and use of internal and external resources (George, 2010). Nursing actions such as education, reinforcement about nutrition, exercise and medication, are just a few examples of how nurses' roles are required in the care of patients with chronic illness, even outside of the hospital. *Neuman's Systems Model* encompasses the three levels of disease prevention: primary prevention, secondary and tertiary levels of prevention. Health systems must take into consideration the psychological, physiological, socio-cultural, developmental and spiritual variables, which are always in constant interaction to affect the health of an individual (Neuman and Fawcett, 2002, Alligood, 2010).

2.22.1.2 Application of Neuman's Systems Model in Primary Health Care

Primary health care and community health nursing provides health services in the client's daily environment. This environment creates a partnership between the nurse and the client. The partnership provides the opportunity for intensive assessment and selection of appropriate interventions for the patient (van Wyk, 2011). For professionalism to be put into action, the nurse will use her knowledge and philosophical assumptions on the client to develop a diagnosis, interventions and goals to prevent further invasions (Neuman and Fawcett, 2002). This is achievable through the use of the nursing process, which includes the rationale for any action taken by the practice nurse (Alligood, 2010).

2.22.2. *King's Theory of Goal Attainment (1981)*

King Imogene's Theory of Goal Attainment started in the mid-1960s from a conceptual framework. King proposed that knowledge of nursing resulted from the systematic use and validation of knowledge about the concepts relevant to nursing situations. The use of knowledge in critical thinking resulted in decisions that are implemented in professional

nursing practices (Alligood, 2010). These central concepts to nursing knowledge are the social systems, health and interpersonal relationships (King, 1981). King's concepts were organised around individuals as personal systems, small groups as interpersonal systems and larger social systems as community and school. King's theory was published in 1981 as a middle-range theory with limited scope, but was precise and discipline-specific (van Wyk, 2011).

Goal Attainment Theory specifically addresses how nurses interact with patients to achieve health goals; the theory is based on several concepts: perception, communication, interaction, transaction, self-role and decision-making. According to King, these concepts represent the essence of nursing. Later on King added and redefined other concepts like space, to mean the personal space, and stress, to include stressors. Later on the concept of learning and coping were added to the original concepts to make the Theory of Goal Attainment complete and to see the whole world as a community receiving the nursing services of caring (King, 1996). From literature and review of this theory a lot has been done by many other authors in the field of nursing and other related disciplines (Frey et al., 2002, Messmer, 2006). The theory presents an important theoretical structure for theory development and theory-based practice (Alligood, 2010).

According to King (1981), for a person's goal to be achieved, the person must continuously interact with the environment and others in the system. The interaction can be between patients, family members, friends, other health professionals, clergy, community members, nurses and others not involved directly in the system of an individual (Alligood, 2010). Goal attainment is achievable with properly defined personal perceptions towards the situation of concern. According to King (1981), defining self, time, body image and personal space are essential for nurses and patients in the community setting. In summary the goal of nursing is to promote, maintain and restore the health of the sick or injured and to care for the dying. Interaction must take place between the patient and the nurse, and the nurse's perceptions must be identified; communication and interaction are essential elements of transaction which facilitate goal attainment (Alligood, 2010).

2.22.2.1 Application of King's Theory to Primary Health Care

King's Theory of Goal Attainment is a practical guide to the nursing practice particularly in community nursing. Nursing as a profession cannot work in seclusion; it calls for a multidisciplinary team, to work, with the goal of promoting, maintaining and restoring health. Nursing services need to work in a system where personal, interpersonal and social systems

interact with an aim of delivering quality health care to patients and their families (Alligood, 2010). According to Murray and Baier,(1996) goal attainment is very relevant in chronic care; interaction between different systems in the process is very important, especially for patients and nurses in PHC (Murray and Baier, 1996). Patients need to set personal goals to reach the recommended blood pressure, lipids and blood glucose levels (Bodenheimer and Handley, 2009) and patients need to set short-term and long-term goals for their care, which are motivating factors.

Further, in the community, the three concepts must interact with other related systems in the community like the education system, health systems and cultural systems, just to mention a few (Liddy et al., 2013).

According to King, the process of goal attainment includes:

Transaction: Which involves bargaining, negotiating and social exchange; transaction is an observable human behaviour interacting within their environment. It makes sense towards gaining knowledge, to be used to deliver service to the patient or community. Each multidisciplinary team has specific knowledge and experience towards managing the client or family (Bousquet et al., 2011, George, 2010). The transaction process is important when setting goals for blood glucose levels and blood pressure for patients.

Establishing and Maintaining Professional Relationships: This is the process of passing information from one member to another or from one department to another through interaction. It allows the process of goal setting and decision-making to take place. At the same time, professional relationships are important when a team approach is required to handle a situation in an organization; respect and mutual understanding among partners and respect for professional views of another person are crucial in goal setting and goal attainment. In community nursing, the nurse and other health professionals, interact with the patient as a partner during goal setting, planning and intervention and the implementation process in goal attainment (Alligood, 2010).

Perceptions: The process of gathering, organising, interpreting and transforming information regarding the patient's health (King, 1981). This process can be achieved through the use of the nursing process, to gather information from the client as the centre of focus in nursing care. Perceptions of both the patient and the nurse are all essential in goal attainment.

Goal Attainment: The nurse is responsible for the use of the nursing process, and sharing important information with other team members from other disciplines involved in the care of chronic conditions at primary care levels and even with the family members. The community nurse is the leader in the process of setting and achieving common goals in the team

(Lekuobou et al., 2010, Gaziano et al., 2014) as has been shown in primary care interventions. The nursing process should be used to continuously re-evaluate the nursing actions, with an aim of improving the quality of life, increasing the goal attainment and improving the nursing practice (Alligood, 2010). The theory has been used in different areas of nursing practice especially in chronic care conditions, as a conceptual framework and as a guiding theory in practice.

2.23 Roles of Community Nursing Care and Practices in Chronic Care

From various nursing philosophies, theories and models are used in the practice of helping others meet their health goals. Nursing has been defined based on the function the nurses fulfil in their profession. Knowledge development in nursing has been an onward and ongoing process for the nurses and the health care systems (Alligood, 2010). The concept of nursing knowledge development is embedded in four major areas as highlighted by (Chinn and Kramer, 2008b), and these concepts influence the practice of nursing in any setting and among patients with varied diagnoses. The concepts or patterns of knowledge development include empirical knowledge which is concerned mostly with empiric knowing and research in the area of practice, personal knowledge, of what nurses' experience and the awareness nurses have about nursing. The researcher has concluded that it is through self-awareness that nurses can understand and know others. Complete self-awareness in the context of interaction elicits meaningful shared human experiences. Hence without self-awareness, the idea of the therapeutic use of self in nursing will not be possible (Chinn and Kramer, 2008b).

The third component of nursing knowledge development is the art of nursing. According to Chinn and Kramer (2008), the aesthetics are important as this involves an appreciation of meaning of a situation and calls for inner resources that transform experience into what is not yet real (Chinn and Kramer, 2008b). It involves the art of going deeper to find meaning in a situation or moment, to connect with human experiences that are unique for each person, for example, sickness with a chronic disease, recovery process or even death (Chinn and Kramer, 2008b).

The ethics or moral component of nursing is a matter of obligation for all nurses. The code of ethics of practice encompasses more than knowledge of norms or conduct in a particular setting. Ethics is continuous judgment from moment to moment about what ought to be done, what is good and what is right and what is responsible, when caring for patients, families and the community as nurses (Chinn and Kramer, 2008b).

Lastly, the freedom of knowing allows human beings to be aware of their capacity for knowledge and to critically reflect upon the social, cultural and political status. According to Charmaz (2006), knowledge provides ways of reducing inequalities and injustice especially in nursing practice. This author further argues that the emancipator of nursing praxis should be integrated, because action and reflection on true praxis must be grounded in all-knowing patterns to be effective (Charmaz, 2006). It is through integration that nursing praxis will produce changes intended to benefit the entire community (Chinn and Kramer, 2008b).

The aforementioned concepts lead to the review of the roles of community health nursing and the practice of nursing in the community setting. Similarly the practice of nursing is seen as the therapeutic role of the nurse to the patients, family or group and/or community (van Wyk, 2011). According to Meleis (2007), for the nurse to care for the patients in a particular situation, they must uncover the experiences of individuals within the context of their significant others. Nurses must always endeavour to uncover the meanings attached to the experiences of patients within a particular society or community, and further consider the facilitating forces that help or hinder individuals from achieving quality health, preventing risk factors and self-managing during chronic care.

Community health nurses have diverse roles and functions in their practices in the community; these roles and functions have been summarised by as they are applied in community health care practices applicable to this study, and are the roles of nurse educators, care providers, counsellors, change agents, liaison nurses, collaborators and referral resource persons. Literature refers to nurses' roles in different settings in the care of chronically ill patients (Gilbert, 1997) such as nurses working with pharmacists, (Kengne et al., 2009) in PHC settings etc. (Mutea and Baker, 2008).

When these roles are put into practice, chronic comorbid conditions like diabetes and hypertension among others can effectively be managed in PHC settings with limited resources.

2.24 Summary of Chapter Two

This chapter has highlighted the health systems under which chronic comorbid conditions are managed. Routinely, chronic conditions are managed in secondary and tertiary health facilities, but with the proposed integration into PHC levels. Literature on what has worked mostly in developing countries towards integration of chronic diseases into primary care was reviewed, as well as the management strategies available for managing comorbid diabetes and hypertension, where most patients in health care systems in both developed and

developing countries are sub-optimally managed and the neither the blood glucose nor the blood pressure is controlled. Complications of the chronic care and challenges faced in the management of diabetes and hypertension in developing countries including Kenya have been reviewed from studies from the region. However, decentralisation of chronic care to PHC may be the solution that needs to be considered in most developing countries. This should be put into effect through the use of context-developed interventions applicable to the care users and the community as a whole.

Several internationally and nationally proposed and used intervention models were reviewed, including the nursing theoretical frameworks applicable to community health care which were reviewed to back up the impeccable roles nurses play in chronic care and general provision of health care to the population.

The next chapter presents the methods and the methodological process used in the study, the research paradigm and design guiding the study, the ethical considerations and the instruments used to collect data, towards the development of a context-informed model of management of comorbid diabetes and hypertension in PHC settings in Kenya.

CHAPTER THREE

RESEARCH METHODOLOGY

3.0 Introduction

Research methodology entails the process and strategies included in the collection of data, data analysis and presentation of research findings. This section highlights the research paradigm, research design, and research approach, gaining entry into the study setting, data collection process and data analysis process. In summary, this section highlights the step-by-step details of what occurred in the field before, during and after data collection.

3.1 Research Paradigm and Design

A Qualitative focused ethnographic methodology was adopted in this study. According to Fetterman (2010), ethnography provides a comprehensive design for uncovering ways people attach meanings to their world, interpret their lived experiences, change their behaviour and practices within a socio-cultural context as was the case with the health care system and patients' experiences with comorbid diabetes and hypertension conditions. Focused ethnography is a qualitative research designed for use by nurses, anthropologists and other social scientists to understand the cultural organization of the health care system and in the current management of chronic comorbid diabetes and hypertension. This qualitative ethnographic approach allows for the in-depth discovery of meanings and realities of the study phenomena, which is achieved through interaction between the researcher and informants, and the informants, and their social environment (Creswell, 2012, Lincoln et al., 2011). Fetterman (2010) further points out that human knowledge is dynamic and needs to be constructed and interpreted as people interact with each other to create meaning in the social system, an aspect that Morse had earlier conceptualized (Morse, 1989, Fetterman, 2010).

The philosophical underpinning of the study is based on 'Interpretivism' or what others refer to as Constructivism, which determines the design or framework of data collection, analysis and even interpretation of the results emanating from specific data (Creswell, 2012). It is the view that knowledge is constructed through the interaction between the researcher and informants or the individual with their environment which later is observed by the ethnographer in their natural environment without any interruption from the researcher (Hammersley and Atkinson, 2007). Fundamental to this worldview is that reality is subjective

and based on what people think, experience and see in daily activities where they live and work, through interaction the reality is socially constructed through language used between the people, environment and the researcher; (Crotty, 1998, Lincoln et al., 2011). According to Krauss (2005), language is used as a medium to describe reality. Ethnography has its roots in anthropology. It denotes the study of peoples' culture or describing or writing about people in their natural environment; the natural settings can be place of work, hospital, home or community (Sprandley, 1980, Roper and Shapira, 2000). According to Fetterman (2010), culture is a way of life, styles of communication, ways of creating meaning from experiences and behaviour and how to interpret and transmit the socially constructed knowledge to others and within the social group. On the other hand, Sprandley (1980) defines culture as a system of shared beliefs, customs, values, behaviours and historical legacies which are passed down the generation line. Similarly, Leininger (1985) states that culture is a specific type of behaviour, practice and belief which forms the identification mark of a particular group of people in a social context, such as ethnic group, age, profession or work environment. It is through the study of culture of a particular group, that the concept of holism, a special aspect of ethnography, can be realized in the study.

A health care system by itself represents a culture which is unique to itself and the people found in that environment. The working environment of a health facility orients a health professional differently as compared to other professions. In this case the health care professional working in PHC is directly involved in the management of patients with chronic comorbid diabetes and hypertension, and has unique beliefs, practices and customs. Similarly patients form an integral part of the health care system, and have unique experiences, beliefs and practices which are fundamental to this study.

The epistemology essential to ethnography is constructionism, in that it picks out the way the patients with comorbid diabetes and hypertension and the health care providers construct the meaning out of their experiences during the management of these chronic conditions. Further, how policies and scarcity of resources influence their daily working environment and decisions and lastly, how they interpret the whole scenario to make meaning relative to their own lives. According to (Hammersley and Atkinson, 2007), constructionism provides the means to how people construct their social world and interpret it through their words and actions and derive meaning out of it in their world or environment.

Since every person interprets stimuli differently based on their environment, patients with comorbid diabetes and hypertension interpret their experiences and world differently from

how health care workers interpret their experiences when offering health care services to patients and their families within the community. Individual health care workers, for instance nurses, react differently to the same situation as compared to doctors or other cadres in the same health facility or different health facility. Thus the theoretical perspective of this study based on this was symbolic interactionism, as human beings interact with each other and react or interpret the situation differently in the face of the same stimuli, be it in the same environment or in different contexts. Patients with one condition (diabetes) may be feeling lucky as compared to a patient with two or three, conditions which are poorly managed, nurses and other health care providers may not feel the same about a mismanaged patient at the facility.

3.1.1. Ethnography

Ethnography is a qualitative research design which requires spending a prolonged period on time in the field, with specific interest in observing what people do, how they do it and the meaning attached to what they do; watching and listening to what they say and asking questions. Generally, ethnography entails collecting every detail that may contribute to the focus of the study (Hammersley and Atkinson, 2007). Ethnography has its origin in the work of Bronislaw Malinowski in the study of native enterprise in New Guinea in 1922 (Atkinson et al., 2001).

Ethnographic studies are field-oriented (naturalistic), the ethnographer must utilize the field to collect data and to interact with informants in their natural settings and environment (Wolcott, 1999, Spradley, 1980, Fetterman, 1998). It is of great importance to understand the influence culture has on an individual, group, family and health care system as this assists in planning, improving health care service delivery, and it prevents making wrong assumptions about ethnic groups and organizations (Hammersley and Atkinson, 2007, Holloway and Todres, 2006).

Ethnographers immerse themselves in the culture they study, through partial participation in daily activities of the people they study for an extended period of time. They engage in constructive conversations with the people and observe the activities taking place, (Hammersley and Atkinson, 2007, Wolcott, 1999, Whitehead, 2005); these authors recommend active participant observation, during ethnographic studies.

In other words, the ethnographer becomes the principle instrument of data collection. According to Whitehead (2005), ethnography is holistic in nature as a means of understanding cultural systems both in health and in communities; ethnography allows

triangulation of methodological strategies of data collection. According to known ethnographers (Denzin and Lincoln, 2008, Denzin and Lincoln, 2011), ethnography provides both thick and thin descriptions of the phenomena of study. Thick descriptions give full information of the culture and the relationship between the informants and their social interactions within their own context, taking note of details on experiences, feelings and emotional stories. Thin descriptions on the other hand describe the ethnographers' perspective and how they interpret the social context under study as they interact with the informants against the personal backgrounds of both the researcher and the informants (Denzin and Lincoln, 2008). Ethnographers make meaning out of the data collected from informants and interpret it within the study context to provide an holistic understanding of the people under study and derive meaning out of the data collected (Holloway and Todres, 2006). Views from Denzin and Lincoln (2000) assert that ethnographic data needs to be contextualized and analysed theoretically to be able to elicit a true picture of the culture under study; similar views are shared by other authors like (Lambert et al., 2011, Wolcott, 1999) and others.

Over the years ethnography has evolved into three main types of ethnographies, namely critical ethnography, classical ethnography and focused ethnography among others like auto, systematic and ethno nursing ethnographies (Speziale et al., 2011). Although names sound different and focus on different aspects of study, they share common characteristics as ethnographies (Fetterman, 2010). While critical ethnography is based on empowering the oppressed in society and is based on critical theory, classical ethnography is based on the study of the entire culture to understand the way of life of the group under study (Speziale et al., 2011). Focused ethnography has been found by several ethnographers to be context-specific, focusing on specific problems found in specified natural settings which the ethnographer constantly observes to understand the phenomena of study (Higginbottom et al., 2013, Morse et al., 1987).

Leininger (1985) describes focused ethnography as 'particularistic study', with a limited period of time in the field, as compared with the classical studies which require prolonged periods of time in the field. Further, Knoblauch (2005) argues that focused ethnography uses technology to collect data, to substitute for long periods of data collection. Focused ethnography allows for triangulation of multiple data sources, and collection methods to

include checklists, observations and document analysis; all this maintains the quality of the study (Cruz and Higginbottom, 2013, Toscan et al., 2012).

Focused ethnography is realistic, practical in capturing data of significance to health professionals to bring change and improve clinical outcomes in health care settings (Higginbottom et al., 2011), which is supported by the works of (Patton, 1990).

Clinical settings and the health care providers provide an ideal culture of study on the management of non-communicable conditions which require long term care of patients (Speziale et al., 2011).

Despite being problem specific and context sensitive, focused ethnography allows the study to be conducted by one researcher, despite the intensity of data collection and analysis (Muecke, 1994). On the contrary, Whitehead refutes that one researcher cannot maintain validity of the findings (Whitehead, 2005), which have been proven to be achievable despite the huge amount of data collected (Speziale et al., 2011). Subsequently the main goal of ethnography, particularly focused ethnography, is to produce knowledge and to improve health care of the community, something others critique to be unachievable through the use of ethnography, as articulated in (Hammersley and Atkinson, 2007). In response to the claim of knowledge production, Holloway and Wheeler argue that focused ethnography is context-specific and aims to improve the practice of nurses and care outcomes of patients within the community or clinical setting (Holloway and Wheeler, 2013).

3.1.2 Fundamental Characteristics of Ethnography

Ethnography has six characteristics which are central to it. However, three of the six share common ground with other qualitative studies. These characteristics include: fieldwork, focus on culture, cyclic nature of data collection and analysis, cultural immersion and reflexivity. According to Speziale et al. (2011), the three most crucial characteristics unique to ethnography are cultural immersion, focus on culture and flexibility. For the purpose of this study, the researcher was able to immerse herself in the field/culture of study in Nandi County for a period of 10 months of intensive data collection involving interviews, observation and document analysis.

Reflexivity is the tension between the researcher as an ethnographer and the researcher as a member of a specific culture (Speziale et al., 2011). Reflexivity is the measure of the interpretation of the ethnographic validity of the study; without it the study finding would be biased, and I would therefore not be able to arrive at the expected destination of the study. According to Whitehead (2005), reflexivity is about continuing examination and re-

examination on the basis of the ethnographer's interpretations and the potential biases of representations of what has been observed in the field, context and the culture under study. For the purpose of this study reflexivity was maintained through constant writing of field notes, personal memos/journal entries, to guide the researcher's self-awareness during interaction with the participants, since the researcher is the primary tool of data collection in ethnography and other qualitative studies (Hammersley and Atkinson, 2007).

Reflexivity has been conceptualized by other ethnographers such as (Foley, 2002, Hammersley and Atkinson, 2007, Whitehead, 2005). It has been categorized into four major sub-categories which include: confession, theoretical, textual and deconstructive reflexivity. Confessional reflexivity involves the confession of an individual conducting an auto ethnographic enquiry; it deals with personal memories and author's emotions; feelings of anger and sadness are part of the confession (Foley, 2002). Another sub-category is theoretical reflexivity; this is where the ethnographer records in writing everything that he/she observes in the field and the conversation with the participants. Foley (2002) maintains that the ethnographer must put aside their professional experiences and knowledge of the culture of study, prior to going into the field to allow them to put aside the biases about the culture which is being investigated. Textual reflexivity (Foley, 2002), is where documents which normally contain details about the culture under study are reviewed or representation of the data is sought from reference documents like guidelines, policies and other legislative documents. The ethnographer takes time to reflect on these documents for in-depth understanding to eliminate biases.

Deconstructive reflexivity is where the ethnographer writes what was said by the informant or participant in simple language as it was said by the informant in the cultural context. The end result of the narrative is an ethnographic report containing in-text fragmented, single sentences which prompt the reader to make meaning out of it (Kerr, 2014). This is normally achieved through the use of endnotes, visual/verbal images of what was said in a single sentence (Foley, 2002). To eliminate biases and to ensure validity of the data in this study, the researcher has endeavoured to use the three categories of reflexivity, through the use of document analysis, theoretical and deconstructive reflexivity, and has given exact words as spoken by the informant and the researcher's own thoughts in the field as they materialised at that moment.

3.2 Research Approach

A qualitative focused ethnographic approach was used for data collection, while grounded theory was used for data analysis. This was to allow the study to reach its main objective of developing a context-informed model for the management of chronic comorbid conditions in PHC settings. Grounded theory was considered because an enormous amount of data collected needed to be analysed and used to be given meaning, through intense interaction with data, to eliminate unnecessary data and the constant comparative nature of qualitative research, which is more organised in grounded theory; this was one of the attributes to be used in this current study. Focused ethnography was chosen because it gives the ethnographer time to concentrate on the observable practices of both patients and health care providers in the health care facility and further through theoretical sampling extended to patients in their homes as the most preferred context of self-management and lived experiences (Higginbottom et al., 2013).

Focused ethnography was relevant as it allows collection of observable practices in a group and documents the “emic perspective or thick description” (Hammersley and Atkinson, 2007) of the informants and study environment without being disturbed by the ethnographer. On the same note, focused ethnography allows the researcher to interpret their own interpretation of the practices observed in the field, the “etic perspective or the thin description” (Knoblauch, 2005) of the situation under study. Qualitative focused ethnography was ideal to study the culture of PHC settings in a rural setting, within a limited period of time, and still get valuable information from the field (Fetterman, 2010). In this study the ethnographer was in the field for a period of 10 months of episodic emersion in the field, doing observation of participants, having informal and formal interviews, documenting reviews and focused group discussions. A qualitative approach usually stresses the socially constructed nature of reality, the intimate relationship between the researcher and informants within the study context (Boeije, 2010).

According to Speziale and colleagues (2011), there are various ways of applying triangulation; of significance are design triangulation, methodological triangulation and method triangulation. Further, Hammersley and Atkinson (2007) state that ethnographers need to include all types of data collected through various methods to enrich the data collected. Rich information about a culture creates a comprehensive understanding about the culture, the practices and behaviour of the people under study. An ethnographer approaches the

culture of study through observation of daily practices, behaviour and interaction of human beings and their environment in a naturalistic environment without making any adjustment for the way things are done usually (Hammersley and Atkinson, 2007). A qualitative approach provides means of forming an intimate relationship between the informants and the ethnographer within the study context. Focused ethnography, just like other qualitative designs, allows for triangulation within the study, to gain rich and informative data from the field. Relevant to this study is the fact that data on experiences, beliefs and practices and meanings attached to a phenomenon could not be explored and extracted using a quantitative approach (Weaver and Olson, 2006, Zahran et al., 2012).

Thus, qualitative methods highlight the extent of the existing problems and stimulate interventions/actions which ameliorate the situation and improve outcomes, which are the case of a focused ethnographic study (Haddow et al., 2007, Maxwell and Miller, 2008, Taylor, 2007).

According to Goodson and Vassar, the goal of focused ethnography is to acquire background knowledge necessary to perform the activities in the study questions (Goodson and Vassar, 2011). Ethnographic studies provide solutions to real problems where little documentation exists or where information is missing or not sufficient to bring change or to improve the situation (Averill, 2006, Tacchi et al., 2003, Patton, 1990). In the case of this study, people reacted to different stimuli differently in different contexts. Health care providers reacted differently when giving care to patients with comorbid conditions and so patients affected by comorbid conditions reacted to different stimuli and responded and interpreted their context differently to those with one condition. Noteworthy is the need to develop a context-informed model of managing chronic comorbid diabetes and hypertension in PHC settings including the community, which is derived from data collection in the same context. Ethnography provided the means of arriving at a proper understanding of the beliefs and practices of both patients and health care providers.

3.3 Study Setting

The study was conducted in Nandi County, in the former Rift Valley Province in Kenya. Nandi County is one of 47 such counties. This county has a total population of 752,965 people according to the 2009 census report of the Kenya National Bureau of Statistics (KNBS, 2010). The county headquarters is Kapsabet and there are several townships, namely Nandi-Hills Township, Mosoriot, Kaptumo, Lessos and Tinderet, among others. A district

hospital or sub-county hospital forms the primary referral point (county referral hospital or county hospital) for the community and to some patients as the first entry point into the health care system. Nandi County has a total of 56 health facilities: one county referral hospital, five county hospitals, nine health centres, 45 dispensaries and the County has a doctor to patient ratio in the whole county of 1:80,000 (KNBS, 2010). The region has a poverty level of 47.4 per cent, with an urbanisation rate of 13.6 per cent as per the 2009 census report. The county hospitals are categorised as level four (4) facilities and offer medical, surgical inpatient services, general practice outpatients services, specialised clinics (diabetic clinic, surgical), maternal and child health services; the hospitals also offer rehabilitation services to patients. The county referral hospital has a diabetic clinic which operates every Monday for diabetic patients and any other chronic medical condition. The district hospitals receive patients from a vast population either as referrals from primary care facilities or self-referrals direct from home or first entry from home. Nandi County is further divided into four (4) sub-counties namely: Nandi South, Nandi Central, Nandi East, Nandi North and Tinderet, which is further subdivided into six(6) constituencies namely: Mosop, Emgwen, Aldai, Tinderet Nandi Hills and Chesumei (Figure 2 below shows the map of Nandi County).

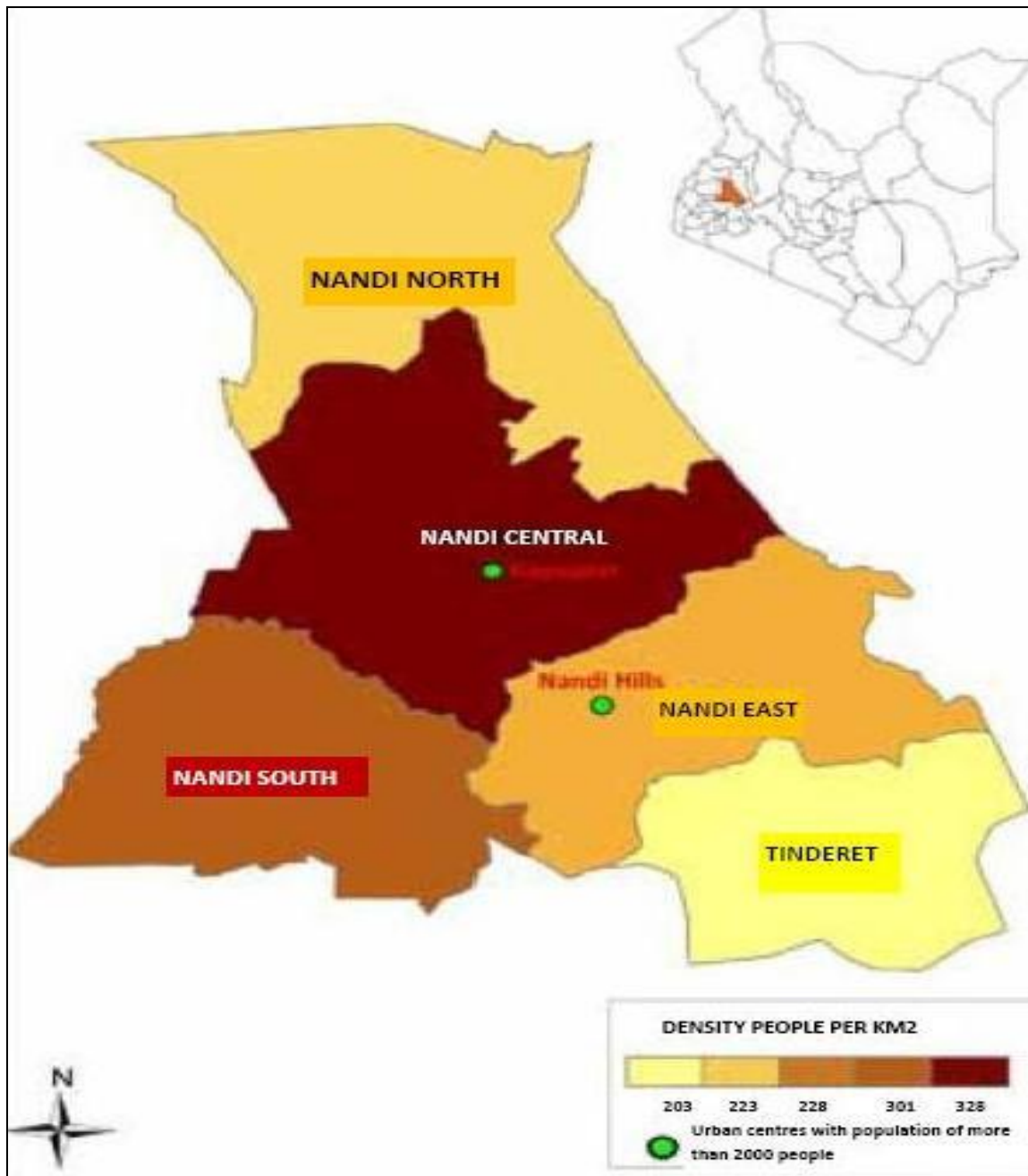


Figure 3: The map of Nandi County in Kenya: Adopted from Kenya Mpya, 2012.

Focused ethnography studies are context-sensitive; the setting should be accessible to the ethnographer and should contain relevant informants who can give relevant information towards discovering the meaning attached to the phenomena of study (Averill, 2006, Fetterman, 2010, Knoblauch, 2005, Speziale et al., 2011).

Nandi County is accessible to the ethnographer, further, as one of the 47 counties in Kenya, it has one of its health priority aims to improve chronic care with only two diabetic clinics in

the county (Knoblauch, 2005). The study forms part of the implementation of the health policy in Kenya on NCDs management at county level (Turin, 2010).

Table 1: Sites of data collection in Nandi County

Facility	Sub-County	Level of service	Supported by
KPDC	Nandi Central	County hospital	County government
KILB	Nandi Central	Health centre	County government
MOS CDM	Nandi North	Health centre	County government
KAPT	Nandi South	Sub-district	County government
CHEM	Nandi Central	Dispensary	County government
MITEI	Tinderet	Sub-district	County government
NAHI	Nandi East	County hospital	County government

Participating facilities in the study all are supported by the County government in different levels of operation. The table above shows the participating health facility in this study.

The participating facilities were included in the study mostly because they are all in the region falling inside Nandi County, where this study took place. Secondly, some of these facilities have the capacity to manage chronic diabetes and hypertension. Last but not least these facilities were easily accessible to the majority of the population as they are all located near the main roads, where patients can easily access them even at night in case of emergency. However others were selected because they are the only facilities offering diabetic/chronic disease management and have health care workers trained towards the same.

3.3.1 Description of the Participating Facilities

Facility 1/KPDC

This facility is in Nandi County headquarters, and has been the district hospital in Nandi Central, but was upgraded to a county referral hospital in 2013. Since 2006 the facility has had a diabetic clinic which has been operating on and off, but now has stabilised. The facility also has medical officers; although not specialised in chronic diseases, they are the ones who review patients. The facility also has Medical Outpatient Clinics and Surgical Outpatient Clinics (MOPC and SOPC). It also has nutritionists trained for diet counselling of patients on diet and follow-up at the clinic twice a month. There is also a support group for patients who come as far as from neighbouring counties.

Facility 2 /KILB

This facility is categorised as a health centre, it is situated outside the urban settings, but is under the leadership of a clinical office and has three nurses trained to a diploma level; they have an old ambulance caravan, but have no driver assigned to them. The structures in this facility can accommodate a good number of patients. It has a very strong HIV outpatient follow up clinic, a working laboratory and pharmacy. Other patients go to this facility for review and refills of medicines.

Facility 3/MOSO

This facility has been a provincial rural training health centre for years, and has been training students in rural experience and community health experiences. It has been the centre for HIV/AIDS in this division for years, under Academic Model of Providing Access to Healthcare (AMPATH). The facility has an integrated Chronic Diseases Management (CDM), where patients with HIV and other chronic conditions are seen together at the same facility, and they have a revolving pharmacy where patients with diabetes and hypertension can buy drugs at a subsidised price. Physicians go to review all patients once a week especially for HIV/AIDS or patients can be referred to a level 5 regional hospital for comprehensive review.

Facility 4/KAPT

This facility has been on the level of a health centre, but was upgraded to sub-county hospital in 2014, with the devolved government. It is under the headship of a medical officer, two clinical officers, several nurses and a nursing officer in charge of nursing services. They have community medical insurance cover for local tea farmers, which is run privately and the NHIF medical scheme by the other general population. At the time of this study, the diabetic clinic in this facility had not been running, although it had been there for some time. There were plans to start it all over again. The researcher decided to follow-up with the administration of the facility for the records of the diabetic and hypertensive patients, but to no avail. This forced the researcher to terminate the data collection at this facility.

Actually we have been having the clinic every Wednesday during the week, but we have had challenges since our doctor was transferred to the County. So we stopped booking patients for review, but those who come will be seen by the clinician who is around until we start booking them again. Now that we have a new doctor, patients will be seen as usual (Ethnographer's Journal, 13th October 2014).

Facility5/CHEM

This is a level 2 facility in Nandi County. The area has a catchment population of 10,722 and in a day this facility can receive between 35 to 40 adult patients or even more if children are added. The facility has a laboratory with a capacity to do basic lab tests and even random blood sugars for diabetics. However according to the nurse in-charge of this facility they have the capacity, but are not empowered to do the management. She said they don't have the community units at the facility, but the Mission facility had community units which serviced follow-up patients in the community. She noted:

We have the capacity to manage and follow-up patients and refer those with complications, but we are currently not empowered to do that in that I am the only nurse here, I have one lab technician and one nurse aid that is not paid regularly. If supplies for the lab come in good time we can offer these services. For now all I do is take blood pressure and refer to the county hospital. (Facility 5, November 2014).

Facility 6/MITEI

The facility is located almost 100km away from the county referral hospital, but it serves communities in the mountainous areas of Nandi County. The facility was upgraded to sub-county hospital in 2014 from a health centre; amenities are still being put in place for the sub-county. It has medical officers and nurses, ambulances and offers all services for that level. In a summary of the situation on diabetes and hypertension among other chronic conditions, the medical officer in charge of the facility said:

Patients are dying because of poverty and lack of follow-up, many patients default and not out of their wish, but simply they cannot afford their treatment nor have no means of following up and being helped.”(Facility 6, March 2015).

Facility 7/NAHI

This facility has for long served as a district hospital and also serves a large population of people working in the tea estates and poor mountainous areas. It has always had medical officers as in charge, but still the diabetic clinic is not routinely run and they still refer patients and do no follow-ups for patients. At the time of data collection, this facility did not have a diabetic clinic; people were being seen as general patients. The researcher felt the facility was not going to be of significance to the study and the management of comorbid diabetes and hypertension. It became impossible to secure an appointment with the contact person in this facility as she always told the researcher this in telephone conversation. The researcher terminated data collection at this facility

“I am really sorry about our meetings, but I will try and get someone, and give her your number and she will contact you when you can come and meet here.”

I felt frustrated about all this, but I waited for the call from the unknown person...which never came..... (Ethnographer’s Journal, 5th March 2015)

3.3.1 Gaining Entry to the Study Setting

Ethnographic studies have six unique characteristics or methods of data collection and one of the main characteristics is the fieldwork. According to Speziale and colleagues (2011), there is no ethnography without the researcher going for the field work. Among the many aspects of fieldwork is gaining entry to the study setting. In this study letters of intention to conduct research within the county health systems on the management of chronic comorbid diabetes and hypertension were written and sent to specific facilities and the researcher followed-up through mobile calls to respective heads of facilities for approval and any assistance. One of the approvals from the county referral hospital is attached (See Appendix 10). Other stakeholders within the county were also contacted once ethical approval for the study was secured from the *University of KwaZulu-Natal* and *National Commission for Science, Technology and Innovations* (See Appendices 15, 16 and 17). Institutions considered as gatekeepers to the Ministry of Health and within the county are indicated in the *Ministry of Health in Kenya* (KMOH, 2006). Gaining entry into the field is a major step during ethnographic studies, to allow smooth research process without any technical or administrative setbacks. Other ethnographers have indicated, that it should be done, through the use of gate keepers to access the participants (Addington-Hall et al., 2007, Averill, 2006, Fetterman, 1998, Savage, 2006).

During the researcher’s first visit in the field, especially during clinic days, the patients and health care workers were more comfortable with the researcher being around when she had a white lab coat, and no name tag was required as all other health providers in most health facilities did not have any. This assists to reduce marginalization and managerial impression among the informants (Speziale et al., 2011). In all other visits to rural health facilities consent was given verbally, despite sending written letters.

3.4 Study Population

According to Fetterman (2010), in focused ethnography studies, the study population should be individuals who can provide relevant information towards achieving the purpose of the study phenomena (Fetterman, 2010, Knoblauch, 2005). In this study the target population

included all health facilities in Nandi County starting from the county referral hospital's diabetic clinic to community units (Levels 1-4), different cadres of health care workers (providers) within the county that included medical officers (MO), clinical officers (CO), nutritionists, public health officers or technicians (PHO or PHT), community health workers (CHWs) and traditional medicine practitioners (TMP where necessary). Importantly, patients with comorbid diabetes and hypertension were included in the population as informants and not as research subjects (Roper and Shapira, 2000). People with comorbid diabetes and hypertension have rich information on their experiences of the conditions and how they manage themselves, and the services they get from health personnel.

3.5 Sampling and Sample Size

Non-probability sampling criteria were used to determine the study sample. In qualitative studies, particularly ethnography, participants are those with rich information on the phenomena of study either through experience or technical know-how (Higginbottom et al., 2011). There is a common agreement on the use of purposive sampling in qualitative studies, in that purposive sampling when used strategically attains the sample required for the study (Hammersley and Atkinson, 2007, Lambert et al., 2011, Roper and Shapira, 2000). Although the researcher had planned earlier to use a specific number of facilities for this study, the reality in the field changed and she had to adjust to suit the situation in the field and the available study population. One diabetic clinic existed in the whole county and it was necessary for the researcher to include it in the study because it had the information which responded to the study questions. According to Patton (1990), purposive sampling occurs where the study phenomena is available at the time of the study.

Other facilities were purposively selected based on the levels or tiers in the Ministry of Health; one rural health centre was also selected because of its strategic arrangements with the AMPATH to provide Chronic Disease Management (CDM) and its initiation of integrating CDM and HIV/AIDS management in the same facility. Although other facilities were selected to participate in the study, they did not have any peculiar roles in the management of the comorbid diabetes and hypertension; through the use of theoretical sampling, they have important information on the management of diabetes and hypertension as health centres in level 2 and 3. Although not all regions in the county have community unit (level 1) services, the researcher was able to theoretically sample the areas in the facility which had active community units to participate in the study (Ritchie and Lewis, 2003). Individual participants in the study were sampled based on their roles in the health facilities

where they work. The clinicians, nurses, nutritionist, pharmacists, records, laboratory and CHWs all have important roles which they play in the management of comorbid diabetes and hypertension.

To be precise, a total of five health facilities took part in the study out of a total of seven which had earlier been selected to participate; the two facilities were excluded from the study due to lack of cooperation between responsible people coordinating diabetes and hypertension in the facility, and the other had stopped booking patients for check-ups due to lack of health personnel.

At the moment we don't have the clinic running, as our medical officer was transferred to the county referral hospital and we have a new one who is still settling in, so we have not booked the patients for a while now.Nursing officer, 8th October 2014

Interviews were conducted individually with the informant at the most convenient place for the informant and not the researcher. Patients were interviewed at their homes, where they seemed to be comfortable. On the other hand health care providers were interviewed at their place of work or just within the facility or offices, based on their own preferences.

3.5.1 Selection of Study Timing

During the data collection period, it was necessary for the researcher to have specific time for going to the field, which fitted in with the informants' free time, time when the facilities were open for daily business, where the researcher could observe the activities of the day, listen to their conversation and take part in some of the daily activities in the health centre. The time was varied and differed from one facility to another. In the diabetic clinic/facility 1, it was agreed with the administrator of the clinic that the researcher would go in on clinic days, normally organised on the first Thursday of the month and last Thursday of the month, from 9am to 3pm each month in a specific room within the hospital. Facility 3 held its CDM clinic on Friday from 9am to 4pm weekly, although patients who really needed to be seen could go any day of the week except Sunday. The other facilities did not have specific days for the clinic, so the most appropriate time was arranged on the phone with whoever was in charge. Individual patients who consented to participate in the study selected their most available day for the interviews at their home.

3.5.2 Selection of Informants

Informants are people who live and work within the context of the study. Consequently they are people who are knowledgeable about the context of study and who have gone through the experience of the study phenomena. The informants must be people who know the context of the study well, an area in which the ethnographer does not know what is going on (Sprandley, 1980). Informants must have information relevant to the study and be willing to share the information with the ethnographer, during their interaction in the field (Hammersley and Atkinson, 2007). According to LeCompte and Schensul (2010), health care providers have unique cultures, beliefs, values and experiences within the health profession and the health care facility work environment. In this study informants who participated were patients/clients who had lived with comorbid diabetes and hypertension for over one year and were on treatment for the two conditions. These were key informants in the sense that they had rich experience in the management of their conditions, individually, as family and even with the health care providers.

Health care providers were key informants as, on a daily basis, they spend time with patients both in in-patient and out-patient care. These professionals included those working in the Ministry of Health, although in different cadres and levels of health care, mainly nurses, clinical officers, doctors, pharmacist/technicians, laboratory officers/technologist, a nutritionist a records officer, and lastly, CHWs/volunteers who serve in level 1 community units and in households. The process of management of chronic comorbid conditions requires team work, as individual practitioners cannot manage the conditions properly.

3.6 Data Collection Instruments

Data collection during this study started early, right from the time of seeking permission from health facilities and this was done mainly through observation. Observation allows you to see, listen and ask questions concerning what you have observed (Denscombe, 2007). In focused ethnography data collection is semi-participatory as the ethnographer has to be involved in some activities and concurrently collects data by recording or observing events as they unfold in the field. The researcher always remains the main instrument for data collection through observing and interviewing informants throughout the study (Speziale et al., 2011). Further data collection in qualitative studies employed multiple approaches to data collection. These multiple approaches enhanced the reliability of results from the study process (Lambert et al., 2011, Tacchi et al., 2003). Creswell (2012) points out that the process of data collection must have specified limits where the study reaches, thus collecting

information through observation, interviews, document analysis and focus group discussion must be delimited before the study commences, to material that is considered fit for the purpose intended. During this study the following tools/instruments were used to collect data:

3.6.1 Interview Guide

This was a set of pre-set questions to be used during both informal and formal interviews with the health care providers and patients/clients who were receiving care at the facilities under this study. The interview guide contained open-ended questions examining the experience of comorbid diabetes and hypertension, meanings attached to living with the two conditions, provision of care to patients with comorbid conditions, professional experiences and the meaning attached to working in the health facility. The interviews were refined based on what was currently being practiced at the health facilities (see Appendix 1 and 2).

3.6.2 Observation/Checklists Guide

The observation guides contained activities which the ethnographer was observing during the study, for instance, activities of the health providers during patient teaching, teach back, documentation of patients' care and availability of equipment necessary for the care at the facility or in the home setting. According to Fetterman (2010), a check list allows the ethnographer to fill in what is available at the site in the field; it is the easiest form of taking field notes of countable items (See Appendix 3 and 4).

3.6.3 Focus Group Discussion Guide

These were pointers to be discussed with a pre-selected group of informants representing the various facilities in the study population who are believed to have adequate knowledge of the culture of study. The guide was used during discussion and contains areas for discussion after individual interviews with health care provider across care settings. Participants in this group discussion included nurses, clinical officers, public health nurses (managerial levels) and nutritionists from level 1, 2, 3 and 4 health facilities (see Appendix 5).

3.6.4 Documents Analysis Guide

The guide was used to analyse available documents used as references for the management of chronic comorbid diabetes and hypertension at the diabetic clinics, health centres' dispensary and in community health units. Meeting minutes were used when planning further action on the health service provision as well as patient records which give statistics of diabetic or

hypertensive patients receiving care at different health facilities (see Appendix 6). More documents were searched based on their relevance or as a result of being referred to by another document or by informants in the field.

3.7 Data Collection Process

Data collection process commenced once the ethical clearance for the study was secured through the research ethics committees both in South Africa and Kenya. The University of KZN Bio Ethics Committee and the University of Eastern Africa, Baraton Ethics Committee respectively Data collection process in this study was conducted in accordance with steps used in ethnography studies. Data collection starts normally from the time the researcher makes first entry into the field (Fetterman, 1998, Spradley, 1980). The ethnographer utilized multiple methods to collect adequate and reasonable data in the field. For the purpose of this study, the following were utilized throughout the data collection process: observations of the participants, field notes, memos, document analysis, individual interviews and focus group discussions.

3.7.1 Participant Observation

During the data collection process, participant observation was an ongoing process throughout the 10 months the researcher was collecting data. In this study the researcher had episodic visits to the health facilities, during which routine observations were made within different levels of care. This was done in accordance with the focus of ethnography as described by other ethnographers (Higginbottom et al., 2013, Knoblauch, 2005, Tacchi et al., 2003).

The researcher employed active listening to what was being said, asked questions prompted by the conversation, or by observing activities. Although not everything could be observed, observation allowed the researcher to collect rich data, which was further enriched by data collected through interviews and document analysis. In this study, observation came in handy as health care providers handled a great number of patients in a day, so their activities could only be observed by the researcher, who also undertook active listening to their conversations during consultation, as well as observed patient teaching of diabetic patients.

Noteworthy was that the whole process was followed right from home to the clinic, and recorded through field notes: The researcher observed patient registration at the records offices, by the records officer, the taking of the vital signs at the outpatient section, and

mainly the blood pressure that was taken when the blood pressure machine was available. It was necessary for all patients with diabetes to proceed to the laboratory for their random blood glucose level to be checked. The time for issuing results was varied according to the level of the facility and by the number of other clients in need of the services. However, waiting time for the laboratory results was 15 minutes at most. From the laboratory, patients either went to the support group for health education (diabetic clinic only), or went to be reviewed by the clinician before they went for their medicine refills or new prescriptions from the pharmacy and made payment for the service rendered, especially at the county hospital, as at other levels of care, services were offered free of charge.

However during the observation phase not every activity was noted down, only ones significant to the study were recorded. As an ethnographer and as the primary tool for data collection, the researcher wrote down her own reflective notes about the day and the activities observed at the end of the each day in the field, to keep track of the data collection process, with date, location and time. Some informants who were patients consented to being interviewed in their homes, for their own comfort and privacy. The researcher had to schedule visitation dates with informants, based on the times most suitable for them. At home, the observations and taking of field notes continued to enrich the data from interviews. At home the following were observed: meal preparations and servings, home environment, insulin storages/presence of a fridge or improvised means, other drugs used, self-monitoring devices, recording of readings and family involvement in the care.

In this study, based on the context, the ethnographer was a participant-observer especially at the diabetic clinic where patient numbers were overwhelming. According to (Sprandley, 1980), the participant-observer gives the ethnographer the opportunity to observe activities which an observer can hardly see. It also reduced tension among those being observed by the researcher. Participant observation and participation allowed the ethnographer to identify what was real and ideal, while considering the socio-cultural context of the people being observed (Whitehead, 2005). The researcher became participant-observer only at the diabetic clinic, as there was a shortage of staff, and also to gain access to the patients in the support group attending the clinics.

3.7.2 Interviews

Interviews are a conversation between two or more people, with a goal to be achieved after the conversation. Interviews create space for the informant to speak out about their

experiences and meanings attached to living with comorbid diabetes and hypertension. On the other hand, health care providers talked about their personal and professional experiences on the management of chronic comorbid conditions at their current work stations.

During the interviews, open-ended questions were used for in-depth interviews with patients and health care workers across the three levels of care in PHC. Interviews were conducted in a naturalistic setting of both the clients and health care workers; for patients their preferences determined the venue for the interview (most of them preferring their homes). Initially, the plans were for interviews to last for 30 to 60 minutes, but the reality of the situation changed especially at patients' homes, as some were prolonged to around two hours. At the informants' homes and the homes of some health care providers, interviews were very informal, due to unavoidable interruptions from family members or colleagues. Interviews can be either informal or formal based on the situation of the informants' context and the type of informants to be interviewed (Higginbottom et al., 2013, Knoblauch, 2005, Patton, 1998). During the interviews, hand written notes were taken, all conversations were tape-recorded after all participants consented to being interviewed and recorded. Memos and hand written notes provided a supportive backup to the recorded interviews where possible.

Interviews were mainly conducted based on what had emerged from the data collected from the observations in the field, as observations only may not provide enough data to explain a phenomena, especially where multiple participants and sites are involved (Higginbottom et al., 2013).

3.7.2.1 Interviews with Health Care Providers

The researcher requested interviews with purposively sampled health care providers, who were specifically involved in the management of patients with diabetes and hypertension. Interviews were conducted after the informant consented and read the information sheet about the study. Most of the informants interviewed in this study were clinical officers, nurses, nutritionists, laboratory technicians, pharmacist technicians, public health technicians and county public health nurses. Through special consideration the CHWs were also included in this group as they were responsible for the service delivery at the community level.

Some of the key questions to health care workers were:

Kindly tell me more about your involvement in the management of patients with both diabetes and hypertension in this facility?

What has been your experience during health service provision to patients with comorbid conditions?

The responses from these questions were refined and others emerged before the next interviews were scheduled, although with different informants, to avoid repeating the same questions. Each health care provider was interviewed as an individual at the agreed time and location within the health facilities where they worked. For CHWs, they were interviewed at the health facility that they were associated with within the community units.

3.7.2.2 Interviews with Patients

Patients to be interviewed were identified from the health facilities they were using for follow-up care, either by being directly approached by the researcher or through the use of facility-based records, and the researcher had to call them for booking of the interview dates. This was done because some patients were not physically going to the facility to collect drugs, relatives were collecting these for them, thus the only way to access them was to check the available health centre records to trace and contact them, or to use the diabetic clinic, the only functioning clinic in the county hospital to contact informants. At the informants' homes, the researcher could not rush the interview, as some of the informants, had more questions to ask of the researcher, based on her experience in the community. Some interviews extended for up to two hours, although the informants still wanted to continue. The interviews were allowed to continue despite interruptions from family members, and interruptions to bring items to the researcher, to see for instance how they preserve insulin, and the type of oral medicine they were taking for the management of comorbid diabetes and hypertension. Some of the key questions asked included:

Kindly would you tell me what your experience of living with diabetes and hypertension at the same time has been?

What does living with diabetes and hypertension mean to you as a person and your family?

In your opinion what do you think could have contributed to the onset of these conditions?

3.7.3 Focus Group Discussion

The focus group provides an opportunity for debriefing with other health care workers and for giving feedback on the ongoing study. In this study, two focus group discussions were conducted, which involved nurses, a clinical officer, a nutritionist and public health technicians, as they form the majority of the health workforce working in PHC settings in the county. The researcher first sent invitation letters to the participants, and followed up on the

invitation with phone calls. Some did not turn-up and the first attempt failed as the participants did not form a quorum required for a focus group discussion. According to various authors, a focus group should comprise six to eight pre-selected informants (Agar and MacDonald, 1995, Alasuutari et al., 2008, Ritchie and Lewis, 2003, Smithson, 2008).

The second attempt was successful, and the turnout was good, and from there the subsequent meeting for the next focus group was arranged, which was also successful. A focus group discussion of seven participants representing all levels of care in the county was conducted. The discussions were moderated by one key informant from the group with experience as a moderator, and the discussion lasted for 90 minutes. All discussions were tape recorded and field notes were taken by the researcher as a supportive backup for the tapes and observations (Knoblauch, 2005, Higginbottom et al., 2013). Some of the key questions to the group were those which could not be answered by an individual health care provider. These included:

What are some of the common challenges being experienced during management of chronic comorbid conditions in Nandi County health facilities?

How best can the health care system be reoriented to accommodate chronic conditions, in primary health care settings?

What steps can be followed in the development of the central register for patients with chronic conditions in the country?

From the analysis of the first discussion group and other data sources, the second and the last focus group was organised.

3.7.4 Document Review/Analysis

Documents used for references during the management of diabetes and hypertension at all levels of care; documents like health policies, clinical guidelines, drug orders, nursing plans, referral forms and treatment plans for diabetes and hypertension, were analysed. Several authors have indicated that these documents hold a significant amount of data, especially when it comes to the quality of care and clinical settings. They tell more about the cultural setting in the community, the interventions which are within their reach and the expected outcomes (Minkler and Wallerstein, 2010, Macfarlane and Alpers, 2009). These documents are relevant in understanding how chronic comorbid diabetes and hypertension conditions are managed within PHC levels. In focused ethnography, observation of participants and interviews only are not adequate to study the culture of a group or a subculture like health care nurses; documents give support to the data collected through observation and interviews

(Cruz and Higginbottom, 2013, Roper and Shapira, 2000). Patients' records for blood pressure and blood sugar were checked and analysed, patients' prescriptions were checked for completeness, clinical guidelines, although not at the sites, were traced and analysed for content on diabetes and hypertension management. The health policy copy has been reviewed for the target and strategies in place towards achieving health for all by 2030. Although nurses participate in the care even at the outpatient level, there were no nursing notes for analysis in all participating facilities. This was blamed on staff shortage, which does not allow for nurses to work at the diabetic clinic and to document nursing care given to the clients. These documents were reviewed as a supportive backup and a source of information which could not be observed or obtained through interviews with the informants.

3.8 Data Analysis

In ethnographic studies, just like all other qualitative studies, data analysis is a continuous and cyclical process which starts from the time the researcher collects the first batch of data (Hammersley and Atkinson, 2007). Data analysis is a systematic way of converting raw data into meaningful information in a reflective manner with in-depth understanding of the emic perspectives in a cyclical process (Dowling, 2006, Fetterman, 1998, Tacchi et al., 2003).

During this study, each day in the field ended with a huge amount of data which needed to be transcribed into written texts; compiling the field notes, personal memos and audios to text, required time and a great deal of patience. Focused ethnography being context-specific, data analysis is based on the context, setting and informants involved; the health care system, health care providers and patients. In order to analyse data towards developing a model which is contextualized, grounded theory was used to help in the analysis of the huge amount of data collected from the field, from the initial stage of data collection. The combination of ethnography and grounded theory in healthcare enhances findings which reflect participants' realities and real life behaviour. It allows the comparisons of both the emic and the ethic perspectives of the informants (Bamkin et al., 2016, Pettigrew, 2000). Grounded theory has been identified to be helpful in bringing out the meaning of data collected by ethnographers, and as being significant in identifying relationships between emerging themes from data. Charmaz and Mitchell (2001), indicate that grounded theory and ethnography share a similar philosophical basis in constructivism, despite having different views on how data is accessed. The next section describes the grounded theory method used for data analysis in this study.

3.8.1 Grounded Theory

Grounded theory first originated from the work of Glazer Barney and Anselm Strauss; it was based on the Chicago School of symbolic Interactionism. Grounded theory became known after the book *Discovering Grounded Theory by Glazer and Strauss* in 1967, with an intention of narrowing the gap in qualitative studies on a generation of theories (Glaser and Strauss, 1967).

Apart from the Chicago school where both Strauss and Glazer studied, and the intense debates on the grounded theory method and theory generation process, several other books from these authors came out as individuals with diverse ideas on how to conduct grounded theory studies (LaRossa, 2005). This diversity of views has led to current researchers, who wish to use grounded theory, generating a theory to clearly identify which version they subscribe to, as processes differ significantly between the Glaserian school and Straussian school. In this study, the Straussian version was used to guide the coding process and the whole data analysis process. With time grounded theorising provided the means of arriving at the outcome of the whole study of developing a context-informed model emerging from data (Strauss and Corbin, 1990, Hammersley and Atkinson, 2007).

Core to grounded theorizing is the relationship between data from the field and the reflexive ideas of the researcher in the situation, painting the real picture of what is happening and why it is happening at that particular moment (Hammersley and Atkinson, 2007, LaRossa, 2005). In ethnographic studies and all other qualitative studies, data analysis commences from the first day in the field, through reading and recreating new questions emerging from the previously collected data. The process remains ongoing throughout the period of data collection until redundancy of concepts occurs in the field (Hammersley and Atkinson, 2007). Grounded theorising usually known for theory development cannot stand on its own as the mirror for theory development, it requires other strategies of data analysis to be able to give further description and exploration of situations and in the context under investigation, as highlighted in (Hammersley and Atkinson, 2007). In this case, the ethnographer established emerging categories on the management of chronic comorbid diabetes and hypertension in PHC levels. During grounded theorizing it is of paramount importance to adhere to the three phases described by (Strauss and Corbin, 1990), to guide the process of data analysis both inductively and deductively. Constant comparative of arising themes and categories form the central aspect of data analysis in grounded theory The coding procedure involves three main steps, namely open coding, axial coding and selective coding (Strauss and Corbin, 1990).

According to Strauss and Corbin (1990) coding is the process of breaking down data, conceptualizing it and restructuring it back to make theoretical meaning.

Open coding: This is the first level of coding, where raw data is cleaned, organised, transcribed and translated, read and re-read over and over again, to elicit meaningful themes from the data for the next level of coding. Ethnographers must be familiar with the content of data they have based on the context and the situation under which it was collected. This has been called the first step into data analysis (Speziale et al., 2011). Similarly, according to Strauss and Corbin, open coding is the process of assigning data categories and sub-categories, which allows the researcher to move forward with data collection. Constant comparison of existing categories with the emerging new ones, keeps the data collection and coding ongoing (Strauss and Corbin, 1990). The first transcripts produced more categories, but as the process progressed, fewer categories emerged. The process of open coding is likened to microanalysis, as described by Strauss and Corbin, where the researcher reads the transcript word by word, line by line, and phrase by phrase and the whole document is read over and over again to elicit categories (Strauss and Corbin, 1990). In this study the researcher used microanalysis of the data to elicit several categories and concepts, for further coding in the axial coding phase.

Axial coding: Data is coded using words identified from the data (emic perspective) from the language of the informant and given meaning by the researcher (etic perspective) by putting subheadings on the text to give data meaning and the relationship between the categories (Strauss and Corbin, 1990, Hammersley and Atkinson, 2007). However, during axial coding the ethnographer identifies the causal conditions or the antecedents, the context of the study, the interactions between them and identifies the intervening conditions before proceeding to selective coding (Strauss and Corbin, 1990). Axial coding is the process of analytically looking for matching items between categories and sub-categories in an attempt to answer the why, where, who, how and what; consequences are attached to this relationship of categories and sub-categories (Strauss and Corbin, 1990). Categories emerged based on their properties and dimensions, which lead to the development of categories and how they are connected with the sub-categories (LaRossa, 2005). According to Strauss and Corbin (1990), axial coding leads to the emergence of the paradigm model; this model encourages the use of six elements of axial coding or relevancy of the study phenomena (Strauss and Corbin, 1990, LaRossa, 2005).

The categories and sub-categories must cover the following aspects to bring out the meaning of the data: the causal conditions, context, action/interaction strategies, intervening conditions and consequences of the core concept of the phenomena of study (Strauss and Corbin, 1990). These aspects form the integral part of the paradigm model which forms an integral part of axial coding during the grounded theorising process. The paradigm model's main purpose is to guide the research to be systematic in the thinking process and be able to relate the structures in the study and the processes involved (Strauss and Corbin, 1990). In this study the core concept which emerged was management of chronic comorbid conditions. The causal conditions are incidences or events which led to the development of a phenomenon under investigation in a specified context (Corbin and Strauss, 2008). The context in the paradigm model refers to the specific properties of the core concept or it may refer to a series of conditions which affect the phenomena of study. Further, Strauss and Corbin (1990) describe the actions and interaction strategies as ways devised to manage, handle or respond to phenomena through a set of perceived conditions. Intervening conditions are those activities that shape, enhance or hinder the actions/interactions strategies from taking place within the specified context of the study. Lastly the consequences are outcomes or aspects of actions or interactions which emanate from the strategies; they can be both long-term and short-term in nature (Strauss and Corbin, 1990). Once all this was coded and the relationship established, the coding process then proceeded to the third phase of selective coding.

Selective coding: The final stage of data analysis during grounded theorizing involves the researcher making constant comparison of data, verifying the emerging categories with data and with the theoretically informed literature review. The emerging model or theory is then subjected to verification with other existing models of chronic care or management strategies, policies and clinical guidelines and a further literature review. The researcher comprehensively describes the management of comorbid diabetes and hypertension based on the data, writes the report in a narrative format using the model emerging from the data towards full understanding of the study phenomenon as it emerged from the data contextualized within the research setting (Braun and Clarke, 2006, Corbin and Strauss, 2008). The emerging model has been verified with data and other models which have been used before and in line with the paradigm model to ground the model at this final stage of data analysis (Strauss and Corbin, 1990).

3.9 Trustworthiness

Trustworthiness in qualitative studies is the quality of the findings and the conclusions drawn from the study. Trustworthiness of a study is achieved through: credibility, transferability, dependability and conformability (Guba and Lincoln, 1994).

3.9.1 Credibility

Credibility is the internal validity of the data collected in the field and how it is interpreted, which has to be done within the period of the study. This study, being an academic programme, was completed within a period of three physical years. Credibility of the study was achieved through a clearly stipulated and explained process of data collection, methods used to collect data in this study, sampling procedures of both the participants, time and context selection. Focused ethnography allows the researcher flexibility to review the observation schedules, interview guides to allow inclusion of what might have been left out during the previous interview or participant observation for obtaining more comprehensive data from the field (Whitehead, 2005, Fetterman, 2010). Theoretical sampling allows the inclusion of informants with relevant information relating to the phenomena of study (Hammersley and Atkinson, 2007). In this study all these processes were done in order to maintain the credibility of the study finding towards the development of the context-informed model on diabetes and hypertension management in PHC. In qualitative studies there are various techniques of ensuring credibility of the research findings. According to Hammersley and Atkinson (2007), triangulation is one specific way used in ethnography to have rich, quality data and findings.

3.9.2 Triangulation

Triangulation is where a researcher applies and combines several research methodologies in one study. There are four main types of triangulation which can be used in any research to ensure credibility of the findings; these are data triangulation, theory triangulation, investigator triangulation and methodological triangulation (Speziale et al., 2011). Data triangulation is the use of multiple sources to obtain differing views about a situation in a single study. Data is collected based on time, space and person in the same context of study. In this study each facility was visited at different times of the day, on different days of the week, the facilities were located far apart from each other and different people of different cadres and qualifications were interviewed and observed. This assisted in clarifying differing issues which arose during data collection.

Theoretical triangulation is where the researcher uses more than one theoretical perspective to interpret the study phenomena. Hamersley and Atkinson (2007) argue that in ethnography it is very hard to choose one theoretical perspective for the study, but requires a combination of several theoretical perspectives. In this study, which is focused on cultural practices of both health care workers and patients on comorbid diabetes and hypertension, symbolic interactionism is the only perspective in use, but still there are chances of others as the study progresses.

Methodological triangulation involves the use of more than one methodological strategy during data collection. For instance in this study, observation, interviews, document analysis and focus group discussions have been used to collect data. This helps to cross-check and further validates the findings of one strategy; it also increases the depth and quality of results and the important guidelines useful in improving health care services (Taylor et al., 2006, Halcomb and Andrew, 2005). The member checks were done with the participants and the researcher's study supervisors as an ongoing process.

Investigator triangulation is where during data collection, there are multiple observers at one particular site and time. In this study the researcher was the principle investigator, there were no other observers in this study, being an educational study project. Triangulation of data collection methods assists in enhancing research findings and in providing rich information about the phenomena of study as articulated by (Lambert et al., 2011, Hammersley and Atkinson, 2007).

3.9.3 Dependability

Dependability refers to the stability of the data being collected over a period of time (Miles and Huberman, 1994). The dependability of this study was maintained throughout the study through regular checks with the informants, with qualitative experts on the content of the data to ensure rich study findings. The presence of the researcher in the field all the time during data collection assists in the maintenance of the quality of data being collected. During the data collection period which took 10 months, the researcher was always out in the field to ensure that all she had planned to do was done. Each section of the study had been explained clearly as the process went on. Those sections of the plan that were not achieved have also been highlighted and reasons given as to why the researcher did not achieve the process. Ensuring the reflexive nature of the researcher being honest to self and with regard to all the things she did in the field, ensured dependability of the study.

3.9.4 Conformability

This is the degree to which the study data collected agrees with the findings of the study; conformability to the study was maintained through constant taking of field notes, through observation, during Interviews and through focus group discussions and organised transcribed data from interviews was confirmed by the study participants (Kerr, 2014). During data analysis the researcher constantly compared data, and where it was not clear, she went back to the field to observe or to get clarification from informants. Although earlier she had proposed to use the services of research assistants, and to train them appropriately, with the actual data collection, their services were not required, as the informants and the researcher could communicate in English and Swahili which she was well acquainted with. Data collected in Swahili was translated into English and back to Swahili, for quality checks and lastly back to English. Most of the available informants confirmed and verified the content of the transcribed data, as expected in most qualitative and particularly ethnographic data (Knoblauch, 2005). Further conformability was confirmed by the qualitative experts and the researcher's supervisors who were conversant with qualitative studies.

3.9.5 Transferability

Transferability is a term used with qualitative studies in place of generalisation of the study findings (Maxwell, 1998, Cruz and Higginbottom, 2013). Although qualitative studies rarely get to be transferred exactly to another site, ethnographic studies are context-specific, in terms of informants, culture and situations which are very particular to a specific study. During this study transferability was maintained through clear description of the study process and procedures of the study regarding data collection, data analysis, study setting and study context or what is commonly known as thick description of the study context. The researcher had also given details of her own reflexives notes during data collection, analysis and findings to the reader.

3.10 Ethical Considerations

Ethical approval was obtained from the Research Ethical Committee at the University of KwaZulu-Natal in Durban, South Africa. Further ethical approval was obtained from the University of Eastern Africa, Baraton in Kenya, as that is where the actual study took place. In addition to the ethical clearance from the learning institutions, a research permit to conduct research in Kenya was obtained from the National Commission for Science, Technology and Innovation. Thereafter regional clearance was sought from the county director of health in

Nandi County, the director of education in Nandi County and the county commissioner. Additional approval from individual health facilities was sought just before the study could commence. Informants' confidentiality was maintained throughout the study, to ensure participants' right of self-determination, autonomy, privacy and anonymity. Consent forms were sought from all participants before commencing on any activity; those who signed were given paper consent to sign on, and those who could not write gave verbal consent to participate in the study.

The researcher sent and made available information sheets both in English and Swahili for health care workers and patients respectively, giving details about the study, and gave invitations to participants to contact the researcher should there be need to get in touch with her on anything concerning the study. The purpose of the study, the sample population, and the duration of the study were all clearly indicated on the information sheet. The information sheet gave relevant information about voluntary participation in the study. Individual informants were to consent verbally and sign the consent form indicating their willingness to participate in the study after full explanation and reading of the information sheet. The information sheets and consent forms both in English and Swahili are attached (see Appendices 7, 8, 9, and 10).

Participation in this study was voluntary and patients' privacy and confidentiality was upheld. Participants could withdraw from the study freely at any time they felt like doing so, confidentiality and anonymity of the participants was upheld and no informants' names were used. Information given to the researcher was only used for the purpose of the study and was not accessible to any other person not authorised to access the data. Codes and dates have been used where necessary to identify data from participating facilities and informants during this study and even during research publications.

Participants had the right to information from the researcher, as she considered giving feedback to nurses, hospital administrations and other health care workers, patients CHWs involved in the study in the form of summarised copies of the final report for their information. The researcher will give a preliminary report and model for the implementation purposes of the study results and further planning within the county health department. However implementation of the model emanating from this study is beyond the scope of this study, but can be considered in future under the leadership of the researcher during her post-doctorate studies.

3.11 Data Management and Dissemination of Findings

Data collected from the field will be kept in safety for future reference and consultation during data analysis. All audio tapes will be kept in the custody of the librarian at UKZN and in the supervisor's office for future reference and will be destroyed after a period of five years after the completion of this study. Findings from this study will be published in peer review journals for accessibility to the public as research articles and the bound thesis will be available at the main library of the University of KwaZulu-Natal. Another copy will be taken to Nandi County for implementation of the model and other details for their facilitation. Individual health facilities will receive a summary and explanation of the model once the study is completed. Letters of appreciation will be written to all informants and health facilities administration.

3.12 Summary of Chapter Three

In this chapter the research methodology has been presented, which includes the research paradigm and research design, the research approach, data collection and techniques used for data analysis, trustworthiness and ethical considerations of the study.

In the following chapter the study findings will be presented.

CHAPTER FOUR

FINDINGS OF THE STUDY

4.1 Introduction

This chapter presents the findings of study arrived at through using triangulation of two qualitative approaches ethnography and grounded theory. Focused ethnography was used as a study method and grounded theory as a method of data analysis. The marriage of the two approaches allowed the use of multiple methods of data collection: participant observations, interviews, focus group discussion and document analysis. The triangulation allowed the researcher to draw rich conclusions that contributed towards the development of a context-informed model to be used in the management of chronic comorbid diabetes and hypertension in primary health care (PHC) settings in Kenya.

4.2 Sample Realization

Informants in this study were conveniently selected in that the researcher selected patients with comorbid diabetes and hypertension who were utilising the health facilities which are public and offer PHC services within Nandi County in Kenya. Theoretical sampling was further employed to sample informants who had relevant information on the management of chronic comorbid diabetes and hypertension in PHC settings. Seven health facilities were conveniently selected to be included in the study, based on provision of services suitable for the management of comorbid conditions of interest to this investigation and operated by the Ministry of Health. Informants were sampled from health care providers, patients/clients and their care givers and community health care-workers, which were interviewed and observed on merit of having relevant information on the treatment of diabetes and hypertension at community units. The researcher got immersed in the health culture of the study settings for a period of ten months, which was characterised by episodic participant observations and focused interviews with knowledgeable informants (Muecke, 1994, Higginbottom et al., 2013). Informants in this study included six patients with comorbid diabetes and hypertension, five care givers, 12 health care providers, and two community health volunteers. Further, data was collected from two focus group discussions each with eight participants, observations and informal interviews were made with seven members of the support groups in the diabetic clinic, and several relevant documents were reviewed. Thus a total of 40 informants were interviewed during this study as summarised in Table 2.

Table 2: Summary of informants and facilities used as the population of study

Population identity code	Data collection	Settings	Number of participants /Facilities	Episodic participant /Observations	TOTAL
Informant #1-7 Patients/care givers	Interviews and observations	Home/facility/ clinic	11	2	11
Health provider (HP#1-12)	Interviews, Observation and participation	Facility/clinic Laboratory, pharmacy/records	12	2	12
Community health volunteer (CHV#1-2)	Interviews (informal/ formal)	Facility	2	2	2
Diabetes support group Discussion (SGD#1-7)	Observations/ participation and Informal interviews	Diabetic clinic Support groups	7	2	7
Focus group discussions (FGD#1-2)	Discussion groups	Facility	8	2	8
Documents analysis	Documents analysis	Several	-	-	Several

During the analysis of data from various sources, categories and sub-categories emerged from words or phrases used by informants to convey their original voices on the management of comorbid conditions. Apart from informants' words and phrases, some other additional categories were derived from government documents, professional reading on the management of the comorbid conditions of diabetes and hypertension which have been used as suggested in Strauss and Corbin (1990). Since the management of chronic comorbid conditions was the phenomenon of interest in this study, it therefore became the core concept to which other categories and sub-categories made reference in a relational way. The data analysis during this study was based on the paradigm model of Strauss and Corbin (1990) as used in the Grounded Theory method.

The analysis is outlined as follows: a) conceptualization of core phenomenon, b) Causal-antecedent conditions that lead to the management of chronic comorbid conditions, c) Contextual conditions underpinning management of chronic comorbid conditions takes place, d) Actions and interactions strategies during the management of chronic comorbid conditions, e) Intervening conditions, and f) Consequences or outcomes of the management of chronic comorbid conditions.

4.3 Conceptualization of the Core Phenomenon ‘Management of Chronic Comorbid Conditions

To reiterate, a core phenomenon central to this study was management of chronic comorbid conditions. A core phenomenon is a central idea or event, happening where a set of actions and interactions is directed at managing, handling, or solving the problem and averting the situation (Strauss and Corbin, 1990). Data sources in this study reflected that the core phenomenon of management of chronic comorbid conditions is conceptualized differently by informants at different levels of the health system. The agreed upon variations in the conceptualization of the central phenomenon were grouped into sub-categories, which emerged as characteristics of management of comorbid conditions in PHC settings. These sub-categories highlighted management of comorbid conditions as: a) collaborative in nature, b) ensuring continuity of care, c) culture-sensitive care, and d) centred on self-management.

a. Management of Comorbid Conditions as Collaborative in Nature

Data sources and informants revealed that management of comorbid conditions (whether single or comorbid) was collaborative in nature involving different stakeholders, both within the health care system and outside of the health care system. According to informants, collaborations are observed at different levels of care, to ensure that management of comorbid conditions is comprehensive. Collaborations are also observed between different sectors which are directly or indirectly influenced by the health determinants. Collaborations also give a chance to community members to work closely with the healthcare system to ensure everyone receives health services. Excerpts from various data sources are herein captured:

....Interventions are well planned by all stakeholders in the community,.... those involved in funding, they provide funds, and those who have manpower to provide services and those who need service to utilize them adequately..... community awareness plays a big role in ensuring collaborations with the healthcare sector and ensures adequate management of comorbid diabetes and hypertension HP#3

In this facility we collaborate together to ensure that patients receive quality services,... we work as a team comprising [of] clinicians, pharmacists, laboratory officers, nurses, and the patients themselves...it [needs]team work to manage chronic conditions....HP#8

...Involving everybody in the fight against chronic conditions is the way to go...HP#6

Efforts of collaborations[should be] done comprehensively in [order] to cover all areas of management of chronic conditions in the region, collaborations work when every department concerned with health is working towards the same goalFGD#1

In this community members collaborate to provide care at household levels... when one is sick, they take responsibility of looking for ways to get medical attention...especially the elderly....they are all members of this community so we are responsible for their care....CHW#2

Collaboration gave rise to distinct properties which were multi-sectoral collaborations and multidisciplinary collaborations. In the multi-sectoral collaborations, different stakeholders involved ensured that collaboration was comprehensive enough. It was observed that the health sector had close and working collaborations with other sectors like agriculture and nutrition, which are linked to risk factor prevention and control in the management of comorbid conditions. Informants expressed their thoughts on diet modification, and natural food production was controlled and determined by those sectors.

Collaborations exist between agriculture and nutrition sectors although on a small scale this has been going, to produce food which is organic and advising members of the public how to prepare the same food, as risk prevention... We collaborate to produce what is utilized within the county....FGD#1

Collaborating with farmers to produce food in the region of high quality ensures that the patients with comorbid conditions in need of diet adjustments are catered for always.... HP#5

It emerged that other sectors within the county have a huge impact on health both directly and indirectly. Informants felt that bringing these different sectors together and harnessing resources will improve the management of comorbid conditions and strengthen the health care system. For instance informants felt that collaboration between health services and non-government organisations responsible for home based care would help in tracing patients, to

provide affordable medicine and to do home visits where the health sector cannot monitor all patients and improve quality and outcome.

... We collaborate with NGOs with home-based services to follow up [on] patients during home visits... that improve the quality of care and outcome.....HP#2

Community members and other organisations collaborate to ensure that those patients who cannot afford medicine, are helped to access the essential medicine at an affordable price, when the health sector cannot supply....HP#5

According to informants, health care providers from different disciplines in health or outside health, collaborate to improve quality of care given to patients with multiple chronic conditions, which are handled from different perspectives of care. Collaborations between health disciplines were seen as the best solution to management of comorbid conditions, which are complex most of the time.

Working as a team of health professionals together gives you the confidence of providing all- round quality care to our patients....in collaboration you handle the patients' problems wholesomely with confidence as everyone is involved....they have multiple conditions which one individual cannot manage comprehensively.....HP#4

b. Ensuring Continuity of Care

Continuity of care emerged as the process of ensuring that patients and their caregivers receive quality services at all stages of managing their conditions both at home and at health care facilities. Data sources further indicated that in ensuring continuity of care during management of comorbid conditions there is the goal for care to be timely, of quality and well-coordinated between health care providers, particularly when referring patients. Informants postulated that continuity of care starts at the community level to include the household, the health centre, county hospital and back home, until the health outcomes are achieved. Data revealed that continuity of care in the management of comorbid conditions requires well-linked health systems with proper and well-functioning referral systems. The information systems allowed quick access to patient information and health services from one facility or provider to another. Abstracts from various data sources are reported:

...Linkage of chronic condition patients from the county hospital back to the health centre, dispensary and community units (households)....to ensure continuity of care

for patients....communication between health care providers about patients' conditions during follow-up.... HP#10

When referring patients who need care of another facility...we first call to inform the receiving facility of the patients....Write well about the patient information, and the nurse on duty coordinates the whole process to ensure that the patient receives quality care, and leaves on time to ensure continuity and good outcome of care....HP#12

...For back referral,..... we receive information on what needs to be done for the patient as follow up directly to us or more detailed information on the discharge sheet of the patient, to ensure continuity of care in the next level of care HP#3

c) Culturally Sensitive Care

Management of chronic comorbid conditions was portrayed as needing to be culturally sensitive. This was observed and witnessed repeatedly during episodic visits to the community and health facilities. Culturally sensitive care is provided by a culturally sensitive provider, who is competent and caring enough to accommodate patients' culture and practices, without assigning values, rating them positively or negatively, right or wrong. It showed that for management of comorbid conditions to be effective health care providers were to be cognisant of cultural norms and expectations of each member of the family, the patient and their religious beliefs/practices. It emerged that family plays an indispensable role in care provision for the sick in the family, for instance children are to take care of their parents, brothers and sisters among others, and have roles as family to provide care, constant monitoring and long term care, a care norm within the family. It became clear that cultural congruent care starts with the cultural history of the patients.

....in my daily practices with diabetes and hypertension, cultural history of patients..... I have learnt to ask them, what they believe in.... tribe and religion..... If you don't ask you will never comprehensively manage the patientHP#5

One needs to be culturally sensitive in this community....try and fit in [with] the norms and expectations of a patient when they come for health care services...Otherwise you may never get to really understand the patient or their families.....HP#12

Under culturally sensitive care, three sub-categories of the category of management of chronic comorbid conditions emerged. These were: a) Culturally embedded parent-child expectations, b) Culturally determined gender roles and expectations, and c) Religiously embedded beliefs and practices.

Culturally embedded parent/child expectations: It emerged that care of parents was also culturally controlled on the basis that parents had expectations of their children, for provision of care, financing treatment and emotional support when parents cannot provide for themselves. On the other hand, children know their roles and as part of their culture it is expected that they care for their parents that they plan together with health care providers and implement care strategies as required for their parents. Children buy equipment and drugs for their parents; they accompany their sick parents to hospital for check-ups and implement treatment plans for them.

.....my children, especially my daughters [who] take care of me, sometimes I can't do anything on my own.... My children especially my daughter has tried to get me comfortable by buying me the machines to monitor my conditions at home....Informant#1

....Culturally in this community it is a requirement or let me say it is expected for children to support parents, especially when they are unable to do anything by themselves, it is a normHP#8

.... we talk and plan about his management both at home, and in Eldoret there is one of my brothers in Eldoret, we plan together and he will consult the doctor when need be, then we do what he has said. It is part of us now, we discuss and plan, implement his care with my siblings....Care giver#2

Culturally determined gender roles and expectations: Culturally congruent care in the management of comorbid conditions was also reflected in the clearly defined gender roles in the community. In Nandi community culture, women had their culturally distinguished roles of care provision to the sick at home in the preparation of meals and home remedies. On the other hand men were not expected to cook and to do housekeeping chores within the community. They were expected to provide protection and ownership of the home. For

instance most men ate what they were given, whether good or bad as the kitchen was out of bounds for them. It emerged that even during chronic comorbid conditions management, men and women perceive their care differently; men require support from their wives in meal preparation and lifestyle modification, while women expected minimum support for the same.

Men in this community don't cook or even prepare meals for themselves, so it is good to involve wives and children on how to adjust the diet for the patients and for the entire family....HP#8

How can I give instructions to my wife on how to cook my food? ... I really don't know what to do there... I don't go to the kitchen, so I eat what she prepares for me all the time, if she does not prepare what is required, then I eat it just like that...SGD#5

When any member of my family is sick, it is my responsibility to ensure that they feed well, take medication to relieve the pain, or even bring them to the hospital...even me now, I have to take care of myself, because it is what they are not used to doing themselves... as a woman, you cannot wait for service, but you do it... SGD#4

Religiously embedded beliefs and practices: It was observed that religion plays a significant role in management of comorbid conditions both at home and in health care facilities. Data sources revealed that religion determined health-seeking behaviour and practices, self-care and diet. For instance, for some patients their religious beliefs did not advocate for oral medication or injections, others encourage fasting and prayer for several days; others encourage believers to eat natural foods only. Muslims and Christians had different religious beliefs and expectations to be respected and accommodated to ensure culturally sensitive care. Informants indicated that understanding of the religious beliefs and practices was relevant during developing patient teaching materials, giving group health education, particularly on how to eat, based on state of health and what to do in case of prayer sessions which require prolonged fasting. Informants expressed their view on religion and management of comorbid conditions as follows:

... as a clinician you just have to be ready for anything... understand the religion of the patients, to know what to teach them, on self-care, diet modification with prayers and what are the risks involved with the practice and comorbid conditions.....SGD#6

I am a Muslim, when I want to fast for prayer, I first consult with the nurse, I measure my sugar levels, and adjust my eating times and what type of fasting I will do...it is about knowing yourself before you fast....SGD#2

...Some patients don't take tablets or injections because of religious beliefs and orientation, they need to be understood and helped to manage their health, while you respect their autonomy and religious practices...but you know they need it to survive...you learn to respect their choices and accommodate them through teaching them what to do.... HP#6

When preparing teaching materials and health education for a group, you need to understand the religious stance of the group...so that they are relevant in the community in which they will be used, particularly when the community is composed of both Muslims and Christians....HP#10

d) Self-Management Focused

Self-management is central to effective management of chronic comorbid conditions. Self-management was characterised and determined by patients taking the responsibility for their own behaviour and activities towards achieving goals in their health. The following properties emerged from self-management as a sub-category in the management of chronic comorbid conditions: a) Self-assessment, b) Self-administration of drugs, c) Awareness of danger signs, and d) Dietary adjustment and regulation.

Self-assessment: Data sources indicated that self-assessment was the ability of the patients to do self-examination of the body parts for early identification of deviations from the normal, as their body is subjected to effects of comorbid conditions. This was evident by being able to assess the feet for any lesions, colour change, loss of sensations and take appropriate actions to prevent further damage.

With this condition, you manage them well by being able to do your own assessment of the body parts you can see and reach for....I assess the legs for heat, if I am able to sense, any colour change on my legs or body, or small lesions on my legs, and decide to go for medical consultation immediately or the next day....SGD#5

I go for body assessment in the clinic, especially the eyes when as I can assess them myself, but the nurse does them for me....SGD#2

Self-administration of drugs and monitoring: It was observed that during self-management at home patients were well acquainted with their own medication regimen and were able to take the medication at the right dose and time. Although expressed as a challenge for some to inject themselves with insulin, most of them injected themselves with the required amount and in the right site. Self-monitoring at home was also observed in a small group of patients who were able to use self-monitoring devices at home, before injecting themselves with insulin or with assistance from caregivers. Interpretation of the results and taking action also characterised self-drug administrations and monitoring aspects of self-management, being able to tell when sugar levels are high or within normal levels.

Being diagnosed with sugar and pressure, means you take medication as required daily at the right dose you were told to take, and time... For me it means I swallow my medicine and inject myself with insulin in my legs (thigh) every day morning and evening. It also means I use the machine to know how far my sugars are once in a while.....Informant#1

I do understand that I have to take my medicine, the tablets daily, but my son injects me because I cannot see clearly the small needle, he does it for me daily...it is a commitment on my part and him also for every day of my life....Informant#2

Awareness of danger signs: It became evident that most patients who had comorbid conditions, had been sensitised about danger signs and the actions to be taken. Informants indicated that they had experienced one or two episodes of hypoglycaemia or hyperglycaemia, when their blood pressure was too high. The danger signs which were mentioned included feeling weak, sweating, blurred vision and light-headedness. It emerged that from experience informants indicated their level of awareness of danger signs were well advanced as compared to newly diagnosed patients.

I am aware that when I feel so lazy to wake up in the morning ...I know the sugar levels are low and need my attention by eating something to boost it....SGD#1

When you feel the head is so light, and you lose your balance when walking...at times you can start sweating so much, then you just need to take action by taking something sweet or asking for help from someone...SGD#3

With time patients become aware of their own body and how to tell the danger signs...as compared to newly diagnosed one, it takes time to know.....HP#8

Dietary adjustments: Participants indicated that after diagnosis for self-management they were to comply with dietary adjustment and modifications. In this study self-management was also characterised by adjusting diets and food intake in terms of amount to be taken in a serving, timing of eating times and type of foods to be eaten. Informants revealed that in the course of managing comorbid conditions, they had learnt to measure their foods, to time when to eat and what not to eat, and what type of food they can eat, which was interpreted to be a change of diet from their primordial state. Some types of food were completely dropped from their pre-morbid diet. Some informants reflected that it was not really a change, but modifications of the former diet to suit the conditions and food intake with moderations necessary for survival and health. Excerpts from informants on diet adjustment included:

With this condition in my life, I have learnt to eat food at the right time, at the right amount and type...I stopped eating what I am not supposed to take....I take food being aware of my condition always....Infromant#1

Managing diabetes and pressure means I don't take sugar or salt at all in my food, I also take measured meals not just like anybody, but I eat normal food, white maize meal, I don't smoke or drink any alcohol anymore....Informant #5

At the clinic patients need to know the meaning of managing the condition with diet,...it is up to them to eat the right food, avoid overeating anything...doing things in moderation is not changing everything ...to survive and be healthyHP#8

...it means I observe the diet they (nutritionist) want me to eat at the right amount, time and type... I eat white maize meals just like anybody, but I eat a small quantity, I eat vegetables, rice, milk, and I also eat fruits (oranges) a half of the fruit....but with an open mind and moderation not to make the sugars scale up again...Informat#3

In the context of this study the concept of management of comorbid conditions is defined operationally through specific characteristics which emerged from analysis data. Management is collaborative in nature, with a number of stakeholders involved in care provision. Secondly management of comorbid conditions is continuous in nature requiring a continuum of care from community level to tertiary levels. Management of comorbid conditions is cognisant of cultural norms and expectations with family members, especially children expected culturally to take care of their old folks with chronic care. Health care providers need to be competent and culturally sensitive and caring to provide culturally congruent care to patients with chronic conditions. Gender roles and expectations determine who should provide care for male patients, while women are expected to learn to prepare appropriate meals for men who need diet modification in self-management. Lastly self-management is regarded as central to effective management of comorbid conditions.

4.4 Antecedents or Causal Conditions

According to Strauss and Corbin (1990), antecedents, commonly known as causal conditions, are those events which lead to the start of a phenomenon. In the context of this study, antecedents are those events which lead to the onset of management of comorbid conditions and relevant action and interactions taken to manage the situation. The following sub-categories emerged from the category of antecedents: a) low level of literacy on comorbid conditions, b) preventable high hospital admissions, c) delays in seeking medical attention, d) high premature mortality cases, e) lack of default tracing in the community, and f) a growing number of people with uncontrolled comorbid diabetes and hypertension.

Preventable high hospital admissions: It was observed that most patients who were on follow-up at the diabetic clinic had been admitted before due to sugar levels being high or the pressure was too high and could not be controlled at home. However, it emerged that before hospital admission most of them did not know how to prevent the sugar levels or pressure, through lifestyle modification and adherence to oral medicines. Informants clearly stated that previously they did not adhere to the lifestyle modification practices, which could have prevented them from what they went through when the sugars and pressure were too high, despite being told earlier by health care providers.

...I was admitted when my blood sugars and pressure were so high...but I could have prevented it by following instructions of diet, eating the right food and exercise,

taking my medicines regularly...now I even started using insulin which was not there before...SGD#2

Most patients are being admitted for reasons which can be prevented at home and outpatient areas, the conditions when they are poorly controlled, they land you in the ward or you move to a higher level of treatment like starting them on insulin....HP#8

Increased number of premature deaths: Data sources within the county indicated that most deaths occurring in the county hospital due to diabetes and hypertension were premature deaths which could have been prevented, especially when occurring in young people between the ages of 40 and 60 years. It emerged that with this current situation in the county, it necessitated the action of decentralising screening services and starting of diabetes clinics within the county for the management of comorbid conditions in all health facilities based on the levels of care.

The mortality numbers due to comorbid conditions mostly diabetes, hypertension among others are common, we lose patients at a very young age of even 40 years, because the sugar levels and pressure are poorly controlled or they don't adhere to treatment, once diagnosed ...with the high statistics, we had to start interventions of managing these conditions quickly at county levels and do the best we can...Administrator#1

Delays in seeking medical attention: It emerged that most people in the community do not make their health a priority, and health-seeking behaviour for acute conditions has greatly improved, as compared to chronic conditions such as diabetes and hypertension. It was observed from the community that most community members delay at home, due to various reasons, including economic factors, as most indicated lack of money for early screening, living long distances from the facilities, knowledge about signs and symptoms and providers' knowledge and skills to diagnose the conditions. Informants indicated that most of them took time to go for general conditions treatment, and accidentally they were being diagnosed with comorbid diabetes and hypertension or with complications already. All the aforementioned factors emerged to lead to the onset of management of the comorbid conditions within the county health systems to avoid further suffering and mortality.

For most of the community members here, simple screening is not a priority especially for chronic conditions, but we see them coming for treatment for simple ailment like common cold, but not screening for diabetes or hypertension....HP#2

....I was taken to Eldoret for treatment ... I was admitted there for 11days, my sugars were very high that the doctor could not understand why. It is then that I was told I had diabetes and high blood pressure. It is then also that I was started on insulin injections and later discharged home when the blood sugars were at 17mg/l.....Informant#1

For me it is out of my wish, the clinic is way too far from home,....the cost of paying for the tests and transport, all this added up, it makes you persevere with the situation as it is at homeSGD#5

By the time we see these patients they are already in an advanced stage of the conditions... some even come with complications already, the sugars are so high and pressure is too high...you just have to act immediately and lower it first...HP#4

Most patients come to hospital when the condition is not under control...if they came early one would control the situation quickly...HP#8

On the other hand, it emerged that health providers were to blame for delaying the diagnosis or even starting patients on medication on time. Some informants felt that due to lack of proper skills and equipment, it then becomes very hard to diagnose a patient properly and on time.

Some patients are not to blame for delays, they can come early to seek help, but we do fail them, because we lack proper knowledge on diagnosis, equipment for diagnosis and skills to do that...so we keep treating them for what we know or keep giving return dates, until it is too late ...HP#2

Lack of defaulter tracing for patients with comorbid conditions: It was observed that most patients disappeared after diagnosis, only to reappear when the situation is too bad or out of control. The conditions can then only be managed at a critical level and patients have to start multiple drug therapy. However informants indicated that with proper registration of patients

and with residence physical addresses being given, it was becoming easy to trace them and start them on treatment, although this is partially being practiced for diabetic and hypertensive patients.

Patients default immediately after they have been told they have diabetes or hypertension...you don't see them for more than three months, they only reappear when the conditions have progressed with no treatment ...tracing them to go back for management of the conditions...HP#11

Where we are not having defaulter tracing, patients complicate so easily and fall out of treatment, and develop complications which we could have reverted, so we started the clinic and support group to get them from where they are.....HP#12

Increased number of people with uncontrolled comorbid diabetes and hypertension: Data sources revealed that half of the patients who have been diagnosed with diabetes also had hypertension, and that the two conditions were hardly being controlled with monotherapy or by managing only one index condition. Informants also indicated the number was growing every day, yet management was only directed at diabetes and blood glucose levels; other patients' conditions were not stable due to hypertension, which was always the silent aspect of management.

From our clinic register our patients seemingly have both conditions, but as the name suggests, it is diabetes we care most about... we have many patients with diabetes and hypertension, both being uncontrolled and needed attention also from us...HP#8

Recently we are having many people coming to the facility with both conditions (high blood pressure and sugars), and with devolution has made us start programmes to try and manage the conditions before they get out of hand.....HP#3

The human resources available were trained for diabetic care, but the number is growing, so we have started retraining staff for other conditions too....to avoid leaning on one condition and leaving the other condition, mainly diabetes...HP#12

In the context of this study the conditions emerged that confirmed the casual or antecedent conditions in the management of comorbid chronic conditions noted earlier. These included: low level of literacy on comorbid conditions, delay in seeking medical attention, preventable

high hospital admissions, increased number of premature deaths from comorbid conditions, a growing number of patients with comorbid conditions and lack of default tracing for chronic condition patients. These factors led to the onset of management of comorbid conditions in PHC settings.

4.5 Context Conditions

According to Strauss and Corbin (1990), context represents specific systematic factors which affect or form the basis for the management of chronic comorbid conditions. In this study the context represents factors which provide the basis for management of chronic comorbid conditions in the form of legal and policy frameworks, guidelines, political initiatives and structural factors within county and health care systems. In this study the contextual factors which emerged were grouped into four main sub-categories, namely: a) health policy frameworks, b) clinical guidelines and protocols, c) political reforms, and d) international/national initiatives and partnerships.

4.5.1 *Legal, Policy and Strategic Frameworks*

Health Policy Framework (2012-2030): The Kenyan Health Policy Framework emerged as one of the legal frameworks that served as a basis for the management of comorbid conditions. The policy framework provides the directions on the prevention and control of all NCDs across all life cycles. The framework is a legal document which defined the government's intention in the provision of high quality long term care for prevention and control of NCDs.

The policy defines the government of Kenya['s] intent to provide high quality health care services including the prevention and control of NCDs which are on the increase in Kenya though halting and reversing the trend of NCDs through implementation of clear strategies of all NCDs...WHO/Kenya, 2014:6)

The policy['s] main objective is to halt and reverse the burden and trends of non-communicable conditions across all life cycles....through active prevention and control of risk factors of NCDs...(HP objective 2 MOH,2012:15)

Kenya Health Sector Strategic Plan III (2013-2018): The Kenya health strategic plan emerged to take specific actions which were aimed at giving directions on how to meet the objectives of the health policy framework with specific targets to be met at the service

delivery level. The plan provided specific actions for the implementation of the health policy objectives on the management of NCDs. The three main agendas in the strategic plans are especially dedicated to the prevention and control of NCDs in Kenya, where diabetes and hypertension are included, although being handled as separate conditions with different targets.

[The aim is to] halt, and reverse the rising burden of non-communicable conditions. This it aims to achieve by ensuring clear strategies for implementation to address all the identified non-communicable conditions in the country.... KHSSP, 2013:14

Minimize exposure to health risk factors. This it aims to achieve by strengthening the health promoting interventions, which address risk factors to health, plus facilitate use of products and services that lead to healthy behaviours in the population.KHSSP 2013:13

Strengthen collaboration with health related sectors. This it aims to achieve by adopting a 'Health in all Policies' approach, which ensures the health sector interacts with and influences design implementation and monitoring processes in all health related sector actions. ...KHSSP 2013:13

National Sector Strategic Plan for the Prevention of Non-Communicable Disease (2015-2025): This is another policy document which emerged to provide the basis for the management of comorbid conditions among other NCDs was the most current and comprehensive strategic plan for NCDs in Kenya. It gives directions to all stakeholders to ensure that the reduction of preventable NCDs is achieved and further provides the roadmap to reduce the high rates of mortality and morbidity due to NCDs in the country. Extracts from the policy are presented:

The development of this Kenya National Strategy for the prevention and control of Non-communicable Disease, 2015–2020, gives directions to ensure that there will be significant reduction of preventable burden of NCDs in Kenya. The purpose of this strategic document is to provide a road map towards reducing the preventable morbidity and mortality due to NCDs and to improve the quality of life of all Kenyans in line with vision 2030..... NSSP for NCDs 2015:8

The current strategy will act as the strategic blue print for the national and county response to non-communicable diseases prevention and control for the next five years in Kenya.... NSSP for NCDs 2015:7

It emerged that although this strategic plan cuts across all other NCDs including mental health, violence and injury in Kenya, it provides the guidelines for individual chronic conditions, with much emphasis on cardiovascular, diabetes and cancer conditions which are on the increase. These conditions share risk factors which can be surveyed, prevented and controlled together.

The strategic document will mainly focus on the four major non-communicable diseases, cardiovascular diseases, cancer, chronic respiratory diseases and diabetes, which make the largest contribution to global morbidity and mortality due to non-communicable diseases. It will also focus on their four shared behavioural risk factors—tobacco use and exposure, unhealthy diet, physical inactivity and harmful use of alcohol... NSSP for NCDs 2015:11

It was observed that the current strategic plan has close interaction with other policies which have influence on the management of chronic condition, in terms of risk prevention and control at community levels. These were the School Health Policy, the Tobacco Control Action Plan (2010-2015) the *Health Sector Function Assignment and Transfer Control Policy paper*, among others not directly linked to NCDs.

School health policy provides guidelines on early prevention of NCD risk factors among the young generation in Kenya. Prevention of exposure to high risk factors and secure environment... Ministry of Education, 2009:16

The Tobacco Action control Plan lead to the development of the Tobacco Use and Control Act of 2007 in Kenya, to control the use of tobacco in public places and increase tax levied on the tobacco product, to prevent further use and exposure to risks to the public leading to the development of NCDs.....GOK, 2007:22

Kenya National Diabetes Strategy (2010-2015): It emerged that the diabetes strategy provided the basis for the development of clinic guidelines on the management of diabetes and other conditions which were coexisting with diabetes. The strategic plan laid the foundation for actions to prevent and delay the onset of diabetes among the Kenyan

population, through improving the quality of life through reduction of complications and premature mortality in people with diabetes.

The goal of the strategy is preventing and delaying the development of diabetes in the Kenyan population; improvement of the quality of life through reduction of complications and premature deaths in people with diabetes....MOH 2010:3

This strategic framework will guide the funding, planning, organisation, provision and monitoring and evaluation of services for people with or at risk of diabetes. It will consolidate and improve the quality and coverage of diabetes care services in Kenya. The framework also identifies the roles of various key players in the development and implementation of diabetes prevention and control services. It defines the processes and inputs necessary for the timely realisation of the national targets...MOH, 2010:9

The strategy also provided a basis for equality in service provision for all people with diabetes regardless of their gender, socio-economic status, race or religion. Health care services for diabetics were to be available to all.

The national diabetic strategy is aimed at ensuring that every person irrespective of their social or economic status, race or creed access diabetes care services without discrimination, and is holistic to all patients seeking care...MOH 2010:13

Kenya Community Health Service Strategy 2006: The strategy emerged to provide the basis of implementing the curriculum for training the CHWs on the management of NCDs at the community level, specifically allowing them to learn and perform on prevention of risk factors at community levels. It was observed that most CHVs were aware of the basic information of health promotion on diabetes and hypertension among other NCDs at the community level. Informants indicated that they had been trained on how to take blood pressure, identify signs and symptoms of diabetes and hypertension. It emerged that the CHVs were able to refer and follow-up patients using appropriate referral forms at specific levels. The main objective of the training of health care workers and CHVs was to increase knowledge and skills in the health promotion, treatment and control of NCDs.

It will be used to administer the NCDs component defined in the CVS curriculum in a systematic manner through well-trained Community Health Extension Workers. In having a harmonized training module, health managers will be able to guide CHVs to

efficiently offer services to communities, linking them to care and referral. This is expected to empower communities to make informed choices to prevent NCDs...MOH 2015:19

With adequately prepared CHWs on the NCDs' health promotion and prevention, screening and linking of patients or those at risk will be faster and efficient, which will prevent delays in the community for those with chronic conditions, or even with those who are sick and require follow-up care...HP#12

4.5.3 Political reforms

It was observed that Kenya has undergone several political reforms, which have affected how the health care system is organised. In several instances the political stability and alignment of the rural government determines the health of the people especially those at the community levels and the poor. In 2007 the Ministry of Health was divided into two ministries which affected management of health care sectors. The situation was resolved in 2013 with the merging of the two ministries into the current Ministry of Health.

Two areas emerged to be influenced by political reforms and had direct impact on health service delivery. These were: i) the Constitution of Kenya/Bill of Rights, and ii) Kenya Vision 2030.

The Kenya Constitution/Bill of Rights: It emerged as one of the basic legal documents that define the right of all Kenyans to access health care services, including those with NCDs in marginalised or rural communities in (See article 5.2.1), and to be able to access affordable essential medicine for the management of their chronic conditions. Essential medicines emerged to be under the control and regulation of the *Kenya Pharmaceutical Policy Paper* in Kenya, which is incorporated within the Kenyan Constitution.

...Access to essential medicines is an integral part of the fundamental right to health enshrined in the Constitution. The Policy provides for strategies to ensure equitable access to essential medicines, particularly for vulnerable population groups... Sessional paper National Pharmaceutical Policy, 2010:9

Kenya Vision 2030: It emerged that policies and legislations were all based on meeting the government's development agenda. It is a political declaration of the government to develop and achieve the middle income country status by 2030. The three pillars include social

development, political reforms and economic development. Under the social development pillar, one of the areas identified for development was improvement of health care to all Kenyans, this included upgrading of health facilities to provide management of NCDs at PHC settings and other tertiary levels including the provision of essential medicines which are affordable for the management of chronic conditions such as diabetes, hypertension and cancer.

Recent measures by government such as reduction in user fees and improved public supply of essential medicines has led to increased utilization of health care services, especially among the poor. Pro-poor spending in health is therefore critical to the attainment of national health goals.....Sessional paper, National Pharmaceutical Policy, 2010:10)

Reducing non-communicable diseases and their main behavioural risk factors will increase population “wellness” or wellbeing which will in turn promote economic and social development as well as reduce health expenditure at the individual and national level....MOH 2015:38

4.5.4 International/National Initiatives and Partnership

It emerged that at national level there are several civil societies and advocacy groups which are pushing the government to develop policies and guidelines for the management of NCDs either as single conditions or multiple conditions. These initiatives have developed alliances for the support of people with diabetes, hypertension and cancer, among other conditions, which has culminated in the development of common strategic plan for prevention and control of NCDs and an individual registry for cancer and diabetes. Among the most active groups identified included the following groups with their respective purposes. The following initiative groups emerged to be active in the management of chronic comorbid conditions in Kenya.

Non-Communicable Diseases Alliance of Kenya (NCDAK): This is a Kenyan alliance set up to organise and coordinate the issues surrounding the global health problem of NCDs. Besides the four main NCDs as described by the WHO (CVDs, diabetes mellitus, cancers and chronic respiratory diseases), Kenya has added other health issues affecting the majority of Kenyans, which included injuries and accidents, musculoskeletal diseases, stroke and mental health. The alliance has membership with local and international bodies with an interest in

NCDs; of significance is the membership of the Diabetes Management and Information Centre and Defeat Diabetes Kenya.

The organisation's main goal is to bring together a synergistic relationship of multi-sectoral stakeholders that will facilitate effective promotional and advocacy activities for prevention and control of NCDs and provision of quality NCDs care services...these have enabled us to liaise with other partners to raise awareness and integration on the management of chronic conditions in Kenya...NCDAK,2014:3

We are also in partnership with the Global NCDS Alliance (GNCA), formed through a union of four major foundations advocating against NCDs, which has formed the basis of managing chronic conditions through funding and advocacy for affordable essential drugs to those who are sick and cannot afford the medication...NCDAK 2014:3

WHO/Kenya Cooperation Strategic Plan (2013-2018): It provides Kenya with the necessary guidelines in its intent to reverse the rising burden of NCDs through evidence-based policies and strategic plans and regular monitoring and evaluation of NCDs through continuous and regular research. This was aimed at being achieved through support and implementation of policies, strategies and programmes through funding, provision of capacities to achieve specific goals, provision of technical assistance in multi-sectoral negotiation for best buys in the prevention and management of NCDs, and lastly, the strategic plan was to support the establishment of the monitoring and evaluation framework on progress of NCDs.

Support the development and implementation of sector-wide policies, strategies and programmes, including research and evidence generation, monitoring and assessing the health situation and trends to prevent and control non-communicable conditions together with their risk factors in order to halt and reverse the rising burden of non-communicable conditions in Kenya...WHO/Kenya 2014-2018:33

Provide technical assistance to engage in multi-sectoral and policy dialogue to establish policies and plans and implement the 'best buy' interventions to prevent and manage the major non-communicable diseases, including measures to reduce exposure to their risk factors ...WHO/Kenya 2014-2018:34

Strengthen national capacity for operational research for early detection, diagnosis and use of cost-effective treatment interventions for non-communicable diseases and for the promotion of health-in-all policies and whole of government approaches and multi-sectoral action...Support the establishment and application of a framework for monitoring progress in the prevention and control of non-communicable conditions...WHO/Kenya 2014-2018:35

4.6 Actions and Interactions Strategies

To preserve Strauss and Corbin's (1990) description, actions and interactions strategies are activities or procedures which need to be either purposeful or goal oriented towards the management of a problem or the phenomena of study. In the context of this study, action and interactions are specific activities employed and undertaken towards management of chronic comorbid conditions in the health care system. The culture of managing comorbid conditions at the PHC level reflected activities at strategic, operational and monitoring levels. These activities were classified as sub-categories under the category of action and interaction in the management of chronic comorbid conditions. The outlined subcategories included: a) Strategic planning level, b) Operationalized level) Monitoring and evaluation level, and d) Management of chronic comorbid condition process.

4.6.1 Strategic Level

In the management of comorbid conditions at the strategic planning level the following properties emerged under the sub-category of the strategic planning level in the category of action and interaction strategies in the management of comorbid conditions: i) legislations/policies and guidelines, ii)resources mobilisation, and iii) material development.

Legislations/policies and Guidelines: Data sources revealed that during the transitional period, both the national and county government were involved in strategic planning for the delivery of health care services towards management of chronic conditions. It became evident from data that the national government was responsible for regulation of standards, quality assurance, policy framework, the health bills and clinical guidelines for all conditions being managed at different levels of the health system.

We are still in the transitional period from the national government... some functions of the national government will not be devolved. It is responsible for the developing and planning for the whole Ministry of Health in Kenya... the health policy is a legal

document for the whole country on health services delivery on a day to day basis...HP#2

The Ministry of Health through the division of NCDs develops legislation, plans, policies, standards and guidelines for the prevention and control of NCDs for the County and National Governments... The standards and quality regulations come from the national government ...GOK#12

It also merged that with devolution several key players were involved in formulation of the Health Policy Framework and other related health policies affecting the management of chronic conditions. Data sources indicated that key players in the development of health policies were the cabinet secretary of health, who is represented by the executive in the national government; he is the person in overall charge of the Ministry of Health. The director of medical services is the overseer of the health services in the whole country and is responsible for the actual planning of the medical services. The division of NCDs falls under the Department of Preventive and Health promotion in the ministry, and is responsible for the planning of strategies to halt the burden caused by the NCDs in Kenya.

The cabinet secretary of health is the one who oversees the planning of all health services in Kenya, and policies and guideline development, including financial planning for the ministry is under him, he is closely assisted by the principal secretary in charge of governance in the Ministry of Health, and lastly we have the director of medical services with several directorates under him, he is in charge of all medical service delivery for both curative, preventive and health promotions ...County Organization Plan, 2013:4

The chief executive officer in the division of NCDs is directly responsible for the planning and development of policies, strategic plans in the ministry on the prevention and control of NCDs in the country together, with the county respective departments concerned with prevention and control of the NCDs....Ministry of Health, 2013:26

Resource Mobilisations: It emerged that the national government's capacity for resource mobilizations for management of NCDs was still low, but was better than nothing considering the communicable conditions still in the country. Data sources indicated that the

national government, by inclusion of the NCDs in its health policy through the Ministry of Health, has mobilised financial resources for the implementation and management of chronic comorbid conditions at the county levels. The resource mobilised was evidently seen in the financial year health budget allocation at 3 per cent for NCDs, although still below the required 15 per cent of the national budget of health. At the strategic level the department of finance and planning is responsible for budget planning and allocation of funds from the national government to the county government based on their needs from the national government.

The national government oversees the budget allocation to the county government, it mobilises the donors to fund the health budget, and from there we get the little share to fund the health programmes within the fiscal budget...We still hope that money for the community screening will be available for us to implement....FGD#1

This financial year we received the budget, 3% budget for NCDs, at least the clinic will run and buy essentials for treatment of diabetes among other NCDs...We have been operating without the budget, things will be better....HP#9

The department of finance and planning is responsible for the resource distribution and finance allocation according to the request and available findings in the ministry...FGD#1

It was also observed during facility episodic visits that although the national government was responsible for human resource planning and budgeting, the county governments were also responsible for planning and redistribution of necessary cadres of health personnel and training towards management of chronic comorbid conditions. It emerged that 63 per cent of the government budget both at the national and county levels was utilised by the human health resources as compared to the 49 per cent used for service delivery (KHSSP, 2012). Some abstracts from government documents and informants are presented:

Availability of human resources who can handle the growing number of patients with comorbid chronic conditions, is a priority of the county government, through the support of the national government...to reduce attrition, have in place evidence based worker forums and norms in the health facilities....FGD#1

The national government still controls resources for new health human resources employment or even training to accommodate the management of comorbid conditions.... The budget they consume is planned for by the national government...it is approximately 60% of the total health budget, and what remains is used for these other essential services...FGD#2

Development of Teaching Material: Informants reflected that evidence-based materials for patient teaching and community sensitisation messages planned and developed at the national government were to be decentralised for use at the county levels and communities. Data sources indicated that well developed public messages from the government empowered communities through the county governments, to take personalised steps for screening and change of lifestyles. Informants felt that it was the responsibility of the national government to ensure that materials and advocacy messages are received by all its citizens. It became evident that the national government in partnership with donors can fund advocacy messages to sensitise the entire nation on the management of comorbid conditions, through prevention and control of risk factors. The main key players in the development of teaching materials emerged to be the national government and the funding agencies working in partnership such as the *Diabetic Management Information Centre (DMIC)*. Excerpts from the informants included:

Developing teaching materials which are relevant to this community are very effective in passing on the information-particularly with picturesuse what is culturally accepted here you will see the impact on the community health behaviour...national government should consider cultures in Kenya before printing them out...HP#12

The whole population when given relevant information on chronic conditions like diabetes, hypertension and even cancer, become aware quickly and take action, as compared to individuals....the national government with its funding partners, if they have, can develop well researched and evidence-based messages for the people of Kenya on chronic conditions management and give them the voice they need to take action....FGD#1

...the messages for teaching patients well planned by the department concerned will go miles in encouraging screening, lifestyle change on risk factors, even before the

programmes are implemented at the community level, they will be aware of the information already....HP#8

4.6.2 Operational level action and interactions strategies

The following properties emerged under the sub-category of the operational level in the category of action and interaction strategies. These included: strategic planning at the county level and implementation at the county level.

i. Strategic planning at county level

In this study it emerged that at operational level policies and plans developed at the national level were being implemented to ensure that management of chronic comorbid conditions was effective. However it was also observed that in the county government, strategic planning was being done to ensure equity and effectiveness in the distribution of the available resources from the national government. Data sources further revealed that planning at the county level mirrored the planning strategy in the national government, however with reservations in the development of policies, legal frameworks and clinical guidelines which were done at the national level.

Each county in the national government is responsible for planning and implementing its own health objectives which are in line with the national health strategic plan, the health policy, the public finance amendment act and the intergovernmental relation act among others... MOH, 2014:27

At the strategic level of the county the following key players were responsible for the planning of the county health services and development plans based on the health needs in the county: the Chief Executive of the County (Ministry of Health) headed the ministry, assisted by the Chief Officer of Health, the two officers were also assisted by the County Director of Health, who is the chairperson of the County Health Management Team (CHMT). During the study it emerged that the main function of the CHMT was to plan and allocate resources for the whole county including the referral county hospital. Further in every sub-county in the region there were respective Sub-County Health Management Teams (SUCHMT) to oversee and plan for the primary care services at levels 2 and 3 and the community committees responsible for organising the community health services at level 1. The abovementioned stakeholders were responsible for planning (including finance) and resource allocation to various programmes running in the county, forming collaborations and

partnerships with other sectors with significant influence on health and the private health sector. Data sources indicated that the county government was responsible for the planning for finance and resource allocation in the prevention and control of chronic conditions.

The Chief Executive of the County is like the minister of health at the county government, he is assisted by the Chief Officer of Health care at the helm of the Ministry of Health...we have the County Director of Health then each department in the ministry is represented based on what they do in the health sector, county nursing services, county public health officer etc..... FGD#2

The CHMT is comprised of the members from all sectors which have a direct influence on health both directly and indirectly even if health does not affect them.... It is the team which formulates plans for running the health services at the county level.....It receives reports from the sub-county health management for planning and resource allocation according to needs from the respective county sectorsFGD#2

The members of the CHMT are responsible for coordinating implementation of the health act and other policies from both the national and county government...it also provides supervision and support of the management of the county health facilities and the work of the sub-county health management teams.... FGD#1

The county governments (executives in the Ministry of Health) formulates legislations, policies and plans and ensure that adequate, predictable and sustained resources are available to strengthen NCD prevention and control programmes.....ensures suitable expertise and capacity for the prevention and control of NCDs and their determinants across the health system....MOH,2015: 53

.....At the managerial level we have all members of all health departments represented, and include other health related sectors like water, agriculture, finance and transport, private health sector.....We plan for the whole county of Nandi....HP#6

ii. Implementation at County Level

Implementation of management of chronic comorbid conditions care at county level emerged as a property under the sub-category of operational levels in the action/interaction strategies

category. Two types of implementations emerged from the implementation property, these were: a) level of health care service delivery, and b) interventional activity levels.

a) Levels of Health Care Service Delivery

The health system at the county level was organised in three levels, namely: levels 1, 2, 3 and 4 which represent the first three tiers in Kenya health systems. These levels of care were: community health services (level 1), primary care services (level 2 and 3) and primary referral hospital (level 4).

Community Health Service: It was observed level 1 was concerned with community health service provision in a small functional community unit (CU) which comprised 1000 households. It was observed that 25 community health volunteers (CHV) each served 40 households, 11 community health committee (CHC) members, in total 35 CHWs, formed one CU. It was observed that CHVs were responsible for health service delivery to the community and implemented health changes and wrote monthly reports for each family visited under the supervision of CHC. Among the several activities done by CHV were checking for nutritional status, immunisation status, safe water for drinking, and defaulter tracing in the community. On several occasions they referred patients to health facilities for further management. Abstracts from CHWs included:

Our services to the community are on a voluntary basis, for instance I am responsible for 40 households, I check general health issues affecting the household, checking for immunisation, checking nutritional status in the family, defaulter finding and directing them back to the facility...I also check the presence of a toilet, safe drinking water...if not there, we initiate to build a toilet and clean water storage...CHV#1

One community Unit has 35 or 36 CHWs who are 25 community health volunteers and 11 community health committee members. On change implementation we come together to help the household adapt to a new way of life, we call them action days...we can build toilets for the household if that is the change we want to implement for them...CHV#2

Primary Care Services: data sources and episodic observations indicated that level 2 and 3 facilities were of primary care category of health services being administered at the dispensary and health centres respectively. The key players at these facilities were the nurses, laboratory technicians, and pharmacist technicians or assistants trained on the job as they

were employed by the community. The nurse was responsible for primary care service provision which included screening, patient health education and referral of patients to the next level. It was also observed that minimum requirements for management of comorbid conditions in level 2 facilities included the functional laboratory, having a functional blood pressure machine and glucometers for blood glucose screening normally supplied by the county government. The nurses were in charge of the health facilities and formed part of the community health committee. It was observed however that their roles were not restricted to management of comorbid conditions, but also general health care and referral of patients to the next level.

At this facility normally we have few staff available, I am the only nurse here, I work with the laboratory technician and a community employed pharmacist assistant to dispense medicine, they are not trained, but they learn on the job...We provide all health services relevant for this level facility; we screen patients for blood pressure, and we do urine analysis at least to check the state of the patients' sugar levels before we refer them to the next level...HP#9

I am the in charge at the dispensary; we have the community health communities who are responsible for day-to-day running of the facility...In the absence of the CHV, I normally carry out community visits around the catchment area...HP#2

The county government has really tried to provide the basics to lower levels, for the dispensary we can now screen those who are at risk of chronic conditions near their homes...we have the blood pressure machine, the lab is working for urine analysis and sometimes we have the glucometers stripes for blood glucose...if they are high we can refer the patient to a county hospital...FGD#2

Episodic emersion into the culture of the community and the health system revealed that level 3 facilities had more staff and infrastructure compared to level 2 facilities. The person in charge at this level was the clinical officer (CO) with nurses working at different stations such as the 'well child' clinic, family planning, or even in the filter clinic, injection room, labour ward and observation wards. It was observed that at level three, the services of a nutritionist was much in demand with regard to HIV services and a pharmacist technician for drug dispensing. It was also observed that for the level 3 facilities which had been upgraded to sub-county were under the management of a medical doctor as the person in charge of the

health service provision. It became evident that management of comorbid condition was all new to some facilities at this level, but they received patients both new and old on follow-up or for medical refills. It was observed that those patients who could not be managed at this level were referred to the next level of management, the county hospital or regional referral hospital.

I am the in-charge at the facility; I have three nurses working within the family planning/child maternal clinic, observation ward and labour wards and injection/filter room. We also have a nutritionist doubling for HIV and general services, the pharmacist technician for giving out drugs to patients...HP#3

This facility was upgraded to level 4 as a sub-county hospital a few months ago, so now we have a new medical doctor as the [person] in charge, and will be running the diabetic and hypertensive clinic in the facility and other health care services....HP#11

We see all patients who come as new from home and those on follow-up with diabetes and hypertension...we only refer those with complications to the county hospital for further management...our laboratory is fully functional, the blood glucose machine is also working and the drugs for managing diabetes and hypertension are available most of the time, except insulin we don't have the stock at the moment...HP#4

Primary County Hospital/Referral Hospital: It was observed that at level 4 health services were provided under the overall supervision of hospital boards which check the overall health service provision at the facility level. Informants indicated that outpatient clinics for management of comorbid conditions were mainly run by clinical officers or medical doctor interns, while other medical doctors were used for consultation purposes.

The county referral hospital is under the supervision of the hospital board, but it reports regularly to the CHMT and the executives in the county. They check day-to-day running of the hospital, regulate resources and other general activities within the hospital....FGD#1

Similarly, nurse duties were mainly seen as passive only for in-patients, with the nutritionists taking the most active role in the management of comorbid conditions at the county hospital. The nutritionists on the other hand, were more concerned with all nutritional teachings, health education and demonstrations for patients and took an active role in running the diabetic

clinics. The Medical Outpatient Clinic (MOPC) and the Surgical Outpatient Clinic (SOPC) were arranged based on the availability of the doctors; the doctors were for specific conditions review and management. Specialists for the management of comorbid conditions were not available at all in the whole county. The laboratory, physiotherapists and eye clinic were all consulted based on the needs of the patients, however the laboratory was commonly accessed, as well as the pharmacy for medicine refills and testing of blood glucose levels. The following abstracts attest to service provision at level 4 facilities:

The diabetic clinic works on an outpatient basis, patients are reviewed by the clinical officer, they prescribe medicine...if the doctor or the interns are available they can also come...but we nutritionists do the health education and patient teaching, measurements of the blood pressure, register patients for the support group and triage those who need extra attention and refer them there....HP#8

The other general medical outpatient clinics are organised once a week, the same for surgical outpatient clinics, patients come directly to see the doctor there once booked for the same....HP#5

We work closely with the laboratory and the pharmacy, as without their services, it will be difficult to manage and monitor these patients even with a diabetic clinic...we consult eye specialists and physiotherapists based on the patients' needs...but we work as a team to manage them always.....HP#8

b) Interventional Activity Levels

At the interventional activity dimension of the implementation level property, in the operational level sub-category of the action and interaction category, a number of sub-dimensions emerged as interventions taken to manage comorbid conditions. These dimensions are elaborated on below: i) level 1: community prevention activities, ii) level 2: non-pharmacological management of comorbid conditions, iii) level 3: combined therapy management of comorbid, and iii) level 4: chronic management of comorbid conditions.

i. Level 1: Community Prevention Strategies

The following activities emerged as part of the interventions done at the community level for prevention of the onset of chronic comorbid conditions: i) health promotion and illness prevention and advocacy, ii) profiling for risk through community mapping, and iii) targeted health promotion for those at risk. These interventional activities are elaborated on below.

Health Promotion and Illness Prevention and Advocacy: It was observed that at the community level the CHWs were involved in promoting health of the households and in preventing illness, through being involved during community action days; home visitations and teaching about healthy diets, particularly eating more vegetables and fruits, dangers of alcohol and smoking and waste disposal within the community. The informants explained that they were responsible for giving household information about avoiding self-medication and instead encouraged them to seek medical attention at the nearest health facility. Excerpts from informants included:

Our work is to teach the community and demonstrate to them especially during community action days, we work with the household to solve their health problems...we conduct home visits and teach the household the dangers of smoking and alcohol drinking, and we also encourage them on healthy nutrition with diets of fruits and vegetables...we also educate them on waste disposal to prevent illness.....CHV#1

In this community, we have tried to encourage the community members to avoid self-medication when they are not well, and encourage those who are sick to try and go for treatment at the dispensary, and for those on medication already for them to remain on it... When they don't visit the hospital because of other reasons, we follow and really encourage them to come to the hospital for proper testing at the hospital laboratory...CHV#2

Similarly it was observed that health care providers and community leaders were active in increasing the knowledge of the community through conducting school health and community meetings (Barazas) on general illness prevention and creating awareness on general conditions like malaria and malnutrition, among others. One informant indicated that:

Community units here are very active, it is through them that health messages reach the household on prevention of illness common here like malaria, malnutrition ...with others like opinion leaders and public health we conduct school health, or community meetings just to teach the whole community about living healthy....HP#11

In this study it emerged that some organisations like *Kenya Defeat Diabetes Association* concerned with creating awareness in the community was using advocacy to reach the

community through training of peer patients and supporting the development of support groups, and clearing up misconceptions about diabetes, especially insulin, in the county.

Kenya Defeat Diabetes Association forms support groups across counties in Kenya, training peer diabetic patients to train others in the community...this will help in improving advocacy....people can talk openly about diabetes, clear misconceptions about use of insulin and how to access insulin...HP#10

Profiling for Risks through Community Mapping: Data sources both from the community and health facilities indicated that some areas with active community health service or CUs, had mapped out the community according to available social amenities like schools, topography, dispensaries and shopping centres. The CHWs and the public health were aware of which area people are at risk of excessive drinking and smoking, or sexual activities which exposed them to HIV and TB. It became evident that through community registration of households by CHV it mapped those at risk in every household in terms of health information, location of the homestead, number of heads in the family and challenges they face.

Community mapping helps you to know the community you are dealing with in terms of number of schools, topography, health facilities and the distance...the culture of the community needs to be known,....we already know which area people drink a lot, smoke or engage in risky sexual behaviour and TB...HP#11

...We keep our registers of those households and their known health problems, we know their homes, because we visit them regularly...each one of us has a map for the community unit and the homestead you visit, showing schools, dispensary, shops, roads....this helps you to know how to help the household when called upon.....CHV#1

Targeted Health Promotion for those at Risk: It emerged that although the priority given to people at risk of developing comorbid conditions was not adequate, there was an improvement in the general population. Informants indicated that prevention of chronic conditions was achievable through initiation of programmes and projects which increase community awareness specifically on chronic conditions like diabetes and hypertension. School health programmes were identified as the easy way of accessing the entire community as each household had children. Children deliver the messages to their parents as they could

read and write as compared to the older generation, and urged parents to take action on their health like early screening.

In the county, we conduct school health programmes on health issues becoming common in the community, through the school children, we target parents to get information and come for intervention and seeking help early on their health...some come for screening and then you know they are at risk or affected by diabetes....HP#11

People at risk of developing chronic conditions are our priority now...we target them through schools and social places....HP#7

Similarly, informants indicated that community-based help projects encouraging families and farmers to plant healthy indigenous foods, which will keep lifestyle diseases away in the community. It was observed that several people were involved in farming of natural foods to supply the community with the best natural foods and to encourage community members to consume them and fruits which is optimally done. One informant noted that:

There are community projects on increasing healthy diet sources through planting locally available vegetables and encouraging the local community to consume a lot of vegetables and fruits, well cooked, and prevention of exposure to toxic smoke during food preparations...HP#10

From experience people here don't like eating an indigenous diet, or fruits, people are running for more processed food...living locally and with natural ones available, we are now encouraging them to eat them more...HP#8

On the other hand, for those already at risk of diabetes or who are affected, they were encouraged to stop eating sugar and salt, and to instead seek to consume more natural foods and vegetables. A CHW indicated.

With health promotion in the community for diabetics, hypertension and others, we normally encourage them to eat a lot of vegetables, encourage not taking sugar in every food they eat, while on medication they are not to work so much, and to exercise regularly. For those with pressure we encourage them not to take salt in all their meals.....CHV#2

It was observed that some medical institutions within the county occasionally conducted free screening for the community to identify those at risk and health education on how to prevent onset of chronic conditions like diabetes and hypertension; those diagnosed are referred to health facilities for follow-up later. Abstracts from informants attested to this:

Sometimes we receive free medical screening from universities in schools both in secondary schools, market places, those who are diagnosed are referred to the health facilities for confirmation and follow-up...HP#9

Support groups help increase advocacy among patients and households in the community; it is in the support group that the patients start their journey of learning about their condition, diet and medicine and even complications ...they meet other patients who are just like them, so they usually feel they are not alone with chronic conditions.....HP#8

ii. Level 2: Non-pharmacological Management of Comorbid Diabetes and Hypertension

Management of chronic comorbid conditions emerged to be classified into stages as previously indicated, and contained in the clinical guidelines for management of single conditions, specifically diabetes. The following domains emerged from the property of non-pharmacological management of comorbid conditions strategies, which included: a) Patient education, b) Weight control, c) Engaging in physical activity and exercises, and d) Use of alternative and natural medicines.

a. Patient Education on Management of Comorbid Diabetes and Hypertension

Informants reported that education for patients and their care givers was central to management of comorbid conditions. It was observed that adequate information through patient education on health conditions prevented early onset of complications and motivated patients to achieve optimum control of blood glucose and blood pressure levels. Health education to patients and caregivers was seen as a means of empowerment with the right knowledge and skills to perform self-care skills and to be in charge of their health. Informants indicated that regular patient education had reduced incidences of diabetes crises as patients became more aware of themselves and self-care skills at home. It was observed that patient education was given individually during consultation; in diabetic clinics patient education in groups was the norm.

Patients who have gone through the nutrition department for education rarely come back into the hospital for admission or with early onset of complications...since we started patient education, admissions in the wards have reduced significantly...teaching them as a group helps to share informationHP#8

It is important that you teach the patients and those accompanying them regularly patient education is central to managing comorbid conditions, they receive information on what they need to do to control the conditions at home....During consultation I give individual patient teaching emphasising self-care at home, diet among othersHP#3

When patients are well informed about their conditions you empower them to make right decisions about their skills for self-care...as knowledge is power, they make decisions on their health...HP#2

The following sub-domains emerged from the domain of patient education in the property of non-pharmacological management in the sub-category of operational level of the action and interaction category in the management of comorbid conditions: a) Education on diet and lifestyle adjustment, b) Self-monitoring and interpretation of the results, and c) Foot and eye self-care. Excerpts from informants attest to the effects of education on their conditions and practices:

Education on Diet and Lifestyle Adjustment: It emerged that patient education on diet or nutrition was highly regarded to be at the epicentre of comorbid diabetes and hypertension management. Once diagnosis of either pre-diabetes with high blood pressure as primary or diabetes with secondary hypertension was confirmed, then patients were started on diet/nutrition education by the nutritionist. The education was general at the beginning on the type of food to eat, the amount to be eaten in one intake and the frequency of feeding which the patient is to observe. It was observed that much emphasis was put on sugar and salt intake; increase of vegetable intake and with caution, increased fruit intake. The nutritionists demonstrated that using the content of locally available foods was also prescribed to the patient and their care givers or family members. It was also observed that patients were constantly being reminded of diet more than any other aspects of self-management. Diet education was presented to suit two comorbid conditions and their respective complications.

We (nutritionists) start patient education on diet as that is the main challenge ...they need to know the type of food to eat and not to eat, the amount to eat at what interval or frequency to take meals, we do educate them on salt and sugar intake especially for those with both diabetes and hypertension.....HP#8

...I do brief patients on diet education and nutritional adjustments required...but I also send them to the nutritionist for further instructions especially on sugar intake and salt measurements....HP#3

...Patients who come to the facility are given patient teaching on an individual basis about general things on diabetes, hypertension, drugs, alcohol, smoking and nutrition (sugar and salt intake, portions of eating particularly fruits and vegetables)...This is routine for us at the diabetic clinicHP#2

I have been told by the nutritionist to eat more vegetables and fruits, stop sugar and salt ...She told me to eat fruits in moderation....I eat half an orange in the morning and the other in the evening because it has a lot of sugar and can affect my sugar levels....I also take white maize meal like everybody...but I take a little amount, one cup...Informant#1

Similarly, informants indicated that from the time they were diagnosed with comorbid conditions, they have changed and adjusted their previous diet, and lifestyles like alcohol intake and smoking needed to be stopped once diagnosed with comorbid conditions.

I don't take sugar or salt at all in my food, I also take measured meals not just like anybody, but I eat normal food, white maize meal...One also has to stop drinking alcohol and smoking or chewing tobacco when you have diabetes and worse with hypertension ...Informant#5

.....things changed, I used to eat anything and all things, meat, sodas, sometimes alcohol only during celebrations, biscuits, rice, maize meal, milk and any other thing that comes my way; I would eat and enjoy it...All that ended, I don't eat white rice, biscuits, sodas...I just eat small portions of boiled food with no salt or oil, no sugarInformant#4

Food/diet changed, I stopped sugar, salt, I eat brown meals, or when they mix I feel it is good. I eat a little salt at times or nothing at all...Informant#2

Home based Self-monitoring and Interpretation of the Results: Data sources revealed that home-based self-monitoring among patients with comorbid diabetes was central to continuity of care, delaying onset of complications and taking the right action at the right time. It was gathered that with time patients learnt to accept and live with the conditions, which determined when to seek medical intervention. Most informants indicated that based on self-monitored results, symptoms experienced within motivated them for check-up earlier than required if they were not feeling well. The availability of self-monitoring machines at home, and knowledge on how to use them, was seen as an advantage to the patients and cutting of cost of transport to the health facility. Knowing what works and when everything is right by the patient helped most of the time to avert crisis and seeking of medical attention early. Excerpts from informants and their care givers attest to this:

Now I've got a machine here at home for measuring ...some days I go to the hospital only to measure sugars and pressure; I know I am fine when at 10mmol/l....Informant #3

For him we have the machine here at home, so I measure his blood sugars daily and when he says he is ok we all know he is ok...I keep the records for his blood sugars just in case...I take it in the morning at 7am...the highest he has ever gone this month is 13mmol/l and the lowest being 7mmol/l.....he has no complaints at all...Care giver#3

When I want to do my fasting blood sugars, since I am near the facility, I can run and get tested and return home for my injections...But I can tell you when I am not doing well...With time I have become a machine for myself...but I am well when blood sugars are below 10mmol/l and pressure 130/85-90mmHg I can't complain about anything....Informant#5

Frequent Foot and Eye Self-care: It emerged that regular inspection of the feet and eyes is important in the course of managing comorbid conditions. Self-inspections became the first

step in detecting onset of complications on the feet and eyes which are the first to be affected by diabetes and hypertension. It was observed that most patients in the community put on open shoes and only used closed shoes when they were going out of the homestead. Informants indicated that they have been educated on how to do self-body assessment on feet for any colour change or tingling sensations. Several informants expressed that their eyes' acuity was fading as time lapsed with the conditions; onset of cataracts and operations were done for correction.

We were taught on how to inspect various parts of our body, for colour change, loss of sensation on the feet or hand, being alert to change in vision, or wounds which do not heal, to go to the hospital.....SGD#5

Seeing, I see well... (Interruption) from the wife (yes the eyes have problems) sometimes he says when he is outside that he does not see well (blurred vision)....He has gone for a check- up alreadyCare Giver#4

I also developed issues with my eyes, I could not see, I developed cataracts and went to Sabatia for cataracts removal. I have removed one, I see well, but now I see this other one has started the problem and I think I will go for a check-up”Informant#2

b. Management of Comorbid Conditions required Weight Control

Weight control emerged as one of the interventions for achieving optimum control of blood glucose and blood pressure. It was observed that most patients with comorbid diabetes and hypertension were obese, which was persistent even in old age, and patients needed to control the weight through diet and exercise. It also emerged that apart from diet adjustment, weight control was an uphill battle for most of patients, due to perceptions culturally upheld by the community and stigma of a slim body associated with HIV. Informants indicated that those patients who maintained their ideal weight and eliminated other risk factors and complications were few, as they adhered to their meal management plan according to the nutritionist.

Weight control is one key aspect in the management of chronic conditions like diabetes and hypertensionwe normally take their weight, height, waist circumference, which gives us the body mass index (BMI), which tells us the best weight patients can struggle to achieve as a measure of managing chronic comorbid conditions or even

diabetes alone... so our patients understand their ideal weights, which is also crucial...HP#8

From my own experience, patients who are within their ideal weight and follow their meal management plan, normally do not progress quickly with complications or to drug therapy.... HP#12

I have remained with this weight ever since I was told not to add more weight; I have remained on diet management to control diabetes and hypertension...for four years now. I have not started drugs, because I have not added or reduced weight ever since....SGD#6

In the community due to stigma attached to slim body frames being equated to having HIV, most people tend to be comfortable with a big body, despite the hazards it carries with it....HP#2

c. Engaging in Physical Activities and Exercises

Management of chronic comorbid conditions requires active involvement of patients in physical activities and regular exercise. Some informants indicated that most patients with comorbid conditions were to benefit from regular physical activities to boost blood circulation in the body. It was also observed that cultural orientation and environmental circumstances in the community determined the ability of some patients to engage in physical activity or exercise. Data sources revealed that older women were not to be seen running or doing jogging exercises openly in the community. Age also emerged to be a hindrance to exercise and physical activities especially for the elderly, based on the type of exercises being undertaken. It emerged that daily activities like household chores for women were regarded as exercise and physical activity as compared to farming activities, walking and cycling for men. Extracts from informants are presented below:

Doing daily and regular physical activities and exercise helps boost blood circulation to the whole body....diabetics must live an active life, but must have adequate rest in between daily activities...Always exercise to burn extra fat, which when left, accumulates in the body and blood vessels. During exercise make sure you walk faster or do whatever you are doing for 45 minutes and ensure that all activities you do

makes you sweat...Walking or aerobics is good for diabetes.....Health education at diabetic clinic, 26th October 2014

I do exercise for 30 minutes while lying on the floor raising my legs one at a time, it helps to make me feel better...Informant #1

Culture in this community can really restrict you on what to do. Women, especially in old age, cannot be seen along the road jogging especially in the interior community...another thing with old age, you become rigid and doing exercise becomes very hard for most of them, but we encourage them to do what they can.....HP#1

I have seen from most patients, women in particular, do what they refer to as exercise in the common daily housekeeping chores...these are not enough to keep diabetes and pressure in check...HP#8

d. Use of Alternative Traditional Medicine and Natural Remedies

Use of alternative traditional medicine emerged as one of the non-pharmacological strategies some patients used in the management of chronic comorbid conditions in the community setting. It was observed during the immersion into the culture in the community that modern medicine and alternative natural medicine coexist and are utilised by patients across all levels of care concurrently. It was observed that cultural beliefs and practices in the community determined the use of natural remedies and traditional medicine, both when faced with communicable and chronic conditions. Informants reflected on first hand experiences of the use of natural herbs and traditional medicine as an intervention to manage chronic conditions soon after diagnosis. Some of the excerpts from informants included:

I have been using the Neem drink to control my blood pressure for a year now while working with the Neem foundation...then I stopped working with them...I could not access the product, and see my pressure is so high and the sugars are also running wild....to me the Neem medicine worked so well....SGD#5

I am using Aloe Vera juice and garlic mixed with ginger to control my blood pressure and glucose...I have now been doing this for one year and have not started the medicine since I was diagnosed...but I am hopeful they remain under control always...SGD#7

It further emerged that in promoting their products traditional medicine practitioners used words which instilled hope and assurance to patients and the community about a cure within weeks as compared to lifelong use of western medicine, which seemed promising to most chronically ill patients and their families. It emerged that to some patients the traditional medicine did not work, or they tried and stopped, and to others it did work as they felt much better. One of the prominent herbal clinic's adverts read:

We at Murugu Natural and Nutritional Clinic use natural products to treat and give answers to 95% chronic conditions like diabetes, hypertension, arthritis, asthma.....Diabetes we treat for five weeks and hypertension we treat it for 25 days..... Murugu Natural and Nutritional Clinic.....October 2014

On the contrary there are those who reported that it did not work for them, despite the fact that they stated using the medicine after being diagnosed and having started on the medicine. Some informants noted their reaction to the herbal use:

...I once tried to run away from injections, and I stopped coming for a check and I went to the market and bought the herbs; they tell us that they work in treating diabetes and hypertension in weeks... Informant#5

Eeh! some time back someone brought for him the traditional medicine boiled for drinking, it was packed in five litres, six of them (wife explaining).I tried to drink it, but I felt nothing, my conditions remained the same, but I never stopped using medicine, I stopped completely and I have never tried anything after that, I only use insulin and the tablets for pressure...Informant#2

It was also observed that culturally the Nandi community is known for their potent herbal medicine which is easily accessible to the community for use as a means of managing chronic comorbid conditions and minor or acute conditions. One informant indicated that the practice is common and it is not about to go away.

....You know in this community herbal medicine is given preference, as the community is known to have very good medicine for some of these conditions and even minor and acute conditions...It is very common and used anyway despite the hospital medicine; the practice is common and is not going away any time soon...CHW#2

iii. Level 3 Combination of Non-pharmacological and Pharmacological Strategies

It was observed that most patients in the community were being managed using a combination of both non-pharmacological and pharmacological treatment plans. Informants expressed that they were not able to control comorbid conditions with non-pharmacological strategies only. In the context of managing comorbid conditions, it was observed that priority of management was skewed towards diabetes and blood glucose control as compared to hypertension or lowering the blood pressure especially on oral combination therapy with more than one drug being taken at the same time to control both hypertension and diabetes. Data sources revealed that clinical guidelines stipulate the protocols that patients with single or comorbid conditions be managed in a systematic manner with addition of drugs, based on patients' level of response to previous management strategies. It was observed that despite unavailability of medical doctors and specialists in lower levels, some patients were still able to achieve optimal control on combined drug therapy and non-pharmacological measures as earlier described and included in the clinical algorithm for both diabetes and hypertension management.

I did not have a chance to use diet and physical activities to control my conditions....I think it was already too late to do that alone, so I was started on medicines first and then told to do exercise and adjust my diet ,what I have continued to do until now.....SGD#1

.....when I was told I had both diabetes and blood pressure...I was started on insulin injections and tablets, and later discharged home when the blood sugars were at 17mg/l. Since then I have been using insulin and tablets always while controlling what I eat and other things...Informant#1

I went to the hospital for a check-up and that is when I was told I am diabetic and at the same time, my blood pressure was so high...I was started on insulin immediately and some injections which I don't know, but after some time, I felt well and was released from hospital and ever since I am on medication always...Informant#4

When patients come here for the first time or even for follow-up...I follow algorithm charts to management them and start them on medication...I send them to the nutritionist for diet education...HP#3

iv. Level 4 Chronic Phase with Multiple Complex Strategies

It was observed that management of comorbid conditions advanced as complications set in and other multiple comorbidities; patients with poorly controlled diabetes and hypertension progressed quickly to the chronic complicated stage which required multiple complex interventions under specialised care and medical specialised personnel at secondary and tertiary health facilities. It was observed that the elderly patients mostly could not do self-management at home and ended up developing complications faster as compared to younger patients with comorbid conditions. Some of the excerpts from health care providers on this level of management included:

We refer those special cases that need specialised care to level 5 and they can be followed up there...for specialised lab tests which they require for their management. At this level, we prefer they remain monitored at level 5 than at level 4 for their own benefit.... HP#8

I have seen here that older patients move quickly to chronic phase and develop complications faster as they cannot care for themselves...they need specialised care at tertiary levels...HP#2

4.6.3 Monitoring and Evaluation Level

It emerged that management of chronic comorbid conditions require constant monitoring and evaluation in the whole process of prevention and control within the county and national government. The following three properties emerged from the sub-category of monitoring and evaluation in the category of action and interactions strategies in the management of comorbid conditions: a) Outcomes indicators, b) Exposure to risk factors, and c) Health system capacity and action to manage comorbid conditions.

a) Outcome Indicators on Morbidity and Mortality

It emerged that management of chronic comorbid conditions at the county level were to be in line with national government targets and indicators as for further planning and resource allocation. It became evident that information on prevalence of comorbid conditions in the county was to be a summation of all cases from all health facilities implementing health services. Data sources revealed that some of the indicators on the management of comorbid conditions at the county level included: cause of death, new cases being seen in a month and a year in various stations. Informants reflected that the number of premature deaths due to hypertension and diabetes needs to be captured for prevention and control of the conditions. Excerpts from informants indicated the concern and need for action.

...For the reason we serve 80% of the patients who come for monthly review both from the clinic, home and referrals, thus I cannot say that the incidence rate of diabetes in Nandi is increasing as we see 400 patients/day and we see two new case of diabetes in a month....HP#7

At the nutrition department, we normally see patients who range from primordial state to those on medication already... the number of new cases coming for nutritional counselling is increasing each day... in a single day we can see two to three new patients coming for advice....HP#12

Documentation of premature deaths, blood pressure and blood glucose levels in all patients being seen in the facility need to be documented well, which can really tell a lot about what actions need to be taken ...to control the conditions in the county.....FGD#2

b) Exposure to Risk Factors to Chronic Conditions

One of the areas for monitoring and evaluation on management of chronic comorbid conditions emerged to be the level of exposure to risk factors in the community. It was observed that the most common risk factors in the community were excessive alcohol consumption among people aged 18 years and above, use of high salt content and a high processed diet in the community among many others as indicated in the ministry framework. Data sources revealed that the county did not have standardised figures on risk factors associated with comorbid diabetes and hypertension, and was conforming to the national framework for monitoring and evaluating risk factors, based on the contextual condition in the county. Some of the extracts from informants are represented below:

We at the public health department in collaboration with nutrition departments are putting up statistics to monitor the risk factors in Nandi county....We don't have standardised figures yet, but we will be there soon; we are still using the framework from the ministry on NCDs....HP#10

The following indicators need to be monitored and evaluated within the country....Intake of alcohol within the community and among patients, number of smokers and the number of cigarettes one smokes, the number of people with high blood sugars among people 18 years and above (less than 7mmols/l or on medication), the number of people consuming fruits and vegetables within four to five servings in a

day; the prevalence of inactivity/week among adults of 18years and above- using less than 150 minutes; the prevalence of people with high blood pressure at less than 140mmHg/90mmHg or on medications, and the number of people who take salt in grams among adults of 18years and above...WHO, 2013

Informants in this study reflected on the level of exposure to risk factors as very important indicators of management of chronic conditions in the county and lack of consistency in data entry on the indicators within the county health systems. It emerged that blood pressure was the common monitoring and target of risk factors that each patient had a right to. Others like body mass index and weight checking was done regularly in the general community population and with those who are already sick.

At the county statistical record we are trying to put these risk factors in groups, We have now started recording alcohol intake among all patients coming to health facilities....but not everyone is doing it with other groups of people in the community...FGD#2

The situation of chronic conditions in rural communities is actually worrying as everybody now is at risk of exposure to risk factors of developing chronic conditions.....In our facility we are recording the BMI, weight, blood pressure and random blood glucose for most patients...this helps in planning new strategies of controlling the chronic conditions...smoking and alcohol drinking is being monitored among patients who come to the facilities like the diabetic clinic...HP#12

The nutrition department and the public health in the department are encouraging intake of vegetables among community members in social places like markets and churches, just to encourage as we monitor the incidence and prevalence of diabetes and hypertension...HP#9

c) Health System Response and Capacity to Handle Comorbid Conditions

The following two domains under the health systems response and capacity property emerged: a) Initiation of patients on drug therapy to prevent onset of complications, and b) Availability of essential medicine and basic technologies to manage chronic conditions.

Initiation of Patients on Drug Therapy to Prevent/Delay Onset of Complications: One indicator for management of chronic comorbid conditions was the ability to initiate patients on drug therapy as soon as they presented in the health facility. It was observed that most of them were already on combined therapy made of multiple medications and lifestyle adjustment strategies, which aimed to delay the onset of complications of both diabetes and hypertension.

You cannot take chances with nutrition only because here, people don't like fruits and vegetables... by the time they come to the clinic they already have advanced too far for nutrition only to work....we start then on combined drug therapy to compensate for the lost time....HP#3

Most of our patients are on combined drug therapy and diet modification ...health seeking behaviour here is very poor and complications set in quickly before one starts medication. To be on the safe side, we start them on combined drug therapy...Culturally; being on management without drugs is very demoralising to patients in the communityHP#12

Availability of essential medicine and basic diagnostic technologies: emerged as another indicator for monitoring and evaluation of management of chronic comorbid conditions. It was observed that most facilities in the county at PHC levels had basic minimum equipment for early diagnosis of diabetes and hypertension. This was observed to be in terms of working blood pressure machines, functioning weighing machines, glucometers and laboratory services which were operational although at minimum capacity.

It became evident that a few patients could afford self-monitoring machines for glucose at home; but blood pressure was rarely reported, as compared to random blood glucose levels. The following were some of the available reports and observations on the capacity to handle the comorbid condition at different facilities:

At the county level laboratory we have sufficient reagents to do the following laboratory tests, including patient teaching and counselling on self-testing and monitoring at home; testing fasting blood sugars (FBS), random blood sugars (RBS) and comparative analysis of the patients for comprehensive body assessment to rule out other cardiovascular, renal and liver problems...We also do analysis and setting of the quality control of the machines....HP#7

At level 2 we have the capacity to manage comorbid diabetes and hypertension. We can at least do the basics for the patients and monitor them on medication...we can do urine analysis for free, we have the machine for random blood sugars and fasting blood sugars and we have the blood pressure machine and it is working well....HP#9

Informants in this study had reservations about the consistency of drug supply in relation to evolved health care systems and drug lists and policies on level of health facilities in Kenya as indicated in Kenya's essential medicine list. Informants indicated that if drug supply was upgraded, unnecessary referrals could be averted. Comments from informants are represented below:

Drug supply to level 2 and level 3 is there; although it has not been regular....it needs to be sustained for the patients with chronic disease through getting funding for the supply of the same at the lower levels of care...FGD#1

...I also give drugs to hypertensive and diabetic patients, because we have them available in the kit from the county headquarters (although not like it used to be before). Now things are becoming worse, as you can order and wait forever or you go for the drugs yourself in Kapsabet.....HP#4

The essential lists and the kits for level 2 and level 3 need to be reviewed to allow certain drugs to be included in level 2 and 3, which cater for the majority of the population....Instead of referring everything to level 4,we can manage with a constant supply of drugs....FGD#2

4.6.4 Management of Chronic Comorbid Conditions Process

The process of managing chronic comorbid conditions emerged as a sub-category under the actions and interactions strategies category in the management of chronic comorbid conditions. It emerged that at every step of the process of reviewing patients with comorbid conditions, there were distinct key players who had different roles in the process. The roles of two key players will be presented in the last section of the process.

The following properties of the management process were routinely observed at the management of comorbid conditions environment: a) Registration at the record stations, b) Measurement of blood glucose levels, c) Observations/vital signs; d) Consultation with

clinician/support group/MOPC; d) Medicine collection at pharmacy; and e) Referral to the next level facilities.

Registration at the Record Stations: It was observed that patients in all health facilities registered at some point of their attendance to the facility for the purpose of statistics. It was observed that patients had their own notebooks for records and the facilities had their own patient registers. The biographical data of the patients were captured as a routine both in patients' notebooks and facility registers. The notebook was stamped with the date and patients retained the notebook.

All patients coming from home must register for them to access health services in the facility, their books must be stamped with the date and their age; names captured and the residence of the patient is also captured on our hospital registry from the Ministry of Health ...HP#3

At the clinic we also register the patients in the book specifically for diabetic patients attending the support group for records of the important parameters for the patients...HP#8

All patients must pass through records to register first and get the number. After that they go to the filter or laboratory. When all the services are done they must go back to records; we capture the diagnosis and return date...before they take medicine and go home....HP#12

Measurement of Blood Glucose Levels: This emerged as one of the routine processes all patients seeking health care services were to go through. It was noted that after records, patients went straight to the laboratory for the measurement of blood glucose levels. It was gathered that patients in need of fasting blood glucose levels went early in the morning before they took their breakfast as compared to others who required random blood glucose. These results from the laboratory were used by clinicians to review patients in combination with other components for management.

At the laboratory patients come directly from home...we do both fasting blood glucose levels and random blood sugars as required. Fasting blood sugars is done very early in the morning while random we do at the time the client comes...We do other tests when requested by the doctor, but commonly we do random blood glucose....HP# 7

Patients who are coming from home already know what they are to do. Some come straight to the laboratory to measure their blood sugars...when they come to the clinic they already have their results which we use to review them...HP#8

Consultation with the Clinician/Support Group or MOPC: It was observed that consultation rooms were performing multiple tasks concurrently. Informants indicated that individual patient teaching took place during the consultation period with clinicians. During the consultation period, patients and health providers had time for discussion on modalities of management and plan together how to achieve set goals, specifically blood pressure and blood glucose levels. It was also observed that patients expressed their challenges in the process of managing comorbid conditions at home either with medicines or diet. Health-care providers indicated that patients' blood pressure and glucose level parameters out of the normal formed the basis for review, majorly concerned with blood glucose levels more than blood pressure. It was also observed that the clinician reviewed the medication/prescriptions of patients based on complaints raised and tolerance to the medicine. It was further observed that individualised physical examinations of patients were done during consultations, but rarely done in a group clinic or group consultations.

When patients come in for review as individuals, you have to ask them how they are doing on medication, diet, exercise, and review all of them one at a time...we normally organise patient educators to teach them as a group on signs and symptoms, and how they need to handle them. Find information about their vision and legs as most of them do not report. You have to ask them how they feel day in and day out at home....it is important to do physical exams on them regularly to rule out some abnormalities.....HP#3

At times you can find one patient with continuous high blood glucose. As a clinician you need to find more information about what the patient is doing at home or not doing right...take time with the patient to plan a new plan of management and how to achieve the goal of management...HP#12

Each day that these patients come here, you must check what medication they are on and review the dosages ,based on what they have reported to you...some of the

dosages could be low or high based on the sugar levels and blood pressure levels.....HP#8

Medicine Collection from Pharmacy: It emerged that the pharmacy is central to the process of managing chronic comorbid conditions. Data sources revealed that patients or their caregivers went to the pharmacy to refill their previous medications or to receive medication for new prescriptions. Informants indicated that the pharmacist was one person who explained what the doctor wrote on their notebooks, timing of the medication, and other rules of taking the medication (with or without food). At this point, patients received instruction on storage of insulin to maintain its potency and how to inject using the available needles. Nurses were more involved during the inpatients' patient teaching on insulin injections and storage. Extracts from informants are presented below:

I dispense medicine to patients after they have been reviewed by the clinician and the prescription is written clearly...I give them clear instruction on how to take medicine, because if you don't explain, they will be worse with their conditions...Some of them come with their relatives and those are the ones you can explain to if the patient is very old or unable to communicate....I give them instruction on how to take medication with food or without food, take at night or once or twice.....HP#1

I also give drugs to hypertensive and diabetic patients ...Some come for refills others come for new orders from the clinician... Specifically for those patients that use insulin, we have to teach them clearly how to keep the drug well so as not to spoil its potency...it needs low temperatures and requires that it be kept cold well...others who were admitted have already been taught by the nurses on how to inject themselves ...HP#2

Referrals to the Next Level Facility: It was observed that management of chronic comorbid conditions is continuous and required to be well co-ordinated across care settings and personnel. Informants reflected on the complexity involved in referral of patients from lower level facilities, as they did not have the necessary coordination for the referral of patients with comorbid conditions. Informants indicated that referral notes were written in the patients' notebooks for outpatients, and patients and their families were responsible for their referral costs to the receiving facility even where no prior notifications were made to the receiving facility. Some of the informants' views included:

We refer patients from level 4 to level 5 especially those who need further laboratory testing and the services of a specialist physician...sometimes you can be monitoring blood glucose and blood pressure, but the kidneys are not functioning, thus it is very important to refer them once a year for a test.....HP#8

During referrals we write in the notebook of the patients, and it is up to their families to ensure that the referrals are implemented on time based on their financial positions...Some wait forever to get to the main laboratory or to see the physician...because they cannot afford to travel there.....HP#12

4.6.5 The Roles of the Health Care Providers in Management of Comorbid Conditions Process

The role of the health care providers emerged as a property under the sub-category of management of comorbid- conditions process. The two properties emerged as roles of health care providers. They included: a) Patient educator, and b) Facilitating the consultation.

Patient Educator: It was gathered that health care providers were responsible for provision of health education to patients receiving care at health facilities. Informants indicated that their roles required adequate information on the conditions and they passed on the same information to patients in the most appropriate form for implementation at home. Data sources also revealed that patient educators needed to be culture-congruent to provide chronic care which was culture-sensitive to the needs of patients and families. Some of the reflections from patients included:

I am a nutritionist, but above all I perform the role of patient educator, educating them about their conditions first of all and then about the treatment and management strategies available and how they can be applied in their specific situations at home and at the facilityHP#8

As an educator you need to be well informed about the patients' conditions, to be able to respond to the patients' questions and allow them to ask those questions. Being an educator requires that you have more information at your fingertips. You must always be informed about the culture of your patients' catchment area, so that you do not cause culture conflict within the community.....FGD#1

As a community health care provider, you just have to be culture sensitive, change your technique based on the patient culture, and be able to provide care which is acceptable within the cultural norms and expectations...HP#2

Facilitation of the Consultation Process: Data sources revealed that health providers took the role of facilitators during the consultation conversations, between them and the patients, with or without their family members. Informants indicated that their role in the consultation room was to assist patients by giving relevant information towards making an informed decision on the appropriate management strategies to be adopted. It was observed that the health providers only provided guidance to allow the patient to take the active role of self-management of the conditions. Abstracts from the informants on being facilitators are reported:

While patients see you like you know everything about their conditions, they have the answers to how they feel and how to move on...So during the consultation, they need to be given time to consult...HP#5

It is a facilitation role as, once the patient goes home, he/she has to do the greater part of management at home, and the family... we assist them to choose and adhere to what we agree upon in the management of the conditions....HP#3.

Informants reflected that during the facilitative role in the consultation room, they promoted patients' autonomy; informants further indicated that their role ends when patients receive the right information on how to manage themselves, and make the right decisions on how to actively participate in self-management. Informants reflected that patient autonomy in chronic care management allows the patients to choose from the many options of care available and make an informed decision; it allows them to be in control of their lives and health, through active participation.

Patients have the power to decide what they want done to them, provided we give them the right information; they need to take an active role during consultation and to that they can have the right information....some patients at times are very reluctant in taking decisions about their health and mode of treatment that suits them at home...We ensure that we guide them to be informed without pushing them to take, for instance, insulin or oral therapy.....HP#3

4.6.6 The Role of Patients in the Management of Chronic Comorbid Condition Process

The role of the patient emerged as property under the sub-category of management of chronic comorbid condition process. The two dimensions which emerged under this property were: a) Take an active role in self-management, b) Adhere to the plan of management.

Taking an Active Role in Self-management: It emerged that patients had to take an active role of care provision themselves, according to the specified decisions made in consultation with their health care- provider. It was observed that most patients who had comorbid conditions were actively involved in doing self-care administration of medicine and diet adherence as required for clinical outcome. Informants reflected that patients who attended a support group were showing positive results in self-management as they shared information during support group discussions. It was observed during a support group discussion, that patients demonstrated adequate knowledge on self-care, medication and physical exercises as prescribed to them by health care providers or educators. Abstracts from informants included:

At home patients are required to actively participate in their own care, for instance regulate their diet, have control of what they eat, how much they take per meal or portions, monitor their blood glucose and pressure...then record and report to their health-care providers with their own readings...HP#3

...I take care of myself, ensure that I eat breakfast, take my medicine and examine my feet now and then, always I make sure that I have shoes on when walking around the compound....Informant #5

During support groups patients share their experiences and how they take care of themselves at home...When we get new patients they have many things they need to learn about how to take care of themselves, they learn quickly and start taking active roles too in their management and share their own experiences with others...HP#12

Adhere to Treatment Plans: Data sources revealed that one important role in the management of chronic conditions are adherence to treatment plans and follow-ups by the patients and their care- givers. Informants revealed that those who did not adhere to the treatment plans progressed faster to onset of complications which is a poor outcome of care and quality of life. It also emerged that patients directed their own care by consulting regularly with health-

care providers to review and revise their drug prescriptions based on their response to the drugs and other strategies. Some of the excerpts from informants are highlighted below:

One role for patients we see in this clinic is to come to the clinic for review and to adhere to treatment plans prescribed for them to ensure that their quality of life is in constant check and they should have a good outcome of care...HP#1

You see patients who don't play their role in following the treatment plan, progress faster in developing complications because their blood glucose and blood pressures are always highHP#9

Patients need to take the role of directing their own management of their conditions. When you direct care, it usually goes your way...you will know when to go for check-ups, take medication as the body tells you what is right, and how it should be done, in consultation with the health care provider...HP#11

In the context of management of chronic comorbid conditions in PHC settings, interventions can either be at the strategic or operational level, which later on require monitoring and evaluation accordingly. Effective management of comorbid conditions require strategic planning of activities, infrastructure, finances, development of policies and protocol, relevant human resources and well-co-ordinated programmes between different stakeholders and key players at different levels of care delivery. Secondly, management of chronic comorbid conditions needed to be operationalized and implemented, where actual management of comorbid conditions were delivered at different levels of care, starting from health promotion and prevention through the chronic phase with multiple complications. Last, but not least, is the monitoring and evaluation of the whole process of management of chronic comorbid conditions and accountability of resources across levels of care within the framework, with indicators and targets to be met. In conclusion of the section is the process of managing chronic comorbid conditions in PHC, which describe the movement involved during the process of chronic- care service delivery and the roles of the main key players, the patients and health- care provider.

4.7 Intervening Conditions

Intervening conditions are broad structural context and general conditions having an influence on the action/interaction strategies towards phenomena (Strauss and Corbin, 1990). Intervening conditions may facilitate or hinder management of chronic comorbid conditions.

4.7.1 Facilitative Intervening Conditions

The following sub-categories emerged from facilitative intervening conditions: i) Family involvement in care, ii) Government commitment to fund health resources, iii) Accessibility to chronic care services, iv) Community participation and involvement, and v) Preparedness for self-management.

i) Family Involvement in Care

Family involvement emerged as one of the facilitating conditions in the management of chronic comorbid conditions. It emerged that family involvement in care included the provision of financial, physical and emotional care, which also boosted the level of adherence to treatment plans. It was observed during episodic emersions in the community that instant change of lifestyles and use of multiple drug therapy was very drastic and scary. Hence it needed prolonged time for patients to get accustomed to and accept living with comorbid conditions. For some patients, it took time to get accustomed to a new way of life and to accept the diagnosis. They needed emotional and physical support. It also became evident that newly diagnosed patients (for four months) managed to cope because of family involvement in managing the comorbid conditions well. Abstracts from patients included:

On his own my dad cannot do anything; we all in the family support him to manage his conditions....so I have to come every morning, measure his blood glucose, inject him with insulin, and give other medications, record the reading. Then I go on with my daily work...My mother, on the other hand, has to ensure his food is right on time and according to instructions from the doctors.....We all take part in his care....Care-giver#2

We (family) do finance and do everything for his treatment and just give him the support...Care-giver#3

My children, especially my daughter, has tried to get me comfortable by being there for me, giving me all the financial support....my other son has also given me his rental houses to collect money from there for my drugs and transport, I see am better off now than before ...Informant#1

ii) Government Commitment to Provide Health Resources

Government commitment to provide required health resources emerged as one of the intervening conditions. Data sources indicated that the country had allocated funds for essential drugs for diabetes and hypertension, and laboratory services for screening and testing both at risk and affected patients on follow-up care. Data sources revealed that the government budget allocation for health had improved from the 6.5 per cent to 7.5 per cent of the GDP. It was also gathered that the government allocation of budget specifically dedicated for management of chronic conditions was approximately 3 per cent of the health budget, which has been decentralised to county levels; other government commitments are price reduction of insulin in all government facilities.

The county is trying to ensure that essential medicine is available for managing comorbid conditions, especially diabetes and hypertension...the budget may be small, but we do not miss insulin, lab re-agents, and other essential medicine here at the county pharmacy and the lab....HP#7

The current budget allocation for the Ministry of Health improved from 6.5 per cent in 2013/2014 to 7.5 per cent in 2014/2015 financial year, to accommodate the emergence of NCDs in the countryMOH, 2014:14

The national government has a working budget for NCDs in general at 3 per cent which now is to be decentralised to all county governments, but with availability of funds, the budget will be reviewed now and then...the government has now reduced the price of insulin from Kshs 2,500 to Kshs 200-500 per vial in all government hospitals...this improves the available services.....HP#9

Government document sources revealed that both the national and county governments were working towards upgrading existing health facilities infrastructures. The intention was to improve lower level health facilities for management of chronic comorbid conditions. It emerged that the county government in line with the national government aimed to upgrade 40 per cent of level 2 health facilities to level 3 facilities and further equip them to fully

functional primary care centres, and further to ensure a fully functioning referral system for forward and back referrals exists to meet at least 80 per cent of the county health services. Some of the extracts from data sources are presented below:

In line with the national government, at the county we aim to upgrade 40 per cent of dispensaries to full primary care units, to ensure an operationalized 100 per cent of model health centres to fully functional primary care facilities, and to put in place a fully functional referral system in at least 80 per cent of counties to ensure even chronic conditions are managed at his level.....Medical officer,2014

It became evident that the shortage of health workers was acute, but there was a commitment to hire more HCWs and equip them with necessary skills to manage diabetes and other chronic conditions evident in the county. Data sources revealed that the county and national government aimed to increase the numbers of HCWs going for CPD from the existing 40 per cent to 70 per cent by the end of the 2016/2017 financial year, a further increase in medical personnel from 5 per cent to 7% per cent and to reduce general health workers' attrition by 10 per cent in the same period. Extracts from data sources are presented below:

The shortage of health staff is acute, but we can use what we have as healthcare workers for the time being to manage the health situations, as we plan to hire more health-care workers, as mostly they affect the quality of care and outcome. We have some health-care providers trained to handle diabetes in some health facilities.....HP#7

...for human health resource management, we target to increase the number of health workers from 40 per cent to 70 per cent in 2016/2017, further increase the number of medical personnel from 5 per cent to 7 per cent, reduce staff attrition from 10 per cent and also redistribute health care workers according to need, not preference.....MOH, 2014:30-38

It was observed that interventions to improve quality of care and patient satisfaction with care were in place at each facility level. This was evident through service charters, price lists for the services and the waiting time allocation for specific procedure. Suggestion boxes were available for feedback from patients and other service users to evaluate health services. One informant at the managerial level had this to say:

Each facility has a service charter, price lists for the procedures and time required for patients to receive the care. We also have suggestion boxes for regular patient surveys which help to evaluate the attitude of workers and self-evaluation for quality and satisfaction with care...HP#6

iii) Accessibility of Health Services

The success of management of chronic comorbid conditions seemed to be dependent on the accessibility of health services, accessed even in terms of the availability of clinical officers and nurses in the absence of doctors. Accessibility has also been enhanced through the availability of the Health Policy Framework directions on decentralization of screening services to lower levels for all NCDs and free health services for level 1 to 3 as a constitutional right. It was observed during episodic emersion in the culture of the community, that accessibility was determined by the patient preferences of the health facility, based on the needs and type of services offered. Extracts from data sources on the accessibility are presented below:

One of the specific strategies to manage non-communicable diseases is through decentralization of health and screening services to lower level facilities to increase access to all at the community level....MOH, 2012:19

With devolution many health facilities have been upgraded and open, so we can access the services near home...this is really helping us not to travel a long distance for monitoring...but when I want to see the doctor once in a while because they are not here I can travel to the big hospital...Informant#3

This facility is near to my home. I can even come for fasting blood sugars and go back for my insulin and breakfast... I walk from my home or use Kshs 20 to come and the same to go back....Informant#5

...for blood pressure I can check near the home at the dispensary, the services are free. You only need your book for recording your readings and your next appointment.....SGD#6

iv) Community Participation and Involvement

Data sources revealed that management of chronic comorbid conditions requires active participation of community members. Informants indicated that community members were

involved in the decision -making process on their own health problems. There were peer support groups which had roles of creating awareness about chronic conditions, especially diabetes and hypertension and educating others as part of the prevention care and disease control; this was more evident during community open days and action days. The researcher noted that, where community health services were active and functional, the community members were actively involved in the community projects and self-help projects which were only observed in specific sections of the county.

*We have diabetes peer support in the community now. They will help in creating awareness...by telling others in the community openly about chronic conditions like diabetes and hypertension which are common in the community....tell them about signs and symptoms they have experienced, prevention of the conditions to others...this is the active role they must take to ensure the diseases are contained...
HP#10*

In this community action days for the community service units are very productive days. We do actions which are result orientated...in preventing the chronic conditions. We have started kitchen gardens for those we feel need it to ensure they meet their nutritional requirements as diet for diabetes...during open days we discuss how to have a complete meal plan with locally available foods. Through these activities you get everybody involved in the community ...we invite people to come and talk to the community...CHV#1

In my opinion leaders in this community are very important in bringing change and getting the community active in disease prevention... we use church leaders to tell church members about chronic diseases such as diabetes and hypertension, and control risk factorsHP#10

v) Preparedness for Self-management

Patients' preparedness for self-management emerged as an intervening condition in the management of comorbid conditions. Preparedness was expressed through patients' understanding of the dynamics of comorbid conditions, acceptance of the conditions and ability and willingness to self-manage through having adequate skills to manage comorbid conditions. It was observed that patients, who showed high level of preparedness and eagerness to learn new things about their comorbid conditions, attained a good control of

blood glucose levels and adhered to treatment plans. Preparedness required leant skills to manage the comorbid conditions which were explicit in the way patients mastered their drug dosages, readings of random blood sugar levels, diet modification and frequency of reviews planned and attended. Some of the informants' extracts are presented below:

For me most of the time when the sugars are often 10mmol /l, I know I'm well, and even if it is over, I examine myself, where did I make a mistake, and correct it quickly to going back to control the sugars.....Informant #2

...I have learnt to accept them as they come...I try to be careful always with what I eat, not to trouble them and take my medicine and eat food always when required at the right amount.... I never miss taking them... It is my ritual of starting and ending my day...I also go for my review when I am supposed to go, I never miss going to the clinic.....Informant#5

Mastery of the diet adjustments and drugs also indicated that patients were willing to adhere to treatment plans from health- care providers. It was observed that participants who attended the support group showed adequate level of understanding on healthy diet compared to those receiving care in other health facilities. Acquisition of adequate skills and ability for self-management prepared patients to respond quickly to slight changes before onset of complications. Extracts from informants included:

Patients who have acquired adequate skills on how you respond to changes in their bodies, usually respond to those changes early enough to prevent delays and onset of complications, they never come here for unplanned admissions ...HP#12

Our patients at the clinic and the support group have mastered their self-management skills particularly on diet, as they share information in the group as compared to those who go to other health facilities and are reviewed as individuals....this really helps to manage comorbid conditions and keep complications away ...HP#8

4.7.2 Hindering Intervening Conditions

The following sub-categories emerged as barriers to management of chronic comorbid conditions i) Limited knowledge on comorbid conditions, ii) Belief systems, iii) Cost implications, and iv) Provider-patient perceived factors.

- i) Limited Knowledge on Comorbid Conditions

Limited knowledge on comorbid diabetes and hypertension emerged as a barrier to management of comorbid conditions across care levels. Limited knowledge became evident in patients with limited understanding of the causes of diabetes or hypertension, despite having the conditions for several years. It also emerged that lack of enthusiasm to learn more on the condition contributed to limited knowledge and poor management outcome. It became evident that some patients had wrong expectations about being cured of diabetes and hypertension once they achieved the optimum, or stopped medication altogether. It was observed that patients who had limited level knowledge on diet modifications, exercise and signs and symptoms of both diabetes and hypertension, progressed to develop complications quickly, as they failed in self-management of the comorbid conditions. Extracts of informants included:

Patients who have limited level of knowledge about causes of diabetes and hypertension and how to manage it, must show enthusiasm to learn about the conditions...I have seen patients who don't know about their conditions, and are not willing to learn, they are negative about the conditions. How do you teach patients who have no enthusiasm to learn about their conditions, or how to care for themselves at home.....HP#2

I don't understand why my sugar levels are rising and falling even to 5mmol/l and it was 23mmol/l, or will it remain at 5mmol, and should I stop the medicine, because now the sugars are within the normal range...I really look forward to stopping the medicines and going back to my normal life.....SGD#9

It further emerged that limited knowledge on chronic conditions lead to delays in seeking medical attention when the conditions have become complicated. Data sources also revealed that illiteracy levels in the community contribute to limited knowledge on chronic conditions, particularly among the elderly, while the younger generations were much more ignorant as to the signs, risk factors and preventive measures. Excerpt from various data sources are reported:

Although the community is trying to have adequate knowledge on chronic conditions like diabetes, the level of knowledge is still low. Some villages/households are not even aware of the signs and symptoms of diabetes and risk factors involved. This really hinders effective management of comorbid conditions; it now becomes a double tragedy....HP#12

Lack of adequate knowledge about chronic conditions, particularly diabetes and hypertension, is common in the community as evidenced by the time patients come to seek medical attention, even when they have the complications...HP#3

ii) Community's Belief Systems

Community belief system emerged as a barrier to the management of comorbid conditions. A community's belief system provides the grounds on which the communities base their behaviour. This include health- seeking behaviours, self-management skills and continuity of care. The following properties emerged from the community belief- system subcategory: a) Spiritual belief, b) Traditional belief, and b) Cultural practices.

a) Spiritual Beliefs

Management of comorbid conditions is negatively affected by the spiritual beliefs of the community or an individual. In this study it was observed that upon a confirmed diagnosis of chronic comorbid conditions, some patients felt the need to be closer to God. Data sources indicated that spiritualism is the strong conviction of the super-natural being that has powers to change destiny and cure all conditions. It was observed that in this community some groups of households, because of their spiritual beliefs, do not take anything manufactured by machines including medicines or processed foods. It was observed that in the event of being diagnosed with comorbid conditions which required multiple interventions, they could not co-operate until the situation was way out of control. This was based on their beliefs. This generally had an effect on the management of comorbid conditions. Extracts from informants are presented below:

In this community we have extremists, who will only be brought to the clinic when they are in a coma or they have already had a stroke...Anyway, it is their belief so you cannot push them beyond this and we respect them...HP#10

Yes, I was told that I have diabetes and hypertension, but we do not believe in taking medicine or getting injections...I have been healed completely from those conditions...God healed me through prayers ...Informant#6

b) Traditional Beliefs

It emerged that in this community, aside from utilising modern medicine technology, were also inclined to utilise traditional herbal medicine as a form of restoring health. Traditional

belief cuts across African communities and community members believe in natural remedies for their complex health problems including conditions like diabetes and hypertension among other chronic conditions. With diversity in the country of 48 tribes, each community has traditional beliefs unique to it for health and social issues. The traditions' belief was acculturated in this community by its unique characteristics which were alluring to community members, even those with chronic comorbid conditions. The following qualities emerged as characteristics of traditional medicine which made it more palatable to users yet hindered effective management of comorbid conditions: easily accessible and affordable compared to modern medicine which is expensive and free of side effects with no chemicals added to them. It emerged that in Nandi culture women are known to be traditional medicine herbalists and males are known to be great leaders. The community is culturally known for unique herbs for treating specific ailments. However, with modernity setting in, the culture is slowly wearing off to clear the way for modern cultures. Some abstracts on the use are reported:

One of the core beliefs of the Nandi community is the belief in trees for medicine... herbal concoctions exist for treating diabetes "Sukari" and "Pressure" hypertension....(Jeruto et al., 2008)

Eeh! Some time back someone brought for him the traditional medicine boiled for drinking, it was packed in six, five litres of them, and I tried to drink it, but I felt nothing, my conditions remained the same, but I never stopped using medicine, I stopped completely and I have never tried anything before, I only use insulin and the tablets for pressure...Informant#2

We have several incidences on those patients who use traditional medicine together with drug therapy, but they never disclose the same to us.... Some have reacted and even we have lost a number of them to the use....we are encouraging them to stop the use of herbal medicine and adhere to lifestyles change and medicine.....HP#12

Those who accepted that they have used and it worked and are still on it indicated that:

I use it because it is locally available and has fewer side effects. Using aloe soothes my body for a while and I can get the medicine on loan...but you cannot borrow insulin from the clinic or hospital....Informant#3

c) Cultural Practices

It emerged that the cultural practices of the community determined management of comorbid conditions, particularly with diet adjustment and general way of life. In this study it was observed that the Nandi cultural practices prevailed especially in cultural foods and way of life and the place of women and men in the community, which negatively affect management of comorbid conditions. It also emerged that in the community there were separate gender roles and expectations which were distinct during consultations with health-care providers or during support group meetings. The gender determined which interventions of self-management can be performed by men or women towards achieving the desired levels of control. For instance, men did not prepare their meals, and it is culturally unacceptable for men to go to the kitchen or complain about the cooked meals. Lack of participation of men in meal-preparation and choice made their management complicated when compared to women with the same conditions. Extracts from the informants included:

The diet in this community, is mainly made of two things, carbohydrates from white maize meal and milk which is protein...it becomes hard for most patients to adjust, add vegetables and fruit to their diet...and this really affects management for diabetes and hypertension.....HP#8

I don't cook or go to the kitchen so I am at the mercy of the kitchen owner (wife) who decides how food should be cooked. I cannot tell my wife what to cook for me, so what she cooks I will take ...This really makes it hard for me as a man to control my diet, which is why my sugar levels are always dancingSGD#7

Gender related roles and expectations emerged as one of the cultural practices which have negative effects on the management of comorbid conditions. It emerged that men culturally do not like being given instructions by women, especially wives and some were aggressive towards their spouses, when it came to diet adjustment and exercise. One informant highlighted the aggression from a husband, who did not like being told to take vegetables or be injected with insulin by his wife. She said:

He refuses vegetables in his diet and exercises, but he does not like doing the exercise or even walking, all he ever does is sit and sleep. When I insist he can even slap me for thatCare giver#3

The men in the older generation are difficult to handle, especially when it comes to cultural practices. They have their mind set on what they practice...how their meals are prepared...Doing exercise or eating vegetables is an abuse to them at times...but with time they get to learn, but this can really affect their management strategies.....HP#8

iii) Centralization of Services within a Decentralized System

Centralisation of health services within a decentralised health system emerged as one of the hindrances to management of chronic comorbid conditions. It emerged that since devolution of the health system to the county government, procurement of medical supplies still remained with the national government. This has affected the whole process of drug supply and distribution of facility kits from the Kenya Medical Supply Agency (KEMSA). Informants also reflected that a poorly coordinated supply chain system had an impact on centralisation within the devolved health systems. Poor coordination leads to sub-standard quality care for patients with chronic conditions.

Lack of supply of drugs to the health centre due to county government failures, or KEMSA not supplying the most needed medicine for the patients is really affecting the management, it only supplies at level 4 facilities.....HP#3

I also give drugs to hypertensive and diabetic patients, because we do have them in the kit from the county headquarters ...although not like it used to be before. Now things are becoming worse, as you can order and wait forever or you go for the drugs yourself (headquarter); that is time wasted the whole day...HP#5

Drugs may be there, but co-ordination of supply to the utilisation is becoming a challenge especially with most county governments...communication between the national government and the county is not working....The stakeholders do not even know that drug kits have not been dispatched to the dispensary or health centre...this then affects maintenance of patients with chronic conditions.....FGD#2

It became evident from data sources that since the cancellation of cost sharing 10/20 for lower level facilities and the introduction of free services by the national government. The health system at the county levels was straining to cope with the situation for both direct and

indirect costs of maintaining the facilities. Abstracts from informants on the health system's costs are reported below:

The cost of ensuring that medicines and the laboratory is running daily is increasing everyday...as new patients come in, so is the cost going up as this is the direct cost that the Ministry of Health incurs to ensure that all services are running...HP#7

It is becoming worse with the county government, than it used to be before; now we have no money because services are free, and supplies are not coming to us...HP#3

iv) High Poverty Levels in the Community

One of the common intervening conditions in the management of chronic comorbid conditions is the high poverty levels in rural settings. Documents reviewed indicated that 1 in 3 of the Kenyan population is living below the poverty level, thus making it impossible for them to buy drugs even at subsidised prices. It was observed that most patients go off treatment when they cannot afford the medicine; they fail to eat properly and hence controlling blood sugars becomes a real problem.

...poverty here is real with over 50 per cent living under the poverty level...it is really a challenge...HP#7

The cost of managing comorbid conditions means it doubles what you have to deal with when suffering with two chronic long-term conditions, which require you to increase medicine intake and transport costs to the clinic regularly...HP#7

Poverty levels here are very high, so you find that the majority cannot afford to pay for health services and then buy medicine altogether.... one cannot even afford Kshs 20 to buy the book. This also leads to lack of proper nutrition which later leads to malnutrition, leading to difficulty in controlling blood sugars... HP#12

It became evident that, for most people living below the poverty line, the costs of medication, transport and other health requirements, adjustments were really hard to comply with. It was observed that in lower levels of health care, despite the free services, there were limitations to free medicine like aspirin and paracetamol, and not to Losartan and Insulin, which most

patients with comorbid diabetes and hypertension were using. Informants highlighted their budget for just one month. They had this to say:

...From my home to here is Kshs 150 one way, another Kshs150 return. Kshs100 for RBS, oral medication is Kshs 50 for each drug, the more you take the higher you pay (Metformin and Glibenclamide) for common drugs for diabetes, HCTZ for hypertension is Kshs150. Insulin is Kshs200 per vial and the support group fee is Kshs50; this adds up to a total of Kshs750 on the minimum/month.....SGD#1

The free medicine is aspirin and paracetamol, not insulin or Losartan for those people with diabetes and hypertension, and this really impacts the management of comorbid conditions at lower levels....HP#2

It emerged that informants were more concerned about the cost of fruit and vegetables, despite the fact they were in the rural community setting compared to urban areas. This affected their adjusted diet plans and the whole goal of management of comorbid conditions. Informants had this to contend with:

..Eeh! It is expensive to buy fruit, and there is no money and buying all the time...Informant #1

.....also I take fruits when there is money to buy.....Informant#2

v) Shortage of Drugs in Public Health Facilities

Shortage of drugs in the public health facilities became a barrier to management of comorbid conditions within the county. It emerged that those who could afford to buy from the chemists or pharmacies remained on medication, but unfortunately, there were those who could not afford the same, who went home with no drugs for days. Others resorted to seeking alternative herbal medicine to maintain their conditions. Extracts from informants are represented below:

At times there are no drugs in the facility, then I buy from the chemist/pharmacy at the shopping centre, although they are expensive compared to the health centre or in hospital.....as they sell in terms of tablets, while those at the health centre are sold as per the days you take them, one tablet is Kshs15 and if you need 30 tablets? (15X30)...Informant#6

The most unfortunate thing is there are some of our patients when we have a shortage here, they cannot afford to buy drugs at the chemist, so they go home with no drugs and even seek traditional medicine for management of their conditions at home...HP#12

vi) Practitioner-Patient Perceived Factors

The following properties emerged from the sub-category of poor practitioner-patient perceived factors: a) Patients' unmet expectations on providers' care, b) Differentiated discriminatory care, c) Poor interpersonal communication skills and d) Lack of responsive healthcare providers and systems.

Patients' Unmet Expectations: Patients with comorbid conditions had certain expectations to be met by their health-care providers. It became evident that when not met on time or in the course of management, these factors hindered them from achieving their expected goals, caused failure to adhere to treatment plans, or further forced them to change health care facilities in search of care. Informants felt that the clinicians are always in a hurry to clear the long lines or are not interested in their conditions; others felt they needed physical examination from the doctor, not only the blood pressure or the laboratory results. Others felt it was difficult to do feet and eye assessment at home, but expected the doctor to do them and give feedback. The following were some of the extracts from the informants' explanations:

When I go to the clinic for a check-up, the doctors are always in a hurry. They just check the reading of the pressure and sugars ...then tell you "you are doing well, continue" ...to be honest, I expect more than that from them.....Informant#1

I expect the doctors or the nurse to check my body and ask me more questions about the progress with these conditions...I am always disappointed with the rush to clear the line...Informant#3

I have never been examined in my eyes, legs ... what is the use of having the examination bed in the room? ...the reason I come is to be checked. If I cannot be checked then I would rather not come here.....Informant#6

I changed the facility because I was not being checked, and the doctors were not really even touching you when you enter the clinic... I was all alone with these conditions...but here I am taken care of well....SGD#4

Differentiated Discriminatory Care: In the culture of management of follow-up patients with comorbid conditions, it emerged that patients with chronic conditions are being screened in the open spaced rooms, unlike other patients who were being reviewed in consultation rooms. Informants felt that during clinic days, their personal space was invaded, which later made them default on follow-up visits, adherence to treatment and practice of self-management skills at home. These were seen as differentiated discriminatory care, based on the type of conditions patients suffered from. It emerged that informants resented the feeling of not being important compared to others, especially with lack of physical space specified for support groups to sit and discuss. They felt exposed and not cared for. Extracts from informants included:

Sometimes I wonder if the hospital cares about us...see where we are meeting as the support group? ...open space, no privacy with yourself and the doctor/nurse to say private things...this is a really public facility....SGD#6

Even when you are sick, I believe it is good to have a private space to talk about yourself, so that the doctor can help you...but here...everyone is listening about your blood pressure, sugars, weight... I feel opened up to everyone.....SGD#4

Nothing new is being done; no one takes you to a special place to be taught about the condition, nothing at all... Informant#2

Poor Interpersonal Communication Skills: It was observed that poor communications skills between health care providers and patients and their family members, negatively impacted the management of comorbid conditions across care settings. Continuity of care for chronically ill patients was dependant on good communication skills, to enhance trust between care-providers and their patients. It was gathered that patients expected certain gestures from health-care providers which they highlighted as being shown concern about their health, being allowed to talk about their own health progress and being given time to voice their concerns and receive responses. Informants vented that health-care providers who

were not talking to them, asking or listening to them during consultations made treatment goals unattainable. Some of the expressions of informants are presented below:

Some of us, not all, have no concern for the patients, they don't trust us, because we have no time for them, or our communications skills are wanting...so patients' goals of treatment remain unattainable because of usHP#12

...because they give us the drugs without seeing the patient... because we go to the pharmacy/chemist they do not ask me anything. They have no questions for me about the patient. If they showed interest to ask, I will go with him.....Care giver#2

At times you really need someone to talk to you about these conditions....but at the facility they look at the paper and write on it without touching you or even giving you time to talk...Informant#5

It was observed in the culture of the health care system during service delivery that management of comorbid conditions and quality of care was affected by poor interpersonal communications skills. It was observed that health care providers' attitudes towards the patients influenced the patients' adherence to treatment and hence care-outcomes.

Attitude of health care workers towards patients affects the service we offer to our patients and this may end up influencing their adherence....HP#8

Team work among the interdisciplinary team in chronic care management was negatively influenced with poor interpersonal communication, particularly when it was on leadership and control of resources. Some informants indicated that power struggle between team members in the facility or personal relationships overstretch to affect service delivery to patients seeking services.

We are supposed to work as team members to follow-up patients and manage them effectively as we share information and expertise for the benefit of the patients....but when we have power struggles among the team members, service delivery is compromised and patients suffer from the health providers' conflicts....FGD#2

It was observed that overcrowding of patients in health facilities affected the quality of care delivered to patients as they did not get the best from their review. Limited time to review patients emerged as one of the factors which affected interpersonal communication; chronic

care requires a comprehensive patient-centred approach, which cannot be achieved within five or less minutes of consultation. One of the informants indicated that:

Overcrowding in health facilities, negatively impacts on delivery to manage chronic comorbid conditions; it affects communication as the clinician is pressured to see all patients...The time we take in reviewing patients is not adequate to allow patients to open up or even disclose the other problems they encounter. Some patients can share with others in the community about the ill treatment they receive.....HP#12

Lack of Responsive Health Care Providers and Systems: The following properties emerged from the sub-category of lack of responsive health-care providers: i) Devolvement of responsibility with no training, ii) De-motivated health-care practitioners/workers, iii) Lack of health teaching materials, iv) Inadequate staffing of health providers, v) Poorly functioning referral system, and vi) Lack of centralized patient database.

Devolvement of Responsibility with No Training: Devolvement of responsibility with no further training emerged as one of the barriers to management of chronic comorbid conditions. It emerged that effective management of chronic conditions required health care providers who were prepared in terms of knowledge and skills to manage chronic conditions. It also emerged that in health-care systems, especially in the devolved and rural health facilities, health-care providers were not adequately prepared for chronic care provision, especially in the rural care setting. Informants working in all levels of primary care provision expressed their unpreparedness to handle the burden of chronic care at their clinical sites. It became evident that a few health-care workers in Nandi have been trained to manage chronic conditions, especially diabetes, even those few who were not working in their areas of specialisation. Some of the extracts of informants' reports are reported below:

Most health workers working in level 2 and 3 or in the community are never trained to fit in the community health requirements...The refresher courses are only targeting those in urban settings, and the in-patient department....HP#10

The only information we still use to manage these patients is what we learnt, common knowledge from school 10 years down the line, and field experience....HP#3

We need training and retraining of health-care providers on diabetes/hypertension to enable them to handle those in their places of work. Further, there is need to conduct

frequent seminars for both the patients and health-care providers in the management of diabetes and hypertension and other chronic conditions within the community/county stakeholders....FGD#1

Demotivated Health Care Providers/Workers: It was observed that most health-care providers were not motivated to provide services which are evidence-based and which provided quality in management of comorbid conditions, especially within the county government. Informants highlighted that as much as they were willing to work, the workload was just too much, and some were not getting any incentives for any extra hours or effort put in their general work environment. Informants highlighted the triggers to lack of motivation:

At times you really work so hard to review all patients, but no one really gives you any incentives to keep you motivated for the next day...the monotony of working without hope for improvement leaves us not having any interest to work here.....HP#2

The workload in this facility is too much. I would not want to add another new load of managing chronic conditions, so I refer them to the county hospital, ...the work is just too much with no motivation from the county government.....HP#3

Lack of Teaching Materials for Health-Care Providers and Patients: This emerged as one of the hindrances to effective management of chronic comorbid conditions in primary care settings, especially in the rural areas. It emerged that most health facilities in the county lacked teaching materials, both for health-care providers and patients. It was observed that, despite the fact those facilities were offering health services to patients with comorbid diabetes and hypertension, there were no charts or posters on the same or patient flyers to take home, instead group-patient teaching was common across care settings. It was also observed that the few available charts were in administrators' offices or where there is limited access to patients or health-care providers. Informants reflected that with pictorial charts and flyers, patients tend to learn faster than through words spoken by mouth. Additionally, it became explicit that most health-care providers were not aware of the strategic plans and manuals available for the management of diabetes and other NCDs.

Extracts from informants are presented below:

...However, we do have a challenge on patient teaching aids, only the nutritionist has patient teaching aids in her office/desk on diabetes...for the rest of us we use our common knowledge to teach patients.....HP#3

Currently there are no patient teaching materials from the national government. All we do is do patient teaching as individuals in the consultation room or, occasionally you can have group patient teaching...Patient teaching aids are not there, leading to no patient education and teaching or information to care-givers at home. Teaching materials that are available are mainly in the providers' rooms (consultation rooms) and not available to the general population of patients....FGD#1

Listening without seeing pictures takes time for me to understand...I really need pictures to remind me what to do at home, I cannot read, but I can see.....SGD#1

Inadequate Staffing of Health-Care Facilities: This emerged as the common barrier to management of chronic comorbid conditions in public health facilities. It emerged that most primary health facilities were too understaffed to provide chronic care services which required long term care. It was observed that mostly nurses were unable to cope due to the multiple roles they played in the health facilities especially in the lower levels. Informants indicated that patients in the community preferred to go to health facilities with staff available for medicines, despite the long distance they had to travel. It was observed that understaffing caused by poor distribution of HCWs negatively impacted on the quality of service delivery, increased delays in diagnosis and waiting time for health services. It became evident that staffing had direct impact on patient adherence and follow-up as most clinicians were concerned with the workload of long queues of patients and not quality of service offered. Informants' views are reported below:

Staffing at the dispensaries is also a challenge, as nurses have been overwhelmed by the multiple tasks they perform in level 2 and 3, as one nurse cannot serve children, adults and chronic and communicable conditions, and at the same time dispense medication to them, give immunisation, and take care of emergencies among others.....FGD#2

Lack of sufficient human health- resource hinders adherence, in that providers are only concerned with clearing the queue of patients they are supposed to review and not the quality of service they will offer to clients, or will not listen to clients' individual concerns...it also leads to diversity (changing health-provider each time you come for check-up or follow-up). This feeling of being new every time you come

for review, pushes patients to go and seek familiarity elsewhere in private clinics.....FGD#1

Poorly Functioning Referral System in Primary Health Care: This emerged as one of the hindrances to management of chronic comorbid conditions in PHC levels. It emerged that chronic conditions require continuity and access to quality care which is timely across care settings. In the context of management of chronic comorbid conditions, a functional referral system forms the central aspect of care to ensure continuity of care. Informants indicated that the referral system in the county was not fully functioning and this became a barrier to continuity of care at lower levels. Informants felt that back referral was not being practiced by all health facilities, particularly for patients who required follow-up care after treatment at a higher level of care. It was also observed that due to poorly functioning referral systems, patients with comorbid conditions from rural and marginalised areas were getting lost on follow-up, and high levels of bypassing or self-referral were overburdening the referral hospital. Informants also highlighted the need to have a well-coordinated referral system within the county health system to ensure continuity of care across care settings. Excerpts from informants are presented below:

At the moment we do not have a very good referral system both for outpatient and inpatient, but there is need to have a specialised referral system for chronic patients like diabetics and hypertensive, among other patients....on rare occasions we receive back referrals, but most of the time we don't from level 5 hospitals....HP#8

Referral of the patients with chronic conditions requires coordination from both sides to ensure continuity of care...We hardly know what is going on with the patients once we ask them to go to the next level...Sometimes we don't even coordinate with the receiving facility....some patients also bypass the lower levels to high levels in the county referral hospital which is now overburdened by outpatientsHP#7

Lack of Centralized Patient Database: This surfaced as a barrier to effective management of chronic comorbid conditions in the region. Comprehensive management of chronic comorbid conditions in PHC required a well-developed centralised database of patients' medical information. It emerged that in Kenya and in Nandi County, there is no centralised patient database on chronic conditions like diabetes, hypertension or even cancer. Informants indicated that lack of the database negatively impacted the management, as there were no

health information records to be passed from one level to another, for comprehensive review of the patients. It was observed in this culture that patients with chronic conditions like diabetes and hypertension carry their health records with them in the notebook or on paper for those with no notebook. Further, it was noted that there was no information about patients being received or shared between health providers from private sector to public health sector, leading to mismanagement of the patients. Informants had this to say:

In the county and even at national health facilities, I don't think we have a central patient data base for diabetes and hypertension. The information we have is very scanty to allow one to effectively follow-up and manage the patient with double conditions....Once a patient forgets the notebook at home or it gets lost, the patient becomes new all over again....HP#3

Most of the time, patients mix care-providers in both private and public sectors, but none of the providers share information on the care given to the patients, and basically there is no history of the patient to be reviewed...most patients end up being mismanaged by different health care providers...FGD#1

In the context of this study the following factors emerged to be intervening conditions during the management of comorbid conditions and were both facilitative and barriers to the actions and interactions strategies: supportive family, availability of resources and monetary funds, accessibility and availability of chronic care services, community participation and involvement in chronic care programmes and self-preparedness towards self-management. On the other hand, barriers emerged to be more than facilitative factors, and they included: limited knowledge of on comorbid conditions, belief systems, centralisation of services in health care systems, high level of poverty, provider-patient perceived factors and lack of responsive health care providers and systems.

4.8. Consequences or Outcomes

Consequences are the end results or outcomes of actions and interactions strategies taken in response to a phenomenon under study (Strauss and Corbin, 1990). These outcomes can either be intended or unintended and are not always predictable. In the context of this study, outcomes emerged from actions or strategies taken towards the culture of management of chronic comorbid conditions. In this study the consequences which were either intended or unintended were further grouped into levels of occurrence. These levels included: a)

Individual/household level, b) Community level, c) Health organisation level, and d) Health system levels.

4.8.1 Individual/Household Outcomes

The individual outcomes were those which directly affected the patient with comorbid conditions, while household outcomes involved the families where individual patients were members and depended on them for care.

The following sub-categories emerged as intended outcomes to patients with comorbid conditions: i) Achieving optimal control of blood pressure and sugar levels, ii) Delayed onset of complication, iii) Improved self-image and emotional stability, iv) Improved quality of life, and v) Increased collaboration with health organisation.

Achieving Optimal Control of Blood Pressure and Sugar Targets: The goal of managing comorbid diabetes and hypertension is to achieve the optimal blood glucose levels and blood pressure. Informants indicated that the process of managing chronic comorbid conditions is long term and requires commitment from both health-care providers and patients. It was gathered that motivated patients had higher chances of achieving optimal control. The informants indicated that:

When patients know what target they are expected to be at optimal control, it becomes easy to manage them; they work hard to be at optimal, than when they don't know what their normal range is... they become motivated to achieve it and maintain it and this is one of the outcomes of intense monitoring and follow upHP#12

Each patient we see at the clinic has their best optimal functioning goals of blood glucose or pressure, we respect what works for the patient and always aim to achieve it or maintain it there ...HP#3

Data sources revealed that optimal blood glucose for diabetics should endeavour to have random blood glucose between 7mmols/l to 11mmols/l or fasting of 4-6.7mmol/l, and blood pressure of more than 140/90mmHg or less for diabetic patients at 135/85mmHg. Informants indicated that knowing the blood pressure and blood sugar targets always gave them the motivation to follow the treatment regimen in order to achieve the target. It helps to reflect and reconsider where there is a problem and correct it. The abstracts from informants included:

Patients and clinicians have to work and set goals at the acceptable levels for diabetic random blood sugar which should be between 7-11mmol/l, for fasting blood sugar at 2-6.7mmol/l and a blood pressure of more than 140/90mmHg, or less for those with diabetes 135/85mmHg...MOPHS, 2010

...I keep record of his blood sugars; I take in the morning at 7am; the highest he ever goes is 13mmol/l and the lowest being 7mmol/l, normal (4-7mmol/l)...He remains stable with no complaints within that limit....Care giver #2

...For most of the time when the sugars are often 10mmol/l and pressure is 135/90mmHg, I know I'm well, and even if it is over, I examine myself, where did I make a mistake, and correct it quickly to go back to control the sugars....Informant#1

Delayed onset of complications: emerged as one outcome of management and strict adherence to treatment plans and follow-up of patients with comorbid diabetes and hypertension. It was observed that those patients who are on management of the comorbid conditions, particularly on combined drug therapy, achieved a good level of control of either condition as compared to those who were on single therapy or on lifestyle modification only. Further, they reported few complications like renal failure, leg amputation and retinopathy; this was attributed to combined therapy and frequent follow-up at the clinic every two weeks.

Here we start patients on combined therapy right away to delay onset of complications... review them every two weeks so that one can easily detect a problem early to delay onset of complications...HP#3

We normally give them return dates which are not far apart, for close monitoring and early identification of problems and to avert complications early...With all sectors working well, patients have fewer complications.....HP#10

Actually since we started following all these patients both old and new, at the clinic, doing physical examination, laboratory testing, the rate of those with complications has gone down,. We don't see them often, especially among patients we have on follow-up since 2006 until now and they are doing well, no complications yet and no admission due to hyperglycaemia or high blood pressure...HP#6

Affordability of Essential Medicines: One of the expected outcomes of management of comorbid conditions is improved affordability of drugs used by patients for management of comorbid conditions. It was observed that since the emergence of chronic conditions, more international bodies concerned with NCDs were becoming more involved in the advocacy and funding of most essential drugs for diabetes and hypertension. It was observed that accessing medicine at an affordable price had improved health outcomes for patients and improved livelihood for families of patients with comorbid conditions. The presence of a revolving pharmacy in the county and subsidy of insulin in government facilities has been one of the outcomes of advocacy on the management of chronic comorbid conditions.

...there is a revolving pharmacy which gives medicine to diabetes and hypertensive patients at a subsidised price to ensure everyone can have access to medicine....complications reported are now few especially foot amputations and diabetes coma, as patients can afford medicine which is hardly out of stock....FGD#1

At the...health clinic you hardly miss medication; it is no longer like before....we could go for months without medicine, you can get the same medicine in private clinic government facilities. He never misses medicine (insulin and tablets).....Care giver#2

Improved Self-image and Emotional Stability: This emerged as one intended outcome to the patient as the individual needs to accept the conditions. It was observed that in those patients with comorbid conditions and those particularly on combined or multiple drug therapies including insulin, their self-worthiness was crushed and emotionally they became unstable. It was observed that with the onset of management of chronic comorbid conditions, and the support group, patients' self-image and emotional status improved which, in turn, boosted their control of the comorbid conditions. Extracts from informant are reported below:

At first it was hard to accept the diagnosis...living all your life injecting yourself daily...it was really demoralising, and the feeling of being worthless surrounds you, eating a diet with no salt, no sugar...then why are you working or living. I actually almost went into depression, but I got help from the doctors (nurses) and it was resolved and I accepted the situation, now I am ok, and got used to injecting myself daily.....SGD#4

Some patients when they come to this diabetic clinic and support group....they are emotionally withdrawn from themselves and others...it takes time for them to adjust to living with two conditions and once used to it, they become stable and they are the ones who help others now....HP#7

Improved Quality of Life: It emerged that improved quality of life was one of the intended outcomes of management of chronic comorbid conditions in PHC settings. The following indicators emerged as dimensions of improved quality of life, a property under the intended outcomes sub-category of outcomes: i) Stability of health, ii) Social interactions/relationships, and iii) Engaging income-generating activities.

Stability of Health: This emerged as a characteristic of improved quality of life. Informants indicated that when they self-reported sugar levels were under control and the pressure readings were within expected targets, their health status was considered stable. Availability of essential medicine also has contributed to most patients leading a stable, healthy life despite the presence of chronic comorbid conditions. Abstracts from informants are presented below:

I do everything normal people do, as long as my blood sugar and pressure are within a normal range for me...and when I am in doubt of anything I can go and check with the health care providers near here...Informant#4

I have observed when patients' health is stable; you cannot tell the difference between them and me...they live a normal life, with all activities normal people do....as long as they know who they are at the end of the day.....HP#1

Social Interaction and Relationships: Interaction and being in relationship with others emerged to be one of the indicators of quality of life. It emerged that one important aspect of quality life in most people is interactions and being able to keep a social relationship with family and friends, rather than being in isolation. Data sources revealed that when patients are empowered with the right knowledge and skills to manage comorbid conditions, their social interactions and relations are improved. Extracts from informants are presented below:

When my sugars and pressure is well controlled I eat the same meals my family eats; only I stick to my portions...I don't eat beyond what I am expected to...we eat at the same time, so you cannot tell the difference...I no longer feel left out in anything....SGD#3

I do attend weddings and my condition does not deter me from being part of the community...because I have children also. I need to take an active role and maintain relationships....I don't have to eat to be there, I take my meals from my home and I enjoy their companySGD#4

Involvement in Income-Generating Activities: Engagement in income-generating activities emerged as one indicator of improved quality of life for patients with comorbid conditions. Informants indicated that their life did not only revolve around diabetes and hypertension. Life was more than diseases. They needed income to support their lives both directly and indirectly for their families. These perceptions were more relevant to middle-aged people of 40 to 60 who had comorbid diabetes and hypertension and still had to fend for their young families. It was observed that most informants were working as usual although with precautions. During episodic emersions in the community it was observed patients had several means of generating income to fund their healthcare services. Some were involved in self-help groups, small community-based Sacco, small businesses such as retail shops, or in small scale to medium scale farming. Abstracts from the informants on income generating activities included:

I get my pension on a monthly basis, but I also keep animals here. We sell milk to make money for sustainability and health- care costsInformant#2

I am still working as a prison warden... I am not even ready to retire; I have a young family to fend for...I do all I can to have income coming in, but always being careful in what I do...SGD#7

I have joined this self-help group, to keep me busy and have financial support to keep me buying my medicine and my diet requirementsInformant#3

4.8.1.1 Unintended Outcomes for Individuals/Households

The findings revealed that unintended outcomes occurred due to failure of individual patients or their families to implement the actions and strategies intended for the management of chronic comorbid conditions. The following unintended outcomes emerged according to the level of service provision. Three unintended outcomes emerged under the property of individual/household outcomes, namely i) Increased level of poverty and cost of care, ii) Poor

adherence to multiple drug regimen, and iii) Stigma due to integration with HIV care programmes.

Increased Level of Poverty and Cost of Care: One of the unintended outcomes of intensive management of chronic comorbid conditions and adherence to treatment plans is the level of increase in poverty among households. Data sources revealed that competing priorities in individual patients and families was financially draining, in that patients had to balance between health budgets and essential basic needs. Informants had this to say:

It is expensive to be going to the clinic every week, as it costs money such as transport, medicines and laboratory fees... I have been spending my pension money on these conditions, and am left with nothing at all, and every month and every day you spend on medicine.....Informant#3

It emerged that some families have depleted their family resources to provide care and drugs for their loved one, adjust their long-term lifestyles, especially diet, and to buy self-monitoring machines. One of the informants had this to say:

We spend a lot on management of these two conditions, leading to depletion of family resources, we continue remaining poor each day for medicine, for transport and change of lifestyle, especially diet....SGD#3

Poor Adherence to Multiple Drug Regimens: One of unintended outcomes in the management of chronic comorbid conditions was poor adherence for most patients who were on multiple drugs for the management of diabetes and hypertension concurrently. Informants indicated that, with many drugs being taken at once, most patients were not compliant to treatment, due to side effects and high-cost medicine; some go off treatment thus leading to poorly controlled conditions, especially for those who were not on follow-up care. It was observed that providers' factors compounded with those in the system contributed to lack of adherence to treatment. Extracts from some of the informants included:

When you know that the missed drugs are the cause of feeling bad, then when you stop taking them you feel better...I stopped taking the medication because they were making me feel much sicker than before, I am now on diet-adjustment only.....SGD#1

...There are those who lack proper information, and they are not doing well at all, They are not coming even for follow-ups Those are the patients who will come to the hospital in a comatose state.....HP#8

Patients' poor adherence is compounded by the number of drugs they have to take at a go. From our clinical observations, those using one or a simple regimen adhere better compared to those with multiple and complex regimens...FGD#1

Stigmatisation Due to Integration of HIV and Chronic Care: Stigmatisation due to integration of chronic disease care and HIV and AIDS- care emerged as one outcome of the management of chronic comorbid conditions. Informants indicated that in those facilities which were integrating chronic care with HIV/AIDS, the number of patients was reducing, indicating the stigma attached to being mixed with HIV patients, due to negative connotations attached to an HIV positive status in the community. This ended up affecting patient turn-up for review at the joint clinic. Excerpts from patients and health care providers are reported:

...For instance here (in health centre) we queue just like others (HIV patients or diabetes/hypertensive) and we see one clinician and after your turn, you simply disappear home you don't want to wait for anything as everyone is looking at you or wondering if you have HIV as the facility is known for HIV not for diabetes or other chronic conditions.....Informant#3

Since we started offering services at the joint clinic....patients particularly from around this community are reducing each other clinic day... people don't like being seen lining up just like HIV patients do ...some have requested to be transferred to other facilities for diabetes and hypertension management, just because of stigma attached to HIV and AIDS.....HP#9

4.8.2 Community Outcomes Levels

Community Embracing and Increased utilisation of Chronic Care Services: One of the outcomes noted from management of chronic comorbid conditions among other chronic conditions, was that it was observed that the community is changing to accommodate diabetics and hypertensive patients during social gatherings; they prepare meals with no sugar or salt at communal gatherings. Some informants intoned that they felt isolated, especially

during communal celebrations, thus opting not to go or going, but not being able to eat or risk being tempted to overeat more portions than required.

Sometimes in our village nowadays, they have food for those who are sick put aside, just to show us we are part of the society... food with no salt, sugar or oil is there...leading the feeling of being alone in a social gathering.....SGD#1

It emerged that in areas where community units were active, utilisation of health services across different levels improved and services were well linked, which further led to early identification and referral of new cases.

We refer patients who presented with symptoms of diabetes and hypertension to the nearest facility for help. Since we started working in this community, utilisation of health services and linking of patients has really improved; generally we are doing early identification of cases and refer them early....CHW#2

Community Participation and Collaboration: Community participation and collaboration emerged to be one of the outcomes of management of chronic comorbid conditions at the PHC level. The activities and services of community units by CHWs on health promotion and sensitisation about risk factors for NCDs are bringing about change in the community. One of the areas of community participation referred to by informants was the growing of indigenous vegetables and campaigns against alcohol among the youth in the whole community. The informants in unison agreed that:

Community collaboration is essential for any project of health care to be successful... management of chronic conditions at PHC levels require that the community be part of every step, through active participation, giving resources which are shared in the community, changing behaviour and supporting the sick will change the trend. Community self-help projects for chronic care are already giving good results for HIV patients; it can also work for NCDs if collaboration into planning, management and evaluation is encouraged...FGD#2

The community is putting up every effort after seeing what alcohol consumption can do in the community from groups in the community to stop alcohol and encourage healthy eating in the community across age sets....the community is becoming sensitised every day.....HP#2

4.8.3 Health Care Organizations Outcome Levels

It emerged that one of the areas where intervention strategies are targeted is the health-care organisations, especially the health-care providers and the available infrastructures for the management of chronic comorbid conditions.

Two areas emerged as properties under the sub-category of health-care organisations-outcomes due to management of chronic comorbid conditions. These were: i) Potential role of information systems in collaborative care, and ii) Effective patient-centred care knowledge and skills.

Potential Role of Information Systems in Collaborative Care: It was observed that in the management of chronic comorbid conditions, information sharing between health-care providers across care-settings was significant. Informants indicated that currently the system was fragmented with no care co-ordination between departments or settings. It was observed that health-care providers' communication among themselves and even to patients was determined by lack of care co-ordination and influenced by poor communication skills, especially between concerned departments in the management of chronic comorbid conditions. Informants specifically noted that the technology of mobile phones is helping in care-co-ordination, and well organised information systems when used effectively, improve care-provision to patients who have complex care. Some of the informants had this to say:

With an information system in place care co-ordinated and demanded by chronic conditions, especially between different health departments, care co-ordination is seen to improve as you can now call and arrange an appointment or even consult with the physician about patients 'care ...FGD#1

We don't have a patient's recall system, as currently the system is fragmented, but we are working on it, as we have all started a diabetic register in every facility to allow care organisation and work distribution. Patients should not be kept for long waiting to be served with one health provider...FGD#2

Effective Patient-centred care knowledge and skills: It emerged that most health-care providers and the system were single-disease based, leaving out patients with chronic comorbid conditions. It was observed that for effective management of comorbid conditions, care provision had to be patient-centred and informants indicated that there was a need for

care-providers to be equipped with adequate knowledge and skills for holistic care provision. Informants further indicated the need for training and to have received adequate tools for service-delivery, as most of them lacked empowerment from the health organisation and the systems to train and provide them with modern tools for screening and diagnosing comorbid conditions. Some informant indicated that:

When empowered with the right information, knowledge and tools, you will have no excuse for not delivering quality service to the patients. You also feel motivated to work and patients become satisfied with the services.....FGD#2

Decentralization of the health sector and chronic care to lower levels will give health-providers opportunities for retraining, being given screening tools and extra space for management of comorbid diabetes and hypertension among others...FGD#1

Increased Cost of Care at Facility Level: Increased cost of care at the facility level emerged as one of the outcomes of management of chronic comorbid conditions, and informants also indicated high costs on management at the facility-level in terms of resources, consumables and personnel. However, there was a significant reduction in in-patient admission which was inversely increased on the out-patient levels. Informants reflected that bed occupancies by patients with diabetes and hypertension and days spent as in-patients had been significantly reduced, relieving health resources for acute and emergency care services. Extracts from informants are presented below:

Since the start of diabetic clinics and the support group here at the county, in-patient admissions have really been reduced and even complications like diabetic coma and leg amputation are rarer than before....so we are putting more effort into out-patient care to leave in-patient care for acute cases and emergencies.....HP#10

Any admission to the hospital facility is costly in terms of consumable resources and personnel and even space. Laboratory costs are more for the patient, because they occupy the bed for longer than acute cases do. The cost is calculated by the number of days the bed at the hospital is occupied by the same patient....HP#11

4.8.4 Health Systems-Level Outcomes

At the health system the following emerged as properties of the sub-category of health outcomes in the management of chronic comorbid conditions: i) Increased health care costs;

ii) Reduced high mortality and morbidity rates; iii) Collaboration between public and private health sectors, and iv) Health policy development.

Increased Health-Care Costs: It was observed that patients with comorbid diabetes and hypertension tend to use health-care services more compared to other conditions. It was observed that regular monitoring of patients at present was on a monthly basis, but patients could consult health care-providers based on the need. The over-utilisation of health services had increased the direct cost for the county health system. One of Informants had this to comment:

The more patients with comorbid diabetes we receive here, the higher the costs of ensuring their tests are done, and we need re-agents, strips, machines and personnel. As a county we must have re-agents. You cannot tell patients we don't have strips after travelling a long distance, and this is the basis for their review...HP#9

At the moment we review patients with diabetes and hypertension once a month, but we have two groups coming here after every two weeks, alternating with each other. The condition of the patients determines how often they need to be reviewed by the clinicians...those with comorbid conditions come here more often than those with single conditions....HP#5

The cost of care- provision for patients with comorbid conditions may seem easy and cheap, but, in reality, it is very expensive; the laboratory spends much more to procure machines and strips for them and they have to be there when they come, because their life depends on them...HP#6

Reduction of High Mortality Rates: This emerged to be one of the intended health outcomes of the management of comorbid conditions. Informants indicated that management of patients with comorbid conditions and early diagnosis of complications has improved the mortality rates, and life expectancy, for most people with chronic conditions, has improved. Informants referred to the national target to be achieved at 27 per cent by the year 2025 as set by the KHSSP, through prevention and control of all NCDs at household and community levels. One optimistic informant had this to say:

I think we can meet the targets set for reducing the mortality rates of people with all NCDs, with proper prevention and control of risk factors in the household and

community which are the catchment area for the health system. Going by the targets of 27 per cent, as in the KHSSP, it is achievable if we have well-coordinated actions and strategies from all health stakeholders and key players....HP#6

Collaborations Between Private and Public Health Sectors: It emerged that one outcome of management of chronic comorbid conditions is the collaboration between the private and public health sector in the prevention and control of chronic conditions. Informants also indicated that with the current advocacy and endeavours to improve health-care services for chronic care, collaborations have been seen between public health services and private health sectors, which have a higher percentage share in health-care provision. It was observed that fragmentation of health care services between health sector partners was to be amended through strong integrative intervention in the prevention and control of risk factors, and treatment of the already affected cases. Some of the extracts from informants included:

What we see working in the chronic care is government collaboration with the private sector in the fight against chronic conditions, especially the comorbid conditions. The private sector has more shareholders in Kenya now and it will help for government to integrate it in the prevention and control of NCDs, especially the prevention of risk-factors in the community....FGD#1

The health-care system is currently fragmented, with effective patient-centred care knowledge and skills, but its cure is collaboration between all health sectors providing health care services...HP#10

Health Policy Development for Chronic Comorbid Conditions: This emerged as one of the consequences of management of chronic comorbid conditions in PHC. It was observed that the current existing health and policy documents in the health system and government are single-disease oriented leaving out people with comorbid conditions. It was articulated by informants that the county level and national government needed to consider the development of chronic comorbid-conditions health policies which will provide specific guidelines or include unique guidelines and protocols for management of chronic comorbid conditions and tailor them to meet the needs of health-care providers and patients in the clinical setting. Some informants indicated that:

From the current experience of the management of chronic comorbid conditions, the health systems need to develop specific policies and include comorbidity in all

possible clinical guidelines available to provide clinical guidance and practice for this group of patients, especially in rural communities where doctors are scarce.....HP#12

The existing health policy and legal documents are focused only on one condition or grouped together as NCDs, and this does not help in clinical service provision for the management of chronic comorbid conditions...there is utter need to have relevant policies.....FGD#2

In the context of this study, the consequences or outcomes of management of comorbid conditions in PHC emerged as being intended outcomes of the process and those that were unintended outcomes. The outcomes were grouped and based on where management interventions are based. These included the individual patients and their respective households, community-based outcomes, health-care organisations, which included the health-care providers, who deliver health care services, and finally the health system which is responsible for the whole service delivery and policy development which could be the turning point of comorbidity management.

4.9 Summary of the Study Findings

In summary, the result of this study revealed that the phenomena of management of chronic comorbid conditions was firstly conceptualised as being collaborative in nature, with a number of stakeholders being involved at different levels of care provision. It was also seen as being continuous, right from the household level to the county referral hospital in a linked manner through levels of care. Management of chronic comorbid conditions was seen to be culture-congruent being cognisant of cultural norms and expectations from children and family members. Firstly, self-management was seen as being central to the management of chronic comorbid conditions.

Secondly, the conditions which emerged to be the casual or antecedent conditions in the management of comorbid chronic conditions included preventable hospital admissions, delay in seeking medical attention, increased number of premature deaths, a growing number of patients with comorbid conditions and lack of defaulter-tracing mechanisms. These factors led to the onset of management of comorbid conditions in PHC settings.

Thirdly, the conditions which provided the context under which the process of management of chronic comorbid conditions in PHC were grouped into four categories which contained

specific factors which formed the basis of management of comorbid conditions: the legal and policy documents, the development of protocols and clinical guidelines, political reforms in the country and international and national initiatives on chronic care.

Fourthly, the action/interactions strategies which enhanced successful management of chronic comorbid conditions, included: strategic planning level, where active events of policies and multi-sectoral strategies are developed towards management of chronic comorbid conditions and the second phase is the operationalized implementation level, where actual care provision took place based on the level of care and facility involved. The third action was on monitoring and evaluation of the targets and indicators, towards meeting the goals of management of chronic conditions. The process of chronic conditions management was also reviewed based on the level of care denoting the patient movement between care providers. Lastly, the roles of health-care providers as a team, comprised of many cadres, emerged as well as the roles of patients in the management process.

Fifthly, the following intervening conditions emerged as being either facilitative or a hindrance to the process of chronic comorbid condition management. The facilitative intervening conditions included: family involvement in care, government commitment, community participation and involvement in health matters and preparedness for self-management. On the other hand, hindrances were much more than facilitative factors, which included: lack of adequate knowledge of the conditions, community belief-systems, centralization of services in a decentralized system, high poverty levels, provider-patient perceived factors, and health systems-related factors which included lack of staff leading to overload, lack of centralized-patient registry for follow-up and future planning.

Lastly, the consequences or the outcomes of management of chronic comorbid conditions emerged as being intended outcomes of the process and those that were unintended outcomes. The consequences of management of chronic comorbid conditions were grouped into levels based on the level of occurrence. The levels were individual/household levels, those that affected the individual patients and households, community, health organisation and health systems-level outcomes.

4.10 Summary of Chapter Four

This chapter presented the results in the form of categories and sub-categories which emerged from different data sources; the schematic presentation of the phenomena of management of chronic comorbid conditions in PHC settings in Kenya as outlined in Figure 4 on page 197.

The development of categories and sub-categories was guided by the paradigm model of Strauss and Corbin, as indicated earlier on.

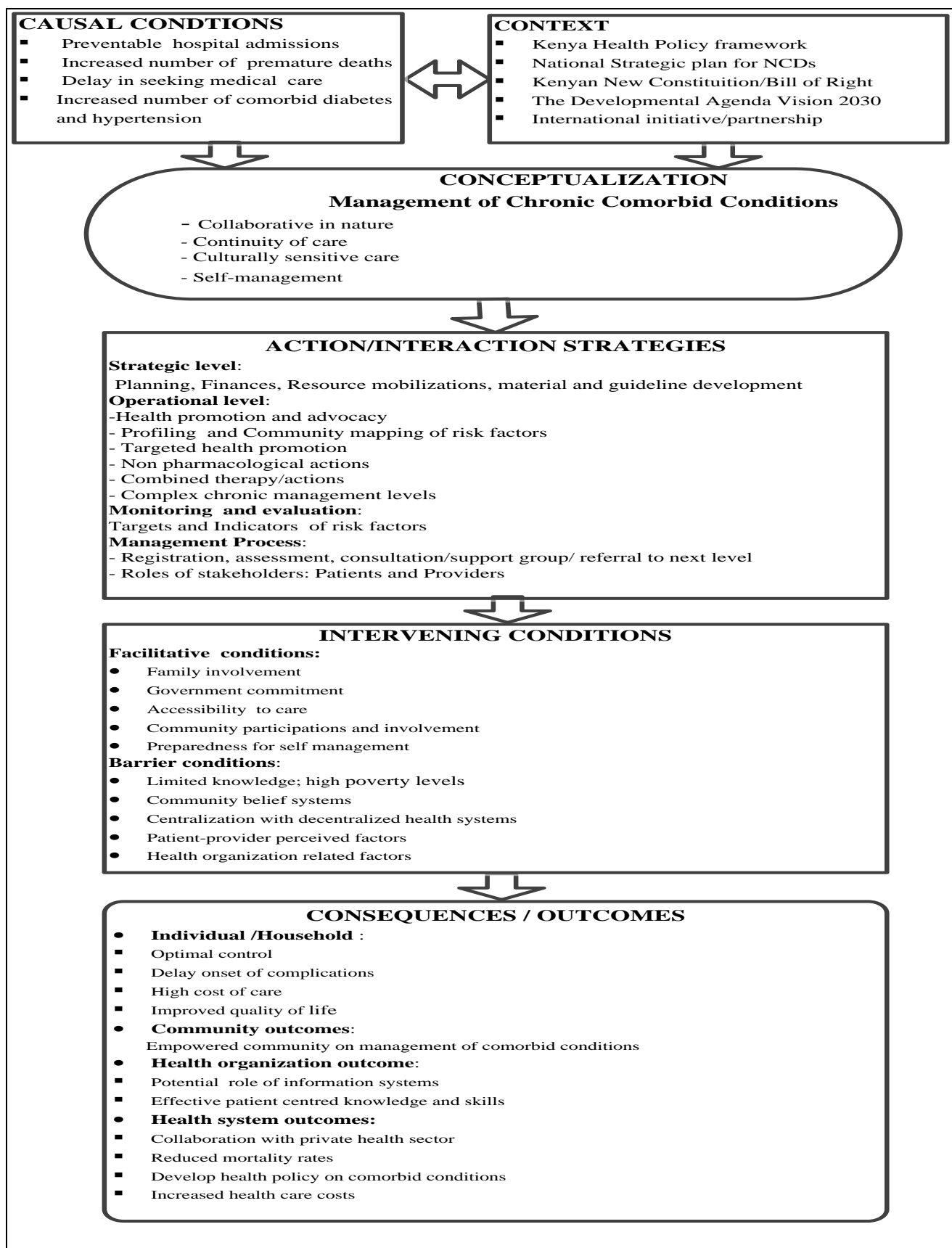


Figure 4: Schematic Summary Presentation of the Study Findings

CHAPTER FIVE

DISCUSSION OF RESULTS

5.1 Introduction

This chapter presents a discussion of the results of the study after extensive analysis. Influenced by the grounded theory as articulated by Strauss and Corbin (1990), the researcher undertook a new literature review in order to underpin emerging factors that could contribute to the development of a model on management of chronic comorbid conditions in primary health-care settings in Kenya. The Selective coding phase as described by (Strauss and Corbin, 1990, Corbin and Strauss, 2008), allows new literature to be incorporated for comparison and for the filling in of the gaps in the emerging new model or substantive theory. It allows the creation of relationships between categories in reference to the core phenomena of the study. To reiterate, guided by an ethnographic design, the purpose of the study was to explore and analyse the current management systems of chronic comorbid diabetes and hypertension among adults in primary healthcare settings in Kenya, in order to develop a context-informed model of management of chronic comorbid diabetes and hypertension in Nandi County in Kenya.

In summary the discussion of the results follows the sequence of the results as they emerged from triangulated data sources used in this study and in accordance with the paradigm model as outlined in (Strauss and Corbin, 1990). The discussion will be outlined as follows: a) conceptualization of the core phenomena management of the chronic comorbid conditions, b) causal/antecedent conditions, c) contextual conditions, d) actions and interaction strategies, e) intervening conditions, and f) consequences or outcomes.

5.2 Conceptualization of the Core Phenomenon ‘Management of Chronic Comorbid Conditions’

In this study the core phenomenon ‘management of chronic comorbid conditions’ was conceptualized as a complex process, which is conceptualized differently by the informants. The common characteristics in the definition of core phenomena include management of chronic comorbid condition as being a) collaborative in nature, b) involving a continuity of care c) culturally-sensitive care and d) a process centred on self-management. These characteristics are further explained below:

5.2.1 Management of Chronic Comorbid Conditions as Collaborative in Nature

Management of chronic comorbid conditions was conceptualized as being collaborative in nature. And it involved the working together of different stakeholders. collaborative actions were observed at i), interdisciplinary level ii) multi-sectoral level and iii) at the community collaboration level.

Multidisciplinary collaboration: management of chronic comorbid conditions was conceptualized as collaborative in nature, with a number of health-care professionals working together to improve health outcomes. In this study inter-disciplinary teamwork and working together was seen in effect during consultations of patients, where doctors, nurses, clinical officers, laboratory technologists, and nutritionists, all played significant roles in the management of chronic comorbid conditions and their individual and concerted activities contributed to effective management of comorbid conditions. The findings of this study are congruent with other studies. Interdisciplinary or multidisciplinary collaboration is conceptualised as the interaction and integration of people from different disciplines working together with a common goal, or adding value to the expected outcomes (Bennett and Gadlin, 2012, San Martín-Rodríguez et al., 2005). Similarly, Lalkhen and Mash (2015) emphasise that team work between doctors, nurses and auxiliary staff working at lower levels of the primary health care enterprise should be encouraged to improve individualised care. In line with this are the views of Henneman et al. (1995). They maintain that multi-disciplinary teamwork increases job satisfaction and improves working relations through increased knowledge, skills and communication among team members. Gilbert et al. (2010), point out that multi-disciplinary collaboration increases interactions across settings and it promotes interpersonal communications, which allow for more information to be shared and for more knowledge to be exchanged. In this way optimal care for chronic patients could be provided and the highest standard of care could be achieved.

Multi-sectoral collaboration: In this study the collaborative nature of management was evident when care involved different sectors related to the health sector, working together as partners to improve the health of people affected with chronic conditions or to prevent the risk factors of chronic conditions in the community. Inter-sectoral collaboration was seen mainly between the agricultural sectors collaborating with the health sector in encouraging community members to embrace the production of healthy indigenous foods. Collaboration was also seen in the sensitization of communities towards diet and lifestyle modification for prevention of risk factors and unhealthy behaviours. This was accomplished during school

health-awareness classes, at agricultural shows and at demonstration farms, this collaboration showed that nutrition is critical in the management of chronic comorbid conditions. Collaborations were also seen between the health sector and the nutritional sector. The agricultural sectors were to increase health foods in the prevention of risk factors as advocated during the *Alma Ata Declaration* on inter-sectoral collaboration as one principle of primary health care (WHO, 1978). Studies have shown that multi-sectoral collaborations with health-related sectors usually lead to improved health policy implementations in PHC, which also enhances health-care practices, especially to health promotion interventions and quality of life in the population (Adeleye and Ofili, 2010, Parekh et al., 2011). According to WHO (1978) inter-sectoral collaboration, forms the basis for the primary health-care strategy which is critical in the management of chronic comorbid conditions and general population health outcomes.

Community collaborations: management of chronic comorbid conditions was also conceptualised as collaborative, where the health sector and organizations were working together with the community, through their involvement in decision-making. Collaboration was observed in advocating for access to care, access to quality services and in creating awareness of chronic comorbid conditions, health promotion messages and participation in supporting those affected with chronic comorbid conditions. Collaboration at the community level was also observed in support groups within the community, where members met to share their knowledge, experiences and expertise. They also shared ideas on how to address issues related to management of chronic comorbid conditions. The findings from informants are in agreement with the Ministry of Health instructions on community involvement and collaboration in the prevention of NCDs (Ministry of Health, 2015b), specifically the initiation of community home-based care for follow-up and defaulter tracing. Studies have shown that community collaboration with the health sector increases sustainability and implementation of policies and practices, especially with regard to community health (Gottlieb et al., 2005, Katon et al., 2012, Rabkin et al., 2012, Katon et al., 2010). Empowerment of the community is critical in the transformation of community health through change of risk behaviours and practices (Armstrong et al., 2006). These findings are in support of (Tzenalis and Sotiriadou, 2010) claim that in order to effect a change in the health-status of the community this can only be accomplished through inter-sectoral and multi-disciplinary collaborations, based on the community needs rather than on organizational needs.

5.2.2 Management of Chronic Comorbid Conditions Requires Continuity of Care

Management of chronic comorbid conditions was conceptualised as being timely and well-co-ordinated care along a continuum of care. Continuity of care was envisaged as the ability of patients to receive care at the community level before proceeding, if necessary, to the tertiary level and back again to the community. In other words continuity of care was as a result of a clear referral system from one level to another.

Receiving care across care levels, based on the services required, allows the patients to navigate and to move along the continuum of care and to navigate health care services among different care providers, including traditional medicine practitioners, who also provided primary services to health-care providers, defined within the cultural expectations of the community and individual patient's health beliefs. Continuity of care among health providers was seen as the ability of health-care providers to co-ordinate health services across care settings for patients with chronic comorbid conditions. In this study continuity of care was conceptualized by patients as the ability to be referred to the next level of care for better or more specialized care, within the shortest time possible, centrally provided and characterised by the timely service provision and care co-ordination along the systems of care.

In this study continuity of care was characterised by timeliness, accessibility and linked co-ordinated health-care services. According to Haggerty et al. (2003) continuity of care is the provision of care which is well co-ordinated, integrated and with seamless interventions across care settings; a scenario which has been depicted in a number of studies (Van Walraven et al., 2010, Hong et al., 2010). Doubova et al. (2013) this study indicates that continuity of care should be timely and goal-oriented. Continuity of care also, to some patients, means receiving care from the same care-provider "not being new each time", accessing medicine and health care services whenever needed (Van Walraven et al., 2010). Linking care is achieved through access to and sharing of patients' information across settings and between care providers (Haggerty et al., 2012). The above views are also echoed by (Sweeney et al., 2012). Continuity of care has been found to enhance adherence to treatment plans and to reduce admissions, (Van Walraven et al., 2010).

5.2.3 Management of Chronic Comorbid Conditions Required Culturally Sensitive Care

In the findings of this study, culturally sensitive care emerged as an important concept in the management of chronic comorbid conditions. Three unique aspects of the culturally-

congruent care surfaced from this study. These included: a) culturally-embedded parent-children roles and expectations; b) culturally-determined gender roles and expectations and c) the culturally-embedded religious practices and beliefs.

Management of chronic comorbid conditions was conceptualized to be culturally sensitive when health-care services and health-care providers were cognizant of the cultural norms and expectations of the service-users and the community. Cultural sensitivity in health services meant that health-providers needed to accommodate the culture of the community and to ensure that the culture and practices of the community were accommodated as well as those of the individual patients. In line with the findings of this study, are various perspectives on culturally congruent care. Leininger and McFarland (2006), maintain that the challenge to the health-providers, especially nurses, is to adapt approaches to care to fit the patients' own needs, beliefs, norms and practices, while remaining sensitive to their own professional culture and beliefs. Rosenstock (1974), posits that a person will adhere to certain behaviour based on the perceived consequences of their actions. They might well change if they believe that such a change will reverse the threat caused by certain behaviour such as smoking, or even certain cultural practices. The results further indicated that health-care providers need to cultivate the ability to learn and be aware of the needs of the ill persons' and, their family members' cultural norms and expectations which may be different from those of the providers, based on exposure, and age gaps. This is supported by (Leininger and McFarland, 2006, Sagar, 2011). Similarly de Beer and Chipps (2014) are in support of health care providers developing culturally competent skills which will allow them to practise culturally congruent care in a culturally diverse community according to cultural competence-care models (Campinha-Bacote, 2002). These skills are aligned with the findings of this study, which require the health-care provider to manage comorbid conditions, develop awareness, skills, knowledge, desire and astute cultural encounters with the patients, families and the community.

Culturally-embedded child, parents' expectations: Management of chronic comorbid Conditions was characterized by children taking care of their parents as culturally expected. The children's role was observed in the provision of financial support and actual provision of care for their sick parents. The noble roles played by children in this study are in agreement with the findings of other studies done worldwide, particularly on emotional support and adherence to treatment/drugs (Rosland and Piette, 2010, Kuo et al., 2012). In the African context, the parent-child expectation is a continuous process, which has no limit based on age or distance from the homestead of the parents. Culture also determines diagnosis and care

responsibilities in a communal family setting, as indicated in a study from Tanzania (Kolling et al., 2010). The relationship between children and their parents is directional and binding culturally on both of them (Tuttle et al., 2012, Pharr et al., 2014).

Culturally determined roles and expectations: Management of chronic comorbid conditions was also conceptualized as being embedded in culturally-determined gender roles and norms. This was observed by the roles women had to perform during chronic care of their spouses as expected in the community where women are culturally regarded as care-providers in the home, including in chronic care provision. The findings further indicated that culturally-determined gender roles formed a central part of culturally congruent care in the management of chronic comorbid conditions. Informants indicated that health-seeking behaviour in the community is also predetermined by gender, amongst other health determinants, such as socioeconomic status. The study finding also indicated that the male gender supports the current findings. Culturally men, as expected in the culture, are not to portray a sign of weakness by assuming sick roles (Szinovacz and Davey, 2013, Pharr et al., 2014) maintain that gender issues are culturally sensitive and diverse and they need to be further investigated. In the African context, being masculine was associated with self-management, adherence to biomedical treatment and diet or a lifetime of medication, in the management of comorbid conditions (Robertson, 2009, Evans et al., 2011, Lubega et al., 2010). But these studies indicated that male patients had poor self-management skills; adherence and general life styles adjustments, as culturally, they are dependent on the female partners or family members for support and implementation of self-management skills. Health-seeking behaviour as also portrayed in this study is inversely affected by gender and related expectations and norms and socially constructed beliefs which are, in accordance with the findings of the study from the coastal region in Kenya (Chuma et al., 2007, Abubakar et al., 2013, Bloomfield et al., 2013, Muchira et al., 2015). Cultural illness practices for women are suppressed as they are to take active roles for both the family and themselves even in chronic conditions (Pharr et al., 2014). Gender in chronic care forms the central aspect which needs consideration during health promotion programmes and general health planning.

Culturally embedded religious beliefs and practices: Management of chronic comorbid conditions was further conceptualized as culturally sensitive in terms of religious beliefs and practices. The findings indicated that health providers need to be sensitive to religious practices of patients and their families and to be able to deliver culturally-congruent care. It surfaced that with the onset of chronic conditions, normal psychological reaction is to seek for answers from different sources including interventions from higher supernatural beings.

In view of the above, Schim and Doorenbos (2010), indicate that comprehensive management requires health-care providers to engage patients or clients and their families, as an experience of culturally congruent care. Research indicates that the role of religion is the first line of coping with chronic conditions or any threats affecting the normal well-being of a family member (Basu-Zharku, 2011, Hughes et al., 2015, Chaumba, 2011, Osamor and Owumi, 2011). Several forms of religious and spiritual healing are dependent on culture (Sato, 2012c). Similarly, Hughes and others have indicated that use of alternative complementary medicine and spiritualism, among South African populations, determines how they utilize modern medicine for the control of chronic comorbid conditions (Hughes et al., 2015). There is consensus that the understanding of different religious group practices and beliefs in the community is of paramount importance in crafting health education, and health messages for community sensitization and offering patient-centred care (Scheckel et al., 2012, Iwelunmor et al., 2014). The belief in a complete cure from a supernatural beings is dependent on religion and spiritualism, as in the case of hypertensive patients in Ghana as investigated by (Kretchy et al., 2013), in a study that upholds the findings of this current study.

5.2.4 Management of Chronic Comorbid Conditions is centered on Self-Management

Management of chronic comorbid conditions was conceptualised to be centred on self-management behaviours and activities of the patients and their immediate family members. Self-management was characterised by the patient being able to perform activities of daily living towards self, or assisted by other family members or health-care providers to perform them, both at home and at a health facility. Self-management, both assisted and self-performed in this study, was characterised by performance of self-assessment of the body, in identifying deviations from the normal. Ability to administer medication correctly and monitor the levels of blood glucose and blood pressure, at home or in the nearest health facility, whenever possible, is also very important. Self-management was further characterised by the patient's ability to correctly identify danger signs such as dizziness, light-headedness, loss of energy, blurred vision among other warning signs that prompt the patient to take appropriate action on time to avert complications and worse situations. In this study, self-management was seen as a process which has its focus on decentralising care to the patients thus minimising the efforts by the health-care providers. This would assist the patients to be responsible for their own health and actions for improved health outcome which is cost-effective for both the health system and the patients.

Assumptions of the social cognitive theory (Bandura, 1986), points out that individuals will take action for change based on their competence to perform the activities, on their attitude towards the change and on the influence of the environment on their behaviour. Similarly the health belief model posits that an individual will be motivated to do self-monitoring and adhere to treatment based on their level of motivation and expectations of the outcomes, perceived levels of achieving the outcomes, on the susceptibility to and severity of the conditions (Rosenstock et al., 1988). Patients' level of knowledge and skills accompanied with previous experience and determination, keep them determined to ameliorate severe symptoms and achieve optimal level of control. To uphold the findings of this study, studies have shown that implementations of self-management activities and behaviour is socially and cognitively influenced by the knowledge and the efforts an individual makes towards meeting the goals of management (Schillinger, 2011, Nadkarni et al., 2011, Al-Khawaldeh et al., 2012). Nadkarni and others, assert that a patient's efforts, decision-making and enactment of the decisions determine self-management behaviour Nadkarni et al. (2011) assist in the implementations.

5.3 Antecedents or Causal Conditions

The finding of this study highlighted several factors which surfaced as antecedent conditions in the management of chronic comorbid conditions. The following factors that led to the onset of management of chronic comorbid in primary care settings were: a) preventable high hospital admissions, b) increased number of premature deaths, c) delays in seeking medical attention, d) lack of defaulter-tracing for patients with comorbid diabetes and hypertension and e) increased number of people with comorbid diabetes and hypertension.

Preventable high hospital admissions: The study findings suggest that management of comorbid diabetes and hypertension was as a result of high hospital admissions experienced in the region and in Kenya. Current statistics in Kenya indicate that up to 50 per cent of all hospital admissions are due to chronic conditions (MOPHS, 2010). Yet according to the WHO (2010b) all risk factors attributed to chronic conditions such as physical inactivity, diet modification, smoking and excess alcohol consumptions are preventable and can be controlled across life cycles. Hospital admissions in most cases among patients with diabetes and hypertension have been known to be preventable through intensive monitoring, medication and self-management strategies (Mohan et al., 2013). Despite that, several studies

have confirmed that comorbidity is associated with high hospital admissions, outpatient emergency visits, health costs and even mortality (Valderas et al., 2009, Long and Dagogo-Jack, 2011, Teng et al., 2015). Kaplan and Feinstein (1974), highlight the importance of considering and classifying comorbidity before evaluation of management outcomes. The findings of this study further point to the need for urgent preventive measures at primary-care levels, prevention and control of risk factors for diabetes and hypertension (Maher et al., 2011).

Increased numbers of premature deaths: it was also outlined that one of the antecedents in this study was the increased number of premature deaths, due to chronic comorbid conditions. The results of this study indicated that most patients, with comorbid conditions receiving care in PHC settings were below the age of 60 years, who are faced with a myriad of complications. Some of them succumb to death earlier than expected (WHO, 2013b). These deaths could have been averted if conditions were managed with comorbidity in mind, through intensive drug therapy and self-management strategies. A situation arose, which triggered the need to decentralize diabetes clinics from secondary and tertiary hospitals to county levels and lower levels of care (Stuart-Shor, 2013). Some of the reasons which have led to the increased number of deaths due to chronic conditions in most developing countries, included, lack of advocacy about chronic conditions to sensitize the community, limited level of knowledge about most conditions and benefits of early screening (Maina et al., 2011). Statistics state that approximately 85 per cent of people in Africa alone are not diagnosed, thus the number of people who are caught unaware of this diagnosis could even be higher than current figures (WHO, 2013b).

Delays in seeking medical attention: This also emerged as one of the factors which contributed to the need of management of chronic comorbid conditions at primary health-care levels. The study's findings suggest that delays in seeking medical attention among rural community populations also triggered the initiatives to start early screening to reach the marginalized population. As earlier indicated, the majority of people in most developing countries remain undiagnosed and unscreened for risk factors. In a study conducted in Malawi, it was found that 94.9 per cent were not aware of their medical diagnosis while three quarters of the 3727 participants had never been screened before (Msyamboza et al., 2014). Other studies also mentioned that cultural factors like poverty, power relations in the family

and utilization of alternative medicine and conventional means of care, lack of knowledge and negative attitudes further contributed to delays (BeLue et al., 2009, Maina et al., 2011).

These findings are similar to those of other African-based studies, where choice of mode of treatment leads to delays in seeking health care, based on the level of susceptibility and severity of the perceived conditions of an individual or family members (Temu et al., 2014, Abubakar et al., 2013, de-Graft Aikins, 2005). Such individuals may go ‘healer shopping’, before settling for conventional medicine or even the use of herbal medicine to relieve symptoms. Psychologists and educationists concur that, people will take appropriate actions towards their change of behaviour and practices, based on competence and the skills to question the happenings within their lives. Freire refers to this move as problem-posing, where there is active participation and critical thinking to provide an intervention in real-life situations to empower people for change, which is patients-centred as implied in (Freire, (1985). The change of mind of the community to embrace critical thinking determines how soon an individual seeks medical attention and accepts lifestyle adjustments amidst other health determinants such as socio-cultural and economic factors.

Increase in the number of people with uncontrolled diabetes and hypertension: This also contributed to the need to manage chronic comorbid conditions at primary health-care settings in Kenya. Increasing numbers of individuals with an ‘index disease’ that triggered secondary conditions and other chronic conditions such as cancer, diabetes, hypertension, including mental health and violence and injuries have led to the onset of management of chronic comorbid conditions. The results from this study are in agreement with others previously reported within Kenya and the Sub-Saharan region (Mathenge et al., 2010, Otieno et al., 2005, Mugure et al., 2014). The findings from these studies report a high prevalence of people with poorly controlled diabetes and hypertension and other comorbid conditions. There are ever-bulging statistics in the number of people with both diabetes and hypertension and this is on the rise daily in rural settings. This is against the previous belief of high prevalence in urban areas (Muchira et al., 2015, Hendriks et al., 2012). In South Africa, comorbidity of NCDs with one another is increasing. The presence of HIV comorbidity also determines the quality of the health services offered (Lalkhen and Mash, 2015). The low level of control can be attributed to lifestyles changes, adoption of western lifestyles and lack of adherence to clinical guidelines by health-care providers (Atieno-Jalang’o et al., 2015). These results create the implication that comorbidity needs to be taken seriously for intensive management, especially in rural settings where the majority suffer in silence.

Lack of defaulter tracing and patient linkage to chronic care facilities: There is fragmentation of chronic care services as vertical programmes, with hypertension and diabetes clinics being organized differently in clinics and hospitals, have emerged as a contributing factor in managing patients with comorbid conditions together. The findings indicated that lack of contact and centralized patients' information records for diabetes and hypertension patients, led to most of them falling off treatment. Studies have shown that defaulters among diabetics and hypertensive patients form the majority of patients who are poorly managed, due to lack of consistency in their follow-up care at the lower levels of care. A study in Kenya has confirmed that poor adherence to clinical guidelines by providers could be attributed to poor control of diabetes and follow-up (Atieno-Jalang'o et al., 2015). Similar observations have been made from the sub-Saharan region on poor control levels (de-Graft Aikins, 2005, BeLue et al., 2009, Maina et al., 2011).

Poor implementation of the health- information systems has affected continuity of access to medical information and patient-linkage to specialist care as reported in Uganda, Cameroon and Kenya as well (Kotwani et al., 2014, Vedanthan et al., 2014, Labhardt et al., 2010), with better patient outcomes compared with previous studies with no tracing and linkage facilities being reported. These findings support the need to develop effective defaulter-tracing systems for effective management of comorbid diabetes and hypertension being the common conditions in the developing countries. The clinical information system forms a central aspect of the CCM, which most developing countries are in the process of adopting in management of chronic conditions, especially for diabetes management (MOPHS, 2010a, Olmen et al., 2012b). Despite the fact that most of the developing countries [Kenya included] require health-system strengthening and restructuring to provide chronic care adequately across care settings.

5.4 Contextual Conditions

Despite the many factors which formed the basis for management of chronic comorbid conditions when grouped together, two categories emerged under contextual conditions. These included: a) political commitment and b) international initiatives and partnership.

5.4.1 Political Commitment

The findings indicated, provided the serene environment and support for the management of chronic co-comorbid conditions in the health systems. The findings of this study indicated that strong and good governance had a direct influence on the policies and legal frameworks

which support quality services-provision. The findings reflected that strong government and leadership through political reforms in Kenya have been the most critical force in the management of chronic conditions. According to Gilson et al. (2011), good governance and leadership, shape the policy implementation and form the entry point to health strengthening for equal distribution of health resources. Strong governance and leadership has been observed in Kenya through: i) development of health policies frameworks and the implementation strategies and ii) political reforms and development agenda.

Health policy frameworks and strategic plans: These findings reflected on the number of policy documents the Government of Kenya has produced over a period of 5 years. They have included aspects of NCDs whilst others focus exclusively on NCDs. These policies and strategic plans formed the basis for the management of chronic comorbid conditions in relation to NCDs, starting at the community level and advancing to the tertiary level of management. This has allowed decentralization of health services in Kenya to allow communities to have active participation and to take responsibility for their own health issues (KMOH, 2006). Policies form the critical aspect of health-care service delivery and quality regulation. According to Atun et al. (2013) and Gilson et al. (2011) health policies transform the whole health systems if they are implemented well and if they are supported by the community being served. Health policy framework over the years has undergone reviews with an aim of improving service provision to the population across life cycles. The policy states the target of halting and reversing the burden of NCDs by 27 per cent by 20130, across all life cycles. The policy has several objectives which cut across several areas of implementation starting with decentralization of screening services to low levels of the community; it also forms the basis for developing clinical guidelines, prevention and control of risk factors across different levels and close monitoring of the targets and indicators of NCDs.

The Kenyan health policy framework is not different from other developing countries in the sub-Saharan region. In South Africa the Department of Health in the Ministry has well-articulated strategies for the prevention and control of NCDs, and implementation of the strategic plan has been underway, through the regulation of policies to prevent and control of NCDs (Rispel and Moorman, 2010). However, according to a civil society Benchmark report, on responses to NCDs in the East African region, despite the presence of policies and strategic plans and well-articulated regulations policies, their implementation has remained weak and lack of research and surveillance information for national planning still holds the

health system back when it comes to chronic care (Anyona and de Courten, 2014). There are other similar cases of slow enactment of legislation across the region (Tumwine, 2011).

Uniquely, the findings highlighted the need to strengthen the health information system to enhance health information-sharing and to encourage evidence-based decision-making for the management of chronic conditions. In spite of clear objectives, the HSSPIII may not be implemented in its present form due to devolution, transitions and other external factors. According to Anyona and de Courten (2014), the influence donors and international bodies have on Kenya's health policy, leads to poor representation of the ideal context and health problems, and this impacts negatively on planning and relevant policy development in Kenya. Secondly, lack of knowledge of policy-makers in the health context in the country, contributes a lot to how study findings from research are interpreted and incorporated into policy (Hennink and Stephenson, 2005, Orton et al., 2011). This, then, calls for context-based studies and for community participation in policy development and in evaluation of health programmes, which could directly be dependent on the community empowerment capacity (Zimmerman, 2000).

National sector strategic plan for the prevention of NCDs (2015-2020): formed the basis for the management of chronic comorbid conditions as a subsection of all NCDs. The document developed by the Division of NCDs in the Ministry of Health is one that is very specific to all NCDs, especially the four major ones where diabetes and hypertension form a major cause of morbidity and mortality in the country. The documents, although designed for the Kenyan context, happen to mirror the strategies by the *Global Action Plan for NCDS 2013-2020*, which was approved during the 63rd World Health Assembly (WHO, 2014). The plan like all others has a target of reducing NCDs by 25 per cent by 2025. The targets will be met through active surveillance of the risk factors, monitoring and documentation of mortality and morbidity cases across the country.

The findings also indicated that the document on NCDs advocated for integration of NCDs prevention and control with communicable conditions to minimize health care resources and accountability. There exists enough evidence as to how integration has uplifted the prevention and control of NCDs in low-income countries with limited health resources (Temu et al., 2014, Demaio et al., 2014). However, with this in mind NCDs come in with a set of comorbid conditions which should be considered during the surveillance and capturing of data for further planning and policy development, especially in Kenya, which is known to be in the forefront in policy development. This has been criticized by other scholars, in that there is a difference in developing and implementation of health policies. Implementation should

be given priority, especially to the already existing policies and plans (Anyona and de Courten, 2014). For instance the implementation of the *Tobacco control Act* and the school policy are still lagging behind across the sub-Saharan countries (Tumwine, 2011). Kenya remains with no regulations on foods, especially salt, sugar, except for alcohol and tobacco, especially in regard to NCDs (Cook, 2013), despite the available *Food-Safety and Management Act* (Oloo, 2010). The diabetes strategy formed the basis for the development of a clinical guideline for diabetes mellitus management, which also has management of hypertension as comorbid conditions and other complications. There are further clinical manuals for health-care workers on the management of diabetes and its complications. However health-care workers were not aware of the manual or the clinical guidelines for diabetes. This was due to poor co-ordination and planning of the national headquarters, especially the division of NCDs and lack of funding in the division to allow distribution of the manuals.

The community strategy developed by the division of Community Health in the Ministry of Health provided directives on how to train CHWs and how to develop the training curriculum for CHWs even within the devolved ministry of health sector (KMOH, 2006). Despite the uptake of the strategy in some areas, only 7 per cent of community services are functional in Kenya, but much more effective under international bodies such as NGOs, Red Cross and USAID (Ministry of Health, 2010). The result further indicated that with the emergence of NCDs, the strategy and the community CHWs provides the basis for the implementation of the CHWs curriculum which was comprehensively developed towards the prevention and control of NCDs right from the community health services levels, under the leadership of CHEWs, linking them to the health facilities for further management and referral. Despite a myriad of challenges facing the CHWs and the community services, such as lack of budgetary allocations and high level of attrition, it has been effective in initiating health promotion, screening and referral of clients in the community (Mireku et al., 2014). Similarly (Akinyi et al., 2014) highlights the effectiveness of the community health service and CHWs in health promotion services. Other countries within the sub-Saharan region have proved the effectiveness and cost effectiveness of CHWs in the management of chronic comorbid conditions In the case of Ethiopia, South Africa and Brazil with the use of family practice (Mamo et al., 2007, Gaziano et al., 2014, Macinko et al., 2010).

5.4.2 Political Reforms in Kenya

The findings from this study highlighted three major areas under political reform which formed the basis for management of chronic comorbid conditions in Kenya. The national organizations and division of the Ministry of Health into functional units demonstrated the collaborative nature of health services. These were a) Creation of Division of NCDs in the Ministry of Health b) the new Kenyan Constitutions and c) the long term development agenda of Vision 2030.

Creation of the Division of Non-Communicable Diseases: This formed the basis for management of chronic comorbid conditions. Chronic conditions have, ever since, received the attention required from the Ministry of Health. Political reforms have a critical influence on health systems especially service-delivery to the marginalised groups. In Kenya the political reform formed the basis for the creation of the Division of NCDs in the ministry and later the results from this study highlighted the effects that political reforms have on health. Kenya bowed to pressure from international health bodies to create the Division for NCDs within the Ministry in 1998. The division has been monumental with no funding and staff for any activity until late 2008/2009 when it was officially included in the *Ministerial Annual Operation Plan* (Anyona and de Courten, 2014). The Division in the Ministry is in charge of developing and regulating the health service delivery to patients with chronic and comorbid conditions across care- setting. Creation of the division of NCDs in the Ministry of Health in developing countries, is one of the requirements for the global action plan for the prevention and control of NCDs through capability-building and contextual allocation of resources for control and prevention programmes (WHO, 2010b). However, to date, there lacks specific strategies and regulation on how patients with multiple or comorbid conditions should be managed especially in PHC settings, in developing countries, as compared to developed countries which have systems in place for multiple chronic conditions, as in the case of the US (Uhlir et al., 2014), which need to be implemented against the relevant clinical guidelines.

The Kenya New Constitution (2010): The findings of this reflected that health systems and service delivery is greatly influenced by the governing constitution, which gives directions on the right of access to health services. This emerged as the basis for managing patients with chronic comorbid conditions across care settings. Devolution is a product of the new decentralization of governance and leadership in order to be closer to the people, including

decentralization of health care system to 47 counties, while reserving certain responsibilities with the national government (KPMG, 2012). Kibui et al. (2015), argue that the constitution has created the forum of the marginalized groups and individuals to be heard, and receive equal health care in Kenya, particularly in article 53 and 57, which encompasses people with chronic comorbid conditions. The constitution gives everybody a right to health especially emergency care in both private and public health services. However, despite the devolved government being closer to the people, it has been criticised for increasing fragmentation of health care services (Atun et al., 2013), especially among the rural-based counties. This has been attributed to lack of active participation of the community in decision-making, a step in the social change process, similarly seen in other countries undergoing transition of power and disease conditions, faced with resource constraints (Rispel and Moorman, 2010).

Long Term National development agenda vision 2030: This emerged as a basis for managing chronic comorbid conditions in Kenya as a way of meeting the goals of development. One of the pillars is health, where it aims to provide high quality health-care and affordable high health-care systems, and further alleviate poverty among the general population (KPMG, 2012). According to Vision 2030 document, the highest priority will be given to the communities and individual households to make decisions concerning their health through a devolved country government health system (Government of Kenya, 2007). Poor accessibility to chronic care has been attributed to lack of involvement of other stakeholders, especially the community, in decisions affecting their health, and lack of information from the health organizations for planning and resource organization.

5.5 Actions and Interaction Strategies

The findings of this study reflect the actions and interaction strategies which heightened management of chronic comorbid conditions at primary health-care settings within the devolved government and the central government. The process of management of chronic comorbid conditions reflected subcategories which were reflected in the following levels of action: a) strategic level b) the operational level, c) health service delivery interventions and d) monitoring and evaluation

5.5.1 Strategic level

The process of management of chronic comorbid conditions in Kenya reflected actions at strategic level. These actions were more evident at: a) Development of legislations/policies and guidelines, b) Resources Mobilization and c) Development teaching materials.

Development of health policies and clinical guidelines: Management of chronic comorbid conditions is dependent on the available policies and the results indicated that for management of chronic comorbid conditions to be sustained in the health sector, there was the need to implement rules governing the health service-delivery across the care settings. The result revealed that there exist clinical guidelines for the management of single chronic conditions in Kenya. For instance, the *National Clinical Guideline for Diabetes* is explicit on the management of diabetes and its comorbid conditions and it stands out as the only guideline which makes reference to hypertension as a comorbid condition (MOPHS, 2010c). The clinical guidelines are to provide a step-by-step management of patients, even though studies have shown poor adherence to them by health-care providers (Atieno-Jalang'o et al., 2015). The health policy and strategic plans for the health sector have been developed and provide step-by-step responsibilities for each level of government. However, the Health Policy framework is not specific to comorbid conditions and still gives minimal attention to NCDs. In order to achieve universal health coverage, in Kenya according to KPMG (2012), strategic planning is essential to ensure all stakeholders are aware of their roles both at the county and the national level. The findings of this study are a mirror of what the national government has incorporated into its strategic plan for the prevention and control of NCDs (Ministry of Health, 2015b).

Resource mobilization: The result of this study indicated that the government of Kenya through the Ministry of Health has allocated both money and non-monetary resources to allow prevention and control of NCDs. Accordingly the Health Policy Framework identifies the NCDs as a major concern to the national government and primarily to the Ministry of Health, the strategic health plans for all other 47 counties mirror it in every aspect and allocates finances the prevention and control of the NCDs, where management of chronic comorbid conditions. According to the Ministry of Health, the budget allocation rose from 6.5 per cent to accommodate the growth need in the health sector with county government receiving 21 per cent of the national health budget (Ministry of Health, 2015b). An allocation which has been criticized to be too low is based on the number of mortality cases of conditions like diabetes and hypertension, least to mention cancer deaths and is below the Abuja declaration of 15 per cent of the total national budget. According to GTZ (2013) reports the allocation of 3 per cent the Division of NCDs is far too low, in the background where 4 out of 10 people have hypertension, and 10 per cent of the population have diabetes and the cancer mortality rate is nearly 90 per cent. According to the Kenyan national health

accounts 2009/2010, the funding allocation to the division of NCDs is still not enough to support country-wide operations for NCDs (MOMs and MOPHS, 2011b).

Despite that, there exists adequate evidence that, at minimum level, health services and organizational have access to the minimum requirement for the prevention and control of NCDs at 50 per cent and available medicine at 27 per cent (Masters et al., 2014), and a human health resource of 1.69/1000 for all cadres in health providers (Luoma et al., 2010). There is still need for more resources which need to be mobilized and channelled to the lower levels of utilization in the community.

Management of chronic comorbid conditions, being a collective process, requires utilization of health resources as a group. To reiterate the theory of learning and empowerment of students who, when equated to the community, requires a deep understanding of the available resources, experience and active participation in the utilization of resources to bring change in health care (Freire, 1985). Lack of awareness about the available resources from the government and active participation by members of the community in a collective manner may hinder community empowerment and implementation of community projects (Perkins and Zimmerman, 1995).

Development of teaching materials: Education materials for patients and health-care providers emerged as one significant intervention for the management of chronic comorbid conditions. Specifically the findings pointed out the steps and responsibilities the central and county government should take in developing relevant health-teaching materials for both patients and health-care providers. The results emphasized the need to sensitize the health sector management teams, starting with the policy makers, as they are responsible for the policy development, empower the health-care providers with adequate knowledge and skills in the management of chronic conditions for change in health service delivery (Zimmerman, 2000). Empowerment of health-care providers has been advocated for and has proven to be active in improving health outcomes and quality of life for patients, especially in the management of diabetes and hypertension (Kengne et al., 2009).

Education not only of health-care providers is through training, over the years and has remained the cause of community empowerment and professional empowerment. Acquisition of knowledge through learning and self-directedness, as Bandura puts it, in social cognitive learning theory, it includes development of personal competencies and self-efficacy, which further influences motivation and actions (Bandura, 1989). Availability of teaching materials for patients motivates learning and increases knowledge towards mastery of the self-management skills and behaviour (Parker et al., 2012). The results from this current study

support the development of materials which are culturally sensitive, for use across the devolved counties in Kenya that empower patients for self-management.

5.5.2 Operational level action and interaction strategies

The findings from this study indicated that operationalized interventions were divided into two levels, which came into action due to the level of transition of governance and devolution of the health sector into the county government. These levels were: i) Strategic planning at the county level and ii) implementation of specific interventions.

5.5.2.1 Strategic planning at the county level government

The findings indicated that in each county government, strategic planning took place in line with the national health policy framework. At the county level policy interpretation was based on the prevailing health determinants which are usually contextualised with the community needs and preferences. The main aim of county strategic planning is for equal distribution and effectiveness in the distribution of the already constrained health resources from the national government is based on the needs of the community. The findings further indicated that the Minister of Health at the county level and the Director of Health were directly connected to the community through different key players across different levels of management. Arguments have been raised on the need to consider patients with comorbid conditions as special groups, who need attention as compared to those with single chronic conditions Policies and guidelines need to reflect the special needs of people with comorbid conditions (Jadad et al., 2010). Similarly in an African context a chronic disease and comorbid needs need to be conceptualised with the patients perspectives, health-care structures and the whole governance needs to be considered (Oni et al., 2014).

The use of a small group of leaders in the community indicates community participation in health issues and this is critically reflected in the current situation and how amelioration of the situation on chronic comorbid conditions has taken place. In this study the role of community health management teams in planning shows contextualization of health problems to suit the regions, which then fulfils the main goal of decentralization (Atun et al., 2013, Wamai, 2007). Strategic planning at the country level, require capacity-building for both health policy-makers, and middle level health managements for effective implementation of policies in health organizations (Nzinga et al., 2013).

5.5.2.2 Action and Interactions Strategies at the County Level

The results surfacing from this study indicated that at the implementation phase of the action interaction strategies, it was accomplished in two levels. These were: i) levels of health service delivery and ii) interventional activities levels.

5.5.2.2.1 Levels of health-service delivery

The findings from this study indicate that health-care services in Kenya are organized in tiers which offer overlapping health services across care-settings. Each county government is responsible for the primary health-care service provision which includes primary care at each level. As a matter of clarification PHC services as defined during the Alma Atta declaration are “*the essential health-care based on practical, scientifically sound and socially acceptable methods and technology made universally accessible to individuals and families in the community through their full participation and at a cost that the community and the country can afford to maintain at every stage of their development in the spirit of self-reliance and self-determination*”(WHO, 1978: 100). However, currently PHC is used interchangeably with primary care, which brings confusion during implementation of service delivery (Dookie and Singh, 2012). With primary care being the service provided by the health care-provider, as being the first contact the patient makes to get in touch with the health systems, while PHC is the strategy of providing the health services in a manner acceptable to the individual, families and community through their full participation (Dookie and Singh, 2012). Service-delivery at each was based on severity of the conditions and availability of services at the point of need. The levels are organized from the lowest to the highest level with in the county offering PHC services relevant to chronic conditions such as diabetes and hypertension.

In the context of this study the health-care interventions cut across the lifecycles and with the implementation of community health services in Kenya in 2006, the community and the household are directly responsible for their health. The findings of this study indicate that the community service-level was very active in areas of disease prevention and health promotion within the community which is in support of the findings from other studies in the country (Olayo et al., 2014, Buong et al., 2013). However, the community health services have been slow in chronic care provision and they are faced with high rates of attrition and lack of motivation for CHWs (Takasugi and Lee, 2012, Mireku et al., 2014). Across the sub-Saharan region, CHWs have been found to be cost- effective and this is also true for South Africa (Gaziano et al., 2014, Petersen et al., 2014), where it is recommended that CHWs and lay

people should provide services in primary health care centres to enhance management of chronic conditions including those with comorbid and multiple conditions.

The findings of this study indicate that level 2 services in the county play a very vital role in the screening of those at risk of NCDs, before linking them to level 4 for proper diagnosis and medication and continuing with follow-ups. The findings also indicated that individuals attempting to access the health services start from the community health services. This is the first contact people made with health-care professionals commencing at level 2 and 3 health facilities, commonly known as (dispensaries and health centres). Task shifting at primary-care levels between lower cadres such as nurses and clinical officers has been proven to be effective in the management of chronic conditions as single conditions from across sub-Saharan regions (Adair et al., 2013, Labhardt et al., 2013, Vedanthan et al., 2014), have established the need to use lower levels of care in chronic care. Despite the issue of the quality of care being compromised with task shifting (Mumbo et al., 2013) with close supervision and training, positive results have been attained.

5.5.2.2.2 Integrated health service delivery interventions at county level

Management of chronic comorbid conditions in Kenya was implemented through an integrated approach to care across PHC levels including the community. The integrated approach to care, based on the public health model of disease prevention, allowed patients to be categorised. This is based on the three levels of prevention, which are interdependent of each other across the continuum of care and which are determined by the time. The findings in this section mirror the integrated approach adopted for management of chronic conditions in South Africa in their *Integrated Chronic Disease Management Model*, based on the WHO ICCM framework, which includes management of chronic communicable and NCDs that interact in the exercise of management (Asmall and Mohamed, 2013). The following activities ranging from health-promotion and illness-prevention at the community level, through to tertiary prevention levels are presented in four categories. These strategies were grouped into four levels: i) community prevention strategies; ii) non pharmacological management of comorbid conditions, iii) combined therapy management and iv) chronic management of comorbid conditions.

Level 1: Community prevention strategies

The following aspects of community-health strategies emerged to be relevant at the community level for prevention and control of chronic comorbid conditions: i) health promotion and illness prevention advocacy; ii) profiling risk factors through community mapping; and iii) targeted health promotion for those at risk:

Health Promotion and illness prevention advocacy: The results indicated that the community environment presents the start of prevention and control of NCDs which affects the majority. The roles of CHWs, particularly the CHVs, were responsible for health promotion and disease-prevention activities. The community-action days were very fruitful for those who are already affected. For instance, planting of vegetables for families who were not able to plant, home visitations for families and health teaching on health diet and adherence to treatment for those who were already affected with conditions. The work of CHV was not strictly based on diabetes or hypertension. It included other acute conditions and general community disease prevention like malaria, maternal health child health and referrals to the health facilities. Community health workers require to be empowered with the right tools and skills for the prevention and control of comorbid conditions (Vedanthan et al., 2014) and funding is required for training and salaries for the CHWs (Mireku et al., 2014).

Profiling risk factors through community mapping: The results indicated that the CHWs being community members and some of them even being patients themselves with comorbid conditions diabetes and hypertension were the right people to do community mapping for risk factors for prevention and control of NCDs. CHVs present a monthly report on their households which is updated every quarter. They are also aware of high risk behaviour in the community, especially smoking, alcohol consumption and sexual activities among others.

This concurs with the actions set in the most current strategic plan for NCDs drawn up for the first time ever by the Kenya Ministry of Health (2015b), towards prevention and control of all NCDs including mental health, violence and injuries. The feasibility study conducted in Kenya has shown that home-based and community screening can be implemented across community settings (Pastakia et al., 2013). Other studies have given a green light to community mapping and profiling among slum dwellers in Kenya (Joshi et al., 2012, Oti et al., 2015) for both diabetes and hypertension as single conditions, but with results indicating high comorbidity rates.

Targeted health promotion for those at risk: Screening for those at risk was carried out in a targeted manner, with the main aim being behaviour change among those at risk or at pre-diabetes and pre-hypertensive phases. The results indicated that targeted health promotion for

prevention of diabetes and hypertension at the community level was being done through community based help projects specifically concerned with encouraging farmers to use organic manure for growing indigenous crops and to improve ways of food preparation and preservation in rural communities.

These study findings concur with reasons found why salt intake is attributed to urbanization and high-end lifestyles in rural communities. Studies have indicated that the processed food colourings and spices all have high amounts of salt and sugar, which is commonly being used both in rural and urban communities to add flavour (Kinyuru et al., 2015, Spearing et al., 2013). Similar characteristics have been reported among the urban poor population in Kenya (Ongeti et al., 2013). Through health promotion and advocacy to the community, change in the practice may be achieved.

The findings in consumption of high fruit and vegetables, has been researched and reported in various countries and has shown positive results in keeping chronic conditions away or at bay (Kunyanga et al., 2011, Tawa et al., 2011). According to Watson et al. (2010) nutritional properties in most common fruits, and cost analysis versus their clinical benefit, in their book, show that vegetable and fruits are less expensive, despite the common notion of most patients that vegetables and fruits were expensive.

Level 2: Non-Pharmacological Management of Comorbid Diabetes and Hypertension

The study findings highlighted the pillars of management for patients who have not advanced to the level of using combined therapy for their conditions. The common findings at this level, which were in practice in the county health systems and community, were: a) patient education, b) weight control, c) engaging in physical activities and exercise and use of traditional medicine. These pillars will be discussed individually in relation to comorbid conditions.

Patient education on the management of diabetes and hypertension: findings in this study indicate that patients' education was central to self-management of chronic conditions. Patients were required to be empowered with the right information to manage their medical conditions. Right information from health-care providers to patients and care-givers was significant if implemented well. Patients' education in this current study focused on three areas, namely: a) diet and lifestyles adjustment; b) home-based self-monitoring; and c) frequent foot and eye care.

Diet and lifestyles adjustment: The results from this study suggested that, based on the context, the most crucial areas for patient education was on diet adjustments. Patients, both

those in the pre-diabetes and in the pre-hypertensive stage were to adjust their diets on sugar intake and salt respectively. Education on food portions emerged to be the most challenging aspect, as most patients found it hard to adjust to eating measured meals as compared to being satisfied with served meals. In summary, education on diet was centred on the eating at the right time, right type of food and eating food at the right frequency.

The anticipation of being cured of diabetes and hypertension and of resuming normal previous diet was an indication of misconception and still lack of knowledge on the comorbid conditions. Most patients were compliant to this requirement on stopping alcohol intake, smoking and intake of all other carbonated beverages. This positive adherence was attributed to regulations by the local government and mass media publicity of the effects attached to them. This can only be explained by the health-belief model which asserts that people will change their current practices, based on the perceived severity and the expected outcome (Rosenstock, 1974). Patients will put more effort towards achieving the goal of optimal control when anticipating cure or when averting complications.

These findings are also echoed by other studies done on single conditions and the significance of patient education (Abdeesso, 2012). Despite that, effectiveness of salt intake restrictions among patients with comorbid diabetes and hypertension has not been tested in clinical trials in African black patients, but a current study in America (Provenzano et al., 2014) on dietary salt intake effects on diabetes, indicates its effectiveness in prevention of hypertension and complications related to CVDs, which upholds results found in systematic reviews (Shirani et al., 2013). This concluded that the dietary approach had an effect in controlling CVDs metabolic effects.

Home-based monitoring and interpretation of the results: The findings indicated that patients were able to monitor themselves at home and to take appropriate action. With regular patient education on signs and symptoms of diabetes and hypertension, patients were empowered to identify the danger signs and respond to them immediately. The results indicated good documentation of self-reported home-based glucose monitoring as compared to hospital-kept records. These findings mirror other studies on the effectiveness of self-monitoring and self-reported levels of control by patients. However, the study also indicated that there were discrepancies on the patients' reading and those from the facility. This could have been attributed to lack of standardization of patients' machines for home-based monitoring among other technical reasons. The findings reinforce the need for standardization of medical apparatus for management of chronic conditions, both at the health facility and individualized devices for home use.

Frequent foot and eye self-care: the findings from this study also indicated that one area of emphasis on patient education was on the need to be cognizant of their own physical changes, particularly to legs and the eyes, which are commonly affected by diabetes and hypertension, as macro or microvascular complications (Long and Dagogo-Jack, 2011) and being able to rule out ulcers which lead to gangrene and amputations. Despite of the fact of teaching by health-care providers, most patients did not practice foot care and eye inspections, until after complications had set in, which most patients attributed to the use of insulin and traditional medicine.

Although the current study did not investigate the prevalence or knowledge of foot-care among patients with comorbid diabetes and hypertension, their practices demonstrated lack of knowledge on self-care, which was also observed in self monitored eye care or seeking of medical attention for the eyes. These results are in agreement with those studies done in other countries (George et al., 2013, Gholap and Mohite, 2013, Ekore et al., 2010). A common feature of all of these studies was a high prevalence of lack of eye and foot self-examinations or by health care providers, despite regular general health education (Njambi, 2013). The results of this study, in conjunction with others aforementioned, recognise the need for patients' education on foot-care and eye examination which should be routinely undertaken for chronic care, particularly in rural communities.

Management of chronic comorbid conditions requires weight control: The current study findings highlighted the need for weight control among patients with comorbid condition. Despite the fact that weight control cuts across most patients with chronic conditions, it makes one of the goals to be achieved among diabetes and hypertensive patients. The results reveal that ,just like other studies done in Africa, most patients are comfortable with big bodies as compared to slim bodies, which have a negative connotation, especially among women (Fezeu et al., 2006, Faber and Kruger, 2005). However, the most current study in Kenya Ettarh (2013) reflects the feeling that most Kenyans may have on preferred body image, although this study may have a skewed opinion different from those in the rural areas as compared to being in a Nairobi-low-income setting. This paves the way to restructure health education materials and to make them culturally sensitive to the context and preferences of the community. Because of the diversity of cultures, results of this study cannot be generalized across regions in the continent or country.

Engaging in Physical Activities and exercises: Findings of this study indicated that management of comorbid conditions in primary health-care settings was dependent on engagement in physical activities and exercises for positive health outcomes. However, the results also highlighted barriers to physical activities among patients especially in the rural settings, which included cultural barriers, based on gender issues affecting men and women in the context of community expectations. Age also emerged as a barrier to engaging in physical activities, as the majority of patients with comorbid diabetes were women compared to men, and in the age range of 40 years and over. However, this was mainly attributed to lack of designated space for exercise as the community, just like all other African countries, lacks amenities for physical activities.

The result indicated that most patients, especially women, preferred domestic work as their option for physical activities as compared to men, who opted for farming, cycling and other manual work (only for younger men) for physical activity. Similar results have been reported in Tanzania, Cameroon and Kenya (Njelekela et al., 2009, Sobngwi et al., 2002, Ayah et al., 2013). However with infiltration of urbanization into rural areas, more studies in rural communities and culturally-tailored health education intervention, models may change the whole picture.

Use of alternative traditional medicine and natural remedies: The finding of this study on the use of traditional medicine and natural remedies for the management of comorbid conditions proved beyond doubt that concurrent use of traditional medicine and modern medicine is real. Most patients admitted that they are aware of alternative medicine and home remedies specifically for the management of comorbid diabetes and hypertension. However, the findings indicated that the use of alternative traditional medicine is determined by the existing cultural beliefs and practices, and the efficacy of the traditional medicine to manage the conditions when faced with health challenges. Culturally the use of traditional medicine has been trusted from the historical proof in the community for certain herbal medicine to relieve or cure medical conditions. For instance most patients talked of the benefits of Aloe Vera and the Neem tree products to relieve blood pressure and to control blood sugar levels. The results in this study are not different from those reported in other studies in Kenya and in the sub-Saharan regions on common use of the traditional medicine (Chege et al., 2015, Matheka et al., 2013, Mwangi et al., 2006, Mwangi and Gitonga, 2014). Culturally congruent aspects need to be factored into health-care service provision for chronic conditions. This will allow patients' disclosure of the use of traditional medicine, to health-care providers for comprehensive and holistic management of patients in primary health-care. In all the studies

continuity of care from the traditional medicine practitioner to the health facility was conspicuously missing. Despite the fact that most traditional herbalists refer patients to modern medicine for laboratory tests, the modern medicine practitioners do not discourage patients from consulting or use natural herbal medicine (Chege et al., 2015). This may be attributed to lack of culturally competent skills and strongly-held beliefs in the superiority of modern medicine against traditional medicine.

Level 3 Combination of non-pharmacological and pharmacological strategies

The findings of this study indicated that most patients attending health-care services in this community were using a combination of non-pharmacological and pharmacological strategies to manage both diabetes and hypertension. Almost all patients were on multiple drug therapy for both diabetes and hypertension. However, diabetes management was more aggressive as compared to hypertension management which was side-lined. The minimum number of medication most patients had were two, either one for diabetes (Metformin or Glibenclamide) which fall in the category of Sulphonyiureas. These were the commonly used drugs in primary health care levels.

On the other hand, Angiotensin Converting Enzyme Inhibitors (ACEI) was the most common group of drugs used for most patients. According to the clinical guidelines (MOPHS, 2010c) for both diabetes and hypertension in Kenya combination therapy was recommended, based on the level of control achieved, patient characteristics including age, socio-economic status, knowledge level among others (MOPHS, 2010c, Maina et al., 2011). Insulin therapy was also being used by most patients whose level of control with oral therapy was less effective or failed to show any change. However, most patients had misconceptions about the use of insulin. Some patients indicated that insulin was a death sentence or others opted to delay its use until when it was extremely necessary, despite the benefits of insulin among diabetics (Mutua et al., 2014).

The results of this study, clearly indicate the discrepancies noted on the use of clinical guidelines among clinicians who have conflicting approaches especially with regard to comorbid conditions (Lugtenberg et al., 2011). A study conducted in Kenya (Atieno-Jalang'o et al., 2015) shows that adherence to current clinical guidelines by clinician is an uphill task for most of them. However, standardization of care for patients with chronic comorbid diabetes and hypertension reported significantly high levels of control in informal settlement patients in support of intensive follow up in the clinic and household (Sobry et al., 2014),

compared to tertiary levels of care as seen from the results of a tertiary-based outpatient clinic (Otieno et al., 2005).

It is significant to note that an early study on the level of prevalence of hypertension in this community indicated a low prevalence of 2.7 per cent (Hendriks et al., 2012). However with urbanization and increased sedentary life, within the space of 5 years, another surveillance study will be due. Most patients' records indicated a poly-controlled blood pressure, blood glucose level, which was attributed to poor adherence to treatment or drug regimen, high level of poverty, most going off treatment, and to negative attitudes towards use of insulin. There might also have been poor control as similarly reported in, quantitative studies as compared to the qualitatively-reported observations in this study.

Level 4: Chronic Phase with Multiple Complex Strategies

The results from this qualitative study indicate that patients who were not responding to the three levels of management were categorized as being in the irreversible phase or were on conservative management. All patients at this level were referred to secondary and tertiary-level hospitals for further management and follow-up as indicated in the clinical guidelines and clinical algorithm for both conditions. As noted earlier this group of patient requires laboratory tests like the HbA1c test as the desired and standard test, which is rarely available in rural health settings and not affordable (MOH, 2010). Similar results have been reported by others (Sobry et al., 2014, Mutua et al., 2014). Patients referred should be followed up and other services given to them such as a home visit and nutritional guidance, to ensure continuity of care, CHWs and social workers are used for this service in South Africa (Gaziano et al., 2014).

5.5.3 Monitoring and Evaluation Level

The findings of this study indicate that for sustainability purposes and quality outcomes, management of chronic comorbid conditions in the health care system required monitoring and evaluation of indicators and set targets. The two main reasons for evaluation and monitoring frameworks depend on continuous surveillance of risk factors and efficacy of the existing intervention framework, which need constant upgrading to meet management targets. Surprisingly, the results indicated that essential medicine and basic diagnostic technologies for primary health-care was available even though at minimal capacities. According to recent reports, there is 80 per cent availability of generic essential drugs both in private and public

health facilities, to handle most NCDs. This is the major target and indicator for monitoring and evaluation of capacity to manage NCDs (WHO, 2013a).

The results further indicated that with devolution, the prevalence of comorbid conditions commonly seen across the county is not known. Mortality rates and morbidity of diabetes and hypertension is far too low when represented and hipped together as NCDs which do not give the true picture of the burden of comorbid or individual conditions (Pastakia et al., 2013). With the current diabetes prevalence being 4.5 per cent (International Diabetes Federation[IDF], 2012), while hypertension being at 12 per cent, other studies in the Country have reported higher levels than 50 per cent (Mathenge et al., 2010, Ongeti et al., 2013, Joshi et al., 2012) and in the local community diabetes has been reported to be 16 per cent (El-busaidy et al., 2014). Thus there is a need to have a national or county-based national survey which will be conclusive on the burden of NCDs, to include risk factors, which have not been ascertained, but found common in several studies (Joshi et al., 2014a, Ongeti et al., 2013).

5.6.4 The Process of Management of Chronic Comorbid Conditions

The results of this study indicated that in the management of chronic comorbid conditions, there were routine practices which formed the culture of health-care delivery at the facility and within the home environment. Any alteration to the process of management or of the environment resulted in destabilization of the quality and outcome of health-care services. The culture of health-care organization may be the same across the health system, but each facility was unique on its own way, and patients too had their own way of doing things at home, which still led to the agreed intended outcome of improved health outcome. The process brought order in the way each section was connected to each other with specific roles.

Registration or triage room: This formed an important starting point for identification of individual patients. However, the registration was manual and lacked centrality as the information captured did not get entered into the county information system. This was attributed to patient's information being written on their notebooks and not into the facility information system, which has been non-functional as has been documented (Anyona and de Courten, 2014).

Measurement of blood pressure and weight: The results indicated that routinely almost all health facilities performed the basics of measuring blood pressure for those who had functional blood pressure machines and weighing scales. However, most patients who were known to be diabetics missed their blood pressure readings. However, blood pressure, though

it may seem insignificant, is the leading cause of macro and microvascular complications among diabetics and a major cause of strokes (Thorogood et al., 2007, Dalal et al., 2011). What is noteworthy is that most patients in the County with comorbid diabetes and hypertension, despite having the condition for more than 9 years, had not done other tests required for diabetes and hypertension such as urine analysis, creatinine and HbA1c tests. This was mainly due to non-availability of the same in the county hospital, level 2 and 3 facilities. Further there is need for comparative studies on the effects of missed laboratory tests at recommended times and health outcomes.

Consultation with the clinician/support group: Findings of this study indicate that consultation rooms in public health facilities were a multipurpose room serving more than one purpose for patients. It formed the basis for management, as patients and clinicians in consultation with each other set goals, evaluated set goals achievements and identified challenges. Clinicians performed physical examination with the available equipment, while others were responsible for taking blood-pressure in the consultation rooms. However, most clinicians and even nurses' consultation time accorded to each patient was extremely brief. This hindered comprehensive examination of the patients, especially eyes, foot and nerve assessment. Similar observations have been made on lack of time as a barrier in management of comorbid conditions and conducting cross-references from clinical guidelines (Valderas et al., 2009, Lugtenberg et al., 2011). A study by Nam and others (2011), found that lack of time is a health provider's constraint to effective management of diabetic patients. Use of support groups or group consultation has been found to be effective in management of patients with chronic conditions. These findings are congruent with studies on group-patient teaching and consultation (Viana et al., 2013, Sobry et al., 2014, Mash, 2012) and give incentive for each accomplished task among patients through the use of group educators in the community (Oliveira et al., 2013, Mash et al., 2015).

Medicine collection from pharmacy: the results of this study highlighted the crucial role of pharmacy in the management of comorbid conditions in PHC. Pharmacists were at the centre of adherence based on the instructions the patients received from them. Instructions on the frequency, duration and other instructions on the medicine was dependant on the pharmacist's knowledge and skills and their responsiveness towards the patient's care. Studies from both developed and developing countries have shown that instructions during this step in the process of management of chronic conditions determined patients adherence and outcome (Nam et al., 2011, Krueger et al., 2005, Roumie et al., 2011, Gross et al., 2013, Wong et al., 2011). Polypharmacy has been found to have negative effects on adherence to

medication and adherence to instructions from pharmacists among diabetes patients (Grant et al., 2003, Nam et al., 2011).

Referral to the next level of care: The findings indicated that chronic conditions require continuity of care from one level to another and, where necessary, to include back-referral for those who would benefit from the lower levels of care for follow-up. However, the process of referral was loosely co-ordinated, as for the most part patients were to implement the referral process with little assistance from health facilities. This was mainly due to lack of referral infrastructures, skills and lack of a centralized information system to allow sharing of patient health information to allow continuity across care- settings. Delays in referral implementation was mostly due to poverty levels in most patients who live below the poverty lines, which further slows the health system response to NCDs (Atun et al., 2013). Moreover, research has shown that there is close association between improved continuity of care and improved clinical outcome among patients (Weis, 2007).

5.5.5 The Roles of the Health-Care Providers in the Management of Chronic Comorbid Conditions

The findings of this study indicated that despite the many roles played by health care providers, the process of service-delivery depends on two important roles in the management of chronic comorbid conditions namely: a) patient educator and b) facilitation of the consultation process.

Patient educator: the results in this study indicated that most health- care providers were the role models patients had towards self-management. The Health-provider's level of knowledge on comorbid conditions determined the information they would pass on to their patients and their care-givers. Uniquely the patient educators had to be especially culture-sensitive and aware of the culture of the community in order to fulfil the role of patient educator (Parker et al., 2012, Kengne et al., 2009, Kotwani et al., 2014). They concluded that the role of CHWs in delivering health education both at home and at facility level has proven to be cost-effective (Gaziano et al., 2014, Dourado et al., 2011). Kenya like most developing countries requires more effort to equip health-care providers and lay educators with adequate skills and knowledge for the management of chronic comorbid conditions.

Facilitation of consultation process: The findings highlighted the facilitation of the consultation between the patient and health-care providers. The process required the healthcare provider to be an active listener to the patient's problems and to facilitate the

process of encouraging active participation in self-management. The facilitator's role of health-care providers in chronic comorbid condition management has been least investigated, especially in developed countries. In sub-Saharan Africa, the facilitation of roles other than nurses has been investigated. A few studies, reported improvement in health outcomes of single chronic conditions (Kengne et al., 2009, Labhardt et al., 2010, Vedanthan et al., 2014).

5.5.6 The Role of the Patients in the Management of Chronic Comorbid Condition Process

The findings of this study suggested two important roles for the patients' in the process of managing chronic comorbid conditions. These roles were: a) active participation in self-management and b) adherence to treatment plans.

Active participation in self-management: The results indicate that the central role of patients' is active participation in self-care, which encompasses all other responsibilities. Active participation of patients in self-management of patients gave them an upper hand to learn what worked for them. This enhanced the consultation process with the health providers and generally improved health outcomes and clinical outcomes. Patients became their own experts when and how to manage their own conditions. The result also indicated the benefits of patients' participation in the patient-support group on how to conduct self-management activities at home. Support from either peers or family members has been found to be a motivator to self-management and improved health outcome for patients with comorbid condition as confirmed in other studies (Schillinger, 2011). It is commonly accepted that, once patients develop skill and experience about situations, they are motivated to perform the behaviour towards an expected outcome (Perkins and Zimmerman, 1995).

Active participation is enhanced with self-efficacy in fulfilling self-management activities. Exercise, diet adjustment and adherence to medication has shown to increase the level of control on blood pressure and blood glucose levels (Al-Khawaldeh et al., 2012). Moreover, the level of health literacy is directly responsible for active participation and level of control achieved (Fransen et al., 2012). The level of knowledge in the general population and patients on chronic conditions, is low especially in Kenya and other sub-Saharan countries scoring below the 3rd percentile, and this is reported also in Malawi (Maina et al., 2011, Msyamboza et al., 2014).

Adherence to treatment plan and follow-up: The results from this study indicate that adherence to treatment plans and follow-up schedule was a significant role for the patient in the management of chronic comorbid conditions. The findings highlighted the significance of

adherence to scheduled review has been found to be effective in the management of hypertension as the titrations of medication depends on the regular schedules of the patients' review, by the clinicians. Studies have shown that most patients' adherence in follow-up care is determined by severity and effectiveness of the treatment to the conditions as it was reported in a study from Vietnam with a dropout rate of 14.6 per cent and regular follow-up of 65.6 per cent (Nguyen et al., 2011). More effort needs to be made to intensively trace and reduce dropout rates among patients with comorbid diabetes and hypertension in rural settings, where the dropout rate could be more due to socio-economic and knowledge levels (Sobry et al., 2014, Pastakia et al., 2013).

5.6 Intervening Conditions

The findings of this study revealed management of chronic conditions in PHC systems was influenced by either some facilitative or some hindrance intervening conditions.

5.6.1 Facilitative Intervening Conditions

The findings highlighted the following facilitative intervening conditions in the management of chronic comorbid conditions. The facilitative intervening conditions were: a) family involvement, b) government commitment to fund resources c) accessibility of services, d) Community participation and involvement, and d) preparedness for self-management.

Family Involvement in care: It emerged from the findings of this study that family involvement in the care was influential in the whole process of managing diabetes and hypertension. Without family, as is a norm in the African context, patients with chronic condition felt deprived of the chance to live and continue with treatment. It became evident that for those who are already diagnosed with comorbid conditions, instant change of lifestyles and use of multiple-drug therapy was very drastic and demanding for most of the people, especially in their old age. Evidence exists on the family involvement in chronic care in the African context (Olmen et al., 2012b, BeLue et al., 2009). According to BeLue and others (2009), family roles stretch back to prevention of risk behaviour leading to onset of chronic conditions and further family support for members with comorbid conditions in accepting new lifestyles adjustments, specifically diet.

Other studies have found that financial support as well as relations in the family affect adherence to management. This is reflected in negative health outcomes (Rosland et al., 2010, Miller and DiMatteo, 2013, Rosland and Piette, 2010). In the current study, despite the

willingness of the family to provide for family members, poverty-stricken families could not support all the financial needs of comorbid conditions, the majority living below the poverty level. This pushed them to seek cheaper and more accessible means of supporting the patients to cope and live with the conditions. Alternative medicine/or herbal medicine is also indicated in other studies (de-Graft Aikins, 2005, Kolling et al., 2010, Goldberg and Rickler, 2011).

Government commitment to provide health resources: One unanticipated finding in this study was the government commitment to providing health resources to the marginalized and those in rural settings, specifically for the prevention and control of NCDs which are on the increase in the county. The result indicated that the government budget allocation for the Ministry of Health in Kenya improved to from 6.5 per cent in the 2013/2014 financial year to 7.5 per cent in the 2014/2015 financial year, despite being still below the 15 per cent of the Abuja declarations (Ministry of Health, 2015a). With diligent use the current budget at minimum level can accommodate prevention of NCDs in primary health care. To reiterate the report from the Ministry of Health on essential medicine for diabetes and hypertension in public and NGO-sponsored health facilities, prices were subsidized and availability has improved (Ministry of Health and Government of Kenya, 2014, Vedanthan et al., 2014). For instance, insulin is available and sold at Kshs 200-500 down from Kshs2,500 in private facilities (Ministry of Health and Government of Kenya, 2014). With decentralization to lower levels, community participation in decision-making and the national government commitment on health issues exerts a positive influence on the management of the comorbid condition and positive results may be realized sooner than before.

The results also pointed out the government's acknowledgement of the acute shortage of human resources in health management and there is now a commitment to hire more to be at the recommended level by the WHO's health-resource ration to patients or population served. The situation regarding shortage of human resources is not unique to Kenya, but it is of global concern (Global Health Workforce Alliance and WHO, 2013, Wakaba et al., 2014). This has prompted the consideration of task shifting to lower levels to substitute for specialist shortage in Africa, which is the hardest-hit continent (Lekuobou et al., 2010, Joshi et al., 2014b). Redistribution of health-care workers according to health needs and specialization, also emerged as a solution to the limited number of health-care providers, especially in developing countries like Kenya and India (Wakaba et al., 2014, Hazarika, 2013).

Accessibility of health services: The findings of this study highlighted that the success of management of chronic comorbid conditions was dependent on the accessibility of health services, accessed in terms of availability of clinical officers and nurses in the absence of doctors and nutritionists to do dietary counselling for patients and the availability of laboratory services and screenings equipment. Availability in this study was seen through the current Health Policy Framework advocacy on the decentralization of screening and health promotion services to lower levels of care, in ensuring continuity of care closer to the people who need the service most. It emerged that health facilities from level 2 were located within a distance of 7.3KM, almost to the recommended 5KM distance to improve accessibility (Anonymous 2014). The study mirrors findings from other countries on how accessibility hinders comprehensive management of chronic conditions (Kiflie et al., 2011, Sambala et al., 2010).

Community participation and involvement: The current study results' revealed that management of chronic comorbid conditions required active community participation and involvement in day-to-day health-care issues and decision-making. In this study, although not a generalized observation, community participation was evident in creating awareness on chronic conditions by those who had knowledge on prevention of risk factors. On the other hand, the community involvement was seen when the community took part in decision-making about their health problems which were affecting them directly through their representative and opinion leaders to the county government. The study findings echo the Alma Atta declarations intention of PHC and community participation and involvement, which remain relevant to chronic comorbid conditions management.

According to WHO (1978), community participation as one of the principles of PHC, was defined as the process whereby an individual or family take responsibility of their own health and welfare and that of their community to ensure they develop capacity to contribute to their own community development. However, with time, community participation and involvement has been conceptualized to reflect community empowerment to attain self-reliance and sufficiency in community development (WHO, 1985). It became evident in this study, that even the poor and marginalized groups, can be empowered with relevant information on chronic conditions, as long as they have access to the available resources to change their lives in the community under the guidance of the CHWs. Household participation and involvement in prevention and control of NCDs has been found to be effective elsewhere, despite the low uptake from community members (Mireku et al., 2014).

Preparedness for self-management: It surfaced from this study that patient self-preparedness in performing self-management at home, was influential to the whole process of managing chronic comorbid conditions. Patients who had good understanding of the dynamics of chronic comorbid conditions, had well-controlled blood glucose and blood pressure levels, as they showed willingness and ability to self-manage both conditions at home. It also emerged that self-management skills are learnt practices, commencing from diagnosis and follow-up of patient through teaching and interactions with other patients and health care providers. Preparedness has been closely related to self-efficacy and having the confidence to perform the behaviour and practices. In a study Al-Khawaldeh and others (2012) found that self-efficacy in diabetes patients enhances self-management behaviour and practices. Low self-confidence was also attributed to low self-management behaviour and skills. The results also highlighted those patients who accepted their diagnoses and forged forward to set goals of management to be achieved, adhered to treatment plans and mastered their plans with enhanced motivation, to alleviate suffering and to delay onset of complications and to improve the quality of life. These concepts of self-preparedness and confidence in self-drug administration, increases adherence to, in particular, insulin use among patients as compared to those with fear, and misconceptions about the same.

5.6.2 Hindering Intervening Conditions

The following factors emerged to act as hindrance in the management of chronic comorbid conditions. These was: a) limited knowledge on comorbid conditions, and there were b) community belief systems, c) centralization of services within a decentralized system, d) high poverty levels, e) shortage of drugs in health facilities, f) poor provider-patient perceived factors, and g) lack of a health system responsive to management of chronic comorbid conditions.

Limited knowledge on chronic comorbid conditions: The study findings highlighted that limited knowledge on the comorbidity of diabetes and hypertension greatly influenced the management of the conditions, across level settings. It was observed that those patients, who had little information on diabetes and hypertension, could not rely on the information from the health-care providers, who in most cases also have limited knowledge and access to teaching materials and references (Kiflie et al., 2011).

Research has shown that self-determination on the part of the patient to learn more about the condition, improves the care outcome (King et al., 2010). Moreover, having adequate

knowledge does not guarantee good level of control, due to other involved factors such as self-efficacy, environmental and social factors which remain constant (Nam et al., 2011). On the contrary, other studies have indicated that the lower the level of knowledge about comorbid conditions and causes, or even signs and symptoms, the lower the chances of taking strategies of self-management to control the conditions and make the right decisions on management (McCleary-Jones, 2011).

The findings of this study are in support of the findings of (Kadu and Stolee, 2015). These were studies on barriers and facilitators of Chronic Care Model in PHC settings as knowledge of the health-care providers on the model and the conditions which later reflected a negative attitude towards chronic care. Limited knowledge of health care providers leads to delays in diagnosis of the patient and assessment of the patient individualized care needs. Consequently, knowledge levels of the general population, patients and health care-provider leads, to poor quality and poor health outcomes and delays in seeking health care (Maina et al., 2011, McFerran, 2008).

Community Belief Systems: In this study under the belief system in the community, three domains emerged under the property of belief system as barriers to management of chronic comorbid conditions. These were: a) spiritual beliefs, b) traditional beliefs and cultural practices. These will be discussed separately, even though they refer to the same aspects in the community.

Spiritual beliefs: The findings of this study indicated that diagnosis with two conditions was a burden to the individual and created a void and urge to be closer to a supernatural being or God than before. The informant in the study had strong convictions that God would change the destiny and reverse the conditions and provide a cure for diabetes and hypertension. Whereas Africans are known to be spiritual in most cases, they are also known to have extreme spiritual beliefs, which contradict modern medicine and principles of chronic care. With the multiple interventions aimed at managing comorbid conditions, patients whose spiritual beliefs were rigid, proved to be hard to maintain on management and even follow-up. Only with the onset of complications like diabetes Keto-acidosis coma or stroke, were they seen to accept any form of management. These findings corroborate the earlier findings of Ghana on 'healer-shopping' and spiritualism (Kretchy et al., 2013, de-Graft Aikins, 2005). There is a dire need to further explore the influence of spiritualism and its effects on chronic comorbid conditions in the rural settings and urban areas, as they present diverse cultural

pictures, and there is a need for comprehensive understanding and management of chronic comorbid conditions.

Traditional beliefs and cultural practices: The study findings categorically highlighted the traditional beliefs of the majority of the people in Nandi County. Despite the fact that other ethnical groups also live in the county, they tend to assimilate and get acculturated to the community's traditional beliefs. Like many African countries, traditional beliefs come in many variations, but this study concentrated only on the use of traditional herbal medicine, as a cure or remedy for diabetes and hypertension or health strengthening option. It became evident in this current study that patients and the general public were utilizing traditional herbal medicine concurrently with the modern medicine for the management of comorbid diabetes and hypertension, although as a stand-alone condition. In Kenya other studies on diabetes have shown in the main that most patients use traditional medicine concurrently with insulin, oral therapy for both conditions, despite being advised against it by health-care workers (Chege et al., 2015, Kigen et al., 2013).

According to WHO (2005), globally, it is approximated that 80 per cent of the global population that use traditional medicines in one way or the other to meet their health needs. In Kenya just like other countries in the sub-Saharan region, the use of the traditional medicine is between 70-80 per cent, based on the cultural and social values attached to the use (Kigen et al., 2013, Rutebemberwa et al., 2013, Amel, 2013). However, the use of herbal medicine is not only based on indigenous knowledge. Evidence exists on the viability of herbal products to control high blood pressure and blood glucose. It is used in different formant as raw/whole plant or concoctions (Amel, 2013, Chege et al., 2015).

Noteworthy is the contextualization of herbal medicine use between geographical region, urban and rural, between the rich and the poor, based on the severity of the conditions (Jeruto et al., 2008, Amel, 2013). However, the findings of these studies were more focused on the use of traditional medicine, culture and tradition inseparable from gender roles. This may have been attributed to having many female patients with comorbid diabetes and hypertension than men, and the natural nurturing character of women in the African context. The study also highlighted the continued use of herbal medicine, despite the disapproval from health-care providers by patients. It is no secret that herbal medicine has been proven to be potent in relieving side effects, signs and symptoms for ages in developed and developing countries (Chege et al., 2015). Herbal medicines are easily available and cheap compared to modern medicine such as insulin. For those self-established herbalists, branded herbs and

medicine, have proved to be expensive for someone living below one dollar away, but they are affordable and easily accessible in rural communities as reported in South Africa (Lotika et al., 2013).

Centralization of supply within a decentralized health system: The findings of this study highlighted one hindrance in the management of chronic comorbid conditions in primary health-care settings, in the current devolved health system and that is the centralization of services and divisions between the national and county government. Despite the fact that the county government is running independently, much of their actions and strategic plans are controlled by the national government. Particularly the procurement and supply of medicine is still centralized under the national government-controlled KEMSA, which is the monopoly in public health sector for procurement, supply and distribution of essential drugs in the form of kits. There are delays, and this affects the availability of drugs for patients whose life and outcome depends on them (Kanda and Iravo, 2015). This was attributed to lack of proper training and communication between the county government and the national government and release of money for procurement from the national government. The county government is still depending on national government to run the devolved health services, and it is incurring both direct and indirect costs of running health service delivery. The decentralization process is still influenced by donor issues, political influences amidst corruption and lack of prioritization of health matters over political ambitions.

The picture on the ground was straining the health-care system, seen after the start of free health services, leading to increase in the days with no drugs or poorly-offered services. Evidence from other countries indicates that the success of devolved health systems depends on the level of control the national government retains and how much freedom and planning towards free-health is assigned to the devolved government. For instance, the devolved health systems in Ghana and Ethiopia (Couttolenc, 2012, El-Saharty et al., 2009), has led to improved health accessibility and health outcomes for the rural communities.

High poverty levels: The results emanating from this study clearly indicated the effects of chronic conditions on the household and individual patients. Most patients with comorbid diabetes and hypertension reported high cost implications to their families and individually. In Kenya and even in the context of this study, approximately 50 per cent of the population is living below the poverty line and 66 per cent of the Kenyan population is living in rural areas (Ministry of Health and Government of Kenya, 2014). This made it impossible for the majority of patients in rural communities to afford drugs, even at subsidized prices in public health facilities. These study findings are a true reflection of the findings of the Household

Health Utilization report for 2014, which indicated that the poor utilize more public health services, as compared to the rich and those in urban setting (Ministry of Health and Government of Kenya, 2014). With only 17.1 per cent of the Kenyan population having some form of medical insurance, it clearly shows that poverty levels are still high and worse in the community where only 1.3 per cent has community-based insurance. Similar concerns have been raised elsewhere in Sub-Saharan Africa (Hendriks et al., 2015, Gustafsson-Wright et al., 2010).

Shockingly, the informants indicated that despite the fact that the lower levels were free, most of the time, the available medicines were irrelevant to comorbid conditions, thus limiting the utilization of the lower levels of care for primary health care. It is expensive to access the same in hospital settings. Thus most patients, driven by poverty go off medicine for as long as they cannot afford the drugs, or they resort to alternatives as indicated in other studies in Kenya and Tanzania (Mwangi and Gitonga, 2014, Stanifer et al., 2015). These studies have clearly shown the influence cultural beliefs have on the management of chronic conditions and health seeking practices, especially among rural communities. The current study corroborates the findings of the most current conceptual model on multi-morbidity in developing countries based on ICCC, on the need to incorporate the cultural beliefs, biological perspectives of both health providers, patients and the health organizations in management (Oni et al., 2014).

Poor Provider Patient Perceived Factors: Poor provider-patient perceived factors emerged in this study as one of the intervening conditions to management of chronic comorbid conditions. These included the following: a) patients unmet expectations on provider's care; b) differentiated discriminatory care) poor interpersonal communication skills, and d) lack of responsiveness to management of comorbid conditions.

Patients' unmet expectations on providers care: The result indicated that living with chronic comorbid conditions can be challenging and complex for both the provider and patients and their families. Patients have specific expectations of their care-providers which need to be met to ameliorate their comorbid conditions. These perceived expectations are broadly tagged on the right to health-care services attitude and respect from the health-care providers. While others felt they needed the professional touch on their health issues, such as eye check-ups. Voluntarily service from health-care providers is not ideal and, the majority of patients felt

neglected by the provider, who was interested in clearing the long lines of waiting patients rather than listening to patients' needs or concerns.

The results of this study can be summed up with what has been described for effective management of comorbid conditions. This is importantly the therapeutic relationship between the patient and the provider, and patient-centred care approach (Hudon et al., 2011). Failure of the relationship forces most patients to keep changing care-providers or suffering in silence from both ends. Poor service delivery and poor interactions between providers have been reported in Tanzania and the USA (Piette et al., 2006, Kahabuka et al., 2012). Patients felt they were not being considered special and the lack of privacy in consultation rooms; especially during group consultation was disturbing.

Poor interpersonal communications between providers working as a team also surfaced as a communications factors which extended to affect patients and to reduce group cohesion. Communication requires active listening and being attentive to the needs of the other person is central to chronic care. According to the theory of goal-attainment, patients and health-care providers need to communicate well and have good working relations; this forms a major ingredient in goal-planning and goal-attainment (King 1989). In most cases, it was observed that patients' goals were not being met, due to poor communication and poor working relations between health-care providers. Studies have also indicated that the negative attitudes of health-care providers determine the patients' perception of the seriousness of the conditions and further determines clinicians' adherence to clinical guidelines (Nam et al., 2011, Atieno-Jalang'o et al., 2015).

Devolvement of responsibility with no training: Another outstanding barrier to management of chronic comorbid conditions in primary-care settings which emerged from this study is devolvement of responsibility with no training by health-care workers in primary-care levels. Most health-care providers working in rural settings, despite performing their duties for patients with chronic comorbid conditions, had no prior training on the management of diabetes or hypertension. As matter of fact only physicians are supposed to manage diabetes and hypertension patients and at level 4 health facilities (MOH and MOPHS, 2009). In the absence of doctors, which is more pronounced in rural settings, other health providers perform those duties. It also surfaced that those few trained for diabetes management have been displaced to serve in areas with shortages leaving patients to untrained personnel. This

has been attributed to shortages and poor managerial skills in health-care settings (Wakaba et al., 2014, Nzinga et al., 2013).

Further lack of knowledge and skills to manage chronic comorbid conditions has been found to be both affecting service-delivery and quality of care to patients, compounding further the problem of sub-optimal management of most patients with comorbid conditions, especially in rural settings (Vedanthan et al., 2014). Significant to note is that this lack of training did not reflect pre-qualification training, but rather refresher courses for the management of chronic conditions, based on evidence of clinical guidelines and contexts. Management of chronic conditions required constant upgrading of knowledge and skills to provide comprehensive care including patient teaching and counselling as comorbidity takes a toll on the emotional stability of patients and families.

Inability to cope with the management of comorbid conditions in most facilities was evident in the inability of the nurses to cope due to the multiple tasks and roles they handle in most health facilities, ranging from offering acute services, recording and even dispensing medicine on top of antenatal care, family planning and 'well-child clinics' services. Despite the glaring evidence of the task-shifting in chronic care and the positive results from nurse-led management of chronic conditions (Vedanthan et al., 2014, Labhardt et al., 2010, Ogedegbe et al., 2014), there are reservations on the quality of care to be offered to patients by low level cadres in community settings. The only solution is to ensure all health-care providers are empowered with adequate knowledge and skills towards chronic care. Nevertheless, nurses' roles in community health-care remain indispensable globally.

Poorly functional referral systems in primary health care: The findings of this study indicated that the referral system in the county's health system was not functioning as it should, especially for patients with chronic comorbid conditions. Continuity of care from one level was greatly hampered as there was no official referral of patients to the next level and back to the lower level for follow-up. It is important to note that the primary goal of management of patients with comorbid condition is to improve the quality of life and health outcomes, through quality, continuous care across care settings (Miranda et al., 2008).

Informants indicated that, after referring a patient to the next level that often marked the end of the referral process, until the patient seeks medical care for the same reason or develops new conditions. This is contrary to the clinical guidelines or chronic conditions in Kenya (MOH, 2009) and the recommendations from chronic-care experts. Poor documents of the

initial assessment and sending patients to the next level lead to non functional referral. Patients expressed it as mismanagement leading to being lost to follow-up as in the case of TB patients (Kizito et al., 2011). Having specialized referral, for patients with diabetes and hypertension, avoids delays in accessing care in the next level, or it can enable visitations from specialists, who are scarce, to the lower facilities for group patient reviews which are closer to them. What works for diabetic clinics in secondary and tertiary facilities can be decentralized to primary health settings with proper co-ordination between team members.

Lack of centralized patient data base: Another outstanding hindrance to management of chronic comorbid conditions is lack of a centralized patients' database for patients with chronic conditions, accessing health-care in the county facilities. Currently, the data captured in monthly records, does not reflect the burden of the chronic conditions in the country. Community-mapping and registration of those at risk of pre-diabetes and hypertension surfaced from the study as one way of ensuring that there is continuity of care across care setting, including those accessing health-care from private sector facilities and faith-based facilities including traditional health practitioners. However, so far in Kenya, only the cancer registry is being developed, although it is only situated in national hospitals (Ministry of Health, 2015b), which might not represent the devolved governments at the county and community levels.

In the Kenyan context public health sectors use of information technology systems has remained an untapped area, especially with chronic care, with no prior access to patient information systems among health-care providers. Studies corroborate the findings of this study in support of the need to have patients' records centralized and databases established for future planning as recommended in most modern policy analysis (Anyona and de Courten, 2014). If this were to be put in place and well maintained it might end up improving work relations and motivations of health-care providers across care settings both in rural and urban areas, lower levels and national level hospitals. This might improve the quality of service delivery.

5.7 Consequences or Outcomes

The findings of this study indicated that management of chronic comorbid conditions has consequences that can either be intended or unintended. Consequences can be real while others were presumed to be potential outcomes of the interventions for management of comorbid conditions. In this study the outcomes were categorized in terms of a) individual

patients or household level, b) community level, c) health organization level and d) health system levels.

5.7.1 Individual /Household Levels

The study findings suggested that patients were the most trusted measure of outcome for health interventions towards management of chronic comorbid conditions. Health outcomes of the individual had direct influence on the family level of support and involvement in care-giving services.

The individual outcomes observed in this study included: i) achievement of optimal control of the conditions; ii) delayed onset of complications; iii) improved accessibility to essential medicine and iv) improved self-image and emotional stability.

Achievement of optimal control of the conditions: the findings indicated that most patients who had comorbid diabetes and hypertension, with intensive monitoring and management, achieved the optimal levels for blood glucose and blood pressure. These, in turn, improved the level of functionality and general quality of life. This finding is corroborated by findings from several clinical trials which have confirmed the health outcome (United Kingdom Prospective Diabetes Study Group (UKPDS), 1998, Hansson et al., 1998). This proved beyond a doubt the possibility of control. However, these studies have also been criticized for having high levels of blood glucose and systolic blood pressure levels which are not realistic and they are not context specific especially among African blacks (Sardar and Eilbert, 2015). In Kenya, it has been shown that close monitoring of patients with comorbid conditions in primary level improved levels of control achieved (Sobry et al., 2014). It was noted that the level of control is not only dependant on medication adherence, but uptake of diet and physical exercise have their contribution to make in the outcome.

Delayed onset of complication: in this study one of the expected outcomes among patients with comorbid diabetes and hypertension is to delay onset of complications through the process of management. The findings indicated that adherence to treatment plans led to delayed onset of complications. Further practice of self-management skills and behaviour, either as a group or individual with the support of their health-care providers reported fewer complications and improved the quality of life. This observation is in agreement with the findings from international studies (Long and Dagogo-Jack, 2011, Bacanu and Botez, 2011). These studies attest that intensive management of comorbid diabetes and hypertension, delays the onset of nephrotoxicity and amputations, among other complications.

Improved accessibility of essential medicines: The result from this study indicated that, with decentralized management of chronic comorbid diabetes and hypertension into primary health facilities, accessibility of essential drugs has improved in Kenya, including those for diabetes and hypertension control. Despite the fact that most low-income countries have limited access to essential drugs, evidence shows that scarce resource, when used and equally distributed, can achieve impressive outcomes for patients and health systems (Maher et al., 2010, Parekh et al., 2011). Advocacy by alliances for NCDs and recent government commitment to control of NCDs, insulin supply to most patients, has been maintained, despite the previous high 'stock-out' rates reported in the country and lack of surveillance surveys for NCDs, as highlighted by (Anyona and de Courten, 2014).

According to the *IMS Institute for Health Informatics (2015)* report, effective use of medicines alone can reduce 80 per cent of the burden of all NCDs, if used appropriately. However, despite the availability of the essential medical list in Kenya and availability of drugs for NCDs (MOMS and MOMPS, 2010), its implementation in the country and county level, health facilities is still partial. This was attributed to the high pricing of drugs, poor health infrastructure which is compounded by poor staffing and supply-demand in lower levels as described by Mendis et al. (2012). They posit that perpetual inaccessibility and the lack of affordability increases the cost of managing comorbid conditions, as individuals and countries suffer the burden of finding it difficult to fund medicine and other health-care supplies. This situation generally presents as a hindrance to chronic care.

Improved self-image and emotional stability: The findings suggested that with management of comorbid conditions and achieved sustained level of control, patients' self-efficacy improved and their emotional stability was boosted. Studies have proved that alleviation of stress among patients with chronic conditions is one intervention of control. According to psychologists, patients with chronic conditions have a seven-fold tendency to develop depression and other mental health illness, anxiety among others (Yohannes et al., 2010), which lead to self-neglect and poor health behaviour such as increased alcohol consumption and smoking. Similarly systematic review indicated that collaborative care from a multidisciplinary team solves the depression and emotional stability among patients with comorbid conditions. This previous study enhances the finding in this current study, patients who were closely monitored and in a support group, had positive self-image and were stable

emotionally, as compared to patients not in active participation of a support group as members.

Improved quality of life: The results indicated that management of comorbid conditions in primary health care settings including prevention and regular control outcome was to improve the quality of life of patients. Despite the fact that comorbidity is associated with poor quality of life, studies have also shown that with intense management and follow-up of patients with comorbid conditions a level of control can be achieved that can contribute to an improved quality of life,(Chin et al., 2014). Patient satisfaction with care and being economically stable has been related to improved quality of life and even adherence to management as was seen in a study from Palestine among diabetes patients (Al-Jabi et al., 2015). The results are congruence with the findings of this study in that comorbidity and poor levels of control are most of the time attributes of lack of knowledge, poor service delivery and a poor relationship with the health-care provider.

The assurance of accessing medicine and consultation from the nearest clinic or facility even from private facilities enhanced adherence. Informant's quality of life improved through social interactions and relationships, despite the early notion that diabetes and hypertension are commonly for older people, it is now common among people below the age of 60 years in the case of the Kenyan context, Bloomfield et al. (2013), who are still socially active and relate to friends and family. Patients who were empowered with knowledge and skills, were motivated to continue with normal life and their social interactions and relations improved as has been demonstrated in a study from Brazil (Carvalho et al., 2013). These findings tend to agree with the elements of social learning theory by Bandura, that self-efficacy and determinations are the motivating factors which lead to desired outcomes (Bandura, 2001) Patients need to be motivated, to take actions towards self-management and normal activities of life, despite being sick.

In this study most patients' quality of life was observed through their involvement in income-generating activities, such as self-help projects to boost their income and boost their out of pocket expenditure for medicine and diet. This was because most of the patients were still middle aged and, regarded as active and productive. These findings corroborate the findings of studies which have indicated that lack of income is a measure for poor quality of life among Nigerians with hypertension. Ogunlana et al. (2009) found that income of the household and individuals determines adherence to treatment plans and access to essential medicine. However, quality of life with comorbidity might need further studies as quality of

life is defined differently and interpreted differently across ethnic groups in Africa and gender differences and norms also have an effect on quality of life.

The following unintended outcomes surfaced from the findings of this study. They included: a) increased cost of care for comorbid conditions and b) poor adherence and c) integration stigma in primary health care.

Increase cost of care for comorbid conditions: the findings of this study are in agreement with the common notion of increased high cost of health care due to chronic conditions and this is double with comorbidity (Valderas et al., 2009, Boyd and Fortin, 2010). In developing countries like Nepal (Saito et al., 2014), approximately 27.5 per cent of the population are faced with catastrophic health expenditure and in Kenya 46 per cent of the health budget is financed from out of patient's pockets (Ministry of Health and Government of Kenya, 2014). In this study the result indicated that patients with comorbid diabetes and hypertension had to incur double costs for medications and diet, which were among the prescribed treatment regimen. Further they incur transport costs to the health facilities, for regular review, or laboratory tests which again are to be paid for from the out of the patients' pockets with no insurance reprieve especially in rural settings and among the poor. These results have been represented by other studies within resource-limited settings in Tanzania (Metta et al., 2015).

Integration stigma in primary health care: one of the unexpected results in this study was stigma attributed to integration of chronic disease management with the existing HIV/AIDS clinics. Patients who were not infected with HIV and AIDS felt stigmatized to line up and be reviewed by the same clinician. This was because of fear and negative connotations still aligned with HIV and AIDS in the community. HIV and even hypertension or diabetes is still regarded as private conditions in the community. With the stigma taking a central toll on most patients others dropped off care, or opted for other health facilities. Despite that integration of HIV and chronic disease management seems to be the perfect intervention in resource-limited settings (Mwangemi and Lamptey, 2010, Fortin et al., 2013, Olmen et al., 2012b). These authors, who are in support of integration of HIV and NCDs management, however, warn that patients' perceptions about it must be understood, to avoid a white elephant health programme, especially for those patients with comorbid conditions, whose health outcome is dependent on continuity of care. These findings are in agreement with the conclusion from a study on integration of HIV/NCDs in developing countries. There is the need for more empirical evidence and operationalized policy and research (Haregu et al., 2014). However, despite the bright evidence of integration of health services to boost chronic

care in primary health care, integration remains an area for further research in line with current policy and regulation standards in most low-income countries.

5.7.2 Community outcomes Level

Community empowerment to embrace chronic conditions health services: The findings of this study high-lighted the significant role communities play in the management of chronic comorbid conditions. Increased knowledge dissemination to the community through the mass media and advocacy on risk factors and management of chronic conditions has led to an empowered community in health decision-making on their health, and change of behaviour to accommodate early health-care seeking practices and a change of an earlier attitude against patients with diabetes and hypertension. The Community level of knowledge is on the rise through community sensitization programmes on high-risk prevention and support group peers who support each other on self-care. This study findings are in line with the most current surveys on health care utilizations in Kenya, which has shown a great improvement in utilization of health-care services (Ministry of Health and Government of Kenya, 2014). Turin (2010), maintains that utilization of health services does not directly translate to improved health outcomes in most cases, rather availability of services focused on the population's needs.

Increased community collaborations and participation: the result from this study indicated that community collaborations with NGOs, private health sectors and the health-care systems has been an outcome of the current move from the government on the prevention and control of NCDs right from the community level. Despite the fact that most health facilities are based in the community, the community collaboration with the health system to allow ownership of community health projects was still at minimum levels. Active participation of and involvement of community representatives in the CHMTs and facility committees in planning and budgeting was one way the community needs were channelled to the government. Other studies have shown that community collaboration care is an outcome process of effective management of chronic conditions at individual and household levels (Mireku et al., 2014). According to the WHO (2010a) community collaborations form the backbone of chronic disease prevention and control, as community is where the most vulnerable groups live (George et al., 2015). According to the World Bank report on community collaboration and participation, community members take active roles in planning for evaluation of health facility services through the use of community score cards, and initiation of compliment and complaint handling mechanisms in the health sector and the community (World Bank, 2014).

5.7.3 Health Organization level

The results from this study found that at the health organization level three outcomes of management of chronic comorbid conditions were observed. These were: i) potential role of information systems in collaborative care, ii) efficient patient-centred care knowledge and skills and iii) Increased cost of management of comorbid conditions at facility level

Potential role of information system in collaborative care: the results from this study indicated that with management of chronic comorbid conditions team cohesion between departments responsible for management of chronic conditions had improved to allow co-ordination of care provision within the health facility and health system. This was attributed to availability of communication technology such as mobile phones within health facilities and paper documents for patients' measurements. However, coordination of services is dependent on good communication skills and interpersonal relationships among health care providers. These views have been found to cut across health care organizations in regard to service delivery (Nam et al., 2011). Patients depend on good communication from health providers for their adherence to treatment plans (Matthias et al., 2010). This inter-departmental collaboration fosters multidisciplinary collaborations between health-care workers across the health-care systems (Cioffi et al., 2010, Tapp et al., 2012). Effective communication among health care providers is a skill, which enhances patient outcomes (Jolles et al., 2012) especially for patients who need long-term care across several health care professionals.

The findings indicated that lack of patient recall system and scheduling of patients' appointments hinder quality health-care services, thus informants indicated that with the current clinics for comorbid conditions, there is a dire need to develop and utilize patient recall systems both manual or computerised whenever resources and technology allows. In this study this was seen as the solution to work overload and one given for most multitasking health-care providers. The effectiveness of patients' recall systems has been shown to improve providers' work output and patient satisfactions with reduced waiting time, especially in Australia among the indigenous communities (Stoneman et al., 2014) and in systematic review by (Comino et al., 2012) They reported improved health outcomes at individual and organizational levels. There is evidence for paper recall systems which are cost-effective in integrated health service delivery in the case of South Africa (Levitt et al.,

2011), a model Kenyan devolved health systems can emulate to improve health outcomes for chronic comorbid cases.

Effective patient centred care knowledge and skills: The findings from this study indicated that empowerment of health-care providers with the right information, skills and tools for service delivery for chronic care served to be an outcome of the current management of chronic comorbid conditions. Health-care workers who are not empowered with health care sources deliver substandard care which leads to lack of patient satisfaction and poor health outcomes. Studies have shown that for effective quality management of chronic care, health providers must have vast and comprehensive knowledge on conditions (de-Graft Aikins et al., 2010b), as it is most health-care providers' knowledge on comorbidity is still limited, compounded by lack of skills and tools. Health-care providers empowerment through training, continuous professional training on chronic comorbid conditions, strengthens the existing health structures to accommodate chronic care as in the case of the ICDM model in the South African Health Department, which has seen improved diabetes and hypertension care in a diverse population. This has also been echoed in other studies as in the case of a study done in South Africa on the care of diabetes using a collaborative model of health-care providers (Oni et al., 2014) and the community-based collaborative model for diabetes care in the same country (Distiller et al., 2010).

Reduction in hospital admission: The results from this study further indicated that management of chronic comorbid conditions at primary levels has reduced the number of patients who are being admitted to the wards. Developing complications as earlier indicated. However, efforts at the health systems level should be encouraged to enhance adherence to care and follow-up at the primary health-care settings as compared to secondary and tertiary levels. This has been observed in a study on long-term effects of intensive blood glucose control among diabetes with hypertension (Orchard et al., 2013). Community-based and outpatient's follow-up for patients with comorbid condition, reduced hospital admission rather than achieved optimal control for most patients, who participated in this study, despite being on regular follow-ups.

Increased costs of management of chronic comorbid conditions at facility level: The results indicated that facilities cost of service delivery to patients with comorbid conditions increased, especially where intensive control was to be achieved. Despite the fact that direct cost in the in the ward was reduced as a result of good follow-up and adherence to follow-up care, the cost of running an outpatients' department although lower than inpatients' was still significant. This was due to high level of turn-up of patients and increased combined drug

therapy among patients with comorbid conditions. This has also been reported from other studies, Zhang et al. (2010) provides solutions for cost crisis in health care including empowering patients for self-management and active participation as also supported by (Kaplan and Porter, 2011). The estimates of health care expenditures for diabetes alone are expected to increase seven-fold. Similarly in the sub-Saharan region and developing countries, the picture for single conditions is the same. However, the general cost may not remain with intensive health promotion and integrated care approach, especially in PHC settings to control the risk factors according to the targets of WHO, as a global action (WHO, 2014). The cost of management for comorbid conditions with multiple drug regimens also needs to be investigated further for future planning.

5.6.4 Health Systems Outcome Levels

The findings from this study indicated that despite the fact that management of chronic comorbid conditions are geared to be measured from the patients' health outcomes. Health care systems also have system-based outcomes which affect quality of care. The following outcomes are discussed: i) increased health care costs; ii) reduction in hospital admissions and iii) legal policy review and development

Increased health care costs: The results from this study highlighted several outcomes both intended and unintended as a result of management of chronic comorbid conditions at primary health-care settings. The findings pointed out that with the current interventions at their formative stage, the cost of care for patients with comorbid conditions has been on the increase, despite the fact that the national budget and allocation to the Division of NCDs in the Ministry of Health in Kenya, just like other developing countries in sub-Sahara, has remained below the 15 per cent of the Abuja declaration (WHO, 2011). With fewer international bodies funding comorbid chronic conditions, the cost of care is bound to escalate if no immediate response is undertaken (Anyona and de Courten, 2014).

Legal policy review and development: the results indicated that comorbidity care is unique and requires standalone policies and legal frameworks to guide healthcare delivery to patients with chronic comorbid conditions. Despite the fact that current health policy frameworks acknowledges and supports NCDs, as a group of conditions, (Anyona and de Courten, 2014). Comorbid conditions need more attention, and resources including human resources and infrastructure across care settings. Evidence indicates that patients who have chronic comorbid conditions end up being mismanaged if handled like any other patients or those with a single chronic condition (Valderas et al., 2009, Islam et al., 2014, Boyd and Fortin,

2010). Importantly, there is need for comorbidity and multi-morbidity of chronic conditions being handled legally and given the attention they deserve based on the threat to humanity. Developed countries like Australia and the United States of America, have developed policy frameworks for comorbid conditions and multiple chronic conditions policies across different levels or models of care such as managed care. In a study conducted to develop a model to understand comorbid as a chaotic venture of management, three main concepts emerged theoretically to show how to understand comorbidity and multi-morbidity from orderliness, through complicated order leading to a chaotic situation (Kernick, 2012). In developing countries, despite the emerging challenges of comorbidity and multi-morbidity, policies and frameworks still continue to support single chronic conditions all grouped together as NCDs. As in the case of Kenya and South Africa with the ICDM model and the modified ICCM model for countries in transitions for from communicable conditions to NCDs and comorbidity (Oni et al., 2014) there is scarcity of research on comorbidity effects in Kenya like other developing countries on the quality of care patients with comorbid conditions.

5.8 Summary of Chapter Five

This chapter discussed significant findings on how chronic comorbid diabetes and hypertension conditions were managed at primary health care settings in Kenya, with special consideration for the devolved health care systems. What emerged during the discussion of the study finding was that management of chronic comorbid diabetes and hypertension conditions was highly contextualized and it was guided by concepts and levels of collaboration between different stakeholders. In real life and practice chronic conditions requires the concerted efforts of the patient, health providers and the community, not excluding the health care systems. It also emerged that management of chronic comorbid conditions was highly influenced by the cultural belief system of the patient, health care providers, health organization and health systems managerial culture.

Despite the fact that external factors may influence change of the culture, the impact of internal cultural belief systems last long and influence health outcomes. The roles of the health-care providers in the management of chronic comorbid conditions are time bound and patient-centred. Providers' satisfactions were based on their skills and cultural competence and empowerment accorded to them for service delivery. Similarly patients' role in the management of chronic comorbid condition was based on their level of involvement in self-management activities and interactions with health care providers. Patient's self-efficacy

determined the health outcomes of the management process. Other important concepts on management of chronic comorbid conditions were highlighted in this chapter.

These factors led to the development of context-informed models of management of chronic comorbid conditions in primary health care which will be analysed further in chapter 6.

CHAPTER SIX

SUBSTANTIVE MODEL DEVELOPMENT

6.1 Introduction

The purpose of this study was to explore and analyse management of chronic comorbid diabetes and hypertension conditions among adults in selected PHC settings in Kenya. This study also aimed at developing middle-ranged theory to guide the management of chronic comorbid conditions within the primary health-care settings in devolved health sectors in Kenya. During the ethnographic emersion in the field and data analysis there was constant comparison of data leading to the emergence of concepts and categories as ascribed to in grounded theory analytical procedures at different stages of open and axial coding. This chapter presents the third phase of selective coding for the development of substantive theory or model of management of chronic comorbid conditions in Kenya based on the paradigm model, which has been explicitly described in the previous two chapters in this study. Strauss and Corbin (1998:115), defines a theory or a model as “*a set of well-developed concepts related through statements of relation, which together constitute an integrated framework that can be used to explain or predict a phenomena*”.

According to Chinn and Kramer (2008) there exist six components essential to theory or model development and these include: a) the goal(s), b) concepts which are the building blocks of the theory c) definition of the concepts; d) the nature of relationships between concepts within the theory/model, e) the structure of the theory/model; f) assumptions underlying the theory/model. The six components of theory development according to (Fawcett, 2005) and (Chinn and Jacobs, 1987) are essential during the process of theory analysis and evaluations.

Chinn and Kramer (2008a) maintain that this being a descriptive explanatory model, go beyond descriptions of a phenomenon to include relationship with other concepts, gives rationale for the relationships, make predictions about their exact relationships and address changes occurring in the phenomenon.

In this chapter the researcher endeavours to present the conceptual model of management of chronic comorbid conditions in a simplified format for easy comprehension by all concerned personnel.

6.2 The Goal of the Conceptual Model

This conceptual model is a clinical context informed explanatory model with three goals, which include:

- a) To provide guidelines to multidisciplinary health-care providers for the management of chronic comorbid conditions (diabetes and hypertension) in the primary health care settings.
- b) To provide a framework for policy review and implementation on management of chronic comorbid conditions at primary health-care settings.
- c) To guide nurses' practices on management of chronic comorbid conditions among the multidisciplinary health professionals in primary healthcare in Kenya.

6.3 Concepts of Management of Chronic Comorbid Conditions Model

Concepts are groups of words which represent an object, properties or events in the theory or model as they form the relational structures of the model. They are used as building blocks of theory (Chinn and Kramer, 2008a). Theories are made of core concepts that has major concepts attached to it followed by sub-concepts of which make reference to the core concept as the phenomenon of the study.

The core concept in this conceptual model is the management of chronic comorbid conditions (diabetes and hypertension) in PHC settings. The core concept was characterized by: Collaboration, Continuum of care, culturally sensitive care and Self-management focused. Directly attached to the core concept are the major concepts which have direct influence on the management of chronic comorbid diabetes and hypertension. These included: a) the context, b) political commitment c) integrated health service delivery; d) guiding principles e) expected outcomes. Relevant sub-concepts to each major concept are explained immediately under the concepts as structurally represented in figure 5.

6.4 Definitions of Concepts in the Conceptual Model

6.4.1 Management Chronic Comorbid Conditions (MCCC)

The core concept management of chronic comorbid condition is defined through its characteristics which emerged from the findings of the study. Management of Chronic comorbid condition as being a process of comprehensive care provision to people at risk of developing chronic conditions and those affected with comorbid chronic conditions. Management of chronic comorbid condition was defined in relation to the nature of collaboration among multidisciplinary teams and the patients to provide care and support to

patients and their families. Partnership between different sectors with the Ministry of Health defined the nature of concerted efforts to prevent, treat and control comorbid conditions. Management of chronic comorbid conditions was viewed from the perspective of the community being incorporated in taking responsibility to prevent chronic conditions risk factors through behaviour change, provision of support to the sick and sharing available resources for behaviour change and participation in health issues of other community members.

Management of chronic comorbid condition was defined in terms of attitudes and respect to the norms, beliefs and practices of the individual and the community in general. Culturally sensitive care is cognizant of individual patients strongly held beliefs, expectations and practices which are socially acceptable to them and their families. Being aware of the significance of family and the role it plays in the management process of individuals, religious affiliation and relationship with the social being determined as health seeking behaviour and practices. The culturally embedded and determined gender roles and interpretations of signs and symptoms presented enhancers of barriers to management of comorbid conditions, communication with health providers and to some extent adherence to treatment plans. Management of chronic comorbid conditions was characterized by the continuum of care which is portrayed in the form of timely accessibility and affordability of health care services across care settings and being able to move from one level of care to another in a well-coordinated manner across care settings and back home or in the community.

Central to management of chronic comorbid conditions process was the ability of the patients to provide self-care, or being assisted by family members in consultation with health care providers. This helped them to perform daily activities necessary for the control and prevention of symptoms and complications attributable to comorbid conditions. In addition, self-management was characterized by self-assessment of body parts for deviations from the normal functioning, adherence to treatment plans including lifestyle modification. Self-monitoring and interpretations of results both at home and in health facilities and taking appropriate actions. The success and utilization of self-management skills was influenced by health determinants such as age, level of functionality, literacy and health literacy levels to acquire skills and ability to set personal goals and make efforts to achieve them through shared decision making. Self-management is influenced by the self-determination and the efficacy the patients puts into care provision to self at home, supported by family and health

care providers or lay CHWs. Evidence exist on the in support of self-management in patient with comorbid conditions

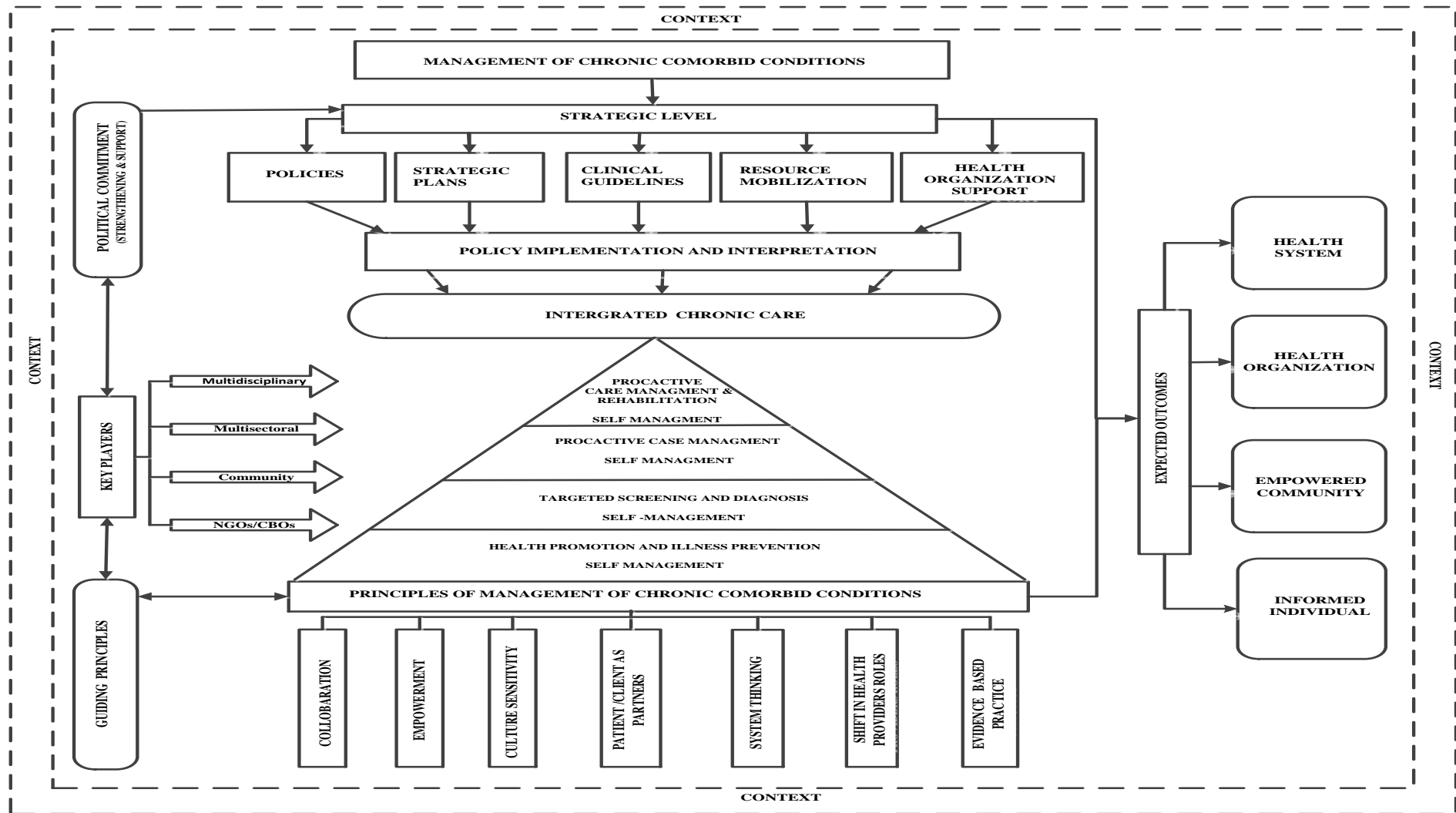


Figure 5: Structural Presentation of Middle Range Theory of Management of Chronic Comorbid Conditions (MCCC MODEL)

6.4.1.1 The Context

Management of chronic comorbid conditions is influenced by the context under which health care services takes place and the system of operations and the community under which patients live and work. The context represents the health policies and the social and environment contexts which determine health service delivery within the health care system. In the context of this study the context represents the resources that guarded health care systems in Kenya. The context in this study is defined by the related activities which have direct and indirect influence to management of chronic comorbid conditions in primary health care. The following are sub-concepts of the context in the management of chronic comorbid conditions' i) the constitution of Kenya; ii) the health policy framework, iii) developmental agenda for Kenya and iv) the international partnership.

The Kenyan Constitution: accessibility of health care services to citizen is influenced by the right to health for all which applies to all stages of life cycle of all Kenyans. The right to health allows all patients to have access to free medical services in primary care services and community health services. With accessibility into the health system guaranteed utilizations of health care services improves, which later determines health outcomes.

The health policy framework: the framework gives directions on the chronic care provision in the Kenyan health system especially with emphasis on the health promotion and diseases prevention the health systems in the resources constrained is regulated by the government on resource allocation for policy implementation and interpretation at health organization levels. The health policy determines the re-organization of the healthcare organization to allow chronic care service delivery. The influence of health policy in chronic care is evidenced by the available strategic plans for chronic conditions across different levels of care in support of evidence based practices.

Developmental agenda for Kenya Vision 2030: One of the factors that have an impact on the health system is the government development agenda, which aims to propel Kenya from a low income country into a middle income country by 2030. Health reforms and improvement of chronic care services delivery across all levels and life cycle is one aim of achieving the vision in Kenya. Decentralization of chronic care services and advocacy to create awareness enhances possibility of improving health accessibility, reducing morality rates and health expenditures of health. The government also through reforms in health finances and

prioritization enhances supply and procurement of essential medicines and diagnostic tools for chronic care.

International initiatives and partnership: management of chronic comorbid conditions in a resource constrained environment is influenced by the presence of international developmental partners. This is achieved through provision of training and capacity building in the management of chronic comorbid conditions in primary health care. Noteworthy is that international initiatives influence on chronic care is based on, partnership especially for funding of health programmes and also depends on accountability of partners and responsibilities which reflects the need of the population being serviced and being evidence based. In the context of this study initiatives and partnership are relevant with communities working in partnership with NGOs and international bodies, in partnership with the government in support of health promotion and lifestyle modification.

6.4.1.2 Political Commitment

In this model government commitment is a major concept on the management of chronic comorbid conditions in primary health care. The commitment of both governments at the national and county at the strategic levels of management involved: i) development of health policies and guidelines, ii) health resource mobilization, iii) development of teaching materials and iv) health organizational support.

Development of policies and legislations: At the strategic level in this model under the Ministry of Health at the national government, legal health policies and frameworks are conceptualized, developed and reviewed, which affect healthcare services across the health systems, based on specific areas involved. The ministry is divided into departments which are related across health service delivery, but with distinctive roles and mandates of operation. The most outstanding roles of the ministerial departments include: regulation and standardization of health services, procurement and supply, planning and finance, quality assurance and monitoring, and evaluation of health system activities. In relation to other models of chronic disease management, the government is responsible for the development of policies and strategic plans for the health care services, and other related sectors, which enhances NCDs prevention and control measures across care services. The CCM, health system provides support to health organizations involved with chronic care through information support and clinical support (Glasgow et al., 2001).

Clinical guidelines and protocols: management of chronic comorbid conditions require evidence based guidelines to give directions on how comorbid conditions should be managed, as co-existing conditions compared to single occurring conditions. Clinical guidelines provides statements and recommendations for health promotion and prevention, diagnosis management, and treatment of comorbid conditions and the referral process to be followed to allow continuity of care and improved health outcomes.

Specific strategic plans: the strategic plans guided by the health policy framework forms the vehicle for implementation of the health policy in a systematic and responsive manner. These plans provide the guidance on how to operationalized health services and give specific targets and indicators for monitoring and evaluation of health care services, risk factors and surveillance of those at risk. In the context of this study, the county government guided by the national strategic plans, develops contextual strategic plans to suit the community in need of health services as compared to the national level based strategic plans. Effective chronic care service delivery is dependent on the level of planning accomplished and implemented at the ministry and county levels. The specific areas relevance to management of chronic comorbid conditions includes regulation and standardization of health services, procurement and supply, planning and finance, quality assurance and monitoring and evaluation of health system activities. Regulation and standardization of health services to ensure that patients and the general community have access to quality and responsive health services. Procurement and supply is the process of ensuring that right and quality medical supply are purchased on time and dispatched to the consumer on time to avoid delays and alleviate suffering. Planning and finance is the process of ensuring that health-care services are relevant to the needs of people with comorbid conditions, and allocation of adequate supplies to ensure continuation of services in relation to chronic care which is long term.

Resources mobilization: In this model resource mobilization at the strategic level cuts across the national government and the county government. At the national level financial planning for the ministry and the respective ministry in the county government takes place. The national government is responsible for mobilization of health human resources, both for clinical and preventive health through capacity building and trainings on chronic comorbid conditions. Resource is mobilized through health insurance for people with comorbid conditions; provision of health services with resource mobilization also entails redistribution of health care providers, based on the population needs and specialization to meet the patients' needs. With financial funding limiting capacity and strengthening of health care

sectors, influences, service provision especially in insulin procurement and teaching material distribution across the country.

Health organizational support: In this model the organization represents those activities which are targeting an improved service delivery at the operational level within the health system. It involves strengthening the service delivery to patients with chronic comorbid conditions, through empowerment of both the health provider and patients as partners. At this stage the health organization culture needs to meet the internationally recognized standards for the provision of chronic care, especially with comorbid conditions as outline in the ICDM of South Africa and also reflected in the Kenya Essential Package of Health (KEPH), which are essential for health care service delivery across settings (Asmall and Mohamed, 2013) and (KMOH, 2006).

In order to meet the standards of service delivery, the following will require to be empowered for change in line with comorbid care: i) health human resource empowerment; ii) functioning health information system; iii) regular essential medicine supply and iv) relevant structures and equipment.

Human resource empowerment: forms an integral part of chronic comorbid management in PHC, health care facilities. It requires to be well staffed with well-trained health care providers to provide chronic care to all types of patient. In this model human resource empowerment retraining of all PHC health staff is essential together with provision of evidence-based clinical guidelines and motivation of health care workers to improve their attitudes towards chronic care. Health care providers require to be empowered with knowledge, skills and equipment, to handle comorbidity especially in primary health care, Oni et al. (2014) maintain that, comorbidity needs to be understood extensively beyond causal conditions to include the providers factors, which include the ability to diagnose and support the patient for self-care.

Functional health information system: for effective management of chronic comorbid conditions, health-care providers require access to patient information, retained at the facility either as paper records or electronic for reference in the subsequent visits, with the same provider or a different provider, to ensure continuity of care. In this model functional health information is the equivalent of the health information system in the CCM and the expanded CCM, which represents the patient and information data, on the prevention and management of single chronic conditions(Barr et al., 2003). In this study the functional health information system is necessary for effective comorbid condition management. The health information system needs to be functioning to organize reminders to patients for follow-ups, to share

information across care providers, and to provide surveillance data from the community for planning and implementation of health promotion activities. Information availability to patients also enhances their decision-making on their own care across care providers.

Relevant Structures and Equipment: in this model, the structures and equipment represents the physical structures and equipment used for the provision of chronic comorbid conditions care services. The structures must be appropriate, clean and well linked to allow patients to navigate through them for quick and timely service provision and improve satisfaction. According to Parekh et al. (2011) appropriate equipment must be used for proper case detections and progressive monitoring, within the acceptable standards, for continuity and improved health outcomes. The health environment must also be clean and safe for patients with chronic comorbid conditions as also indicated in the ICDM in South Africa, which also incorporates HIV, TB into the PHC settings (Asmall and Mohamed, 2013). In this model, the necessary facilities in terms of space, laboratory apparatus and diagnostic tools recommended for chronic care such as basic blood pressure machines, glucometers, weighing machines, eye examination tools, physiotherapy services, form an integral aspect of the comorbid condition.

Regular essential medicine supply: in this model forms an essential aspect of health organizational support, which supports the integrated chronic health care interventions across the continuum of care. This ensures that all essential medicine for chronic comorbid conditions is available at the facility and affordable for use by patients is a regular basis to enhance adherence and improved health outcomes.

6.4.1.3 Policy Implementation and Interpretation

Health system in decentralized government requires that policies made at national level be implemented and interpreted or operationalized to suit the context of the specific counties and the population needs. The implementation is done at the community level through community committees, SCHMTs and CHMTs, who have direct influence on how integrated health care services are offered within the county.

6.4.1.4 Integrated Chronic Care Approach

Integration of chronic care denotes the way health-care services are organized and managed to allow individuals to have access to the service whenever they need it and the way they require it delivered in order to meet the value they pay for. Asmall and Mohamed (2013), defines integration of chronic care as provision of all health services in terms of prevention, diagnosis, treatment and chronic care entailing long term follow-up and monitoring.

Management of chronic comorbid conditions is characterized by a multilevel services delivery which requires coordinated, organized in a seamless health services for smooth navigation of health organization structures and services by patients. Integration is measured through accessibility of providers, facilities, essential medicines and general care at an affordable cost. Patients with comorbid conditions, may have challenges both socially and physically, but should have access to health services relevant for their comorbid conditions in a timely manner. Integrated chronic care should facilitate referrals from one health provider to another and enable continuity back to the community. Integration may be seen as a solution to health care fragmentation in a resource constrained health care system and increased health care costs for patients who cannot afford the costs. This build on previously existing in chronic care (Lorig and Holman, 2003, Unützer et al., 2013).

Primary prevention and illness prevention: integrated health services delivery in the context of this study is presented in the form of a pyramid of the public health approach with health promotion taking the base of the pyramid as the primary preventions. Health promotion is the process of enabling people take active roles in controlling the determinants of health, such as culture, economic status, technology, social support, gender, and education levels among others, which intern improves the health outcomes of the population or individuals. Integrated service delivery at the primary level, intends to have more people involved in behaviour change and active participation in their own care issues. Some of the activities involved at this level of prevention include health promotion and advocacy on prevention of risk factors, community mapping and profiling of risk factors and mass screenings for targeted groups in schools, the elderly and other vulnerable groups.

Secondary prevention and targeted screening level: in integrated health services the next of the lower bases of the pyramid is the targeted screening and early detection of chronic conditions and those at risk of developing comorbid conditions. At this level specific activities are employed for case detection and confirmed diagnosis and initiation of self-management directed intervention through communication and informed interaction with the health care providers. Individuals at this level employ non-pharmacological interventions based on life styles medication and behaviour change. Adherence to behaviour change on diet, weight control and physical activities is determined by the level of self-determination, the severity of the signs and symptoms attributable to the threat of chronic conditions. People accept to change based also on the cognitive psychology, where patients and the community gain and acquire knowledge about the conditions and their effects on the quality of life (Bandura, 1989).

Proactive case management of chronic comorbid conditions: closely linked to the secondary prevention is the proactive case management of individuals who are confirmed to have comorbid conditions, but with no identified complications the health services. Individuals take active roles in their own care with the health of health care providers through training, interaction with members of the support groups to allow them develop coping mechanisms of living with comorbid conditions, seek emotional support and physical support from family members to allow them go through the whole process of care. Proactive case management involves initiation of patients on combined therapy of both behaviour change and medications which could be multiple or single, injectable or oral medicines. Self-management both planned and planned activities take active roles, where patients' level of interaction with health providers increased with the number of encounters within a specified period of time and utilization of evidence based clinical guidelines for the management of individual patients.

Tertiary prevention and proactive care management: the tertiary level is characterized with appropriate referral of the high risk and complicated patients to specialized health care providers in the next level of management, where patients may benefit from. Rehabilitation services for patients with comorbid conditions may be preventive or physical rehabilitation. The preventive rehabilitation is where a patient is referred to the next level before onset of complications, while physical rehabilitation is the case management for where functional disabilities have set in, but may regain physical functionality after specialized care to gain physical active life. Care coordination continues across the levels of integrated health care to allow continuity of care across settings and community.

Self-management focused care: self-management in the context of management of chronic comorbid condition was characterized by the capacity of the patients to perform self-care activities across all levels of the integrated care approach. Self-management was visualized as being both planned and unplanned, while receiving assistance from immediate family members, support groups or health care providers. This assisted self-management is referred to as assisted or supported self-management; the focus of self-management is to develop patients' self-efficacy and determinations driven by self-set goals of care. On the other hand the planned or self-performed self-management is achieved through training by patient educators or through regular traditional health education by health providers or advocacy groups. Self-management skills can be learnt through the social support group networks in the community where they learn from each other's experiences. Studies have shown that self-management is cost effective and can reduce general health cost especially in developing

countries health system context where poverty levels are high. Self-management guided by the social ecological perspectives allow the patients to acquire the expert role in self-assessment, monitoring and self-drug administration, which enable individual patients to cope living with comorbid conditions rather than learning to manage the conditions only (Greenhalgh, 2009). On the other hand self-management support entails patients taking active roles in decision making, care planning, goal setting and health related problem solving these aspects have also been seen in several models and studies in support of self-management (Barr et al., 2003, Ryan and Sawin, 2009).

6.4.1. 5 Key Players

Key players are the main stakeholders who have direct influence on the management of chronic comorbid conditions in PHC settings. The stake holders have specific roles and responsibilities which ensure health services provided are of good quality and relevant to the needs of the patients and community. The following formed the key players in the context of this study: i) Multidisciplinary teams, ii) Multisectoral policy makers, iii) the Community and iv) Community based organizations/NGOs/advocacy groups

Multidisciplinary teams: is a team of health care providers from different cadres and training, responsible for health care service provision to patients with chronic comorbid condition. They include nurses, doctors, clinical officers, nutritionists, public health officers among others.

Multisectoral policy makers: these are leaders and representatives from different government sectors affiliated to health who directly or indirectly contribute to the health care service provision. The services they provide range from funding of health services provision, nutritional advice and self-help projects in food production, procurement and distribution of health care supplies among other services.

The community: is the general population among which individual household and individual patients with chronic comorbid conditions belong, either as clients, healthy people at risk of developing chronic conditions. The community provides the environment for interaction and catchment areas for high risk individuals and implementation of health promotion programs. Service provision to the community is performed by the CHWs and support groups formed by patients who are peer educators for both at risk and affected. The CHWs service as a link of the community to the health system. The community has shared space and resources, which are influential in local policy through active participation and involvement in decision making in matters of health as also highlighted in the expanded CCM (Barr et al., 2003).

Community based organizations/NGOs/Advocacy groups: these are the both development partners and key stakeholders who provide support to the integrated health service delivery. Main responsibility in the management of chronic comorbid conditions is through community sensitization and creation of awareness, community resource mobilization for health promotion and training of CHWs and convergence of advocacy groups for provision of home based and community based care services.

6.4.1. 6 Guiding Principles of Chronic Comorbid Conditions Management

As the number of patients with chronic comorbid conditions continues to grow, as new epidemiological condition evolve through biological interactions. This creates the need to have general principles in which service delivery to patients with comorbid conditions is based to ensure quality of care across care settings constrained by resource. In this model, the following principles provide the foundation to base management of chronic comorbid conditions i) collaboration, ii) culture sensitive iii) empowerment, iv) patient/clients as partners v) shift in health providers roles vi) system thinking vii) evidence based practice.

Collaboration: Management of chronic comorbid condition is collaborative in nature involving working together of different people from various fields of healthcare sector, health professionals, community, household and patients with an aim of improving health outcomes through active participation in decision-making and setting clinical goals. Collaboration refers to working together as a team made of multiple disciplines and coordinating service delivery between different health care departments. It is the collaborations between related ministerial sectors which have direct influence on health, towards improving health outcomes of the entire population through the use of available resources. Community collaborations with health sector in decision-making on matters concerning their own health and getting involved in practical activities of management of chronic comorbid conditions.

Culture sensitive: In this model management of chronic comorbid conditions is greatly influenced by the cultural orientation of the community, patient, providers and the health system. For patients to receive holistic care which is person-centred as compared to condition-centred, care must be sensitive to the cultural beliefs, norms, practices and expectations of the patient and their immediate family members. Comorbidity compact with changes requiring constant adjustments based on the socio-cultural and economic status of an individual and the entire community. Health-care providers need to equip themselves with cultural competence skills, to allow them to provide culturally congruent care. Clinical

cultural competence requires knowledge on patients' culture, the desire to know about the culture of the community they live and work. To acquire skills to interpret the cues, norms and meanings attached to behaviour and practices of the patients or those at risk, which determine health-seeking and adherence to treatment plans.

Empowerment: in management of chronic comorbid conditions empowerment is the process of enabling individual, and communities gain control of their own health. This also helps change the environment and behaviours to improve health outcomes, through active participation in prevention and control of NCDs risk factors. Empowerment allows individual patients acquire knowledge to perform activities of daily living pertinent with chronic comorbid care. Empowerment is a social action process through which individual, communities and organizations gain mastery over their lives or practices in the context of social political environment to bring about equity and quality of life. Aujoulat et al. (2008), maintains that patients with chronic conditions should be empowered to manage and live with comorbid conditions. Empowerment is achieved through acquisition of knowledge, new skills, improved communications skills and adoption of behaviour change in the community. Utilizations of evidence based guidelines and protocols for comorbid conditions may lead to informed health proved and informed patients encounters which lead to improved health outcomes.

Patient /client as partners: management of chronic comorbid condition requires that the patients be seen as a fully-fledged member of the health care provider team. Patients are embodied as partners in chronic care perform a greater portion of their own care both at home and in consultation with health care provider. Patients are more experienced on how to cope and live with multiple chronic conditions, manage signs and symptoms as a concord or single symptoms at different times of along the disease process. For effective partnership between a multidisciplinary team of health care providers and the patient with comorbid conditions, integration of patients' experiential knowledge of the conditions, and success of self-management skills and practices and the scientific knowledge of health care professionals, is paramount. Evidence exist that for patients/clients to participate as partners, they need improved competences and engagement through constant communication with health-care providers. This can be done through learning practices, assessment practices and adaptation practices, which need to be considered by health-care providers (Pomey et al., 2015). It is learning by doing and listening to self and correcting the wrong practices, assessing to detect deviations from the normal changes of the body and adaptation is accepting and living with

chronic conditions while taking the initiative to fill the gaps of the health-care providers, health systems by using complementary means as alternatives to care.

Systems thinking: Management of chronic comorbid condition is based on the system thinking where different aspects of care and patients' needs have to be considered from the point of holism and not in parts. From the social ecological perspective, chronic comorbid conditions emerge as a result of interplay of several factors including determinants of health within complex systems (Greenhalgh, 2009). System thinking is the brain game for problem solving which require actors from multileveled systems to provide solutions. The best example of whole system approach of care is the utilization of patient centered care approach and provision of care out of the clinic based health services, to include the community in decision making and involvement in health care program. Systems thinking allow initiation of large scale programs to reach all aspects of chronic care and not individual patients, but to include resource mobilization for health promotion, self-management, education programs across chronic conditions, creation of a health environment for patients with chronic comorbid require safe environment and support from the wider society where they live and work. System thinking enhances collaborative cooperation in goal settings and enhancement of new skills and competences of the entire community for change of behaviour and lifestyle modification and care to those who need physical rehabilitation.

Shifting health provider roles: Management of chronic comorbid conditions embodies the active role of patients and their families in direct care provision. This necessitates the shift from the monopoly of care provision of health care providers, where they make all the decisions, while not accepting any contribution from the patients and their families. The paternalistic roles of health care providers especially doctors in chronic care need to be replaced with patients centered care, which allows the patients to be engaged in decision making, goal setting and treatment planning, change of attitude and considering the patients preferences based on the socio-cultural orientations, economic status and patients expectation of care services.

Evidence-based practices: effective management of chronic comorbid conditions in PHC should be based on the health care professional clinical expertise integrated with best acceptable clinical evidence, patients' values to make sound decisions during the management process of patients. Health is providers need to have access to clinical guidelines which are evidence-based to allow them to manage patients to acceptable standards and to achieve optimal level of control. Clinical guidelines need to be patients tailored especially when comorbidity of chronic conditions is of concern. Evidence-based practice is evidenced

by the availability, accessibility of clinical guidelines for comorbid conditions as compared to single conditions. It entails accessible to standardized clinical guidelines and protocols, standardized patients teaching material, provider education channels including continuous professional development in collaboration and leadership. Evidence-based puts emphasis in documentation of patients' data and service provided for monitoring, evaluation including revision of treatment plans and feedback to the system and patients. Evidence-based practice embodies accessibility of specialist care through well linked and coordinated referrals to the next level and back to the community for continuity purposes.

6.4.1.7 Expected Health Outcomes

In this model these are the consequences arising from the management of chronic comorbid conditions in primary health care settings which are directly influenced by the empowerment process and based on the interactional activities both at the national and the county levels. The expected health outcomes are based on the social cognitive theory which makes the assumption that interactions between personal, physical and environmental factors have an effect on behaviour change of an individual's, community and organizations. The expected outcomes in this model are grouped into four levels namely: a) individual /household outcomes; b) community-based outcomes; c) health care organizations and d) health systems.

Individual/household outcomes: these are the outcomes which are directly experienced by a patient with chronic comorbid conditions and their immediate family members. Management of chronic comorbid conditions is patient-centred, with all activities directed to ameliorate the signs and symptoms and to improve the patient's quality of life. It is believed that once patients have been empowered with the right knowledge, skills, and coaching for self-management, it expected that they will have a positive attitude towards the comorbid conditions, improved quality of life and optimal control of comorbid conditions. Empowerment with information and social support leads to change in negative risk factors such as smoking and alcohol intake through active participation in behaviour change activities, which leads to delays in onset of complication and improved self-management skills and practices. Patients and household, who are empowered with information and skills, are activated towards quality care through interaction with health-care providers within the health care systems, to allow continuity of care and improved health outcomes. There is outstanding improved self-management ability of patients as self-performed and supported by their family members in partnership with the health care providers.

Community-based outcomes: these are health-related outcomes directed at the community and the available health resources. Collaborations require active participation and involvement of community members in decision-making of health-related issues, which directly affects the targeted community. Management of chronic comorbid conditions at PHC levels, empower the community to embrace positive health behaviours and change of attitude towards risk factors, such as smoking, alcohol consumption, high salt intake, delays in seeking health care attentions among other related factors. Increased community resource mobilization towards health promotion and disease prevention programmes with community-based partners, advocacy groups and local governments, increased utilization of CHWs in health promotion and behaviour change in the community forms one of the major long-term outcomes of management of chronic conditions.

Health organizations outcomes: the health organizations provide the environment where health care providers interact with patients, with other health care providers and provision of essential health services for the management of chronic comorbid conditions. With adequate training of health care providers, supply of essential medicines and equipment across care settings. Health care providers become motivated and experience job satisfactions and retention levels increase. Working as a team in collaboration with the patients helps to improve communication skills and problem-solving skills also become part of the clinical cognitive skills and this is also in line with the expanded CCM at the health organizational level and at the community level which forms the basis for health promotion and chronic care services (Barr et al., 2003). For holistic care provision to patients with comorbid conditions requires health care provider and the health care facilities to accommodate and negotiate with the patients for improved health care outcomes. A culturally competent health care provider is sensitive, aware and respects the culture and beliefs of their patients without compromising the ethics of the profession of their respective cadres.

The health systems outcomes: these are proceedings of management of chronic comorbid conditions, which directly affect the health systems, in terms of strategic planning and resource distribution. The expected outcomes to the health systems include increased awareness of health policy makers, development of relevant health policies for comorbid conditions, training and curricula development for health professionals and CHWs on chronic comorbid conditions. Increased use and review of clinic guidelines for chronic condition and increased budgetary allocation for prevention and control of chronic condition. Increased collaboration between the government and international bodies should improve funding and capacity building on the management of chronic comorbid conditions. Reduced hospital

admission emanating from community and PHC settings, will reduce the cost of health care and reduce mortality rates which affect development of the nation both at the county and national levels.

6.5 Relationships and structural description of the model

Based on Strauss and Corbin (1990), theories or models are seen as a set of related rules of many concepts and how they are related to each other. Similarly, Chinn and Kramer (2008a) defines relationships as the linkage between concepts, which are sometimes referred to as proposition statements, which can either be descriptive explanatory and predictive in nature. Further Chinn and Kramer (2008a) maintain that relational statements need to be structured to have a clear direction of their relationship from one concept to another, whilst the structure of a theory directs the conceptual relationship within it. This allows the reader to easily follow the description of the model when presented in a symbolic presentation in one structure. In this study the model is represented in a structural figure with all concepts fully represented and their relationship indicated by use of shapes or arrows. The theoretical model emerging from this study is represented as combinations of concepts derived from data, the paradigm model and literature from relevant studies and models used in this study.

The context of model is the resource constrained health care system, which is influenced by the constitution which provides the basis for health for all and health as a right to all citizens. The context is also depicted by the health policy governing the health care service delivery, through the implementation of the policy at the county level. The context also represents the political environment under which the health systems operates which in turn affects the health systems including the developmental agenda of the government vision 2030, where health is one of its pillar. The context surrounds processes, actions and outcomes of management of chronic comorbid conditions with a continuous dotted line which allows exchange of information and resources both within the health system and outside, including being influenced by international bodies and partners.

Directly attached to the context is the political commitment to develop policies, and legislation which support management of chronic comorbid conditions under the principles of the PHC approach for equity and accessibility of health to all. Political commitment is also evidenced in availability of respective strategic plans for related department in chronic disease prevention and control, resource mobilization, development of patient and provider teaching materials, clinical guidelines and health organizational support. The political

commitment at strategic level in the Ministry of Health has direct influence on the implementation and policy interpretation at the county level. The county level or the operational level in a decentralized government determines service delivery in the community and health care organizations the policy implementation and interpretation into local health needs determines health care provision at facility and community level. The integrated health service delivery is an interactive approach of management, presented in a pyramid with disease prevention taking the lower broad base of the integrated services with most services being rendered by the community and patients as compared to specialized care where few patients are being reviewed. Self-management practices are present at each level denoting individual participation in health care issues right from health promotion at the primordial phase. The second level involves target screening, early case detection and lifestyle modification, followed by the proactive case management through the use of combined therapy and lastly is the proactive care management and rehabilitation.

The principles of management of chronic comorbid conditions in PHC cuts across the health care system to improve management of chronic conditions in resource constrained setting like Kenya, which has further devolved the systems to county levels. The whole process of management is facilitated through the employment of the guiding principles by the key players starting with direct involvement of the patients, community, multisectoral stakeholders and developmental partners and advocacy groups who provide advice and consultancy with the policy makers for support and strengthening of the health system and service delivery. With concerted efforts across the health system, health organization, community and other stakeholders coupled with active participation of individual patients leads to improved outcomes at the health systems, facility, community and household especially improved health outcomes.

6.6 Basic assumptions of the conceptual model

Assumptions are basic premises accepted to be the truth without being proven to true, but are fundamental to theory development and theoretical reasoning (Chinn and Kramer, 2008). The following assumptions have been derived from management of chronic comorbid model in primary health care settings:

Management of chronic comorbid conditions is socially constructed and interpreted: Management of chronic comorbid conditions is a socially constructed phenomenon, as it is mainly determined by the social process of knowing how people's attitudes, knowledge and skills determine their behaviour change either positively or negatively. Change comes

through constant interaction between partners. Conrad and Barker (2010) assert that chronic illnesses are socially constructed, based on how meaning is attached to the diagnosis, assuming of the sick roles and the social interactions within the community. All of this determines the behaviour change and actions to be taken while living with chronic conditions. Similarly, Martin and Peterson (2009) posit that health care reforms, need to have an understanding on how chronicity is explained socially to guide the redesigning of health care systems and services to chronically ill patients and families in the community, similar views have led to the modification of the ICC model to suit multi-morbidity in countries undergoing transition (Oni et al., 2014). Management of chronic comorbid condition is socially constructed as evidenced by the stigma attached to integration of HIV services with the chronic disease clinics, the culturally acceptable norms and roles ascribed to individuals in the community coupled with religious orientation influencing health services uptake and interpretation of the chronic conditions and uptake of health promotion activities and behaviour change.

Management of chronic comorbid conditions is politically controlled: Management of chronic comorbid conditions in the health care system is politically influenced, and health services provision is heavily dependent on governance and style of governance being practiced in the country. Government commitment to health care has great influence on the health outcome of individual patients, health care provider's motivations; skills and quality of service provision. Political reforms have direct influence on health in terms of decentralization of health services, procurement of medical supplies, and provision of health services to the marginalized groups of people, including those with multiple comorbid conditions (Jadad et al., 2010). The success of management of chronic comorbid conditions relies heavily on the continuity supply of essential medicines, motivated health care providers, and policies and regulation of health services, which are dependent on the commitment and political stability in the country, as raised in the UN political declaration (Hogerzeil et al., 2013). Partnership with other funding bodies for budgetary allocation for chronic comorbid conditions is heavily dependent on the accountability, equality and equity of how resources are utilized within the central and devolved government as is the case in Kenya (Muchomba 2015).

Management of chronic comorbid conditions is embedded in active participation in decision making: patients with chronic comorbid conditions need to take active participation in shared decision making of health issues affecting their lives based on their experiences and preferences with health care providers during consultations and care encounters. Patient

participation should be seen through learned practices, assessment and adaptation practices. Patients active participation is determined by health determinants (Longtin et al., 2010) and the role patients play in the whole process of care especially in planning and goal settings (Epstein and Street, 2011). This all lead to improved adherence to treatment plans and lifestyle modification, and self-monitoring (Roumie et al., 2011).

Self-management for patients with chronic comorbid conditions may be conflicting is skills and information is delivered separately for each condition: to avoid giving conflicting information to patients and care givers, multidisciplinary teams need to work together to improve patients care outcomes and improve quality of life through supported self-care and management. There exists evidence on the need for concerted effort in provision of self-management to patients with comorbid condition in PHC (Gilbert, 1997, Tapp et al., 2012, Thorogood et al., 2007).

Management of chronic comorbid conditions is based community involvement and participation in health issues: that community provides the perfect environment of chronic care provision. Involvement of the community and participation in program development, budgeting and implementation of health promotion and disease prevention programs increases sustainability of the programs and adherence to long term risk control initiatives. Initiation of self-help projects, peer support groups for patients with diabetes and hypertension among other chronic conditions are more sustainable in the community than in health care facilities. According to the social and ecological model of chronic illness, the community should provide conducive environment for chronic care services extending out of the health system into individual homes and community (Greenhalgh, 2009). Further maintains that the community should protect the people, by removing all obstacles and cultural norms which are barriers to behaviour change and improved health outcomes. The community also has direct influence on health policies and laws which govern health system, involvement in resource mobilization for health at community level, supports chronic care integration into community health projects (Jadad et al., 2010).

Management of chronic comorbid conditions requires timely and well-coordinated across care settings: patients with comorbid conditions or at risk developing comorbid conditions require timely, planned and coordinated care across care settings. Time is a central factor in measuring continuity of care in terms of duration and experiences of the patient on the conditions and the number of times patients can access the health facility for chronic condition care services (Haggerty et al., 2012). Care coordination through health information

system; allow exchange of patient health information and timely services provision to patients and their family members.

6.7 Usability of the Model

As earlier mentioned in this study and within the chapter, this model will be specifically used to guide the health care services for management of chronic comorbid conditions, by multidisciplinary health care providers in PHC settings in Kenya. The model will be used in developing community disease prevention programmes while utilizing different cadres of health care, in collaboration and partnership with community-based organizations, government-based stakeholders including other ministries like education in conducting mass screening of the school-going population, development of regulatory policies which inhibit use of tobacco and alcohol in the community. Due to the multidisciplinary nature of primary health care, the researcher who is a nurse could not look at nurses' roles only, but the study comprehensively covered a mixture of health care providers. The model opens new areas for research in comorbid conditions management by specific cadres of the multidisciplinary teams in PHC, for instance nutritionists' involvement in comorbidity management at primary care levels and community settings. The model once implemented in the country level can further decentralize health promotion programmes and targeted screening, initiation of high risk management and case management to lower levels of care which are linked and coordinated with country hospitals.

6.8 Quality assessment, implementation and evaluation of the model

The process of evaluating the end result of all qualitative studies is critical by itself and evaluation of theory in both ethnographic and grounded theory studies is a critical step in the process of theory development (Goodson and Vassar, 2011). Walker and Avant (2011), point out that the value attached to a theory or a model primarily rests on what the analysis reveals, but should be able to reflect one's feelings and biases to a certain level (Walker and Avant, 2011). Further as Strauss and Corbin (1990), indicate a good quality theory or model should be able to meet the following four aspects: i) fitness for the areas of study, ii) comprehensibility for both study participants and users, iii) generality and iv) control.

The fitness for the area of study: according to Strauss and Corbin (1990), the theory emerging from diverse data in a particular context should be able to fit the substantive area of study and

the phenomenon under study, and allow transferability of the theory to areas with similar context. In this study the fitness for the study was achieved through making explicit the sample size of the study, comprehensive description of the study setting and participants. Further by stating that the outcome of the study would be a substantive model of managing comorbid conditions which is product of data generated at county level and the goals for the study and the contribution of the model was clearly explained.

Further to show the fitness of the study to the area of practice, the researcher compared the current findings with the existing evidence-based on literature from other studies in the field of study. The findings from this study in the form of categories and subcategories have been engaged with in the previous existing literature. The study finding is congruent with the current need for interventions to address the emergence of chronic diseases in the public health practices, which forms the breeding ground for comorbidity of the chronic condition. Comorbidity continues to put pressure on the already constrained healthcare systems and to some extent even in developed countries.

Comprehensibility of the study for both participants and the users This refers to the ability of the data theory and the study findings to represent the reality of the phenomenon under study and also to be understood by the participants and those who will use the model in their work (Strauss and Corbin, 1990). In this study stability was achieved through, presentation of the study findings using informants own words, or using policy documents exact words such as “legislation”, “continuity” and using them as categories and subcategories in the study. Secondly through constant comparative method of refining and collecting more data this allowed validation of the study findings by participants, especially in the focus group of health care workers and the support group meeting of patients with chronic comorbid diabetes and hypertension. This confirmed the informants’ meaning of the words used during interviews and improved interactive communication among group members and health care providers. Informants and patients expressed their views openly either as a group or as individuals and this clearly showed that they understood the process and their roles in the process of management, which led to theoretical construction in this current model.

Generality of the theory/model: Strauss and Corbin (1990), maintain that as long the data upon which the theory/model is based is comprehensive enough and has broad and conceptual interpretations, then the theory/model would be abstract enough with variations which would make it applicable to various contextual situations and applicable to the phenomenon of this study. Generality was achieved through clearly explained procedures and

comparison of the substantive theory with the already existing models or theory, relevant literature and clinical trial studies all of which have reflected the results emerging from this current study.

Secondly, triangulation of different data collection techniques, as from participant observation, interviews, focus group discussions and document analysis gave a rich set of data to represent the context under investigation. This made sure that reliability and validity checks were employed throughout the study. Secondly the utilization of theoretical selection for both participants and documents for analysis increased the quality of study and thus the model emerging from this study. Further, to enhance the quality of ethnographic study, use of a systematic model of analysis of data as in the paradigm model in (Strauss and Corbin, 1990) which comprehensively represents the contextual situation on the phenomenon of the study.

The control: In accordance with grounded theory study, the use of a conditional matrix allowed the researcher to specify the conditions which control the relationship of concepts in the theory (Strauss and Corbin, 1990). In this study the conditional matrix allowed the researcher to check critically how concepts interacted with one another in the process of management of chronic comorbid conditions. The researcher established that management of chronic comorbid conditions in primary health care settings, does not only start and end with health care provision, but is embedded in the strategic level of planning, implementation and interpretation of policies. Intervening conditions at personal level, organizational levels and at the system levels and how directly affects the service delivery which also affect health care outcomes to patients, community and the health care organization and system.

6.9 Conclusion

The study was conducted to explore and analyse the way patients with comorbid diabetes and hypertension were being managed in primary health care settings. With an aim of developing a context-informed model for the management of chronic comorbid conditions, where diabetes and hypertension formed one set of comorbid conditions. It emerged that management is a term that encompasses a number of activities and strategies which should be used in the provision of comprehensive care of patients with comorbid conditions. Management of chronic comorbid conditions was conceptualized as being collaborative in nature, requiring the working together of people with different experiences and levels of knowledge. Management of chronic comorbid condition is a continuous process determined

by time, accessibility and care coordination. Management of chronic comorbid conditions is centrally influenced by the patient's ability to perform self-care activities which mostly is determined by the cultural practices within the community and households. Management of chronic comorbid conditions is centrally influenced by knowledge; attitude and skills of both the provider and the patient, in addition to the motivating factors, communication skills, problem-solving skills and patient coaching constitute the empowerment process towards behaviour change. Apart from the aforementioned concepts, other contextual factors such as health policy and political will power, community participation, cultural diversity, community involvement and participation, patient-centred care, integrative care approach, form the foundational principles for the management of the chronic comorbid condition. The developed model indicates that improvement in quality of care provision through empowerment of individuals, communities, reorganization and strengthening healthcare systems will lead to improved quality of care, health outcomes and reduced cost of management. It should reduce the high rates of mortality and morbidity in resource-constrained settings.

6.10 Contribution to Knowledge

In Kenya and other developing countries, comorbidity is on the rise and is soon to become the normal phenomena in most health care settings. Management of chronic comorbid conditions is not a priority in many developed countries, but also should form the base of policy-making process in all health systems. It is the belief of the researcher that this study will form a contribution to health policy making with specific reference to comorbid conditions across care settings. It may enhance the speeding up of registration and regularization of traditional herbal medicine as its continual use without quality control endangers the lives of many, despite the evidence of its potency.

The model will make a practical contribution in the clinical settings where clinical follow-up care of patients with diabetes and hypertension is skewed towards diabetes only and hypertension clinics are organized separately, thus collaboration between the two groups of professionals may ameliorate poor utilization of limited resources for quality care and improved health outcomes.

One unique contribution of this model and this study is the principal position that culture should be accorded in the management of chronic comorbid conditions policies and clinical guidelines. Despite the fact that culture has been conceived as a limitation in most clinical settings and even adherence to management plans. Utilized in a positive perspective through

provision of culturally congruent care within the context of comorbidity, may be the turning point to improved chronic care in Kenya and Africa where culture has been the main obstacle to health care utilization and behaviour change.

The researcher conducted this current study with much influence of the professionalism of nursing. Nurses form the bulk of the health care providers in primary health care services. Given the opportunity to implement this study within the devolved health sector, the model will improve nursing services at the outpatient level, where nurses' impact is being neglected. Thus this model will open further areas of study with special references to nurse, CHWs and nutritionists who take the most active roles in nutritional aspect of care and follow-up of patients with comorbid diabetes and hypertension.

In line with the purpose of the study, the researcher has only developed the model of chronic comorbid conditions in primary care settings in one region, with the current decentralized government systems in the country. The model creates other opportunities for further studies in areas of comorbidity within different cultural contexts settings and health care providers and patients with other conditions such as depression, cancer, mental illness apart from diabetes and hypertension. Further implementation of the model especially in rural setting for chronic conditions, may improve service delivery and health outcomes for patients with chronic comorbid conditions. This can be achieved through further research and regional-based surveys to estimate the burden of chronic comorbid based health determinants especially the socio-economic factors, environment and the level of exposure to risk factors.

6.11 Limitations and Further Research

This focused ethnographic study is not easy for the researcher to interrogate with a view to pinpointing areas of limitation, as the researcher was immersed in the study from the outset. However, during the course of this study the researcher highlighted the following limitations and suggests further areas of study:

Limitations during data collection: This being an ethnographic study, it required a prolonged period of study during data collections, thus time remains a limitation to most qualitative researchers due to robust of data collected from the field. The researcher utilized several data collection techniques, such as observations, document analysis, informal and formal interviews and focus group discussions. Within the ten months the researcher was in the field, much of her time especially during the first two months were spent looking for gatekeepers' approval and scheduling of clinic days. However once gate keepers permission was sorted out

the process went on as earlier planned, forcing the researcher to extend the data collection, and to reschedule focus groups discussion meetings. In the future other researchers hoping to do similar studies should plan ahead and allocate extra time for gate keepers' permission. The researcher also experienced limitations in term selecting informants especially at the lower levels of care, due to lack of documentation. This was managed by including the only diabetic clinic in the County situated at level4 health facility in the study, and accessing their group records, and accessing patients during clinic days and their records from the handwritten notebooks.

Language limitations in the community: the researcher being a non-native in the region where data was collected, was a challenge to the researcher, despite being fully oriented to the health care systems, language barriers especially was a challenge in the first instance, but was later handled with a little adjustment to the data collection tools to suit the language level of informants, especially the patients to easily comprehend. The researcher opted not to use the services of interpreters, due to lack of qualified interpreter services in a language diverse community accessing health services in the county. Instead the researcher used the national language, Swahili, with patients/informants who could not use English, and translated the patients' notable words relevant to the study for instance: 'Sukari' or 'Pressure' to denote Diabetes and Hypertension respectively.

Diversity of specialization of health care providers: working with multiple groups of health care providers proved an uphill task for the researcher. The researcher's background being a nurse and working with the general population of health care providers as per the study, proved to be challenging, as others were trained differently and internal power struggles were not easy to accommodate during the study. The researcher opted not to identify herself with any group of health care providers to promote harmony during data collection, which yielded good results and collaboration during the study period as shown in the composition of the focus group discussion meetings. The diversity of health care providers helped to diversify the findings of this study and to accommodate other cadres of health provider out of the usual scope of providers, to include nutritionists, lay health workers and traditional herbal medicine practitioners.

Methodological limitations of ethnographic designs: The researcher experienced a limitation in data analysis especially analysis of ethnographic data to elicit a model. This was however overcome through the guidance of expert supervisors on the use of grounded theory (Strauss and Corbin, 1990) paradigm model for analysis and organization of the model. While using the paradigm model the researcher realized that, ethnographic studies are usually enhanced

through the use of grounded theory to present clinically-based models, to be used to solve clinical dilemma, which needs contextual formulated actions or interventions.

The researcher encountered technological difficulties with the use of Nvivo software, during data analysis for final coding and axial coding. The software purchase period expired after the researcher had started uploading data into it, and it took a longer period for the institution to purchase another one. In consultation with my supervisor, the researcher opted to do manual coding for both open and axial coding, although a lot of time was spent, the codes emerged and the analysis proceeded as previously planned.

Model Validation and Implementation: The researcher had limitations with time to verify the model with other experts and implement the model in clinical settings. This limits this model to desk top which lacks opinions, agreements and disagreements from health providers, experts and other clinical experts. Thus there is need for further validation through implementation of the current model.

6.12 Recommendations

The study recommends that policy makers should obtain the opinions of health care providers, especially on what works for patients in the community settings. Instead of utilizing a team of experts only with no contextual facts, especially in the clinical settings as urban facilities and rural facilities differ greatly.

The study also recommends that the Ministry of Health in the National Government in-collaboration with the county government health systems should endeavour to implement the already existing policy documents, strategies, clinical guidelines and protocol, instead of creating new policies. With special reference to chronic conditions as rural and general and rural public health facilities do not have access to the guidelines and this lowers the quality of care based on evidence-based practices.

Comorbidity of most chronic conditions is a new health challenge in the management of chronic diseases. Adequate resources should be allocated to manage the conditions which could be the downfall of most health care systems failing to meet the health demands for the aging populations. There is a dire need for developing specific policies and clinical guidelines for the management of chronic comorbid conditions such as depression, stress, cancer, heart diseases among others especially in the community and primary care levels.

The issue of centralization in a decentralized health care system continues to be an intervening condition in the daily operations of health systems. The policy makers should

make an earnest move to decide where the health care systems falls as it is currently in Kenya, health care providers and the whole system is fragmented leading to poor service delivery especially to chronically ill patients who need long-term and holistic care approach. The study recommends that there should be a mutual collaboration and partnership between modern medical practitioners and traditional practitioners of herbal medicine, who continue to provide, primary care to the majority of patients with comorbid conditions in the community, as form the first access into the health care system for most patients. This partnership will improve adherence and continuity of care across settings and providers.

6.13 Critical Reflection

Having reached the conclusion of the thesis, this section, the researcher turns to reflect on the personal experiences of the journey of this current study, captured in the memos from the field, and during the process of composing the thesis, confessing my personal feeling, biases and their contribution to the current study. According to Foley (2002), it is a place for reflexivity of the ethnographer and making it known to others.

This section of the thesis describes my own experience as the ethnographer or the etic perspective of the study. It is widely known that ethnographers report on the insider and the outsider perspective. This section will dwell on the researcher's personal experiences as an outsider in Nandi County, and on being a non-native researcher in a community known to be culturally sensitive and diverse. Going native also posed a methodological challenge, especially when collecting data from fellow clinicians and the views of patients and their behaviours could only be seen from the clinician perspectives as an outsider. According to Hammersley and Atkinson (2007) the researcher being an outsider may influence her views on clues which are regarded as natural behaviours or actions among the participants, thus fail to understand the culture in the community or group. While on the other side the insider ethnographer may 'over-rapport' with the participants and fail to recognize the natural occurring practices or clues.

Critical reflexivity of myself as an ethnographer: During the process of developing the proposal, I considered several methods, including the classical grounded theory, action research, classical ethnography, before settling for focused ethnography. It was not easy to settle for ethnography, but with the help of my supervisors and other experts in the department, I finally settled on focused ethnography. In ethnography just like other

qualitative studies, it is necessary to understand the social reality of people as it is constructed from a multi-dimensional perspective or framework (Creswell, 2012).

In this study I focused on the lived experiences and practices of people with comorbid chronic conditions with the focus on diabetes and hypertension. The cultural experiences of health care providers responsible for health care service provision to patients with comorbid conditions, with the aim of extrapolating the socio-cultural factors which affect the management of chronic comorbid conditions in primary health care. Further I explored culture of the health care system at the county level and how it influences the management of chronic comorbid conditions at the community level and household.

Like many other ethnographers, in this study the researcher is the primary tool for data collection. I heavily relied on the participant observation method, both informally and in formal interviews in health facilities, homes, offices and social gathering such as market places, where people with chronic comorbid diabetes and hypertension were bound to be found or cared for to elicit contextual information about their management including self-management. This gave a contextual understanding of how individuals and health care providers differ on the management strategies of comorbid conditions. According to Speziale et al. (2011) it is vitally important for the researcher to be immersed in settings of the culture under study to allow understanding of the context of the phenomenon under investigation.

Being the main instrument of data collection (Fetterman, 2010), it became important to be considerate of the interpersonal skills and personal experiences, which form an important aspect of the fieldwork. During my emersion in the field for ten months (July 2014-May 2015), I kept a diary; a record of my feelings, thoughts and personal experiences as they occurred to me during the research period, which forms the basis of this reflexive report.

Gaining Entry to the Community: Gaining entry to the community and the accessing the permission from the gatekeepers, proved not to be as easy as I had earlier thought it would be. Having been away during the transition period from central to devolved governance, things had changed and so the research protocols had changed and required an orientation period on how to access permission to conduct research studies in any of the public health facilities in Kenya. To my surprise I found myself being regarded as a foreign student because of my affiliation to the University of KwaZulu Natal. I had to explain and provide proof of my citizenship and academic affiliation in Kenya, before getting a permit to conduct research in Kenya. This has been attributed to fear of unintended harm to the study subjects and lack of any benefit to the host county as the results are never disseminated to the

participants. Burgess (2002) points out that gaining access to the field requires familiarity and the strangeness of the culture to allow the deep understanding of the phenomenon of study.

I used my local affiliation to the only University in the County to access the health care personnel, who were familiar with the health care services and the routine culture both in the community and in the health facilities. However this had to be a long wait for the clearance from the national government and county government, procedures I was not oriented to before. I had to make several trips to National Government offices for the permit, with excuses of the Director or the Secretary being away, out for lunch or in a meeting. It was frustrating and time-consuming, but protocols had to be followed. At the county level, the process of accessing entry was smoother than the national level clearance. The health facilities access was more welcoming as compared to what I had experienced at the national offices; this was mainly attributed to most of them being familiar with me having worked in the county for many years with students in the community. Despite that the health-care providers were welcoming in person; their responses to communications by email and telephone were very frustrating, as no responses were forthcoming from them, despite being sent early.

Access to patient's homes after identification was one area which proved to be interesting, as most patients and care-givers indicated enthusiasm to receive me in their homes, sharing the information about their conditions, with no barriers of me being a stranger and not a native of the community. I had the impression from patients that, they long to have home-based care and visits from health care providers within the context where they live and practice self-management.

Language barrier and cultural diversity: Despite the fact that I have lived in this community for more than ten years, I still remain a stranger to the local Nandi language, even though that I have learnt the meaning of nonverbal communication cues, which shape the behaviour and certain practices in the community. I grew up in a different community where sick roles are interpreted differently and caring responsibilities are equally shared among the female and male genders. The community of study has several ethnic groups residing in it, thus it was difficult to adhere to one local language as the medium of communication, and thus I considered the use of Swahili as the national language to collect data from patient informants. Studies have shown that use of a translator alters the meaning of the informant's original words (Temple and Young, 2004, Squires, 2009). Recommendation to use a qualified language expert (Edwards, 1998) posed challenges, on quality of data to be collected, I then

opted to use the national language, which all the informants were familiar with and could not alter the informants meaning.

Role separation in the field: During this study I found myself having to think and make clear distinctions of my roles as a healthcare provider, researcher and community nurse educator. To patients I was a health provider, who was interested in their comorbid conditions, willing to go an extra mile to visit them individually at home and spend some time with them and educates them on how to manage their comorbid conditions. On the other hand to the health care provider, I was one of them, expected to lend a hand when they had a shortage or needed help with the patients, or others looked at me as the researcher who needed facts to solve their clinical issues. Research studies have also identified the challenge of role separation as being critical in ethnographic studies for practitioner-researcher (Ledger, 2010, Allen, 2004, Marshall et al., 2010). According to Ledger (2010) she had to deal with multiple identities, to maintain the credibility of the study, for Marshall et al. (2010), dual identity opened ways for gaining access and negatively inhibited establishment of trust between researcher and nurses. In Allen (2004), the inability to fit into the culture was a challenge. In my case, it became necessary for me to define my roles and constantly reminded health care providers of my role as a researcher and not a practitioner. Although I would participate in minor cases as blood pressure and weight monitoring for some patients, to break the long circles of observation, I did not take or handle any critical decision-making activity.

This being a focused ethnographic study, to define my roles, I scheduled my visits to health facilities as episodic to allow the role of the practitioner is diminished and not to be counted as a staff member, but a researcher with distinct time of operation. On the part of the patients, I did not offer any screening services at home or patient teaching, but responded to their questions and encouraged them to visit the health facilities. It reached a point in time, when I considered taking my glucometers and blood pressure machines with me for home visits, but I dropped the idea, as I was going to disrupt patient's routines and confuse my roles as a researcher and a practitioner. It happens that in field work, practitioner experience can face one with an ethical dilemma when, for example, observable practices have been observed to be unsafe practice, leading to a layer of complexities in practice (Marshall et al., 2010, Ledger, 2010). To the best of my knowledge, I tried to remain a researcher, with health providers, but to patients I could not resist to respond to their inquiries with no practical interventions or promises made to them.

Demarcating boundaries during fieldwork: During ethnographic studies, knowing when and where to exercise your expertise and authority can be difficult. In this study I had to learn to

be flexible to deal with health care providers, especially when I felt, I could not fit into their routines and programmes. I had also to learn to be responsive to the needs of my informants, administrators and colleagues and at times it required that I cross boundaries or remain focused in the same position for the sake of the study.

Delineating strategy as suggested in Ledger (2010), sounded easy to solve multiple or double identity, but proved hard to be practiced in the community setting, but was more easily adapted in hospital settings, where you could avoid patients or limit time. I choose to abide by the suggestion given by (Atkinson and Hammersley, 1994), which involved exchanging professional expertise to access research information. I remained focused to discuss and demonstrate to patients what they needed to know about their conditions, as a way of gaining confidence from them and accessing the information I needed for this study. This helped me to be comfortable with the double roles of being a researcher and practitioner regarded expert.

Finally I had to let go of the bond I had developed with patients and health providers, the second visit in informants homes, formed the day of letting them know that I will be leaving the community to complete my studies and get a solution to the challenges they were experiencing. It was sad for the support group in one of the health facility that I will not form part of them after spending six months with them. However I prepared them for my departure and all wished me well and looked forward to working with me in the community. The health care providers also had anticipated my departure at some point, but they felt that the stranger and the insider role I played during my study, will be missed both in their respective facilities. Finally all the participants were prepared for me to terminate the study, and they wait for the final report emerging from the ethnographic study.

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APPENDIXES

Appendix 1: Interview guide health care workers/professionals

Thank you for giving me this chance to interview you.

a. Introduction of self and topic

General background information

Please describe your position here at the health facility (level/name of facility).

How many years have you worked here in this facility?

How many years of experience do you have as (occupation)? (Probe into specific roles they play within the facility)

Understanding of the conditions

What is your understanding of comorbid diabetes and hypertension conditions?(Signs and symptoms)

How often do you see patients with chronic comorbid conditions at the facility?

Could you describe the process of managing diabetes and hypertension in the health facilities/clinic?

b. Clinical culture and practices of health care workers

- a. Kindly describe routine services you offer to the patients within the facility with both diabetes and hypertension? (referral, follow-up, patient teaching, documentation, communication - the process of management)

How do you ensure a patient receives proper treatment and follow-up care? (Who needs to be involved? At what level? What degree of responsibility has to be assumed? And to whom should this be, reported?)

C. Experiences during management

What has your experience been like when providing care to these patients?

Are there any special provisions made to follow-up high risk patients post discharge?

Patients' characteristics during care

How do you assess the level of knowledge of patients on their conditions?

From your view, what factors influence the adherence to a treatment plan and follow-up care for patients with diabetes and hypertension?

In your view, what are the available alternative means of care patients use when diagnosed/started on treatment (mention, list and reason for the use)

Information systems supported

d. Briefly describe the process of communication about diabetes and hypertension care within the health care system:

Do you have facility telephone lines or mobile phones (mobile)?

Who is responsible for the communication between the health facilities on patients' follow-up care; referral system in place)

Challenges and meaning attached to their work of care provision to diabetic and hypertensive patients (How do you go about these challenges in your work?)

Appendix 2: Interview guide for patients with comorbid diabetes and hypertension

Thank you for agreeing to talk to me today.

How are you doing today? How are you feeling today?

I would like to talk to you about your health in general, please feel free to discuss with me and how you feel about your current health status.

General information and profile demographic data

- a. When did you come here? (hospital, health centre, wards)
 - b. How did you come to the hospital or clinic/health facility? (list the mode)
 - c. How long have you been having this problem? (years---months)
- 1) Understanding and beliefs attached to the condition
 - a. Please could you tell me what you understand about the health problem you are experiencing?(signs and symptoms, how did you know)
 - b. How did you know you had the conditions?
 - c. What happened once you knew you had the problem?
 - d. What do you believe caused the conditions you have now? How can the conditions be treated /prevented/controlled?
 - 2) Meanings attached to the problems
 - a. Do you have another way you can describe your condition?
 - b. What does it mean to you individually to have two conditions?
 - c. What does it mean to you and your family members?
 - 3) Experiences with the condition
 - a. Kindly describe your experiences living with two conditions together?
 - b. What has been the most challenging event in your life living with these conditions? (disease, medicine, support, finances, please explain)
 - c. How have you handled the challenges in your care now and before?
 - d. What do you do to manage your condition at home, differently from what you are told at the hospital? (***Any other methods you use to manage the conditions, please explain***).
 - e. Is there anything important about you, care, or medication you would want to know or discuss with me?

Appendix 3: Observation guides/checklists diabetic clinic

Components Of Chronic Care Management Primary Health Care	Frequency / number of items / remarks	YES	NO
Health system and health care organisation Budget and planning for chronic care management Administration support for the chronic care within the hospital and outside			
Clinical information system/referral system Referral forms for (forward and Back Communication prior Patient records Hospital records recall system for patients			
Service delivery design Staff involved in the care of patients Nurses Clinical officers Medical practitioners/public/private Community health workers Traditional herbal practitioners Others Years of service Specialization/ratio of health workers			
Decision support system Clinical guidelines Manuals for health care workers Essential drug lists available and used Laboratory services available High risk prediction lists			

Self-management support Patient teaching materials, health education, charts, support peer group, nutritional services, demonstration, care planning			
Community / resources and policy Home visits, outreach programmes Community based health promotion projects Household teaching and screening			

Appendix 4: Observation guide for health centre

Components for the chronic disease management at primary health care	Yes/available	Not available	Comments
DIAGNOSTIC EQUIPMENT: Thermometer Stethoscope Blood pressure measurement devices Measurement tape Weighing machine Glucometers machine			
LABORATORY SERVICES Glucose levels Lipids levels Blood glucose test strips Urine protein test strips Urine ketones test strips			
ESSENTIAL DRUGS FOR CHRONIC CONDITIONS (Ministry of health drugs list in Kenya)			
REFERRAL SYSTEM/INFORMATION SYSTEM Patient records/register Follow-up care Notes for referral/forms/notes			

Communication means- paper/telephone/ notes/forms			
HEALTH CARE WORKERS/ SPECIALISATION Ratios how many available/standard Nurses Clinical offers Medical doctors Nutritionist Private practitioners Public health officers Community health workers or extension officers			
Community resources and policies Number of community units in place/ resources available for use Personnel/support group/materials Household resources/access to health facilities/materials and information			
Disease prevention programmes/supervision from district hospital Community participation Mass screening Home based care services Alternative medicine available and used			

Appendix 5: Focus group guide with health care workers

Introduction of the researcher and participants

Presentation of rules and guidelines for the group discussion

Presentation of the research and case findings from the previous data collected:

The following topics will be discussed:

General experiences of the group members on:

1. Experiences in managing of comorbid hypertension and diabetes
2. Patient teaching/patient education materials
3. Adherence to treatment by patients
4. Clinical manuals/guidelines utilization
5. Challenges of providing care to patients with comorbid hypertension conditions
6. Referral systems- two way pathway
7. Self-management and alternative treatment methods/culture sensitive care
8. Follow-up care for patients with comorbid conditions

Appendix 6: Document analysis guide

During this study the following documents will be read, reviewed and analysed on how they apply to management of chronic conditions in primary health care.

1. Health policy on management of chronic comorbid conditions.
2. Clinical protocols /guidelines on chronic comorbid management at each level of care.
3. Procedure manuals and evidence based guidelines for health care providers.
4. Minutes for meetings held on planning on management of chronic conditions/mission Statements for facility/community linked programmes.
5. Registers and recall system for patients with chronic conditions.
6. Regional information on health (demographic data, socio-economic data, statistics).
7. Health promotion materials/plans.

Appendix 7: Information sheet for health care workers/providers

INFORMATION SHEET FOR PARTICIPANTS IN THE STUDY

Health care providers

Greeting Colleagues

My name is Immaculate Nyaseba Marwa, and I am a PhD student from the University of KwaZulu-Natal (Community Health Nursing), School of Nursing and Public Health Sciences, College of Health Sciences, Howard Campus, Private Bag X54001, Durban, 4001, South Africa.

Mobile Numbers: +254-721556016, or +27785572462; Email: nyasebamarwa@yahoo.com or nyasebamarwa@gmail.com

You are being invited to participate in a study which involves research on the management of chronic comorbid conditions (diabetes mellitus type 2 and hypertension) among adults within primary health care settings in Nandi County. I am conducting a study to be able to understand how to improve continuity of care and improve chronic care services within the County and reduce high rates of admission in the County. The findings from this study will be used to develop a context-informed model, under nurse coordination and community health workers and households, to ensure continuity of care that is affordable and accessible.

The study is expected to enrol six health facilities which include Kapsabet District Hospital, health centres or level 2 and 3 health facilities and community units within Nandi County. Health facilities accessible to the researcher will be included and those under the public health services will be included in the study. A checklist will be used to collect data at the facility level, concerning available tools and equipment required to provide care to patients with chronic conditions like diabetes and hypertension. The tool contains five major areas of concern to the management of chronic conditions in health care organisations. Health care professionals responsible for diabetic care will be invited for an interview and focus group discussion at a later date during the study process. Documents used for references on the management of diabetes and hypertension within the facility will be reviewed for information, departmental meetings concerning care provision, and patients' statistics within the health facility will be included in this study.

During this study, the researcher may ask you some questions, as a group or as an individual, based on your experiences, practices and beliefs, towards meeting the objectives of this study. Individual interviews will last between 30 and 60 minutes, and informal conversation may take less than five minutes of your time. Further you may be invited to attend a forum group discussion in the course of this study; further information on time, venue will be communicated to you in due course as the study progresses. During this study I will be within health facilities and I will take part in some activities within the health care services. I will be observing some routine activities within the health care premises on how chronic care services are implemented. My area of interest is patient treatment records, follow-up care, health promotion material, health education, and adherence to treatment plans and drug regimen as well as patient provider interactions.

The following are terms and conditions for participation in this study:

1. This study is being conducted by the researcher as a personal project and as a requirement for the completion of the doctoral degree;
2. Participation in this study is voluntary for all participants;
3. The researcher will destroy all information collected during this study as soon as it is entered into the computer system for analysis and interpretation;
4. Names of participating health facilities will not be disclosed during the writing of the report, but codes will be used;
5. Names of all participants in this study will not be revealed to another party not involved in this study;
6. Refusal to participate in this study will not have any implication on you, your employment or your care;
7. Participation in this study can be withdrawn at will at any stage of the study;

8. No reward will be given to any participant or health facility, but feedback will be given to relevant bodies like the administration of health facilities; individual feedback will also be given to individual participants at the end of the study;
9. During this study you will not be subjected to any health risk or discomfort caused by your participation in the study.

This study has been ethically reviewed and approved by the UKZN Biomedical Research Ethics Committee and University of Eastern Africa Baraton, in Kenya (approval numbers NUMBERS MISSING, _____-_____).

In the event of any problems or concerns/questions, you may contact me on the above given contacts or my supervisors, or the UKZN Biomedical Research Ethics Committee, contact details as follows:

Supervisor:

Prof. Mtshali, N.G Email address

Mtshalun3@ukzn.ac.za

Or

Prof. Mchunu G., Email address

Mchunug@ukzn.ac.za

Or

Biomedical Research Ethics

Administration

Research Office, Westville Campus

Govan Mbeki Building

Private Bag X 54001

Durban

4000

KwaZulu-Natal, South Africa

Tel: 27 31 2604769 - Fax: 27 31 2604609

Email: BREC@ukzn.ac.za

Appendix 8: Information sheet for patients/clients

Greeting Informants

My name is Immaculate Nyaseba Marwa, and I am a PhD student from the University of KwaZulu-Natal (Community Health Nursing), School of Nursing and Public Health Sciences, College of Health Sciences, Howard Campus, Private Bag X54001, Durban, 4001, South Africa.

Mobile Numbers: +254-721556016, or +27785572462; Email: nyasebamarwa@yahoo.com or nyasebamarwa@gmail.com

You are being invited to participate in a study which involves management of chronic comorbid diabetes and hypertension at primary health care settings in Nandi County. The study seeks to understand the lived experiences, beliefs and practices of people with comorbid conditions and you happen to be one of them. The findings of this study will assist the policy makers and health care workers to improve services towards servicing you better.

During this study, I will be seeking to talk to you about your personal lived experiences, concerning living with diabetes and hypertension at the same time. What you do to ensure you receive care and challenges you face with conditions. You will be asked to take part in face-to-face interviews with me at the place you feel comfortable to discuss your experiences, beliefs and practices. At some point I may visit your home if you are comfortable with that. The interview will take up 30minutes to one hour of your time. I will also be taking notes while we discuss your experiences, recording our conversations and observing how you go about your own care at home or at the health facilities.

The following are terms and conditions for participation in this study:

1. This study is being conducted by the researcher as a personal project and as a requirement for the completion of the doctoral degree in the School of Nursing and Public Health, College of Health Sciences, University of KwaZulu Natal.;
2. Participation in this study is voluntary for all participants;
3. The researcher will destroy all information collected during this study as soon as it is entered into the computer system for analysis and interpretation;
4. Names of participating health facilities will not be disclosed during the writing of the report, but codes will be used;
5. Names of all participants in this study will not be revealed to another party not involved in this study;
6. Refusal to participate in this study will not have any implication on you, your employment or your care;
7. Participation in this study can be withdrawn at will at any stage of the study;
8. No reward will be given to any participant or health facility, but feedback will be given to relevant bodies like the administration of health facilities; individual feedback will also be given to individual participants at the end of the study;
9. During this study you will not be subjected to any health risk or discomfort caused by your participation in the study.

This study has been ethically reviewed and approved by the UKZN Biomedical Research Ethics Committee and University of Eastern Africa Baraton, in Kenya (approval numbers _NUMBERS MISSING____-_____).

In the event of any problems or concerns/questions, you may contact me on the above given contacts or my supervisors, or the UKZN Biomedical Research Ethics Committee, contact details as follows:

Prof. Mtshali,N.G
Email address Mtshalun3@ukzn.ac.za
Or
Prof. Mchunu G.,
Email address Mchunug@ukzn.ac.za
Or
Biomedical Research Ethics
Administration

Research Office, Westville Campus
Govan Mbeki Building
Private Bag X 54001
Durban
4000
KwaZulu-Natal, SOUTH AFRICA
Tel: 27 31 2604769 - Fax: 27 31 2604609
Email: BREC@ukzn.ac.za

Appendix 9: Consent Form

I.....have been informed about the study entitled: A focused ethnographic study on the management of chronic comorbid diabetes and hypertension conditions among adults in selected primary health care settings in Kenya

by.....(Researcher’s name or research assistant).

I understand the purpose of the study and the procedures to be followed during the study.

I have been given the chance to respond to questions about the study and have been given responses accordingly.

I have also been informed about the available treatment if injury occurs during my participation in this study. Further I have been given the opportunity to ask any further questions about my rights as a participant in this study and details of the contact numbers of the researcher, and other authorities have been provided for clarification and contact if the need arises.

Supervisors:

Prof. Mtshali

Email: Mtshalin3@ukzn.ac.za

Prof. Mchunu

Email: mchunug@ukzn.ac.za

Or

Research Office, Westville Campus

Govan Mbeki Building

Private Bag X 54001

Durban

4000

KwaZulu-Natal, SOUTH AFRICA

Tel: 27 31 2604769 - Fax: 27 31 2604609

Email: BREC@ukzn.ac.za

Biomedical Research Ethics
Administration

--

Signature of participants

Date

Appendix 10: Translated consent form in Swahili

Mimi.....Nimefahamishwa kuhusu utafitihaki:umakiniEthnographicutafiti juu ya matibabu ya magonjwa ya kisukarinashinikizo la damumiongoni mwa watu wazimakatika baadhi yamsingiya huduma ya afyakatikaKenya.....(jina laMtafiti'auMsaidiziUtafiti).

Nina elewamadhumuni ya utafitinataratibu za kufuatwawakati wa utafiti. Nimepewa nafasi ya kuuliza maswali kuhusuutafitina nimepewa majibuipasavyo.

Pia ninaelewa kuwamatibabu yatatolewa kama nikuumia wakati waushiriki wangu katika utafiti huu.Zaidi nimepewa nafasi ya kuuliza maswaliyoyote zaidi kuhusuhaki zangukamamshirikikatikautafiti huunamaelezoya mawasiliano yamtafitina mamlaka zinginezimetolewakwa ajili ya ufafanuzinamawasilianoikiwahaja itatokea.

Wasimamizi wa Utafiti

Prof. Mtshali
Email: Mtshalin3@ukzn.ac.za

KwaZulu-Natal, SOUTH AFRICA
Tel: 27 31 2604769 - Fax: 27 31 2604609
Email: BREC@ukzn.ac.za

Prof. Mchunu
Email: mchunug@ukzn.ac.za

Or

Biomedical Research Ethics
Administration
Research Office, Westville Campus
Govan Mbeki Building
Private Bag X 54001
Durban
4000

Sahihi ya
Mshirika.....
.....
Terehe.....
.....

Appendix 11: Permission to Conduct Research

Director of Health,
Nandi County-Kenya,
P.O. BOX, 34,
Kapsabet- Kenya

Dear Sir/Madam,

RE: Application to Conduct a Research

I hereby seek permission to conduct a research study within the health facilities within the county health care facilities. I am undertaking PhD studies at the University of KwaZulu-Natal, and part of the requirement is to conduct a research study to contribute to knowledge and improve the health of the community.

The title of my research is *A focused ethnographic study on the management of chronic comorbid diabetes and hypertension chronic conditions among adults in selected primary health care settings in Kenya.*

The study seeks to understand how care is given to patients with comorbid diabetes and hypertension within primary health care settings. The study aims to collect data to determine the current management systems of care and how continuity of care is maintained between the three levels of care or between health service providers within the country. The results of this study will be used for further planning and development of a context informed model of chronic care under the coordination of nurses in collaboration with community health workers. The study will involve public health sector, health care workers from level 3 facilities, diabetic clinics and patients receiving care from the settings, and community health workers within the county.

The research proposal has been submitted to the ethics committee of the University of KwaZulu-Natal in South Africa for approval and University of Eastern Africa Baraton in Kenya. Hereon attached are the letter of approval from research ethics committees, the informed consent, data collection tools and information sheet.

Your consideration will be highly appreciated.

Yours faithfully,

Immaculate N Marwa

Contact: email: nyasebamarwa@yahoo.com or 212558168@stu.ukzn.ac.za

Mobile contacts: +254-721556016 or +27-785572462

Appendix 12: Permission to conduct research

Medical Superintendent,
Kapsabet District Hospital,
P.O. Box 5-30300,
Kapsabet-Kenya.

Dear Sir/Madam,

RE: Application to Conduct Research

I hereby seek permission to conduct a research study in Kapsabet District Hospital. I am currently a student at the University of KwaZulu-Natal, School of Nursing undertaking PhD in Community Health Nursing. Part of the requirement is to conduct a study towards contributing to new knowledge and improving nursing practice and community health services. The study seeks to understand the current practices in management for patients with comorbid diabetes type 2 and hypertension, who have been discharged home, and how continuity is achieved during the interface of going home from hospital. Further the study will seek to find out patients' self-management practices, beliefs and experiences during the course of care.

The title of the research is *A focused ethnographic study on the management of chronic comorbid diabetes and hypertension conditions among adults in selected primary health care settings in Kenya.*

The research aims to interact with patients with both diabetes and hypertension, health care workers concerned with their care, the discharge process back home and follow-up care. This will require me to participate in some activities within the hospital from time to time for the sake of collecting data towards understanding how care is offered, patient follow-up is planned and identifying the gaps of service delivery between the hospital and the health care centres or community units. I intend to start data collection by September, 2014.

The research proposal has been submitted for ethical clearance at the University of KwaZulu-Natal in South Africa, and University of Eastern Africa, Baraton for clearance on behalf of the Ministry of Health in Kenya. Attached is a copy of the summary of the research proposal, information sheet for the participants and consent form for your perusal.

I look forward to hearing from you soon for further action.

Your consideration will be highly appreciated.

Yours Faithfully,

Immaculate N. Marwa

Contact s: email:nyasebamarwa@yahoo.com or 212558168@stu.ukzn.ac.za

Mobile contacts: +254-721556016 or +27-785572462

Appendix 13: Application to conduct research

The In-Charge,

.....

Health center

Dear Sir/madam

RE: Application to Conduct Research

I hereby seek permission to conduct a research study at the Kapsabet District Hospital. I am currently a student at the University of KwaZulu-Natal, School of Nursing undertaking a PhD in Community Health Nursing. Part of the requirement is to conduct a study towards contributing to new knowledge and improving nursing practice and community health.

The title of the research is *A focused ethnographic study on the management of chronic comorbid chronic diabetes and hypertension conditions among adults in selected primary health care settings in Kenya.*

The main aim of visiting the health facility is to study interactions with the nurses, analyse the documents, referral pathways of diabetic patients with hypertension as a comorbid condition and the current practices and experiences of nurses working in this level.

The research proposal has been submitted to the research and ethics committee at the University of KwaZulu-Natal and the Ministry of Health research and ethical committee for approval. Enclosed is the letter of approval, informed consent, and information sheet for your perusal.

Your consideration will be highly appreciated.

Yours Faithfully,

Immaculate N. Marwa

Contact s: email:nyasebamarwa@yahoo.com or 212558168@stu.ukzn.ac.za

Mobile contacts: +254-721556016 or +27-785572462

Appendix 14: Invitation to Participate in a Focus Group Discussion

Dear Colleagues

You are hereby invited to attend a focus group discussion as a follow-up to the interviews we have held within the health facilities.

The following areas will be discussed:

1. Patient teaching/patient education materials.
2. Adherence to treatment by patients.
3. Clinical manuals/guidelines utilisation.
4. Challenges of providing care to patients with comorbid hypertension conditions.
5. Referral systems- two way pathway.

Venue: District hospital conference hall

Time:

Date:

See you there, keep time!!!

For any inquiry please do not hesitate to contact me on:

Nyasebamarwa@yahoo.com Or 212558168@stu.ukzn.ac.za

Mobile numbers 254-721556016

TAARIFA / Maelezo kwa washiriki (wagonjwa)

Salamu kwa jumla,

Kwa majina mimi ni Immaculate Nyaseba Marwa, mwanafunzi wa shahada ya juu(PhD) kutoka Chuo Kikuu cha KwaZulu-Natal (jamiiAfya Nursing), Shuleya Nursing na Public Sayansi ya Afya, Chuo cha Sayansi ya Afya, Howard Campus, Private Bag X54001, Durban 400 South Africa.

Simu ya Mkono: +254-721,556,016, au +27-785,572,462; Barua pepe: nyasebamarwa@yahoo.com au nyasebamarwa@gmail.com.

Umealikuwa kushiriki katika utafiti ambao unahusisha usimamizi au matibabu ya muda mrefu ya magonjwa ya kisukari na shinikizo la damu katika mazingira ya huduma za afya ya msingi katika Nandi County. Utafiti Unakusudia kuelewa uzoefu, imani na matendo ya watu na hali ya kisukari na shinikizo la damu kwa mgonjwa mmoja kwa pamoja. Matokeo ya utafiti huu utasaidia watunga sera na wafanyakazi wa huduma za afya kuboresha huduma na kukuhudumia bora.

Wakati wa utafiti huu, Nitahitajika kuzungumza na wewe juu ya hali yako binafsi uzoefu wako, kuhusu unavyoishi na ugonjwa wa kisukari na shinikizo la damu kwa wakati mmoja. Wajibu unaoteleza ili kuhakikisha unapata huduma ya matibabu yako, changamoto unazozipata. Pia nitakuuliza kushiriki katika mazungumzo/mahojiano bayana au uso kwa uso nami, nitakuuliza maswli kuhusu magonjwa ya kisukari and shinikizo la damu, matibabu, huduma ya matibabu. Baadhi ya utafiti utanibidi nikutembelee kwako nyumbani, ikiwa utanikubalia ili kusudi uwe na starehe wakati wa mahojiano na mimi. Mahojiano ya tadumu muda wa dakika 30 hadi saa moja ya muda wako. Wakati wa mahojiano yetu nitakunuu kutumia kinas sauti na hapo hapo nitaandika maelezo kwa ufupi kuhusu maozoea yako, tabia and huduma unazotumia kwa ajili ya matibabu ya magojwa ya kisukari na shinikizo la damu.

Zifuatazo ni sheria na masharti kwa ajili ya kushiriki katika utafiti huu

1. Utafiti huu unafanyika na mtafiti kama mradi binafsi na kama mahitaji kwa ajili ya kukamilisha shahada ya falsafa;
2. Kushiriki katika utafiti huu ni kwa hiari ya washiriki wote sio kwa lazima;
3. Mtafiti ataharibu taarifa zote zilizokusanywa wakati wa utafiti huu haraka baada ya kizinakilikatika mfumo wa kompyuta kwa ajili ya uchambuzi na tafsiri,
4. Majina ya vituo vya afya ambavyo vimeshishiriki hayataatumika wakati wa uandishi waripoti, lakini herufi zingine zitatumika badala ya majina kamili.
5. Majina ya washiriki wote katika utafiti huu hayatawekwa wazi kwa watu wengine wasio naUshirikakatika utafiti huu,
6. Kukataakushirikikatika utafiti huunikwahiyariyakokukataakushirikihakutaadhiri kwanamaanayoyote, ajirayako au hudumayamatibabuyako.
7. Kushiriki katika utafiti huu au kikatisha kushiriki in kwa mapenzi and hiyari yako mwenyewe, unawezakuondoka kwa hiyari wakati wowote wa utafiti huu;
8. Hakuna malipo yoyote yatatolewa kwa mshiriki au kituo cha afya, lakini maoni

yatatolewakwa usimamizi wa vituo vya afya, maoni yatatolewatolewa kwa washiriki mwishoni mwa utafiti;

9. Wakati wa utafiti huu hautakumabana na hatari yoyote ya afya au usumbufu unaosababishwa na ushiriki wako katika utafiti.

Utafiti huu umechungunzwa kimaadili upya na kupitishwa na Chuo Kikuu cha KwaZulu –Nata kitengo cha utafiti wa Kamati ya Maadili na Chuo Kikuu cha Afrika Mashariki Baraton, Kenya. Kwa ajili ya tukio la matatizo yoyote au wasiwasi / maswali unaweza kuwasiliana na mimi kupitia njia za mawasiliano zilizo orodhedheswa hapo juu au wasimamizi wangu wa utafiti au UKZN matibabu Utafiti wa Kamati ya Maadili, maelezo ya mawasiliano kama ifuatavyo:

Wasimamizi wa utafiti

Prof. Mtshali,N.G Email address Mtshalun3@ukzn.ac.za

Au

Prof. Mchunu G., Email address Mchunug@ukzn.ac.za

Au

biomedical Research Ethics Administration

Research Office, Westville Campus

Govan Mbeki Building

Private Bag X 54001

Durban

4000

KwaZulu-Natal, South Africa

Tel: 27 31 2604769 - Fax: 27 31 2604609

Email: [BREC@ukzn.ac.za](mailto: BREC@ukzn.ac.za)

Appendix 16: Ethical Clearance from Kenya



NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY AND INNOVATION

Telephone: +254-20-2213471,
2241349, 310571, 2219420
Fax: +254-20-318245, 318249
Email: secretary@nacosti.go.ke
Website: www.nacosti.go.ke
When replying please quote

9th Floor, Utalii House
Uhuru Highway
P.O. Box 30623-00100
NAIROBI-KENYA

Ref: No.

Date:

24th September, 2014

NACOSTI/P/14/4551/3239

Immaculate Nyaseba Marwa
University of Kwa Zulu-Natal
SOUTH AFRICA.

RE: RESEARCH AUTHORIZATION

Following your application for authority to carry out research on "*A focused ethnographic study on management of chronic comorbid (diabetes and hypertension) conditions among adults in selected primary health care settings in Kenya,*" I am pleased to inform you that you have been authorized to undertake research in **Nandi County** for a period ending **31st August, 2017.**

You are advised to report to **the County Commissioner, the County Director of Education and the County Coordinator of Health, Nandi County** before embarking on the research project.

On completion of the research, you are expected to submit **two hard copies and one soft copy in pdf** of the research report/thesis to our office.


DR. S. K LANGAT, OGW
FOR: SECRETARY/CEO

Copy to:

The County Commissioner
The County Director of Education
The County Coordinator of Health
Nandi County.

National Commission for Science, Technology and Innovation is ISO 9001:2008 Certified

Appendix 17: Ethical Clearance from UKZN



09 October 2014

Mrs Immaculate Marwa
P.O Box 2500-30100
Eldoret, Kenya
212558168@stu.ukzn.ac.za

Dear Mrs Marwa

PROTOCOL: A focused ethnographic study on management of chronic comorbid (Diabetes and Hypertension) conditions among adults in selected primary health care settings in Kenya: Degree Purposes (PhD). BREC REF: BE321/14.

EXPEDITED APPLICATION

A sub-committee of the Biomedical Research Ethics Committee has considered and noted your application received on 20 June 2014.

The study was provisionally approved pending appropriate responses to queries raised. Your responses received on 02 October 2014 to queries raised on 17 September 2014 have been noted by a sub-committee of the Biomedical Research Ethics Committee. The conditions have now been met and the study is given full ethics approval.

This approval is valid for one year from **09 October 2014**. To ensure uninterrupted approval of this study beyond the approval expiry date, an application for recertification must be submitted to BREC on the appropriate BREC form 2-3 months before the expiry date.

Any amendments to this study, unless urgently required to ensure safety of participants, must be approved by BREC prior to implementation.

Your acceptance of this approval denotes your compliance with South African National Research Ethics Guidelines (2004), South African National Good Clinical Practice Guidelines (2006) (if applicable) and with UKZN BREC ethics requirements as contained in the UKZN BREC Terms of Reference and Standard Operating Procedures, all available at <http://research.ukzn.ac.za/Research-Ethics/Biomedical-Research-Ethics.aspx>.

BREC is registered with the South African National Health Research Ethics Council (REC-290408-009). BREC has US Office for Human Research Protections (OHRP) Federal-wide Assurance (FWA 678).

The sub-committee's decision will be **RATIFIED** by a full Committee at its meeting taking place on **11 November 2014**.

We wish you well with this study. We would appreciate receiving copies of all publications arising out of this study.

Yours sincerely

Professor D.R Wassenaar
Chair: Biomedical Research Ethics Committee

Biomedical Research Ethics Committee

Professor D R Wassenaar (Chair)

Westville Campus, Govan Mbeki Building

Postal Address: Private Bag X54001, Durban 4000

Telephone: +27 (0) 31 260 2486 Facsimile: +27 (0) 31 260 4609 Email: brec@ukzn.ac.za

Website: <http://research.ukzn.ac.za/Research-Ethics/Biomedical-Research-Ethics.aspx>

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Appendix 18: Ethical clearance from affiliate university in Kenya



**OFFICE OF THE DIRECTOR OF GRADUATE STUDIES
AND RESEARCH**

UNIVERSITY OF EASTERN AFRICA, BARATON

P. O. Box 2500-30100, Eldoret, Kenya, East Africa

August 13, 2014

Immaculate Nyaseba Marwa
University of Kwa-Zulu Natal
College of Health Sciences
School of Nursing and Public Health
Department of Nursing
Private Bag, 4041 Durban,
South Africa

Dear Immaculate,

Re: ETHICS CLEARANCE FOR THESIS PROPOSAL (REC: UEAB/08/07/2014)

Your research proposal entitled *A Focused Ethnographic Study On Management Of Chronic Comorbid (Diabetes and Hypertension) Conditions Among Adults In Selected Primary Health Care Settings In Kenya* was discussed by the Research Ethics Committee (REC) of the University and your request for ethics clearance was granted approval.

This approval is for one year effective 31 July 2014 until 30 June 2015. For any extension beyond this time period, you will need to apply to this committee one month prior to expiry date.

Note that you will need a clearance from the study site before you start gathering your data.

We wish you success in your research.

Sincerely yours,

Handwritten signature of Jackie K. Obey in blue ink.

Ms. Jackie K. Obey (MPhil)
Chairperson, Research Ethics Committee



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CHARTERED 1991

Appendix 19: Interview transcript example

INTERVIEW WITH HEALTH PROVIDER

Introduction for the interview was done early, but time allocation and date remained pending for the most appropriate time.

R: From the conversations with the support group today; how do you rate patients' knowledge of their conditions (diabetes and hypertension)?

The knowledge of the general population is still below average, but for patients who come to the clinic as required; their knowledge improves with time as they live with the conditions.

I: "Most patients come to hospital when the condition is not under control, and they truly don't know even the signs and symptoms of their condition, all they know is how they are not feeling well. Most of them come to the hospital when they are really down. After discharge home from the ward most patients are discharged through the nutrition clinic and that is where they start their journey of learning about their condition, diet and medicine and even complication, they meet other patients who are just like them, so they usually feel they are not alone".

We normally take their weight, height, waist circumference which gives us the Body mass index, which we tell them the best wait they have to achieve as a measure of managing chronic comorbid conditions or even diabetes alone... so our patients understand their ideal weights, which is also crucial in calculating their medication dose.

Patients have different and alternative modes of managing their conditions right from home to the hospital. Those who use the clinic and hospital facility can use diet adjustments or complete lifestyle modification, diet and exercise and medication to control their blood pressure and blood sugars and even delay the onset of complications.

R: How is the process of transferring a patient from this support group or clinic to another facility being done from Kapsabet diabetic clinic?

I: To be honest, we have not written any transfer letter, but we have received a transfer letter from Mosoriot CDM clinic and the patient is here with us in the support group. We are thinking of developing identification cards for diabetic patients, who are attending this support group,

At the moment we do not have a very good referral system both for outpatient and inpatient, but there is need to have a specialized referral system for chronic patients like diabetics and hypertensive among other patients- at the moment the in charge of the ward or unit referring a patient is always responsible for all the processes of referral to the receiving facility. Occasionally we receive back referrals, but most of the time; we don't from level 5 hospitals.

Another challenge that is being encountered in the course of diabetes management and hypertension, is the trained staff on the management issues of diabetes, the whole referral county Hospital has only three trained personnel and only one is actively involved with diabetic clinic, others are not, the one involved is combining nutrition and nursing responsibilities

Misunderstanding between health care workers themselves can be a challenge which hinders proper management of chronic conditions- conflict of interest also sets and patients suffer at

the end of it all. Running support group is an initiative of the nutrition department, yet the hospital management wants it to be a nursing department issue, and this lead to the closure of the support group clinics and even now, the clinic has been moved from first Thursday of the month and last Thursday of the month to every Monday at the MOPCs room.

Internal conflict between the team members is going to stretch and extend to patients under their care (Nutritionist and Nurses, clinical Officers- patients prefer those they are used with from the start. Administration is trying to combine the MOPC and the diabetic clinic to be on the same day, currently there is no space for support group meeting. Those trained for diabetes are no longer working with diabetic clinic team, unless consulted on issues about diabetes, they will avail themselves

However we nutrition cannot say that we run the clinic on our own, but we work as a team made of medical doctor, pharmacist, nurses, lab technicians, clinicians(CO), and patient and their families..

If community health workers were available work will be easy for all of us especially in tracing defaulters and household follow-up.

R: What is the routine practice for patients who attend this clinic right from home until when they leave the facility?

I: There are two ways of being seen in Kapsabet referral county hospital:

Patients who come from home with complications and needs to be seen by a physician only, they go the Medical Outpatient Clinic (MOPC)

The other group is the ones come to the facility for support group and regular checkups:

From home they go straight to the lab for the RBS and take vital signs at the reception of the outpatient department. The movement in a diagrammatic format looks like this:

Home-----→Lab---→support group/clinic/MOPC-----→pharmacy/clinician office if they have high blood pressure or RBS-----→-home or admission ----home later on discharge through the diabetic clinic.

R: Do you at time experiences some challenges with these patients in the support group

I: Of course we have challenges like shortage of drugs, mostly insulin, you find that after the clinic, it is very hard for us to tell the client to go and buy insulin from the chemistry where it is costing a fortune, as compared to Kshs.200 and transport to some patients they require up to Kshs.600 for coming and going back.

Misconception about the use of insulin, some patients are simply afraid of injecting themselves every day, others listen to stories from others, and others see that it is a punishment and a curse to continue to use insulin yet other swallow tablets.

Other patients react with insulin, so which other methods of control can be used? The patient can be started on oral until when the blisters recover, or can reduce to one injection a day. Others you cannot just stop using insulin as it can be vital with no other alternative with insulin, you manage the blisters and administer antibiotics and observe what happens, during the next visit.

Another challenge is the storage of insulin in different locations where there is no electricity or fridge, so patients are encouraged to improvise the cold storage of insulin. One common method used is double container method, one with water and another with insulin bottles. But we are not sure of the potency of that insulin and the duration it can be used by the patient-- (Check the American Diabetes Association, recommend using fridge or keeping at room temperatures for 28days or a month).

Others use plastic bag to rapping the insulin and dip in another container with water to preserve the coldness in insulin,

Others still deep insulin inside a clay pot with cold water and keep it in cold dark places in their houses

Patients who are not adhering to clinical instructions move quickly to developing hypertension despite that they did not begin with it... they come back with ever high blood glucose levels and you just can't point a finger what is causing it... that I have observed from most of our patients in this region

R: In general what has been your experience at the diabetic clinic and running of the support group here at this facility?

I: It is really hectic to work with all this patients and still do your routine work, but all the same it is manageable, as these patients don't come every day. We support each other on a monthly basis from the group of the staff working here; the administration is equally not very supportive, they come handy during diabetic week and world diabetes day to support us.

Actually since we started following all these patients both old and new, the admission and readmission in the ward is reducing and complications are few among the old and new patients

At the moment Defeat Diabetic Kenya is planning to decentralize diabetic support group to the health centres and dispensaries for easy accessibility and reduces the cost of transport...policy makers must be willing to support the whole process,

The support group allows its members to have special consideration when it comes to going to the lab, pharmacy and review by the clinician without following the long queue of other patients, they also get a snack every day they come for review to keep the blood sugars at bay and allow them to get time to wait for patient teachings and follow-up results from the lab. For those who have their blood sugars high and blood sugars are taken to the clinician as priority for review and attention immediately. All other patients are also reviewed by the nurse/nutritionist or a clinical officer will be called to review all patients and change the prescription where the patient has concern.

R: What is your experience with family members or care givers to patients attending the diabetic clinic here?

I: Well as I had mentioned to you, we see these patients here once or twice a month, most of them come alone for check up, except the old ones who need support. Culturally in this community it is a requirement for children to support parents, especially when they are unable to do anything by themselves. We rarely get a group of family or care givers as a group, but when there is a change in condition they do come for consultation , when patients are weaker we see them accompany them. But I feel each patient should come with their care givers to be educated on how to manage the condition at home. Men in Nandi community

don't cook or even prepare meals for themselves, so it will be good to involve wives and children on how to adjust diet for the patients and for the entire family. Otherwise without them, we are doing half the management of the conditions.

R:I must say thank you for the support and your willingness to share information and your experience on the management of chronic comorbid diabetes and hypertension at the clinic.

Before we end this interview session do you have anything to share with me which you feel is necessary for the purpose of this study.

I: I think we have discussed all for the day.

R: Thank you so much for participating in this study. I hope we continue next time, for another interview session next month. Kindly note that this conversation is confidential and only codes will be used for further qualitative data analysis.

Bye.

Appendix 20: Letter from the Editor



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9 March 2016

To whom it may concern

EDITING OF RESEARCH DOCUMENT: IMMACULATE MARWA

I have an MA in English from University of Natal (now UKZN) and have been performing editing services via my company for ten years. My company regularly edits the research dissertations, papers and theses of the School of Nursing, Environmental Studies and various other schools and disciplines at the University of KwaZulu-Natal and other institutions, as well as editing for publishing firms and private individuals on contract.

I hereby confirm that Dennis Schaffer from WordWeavers cc edited **Immaculate Marwa's** thesis titled "A Focused Ethnographic Study on Management of Chronic Comorbid (Diabetes and Hypertension) Conditions among Adults in Selected Primary Health Care Settings in Kenya" and commented on the anomalies he was unable to rectify in the MS Word Track Changes and review mode by insertion of comment balloons. Corrections were made in respect of grammar, punctuation, spelling, syntax, tense and language usage. Once the queries referred to above have been attended to by Immaculate, the document should be correct. Please note that the Appendices were not edited.

I trust that the document will prove acceptable in terms of editing criteria.

Yours faithfully

C Eberle

Catherine P. Eberle (MA: University of Natal)