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Perceptions of Health Professionals in Ghana on the Role of the Community in Chronic Disease Management

Jesuseme Omoruan

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The prevalence of chronic disease has been on the rise in various developing countries. This study is an exploratory investigation of the perceptions of health professionals in Kumasi, Ghana on the role of the community in chronic disease management. Using the Chronic Care Model and the Expanded Chronic Care Model as frameworks, the objective of the study was to examine the extent of community-healthcare system in chronic disease management and to explore the barriers to and facilitators of community involvement in chronic disease management. By exploring the availability of community resources that positively contribute to the management of these patients, the study fills an existing gap in the literature related to community involvement in chronic disease management.

The study used a mixed methods approach, utilizing both qualitative and quantitative data. Data were obtained from interviews with 50 healthcare professionals and a quantitative survey of 109 healthcare professionals. Research findings revealed that the family unit is the main form of support for patients with chronic diseases. Findings additionally revealed a lack of community support, resources, and community partnerships in the efforts towards effective health management for patients with chronic diseases in Ghana.

KEY WORDS: Chronic disease, Ghana, Health management, Healthcare, Health professionals, Health system
PERCEPTIONS OF HEALTH PROFESSIONALS IN GHANA ON THE ROLE OF THE COMMUNITY IN CHRONIC DISEASE MANAGEMENT

by

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A Dissertation Submitted to the Graduate Faculty of Georgia Southern University in Partial Fulfillment of the Requirements for the Degree

DOCTOR OF PUBLIC HEALTH

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PERCEPTIONS OF HEALTH PROFESSIONALS IN GHANA ON THE ROLE OF THE
COMMUNITY IN CHRONIC DISEASE MANAGEMENT

by

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July 2018
DEDICATION

My dissertation is dedicated to my family and close friends who have been my number one supporters and a pivotal key to my success. I would also like to dedicate my dissertation to my late grandfather, Dr. JC Omoruan who I wish could have witnessed me trail behind in his academic footsteps.
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With all of the trials and tribulations as it pertains to my health, my family has been my absolute rock through everything and I am so appreciative of each one of them. Thank you, Mom, Dad, Aira, and Ebie, for being my constant support system through it all, I honestly don’t know what I would have done without you.

To my dissertation committee, I am so fortunate and lucky to have had the chance to learn from all of your expertise throughout this process. I would like to especially thank my chair, Dr. Bettye Apenteng, for working with me while I was across the country in Seattle. None of this would have been possible without you, the lessons and knowledge I have gained are endless and I’ll forever be grateful.

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# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACKNOWLEDGMENTS</td>
<td>3</td>
</tr>
<tr>
<td>LIST OF TABLES</td>
<td>5</td>
</tr>
<tr>
<td>LIST OF FIGURES</td>
<td>6</td>
</tr>
<tr>
<td>CHAPTER I - PURPOSE OF THE STUDY</td>
<td>7</td>
</tr>
<tr>
<td>Significance of the study</td>
<td>9</td>
</tr>
<tr>
<td>CHAPTER II - LITERATURE REVIEW</td>
<td>13</td>
</tr>
<tr>
<td>Global burden of chronic diseases</td>
<td>13</td>
</tr>
<tr>
<td>Burden of chronic diseases in sub-Saharan Africa</td>
<td>16</td>
</tr>
<tr>
<td>Chronic disease management in Africa</td>
<td>17</td>
</tr>
<tr>
<td>Burden of chronic diseases in Ghana</td>
<td>20</td>
</tr>
<tr>
<td>Chronic disease management in Ghana</td>
<td>23</td>
</tr>
<tr>
<td>Organization of the health care delivery system</td>
<td>24</td>
</tr>
<tr>
<td>Clinical management of chronic conditions</td>
<td>25</td>
</tr>
<tr>
<td>The chronic care model and chronic conditions</td>
<td>33</td>
</tr>
<tr>
<td>Conclusion</td>
<td>36</td>
</tr>
<tr>
<td>CHAPTER III - CONCEPTUAL FRAMEWORK</td>
<td>38</td>
</tr>
<tr>
<td>Chronic care model</td>
<td>38</td>
</tr>
<tr>
<td>CHAPTER IV - METHODOLOGY</td>
<td>48</td>
</tr>
<tr>
<td>Study design</td>
<td>48</td>
</tr>
<tr>
<td>Study population and sample</td>
<td>49</td>
</tr>
<tr>
<td>Qualitative instrument</td>
<td>50</td>
</tr>
<tr>
<td>Quantitative instrument</td>
<td>51</td>
</tr>
<tr>
<td>Ethical considerations</td>
<td>58</td>
</tr>
<tr>
<td>CHAPTER V - RESULTS</td>
<td>60</td>
</tr>
<tr>
<td>Quantitative &amp; qualitative findings</td>
<td>62</td>
</tr>
<tr>
<td>CHAPTER VI - DISCUSSION</td>
<td>82</td>
</tr>
<tr>
<td>Recommendations</td>
<td>98</td>
</tr>
<tr>
<td>Future research</td>
<td>95</td>
</tr>
<tr>
<td>Conclusion</td>
<td>101</td>
</tr>
<tr>
<td>REFERENCES</td>
<td>104</td>
</tr>
<tr>
<td>APPENDIX A</td>
<td>118</td>
</tr>
<tr>
<td>APPENDIX B</td>
<td>120</td>
</tr>
<tr>
<td>APPENDIX C</td>
<td>122</td>
</tr>
</tbody>
</table>
LIST OF TABLES

TABLE 1.1 Definition of terms ........................................................................................................12
TABLE 2.1 Distribution of malnutrition, hypertension and stress in Accra study population ..........23
TABLE 3.1 Five self-management skills ..........................................................................................40
TABLE 3.2 CCM components ........................................................................................................44
TABLE 3.3 Expanded CCM components .......................................................................................45

TABLE 5.1 Characteristics of survey respondents .........................................................................60
TABLE 5.2. Health professionals’ perception of the level of current community support for people living with diabetes and/or hypertension by demographic characteristics (N=104) ..........................................................63
TABLE 5.3. Spearman correlation matrix: perceived degree of community role in chronic disease management ......65
TABLE 5.4. Health professionals’ perception of the extent to which health organizations partner with the community by demographic characteristics (N=104) .............................................................................................74
TABLE 5.5. Spearman correlation matrix: perceived effectiveness of community engagement strategies...............77
TABLE 5.7. Qualitative themes and research questions .....................................................................80
TABLE 5.7. Qualitative themes and research questions .....................................................................80
TABLE 5.8. Decomposition of inertia among community role variables for the First two dimensions ..........120
TABLE 5.6. Decomposition of inertia among community engagement strategy variables for the first two dimensions ...........................................................................................................................................122
LIST OF FIGURES

FIGURE 2.1. Accessibility to CPHS compounds in Wa West district in Ghana...............................................................27
FIGURE 2.2. Accessibility to health centers in Wa West district in Ghana...........................................................................27
FIGURE 3.1. The Chronic Care Model.............................................................................................................................41
FIGURE 3.2. The expanded Chronic Care Model...............................................................................................................45
FIGURE 5.1. The community provides adequate support..................................................................................................63
FIGURE 5.2. Role of community members and entities.......................................................................................................64
FIGURE 5.3. Scree plot of principal inertias after MCA .....................................................................................................66
FIGURE 5.4. Perceptions of healthcare providers on how much of a role the community can play in chronic disease

management. .................................................................................................................................................................69
FIGURE 5.5. Healthcare organizations and community partnerships....................................................................................73
FIGURE 5.6. Effective strategies for community engagement .................................................................................................79
FIGURE 5.7. Scree plot of principal inertia after MCA (community engagement strategies) ..................................................78
FIGURE 5.8. Perceived effectiveness of select community engagement strategies...............................................................81
CHAPTER I

INTRODUCTION

Non-communicable diseases account for more than one-half of the global burden of disease (Benziger, Roth, & Moran, 2016). Following a decline in the deaths attributable to communicable, maternal, neonatal, and nutritional causes, more deaths are being caused by non-communicable diseases (Benziger et al., 2016). In 2014, the World Health Organization stated that diseases such as diabetes, cardiovascular diseases, and cancer caused 38 million deaths all over the world in a single year (Marcelli et al., 2017). Eighty percent of these deaths came from some of the poorest countries in the world (Marcelli et al., 2017). Unfortunately, disadvantaged and marginalized communities in developed countries suffer an increased burden of chronic illness (Davy et al., 2015). It is estimated that by the year 2020, approximately 60% of the global population will be affected by chronic illnesses (Marcelli et al., 2017).

The shift in prevalent diseases in the world can be explained by epidemiological transition. The epidemiological transition focuses on the complex changes in patterns of health and disease, the interactions between these patterns and their economic, demographic, social determinants, and consequences (Agyei-Mensah & Aikins, 2010). Middle-income and low-income countries are affected differently by the epidemiological transition than other countries (Marcelli et al., 2017). Most middle-income countries are further along the epidemiological transition. For example, in 2010 heart disease was the primary cause of disability-adjusted life-years lost in China (Kruk, Nigenda, Knaul, 2015).

Chronic disease burdens have continued to grow in Sub-Saharan Africa (Guariguata et al., 2015). African countries are going through an epidemiological transition that is caused by both communicable and non-communicable diseases (Aikins et al., 2014). Africa’s “double
“burden of disease” recognizes the coexistence of communicable diseases such as malaria and tuberculosis and chronic non-communicable diseases such as hypertension and diabetes (Agyei-Mensah, & Aikins, 2010). In the extremely developing countries, premature mortality is 3-4 times higher than in more developed countries (Marcelli et al., 2017). Due to being underfunded and under-resourced, sub-Saharan Africa struggles to cope with the double burden of communicable and non-communicable disease (De-Graft-Aikins, 2006). In poorer countries, health protection networks are weak or not present (Marcelli et al., 2017). Studies show that the cumulative burden of infectious and chronic diseases is more prevalent in African cities with high levels of urbanization, rural-urban migration, and poverty (Agyei-Mensah & Aikins, 2010).

Ghana is a low-income country in West Africa, with approximately 28 million people (Ghana Statistical Service, 2016 & Hathcock, 2017). Like other African nations, the country has seen an increase in the prevalence of chronic conditions like diabetes and hypertension. In 2002, an estimated 6.3% of adults in Ghana, aged 15-70 years, had Type 2 diabetes (De-Graft-Aikins, 2006). The increasing prevalence of Type 2 diabetes in Ghana is thought to be attributable to high rates of biomedical non-adherence, the high cost of care, structural inequalities and the use of traditional healers (De-Graft-Aikins, 2006; De-Graft Aikins et al., 2012; Kretchy, Owusu-Daaku, & Danquah, 2014).

Managing chronic diseases in Ghana is a complex process or endeavor, the current healthcare system does not provide equal coverage for Ghanaians, resulting in a lack of chronic care (Goeppel, Frenz, Grabenhenrich, Keil, & Tinnemann, 2016). The social health insurance scheme in Ghana is mandatory by law but voluntary in practice (Duku, Nketiah-Amponsah, Janssens, & Pradhan, 2018). As of 2013, active membership in its National Health Insurance Scheme (NHIS) was 38% of the population (Duku et al., 2018). A possibility of low enrollment...
levels in Ghana could be due to a perception that service quality is lower for people who have health insurance compared to those who pay for health services out of pocket (Duku et al., 2018). There is an apparent difference between the service delivery process for people with and without health insurance (Duku et al., 2018). The NHIS processing at health facilities is long, which could be deterring people from seeking care (Duku et al., 2018). Assessing the health of a population is the start of positive change that could lead to better management of chronic conditions of patients in Ghana (Duda et al., 2011).

Given the public health significance of the increasing prevalence of non-communicable diseases in Ghana, understanding perspectives of health care providers who care for such complex patients is crucial (Loeb et al., 2016). Further, to help improve the management of diseases in countries like Ghana, health systems must strengthen primary health care and leverage existing community resources to improve the management of patients living with non-communicable diseases (He, Muenchrath, & Kowal, 2012).

Purpose of the Study

The purpose of this study was to examine the perceptions of healthcare professionals on chronic disease management in Ghana, focusing largely on the management of diabetes and hypertension – the two most common chronic conditions in Ghana. The Expanded Chronic Care Model (CCM) is the theoretical framework used as a guide for understanding how to improve the management of chronic illness in Ghana through a holistic lens that leverages community resources for the promotion of population health (Barr et al., 2003). The Expanded CCM model encourages people who work in healthcare to serve patients and the community in a more holistic way (Barr et al., 2003). The study employed a mixed-methods approach by using both qualitative and quantitative methods. Key informant interviews with health care providers were
conducted to obtain their perspectives on how to effectively engage communities in the care of patients with chronic conditions. Additionally, a survey instrument, designed specifically for the study, was used to obtain perceptions of health providers concerning patient management, the role of health care providers, and the role of the community as it pertains to chronic disease management in Ghana.

Research questions

The following research questions were developed to understand the current state of and opportunities for community involvement in chronic disease management, specifically diabetes and hypertension, from the perspective of healthcare providers:

1. From the perception of healthcare professionals, how much of a role can the community play regarding chronic disease management?

2. How is the community and healthcare system currently working together for the care of patients with chronic conditions?

   b. What are the barriers and facilitators of community and health system partnership?

3. How can existing community resources be leveraged to support chronic condition management or chronic disease management?

Significance of the Study

Chronic care is a key issue among patients with chronic conditions. However, despite being an important public health issue in Ghana, there is limited research. The role of the community in the management of patients with chronic diseases is a pertinent area to be
explored. However there is a dearth of research on the subject matter. The existing data focuses more on communicable diseases rather than on non-communicable diseases. Through gathered knowledge, no specific data has been published about health professionals’ perceptions of the challenges and status of diabetes and hypertension management in Ghana, permitting further investigation on the matter. Consequently, the main objective of this research was to describe healthcare professionals’ perceptions of chronic disease management, with a focus on diabetes and hypertension management. The findings from this research has the potential to: (a) increase awareness in Ghana of chronic disease management, (b) increase awareness of the need for community involvement in managing patients with diabetes and/or hypertension, (c) contribute to the dialogue on finding ways to improve the management of patients with diabetes and/or hypertension.

Providing insight into healthcare professionals on the clinical management of patients with chronic disease as it intersects with community involvement will help create more effective methods of managing said patients. This research provides the opportunity for future interventions and investigations focusing on shared leadership between the community and healthcare systems in the care of patients with chronic conditions.

Assumptions:

1. The participants of this study are a good representation of Ghana’s healthcare professionals who care for patients with chronic conditions.
2. The participants of this study will answer questions frankly and honestly.
3. The participants of this study will be able to communicate in the language in which the questions are asked.
### Definition of Terms

<table>
<thead>
<tr>
<th>Term/Phrase</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chronic Disease</td>
<td>See Non-Communicable Disease</td>
</tr>
<tr>
<td>Hypertension</td>
<td>Also Known as high blood pressure; a condition in which the blood vessels have persistently raised pressure (WHO).</td>
</tr>
<tr>
<td>Diabetes</td>
<td>A chronic disease where the pancreas does not produce enough insulin or when the body cannot effectively use the insulin it produces (WHO).</td>
</tr>
<tr>
<td>Globalization</td>
<td>The increased interconnectedness and interdependence of people and countries (WHO).</td>
</tr>
<tr>
<td>Epidemiological</td>
<td>The complex changes in patterns of health and disease, the interactions between these patterns and their economic, demographic, social determinants, and consequences (WHO).</td>
</tr>
<tr>
<td>Transition</td>
<td></td>
</tr>
<tr>
<td>Communicable</td>
<td>Diseases that are passed from person to person (WHO).</td>
</tr>
<tr>
<td>Diseases</td>
<td></td>
</tr>
<tr>
<td>Non-Communicable</td>
<td>Also known as chronic diseases; diseases that are not passed from person to person (WHO).</td>
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<td>Diseases</td>
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</tbody>
</table>

### Summary

In this chapter the introduction to the background and scope of the problem was presented. The purpose of the study was also articulated. In Chapter 2, a review of the related literature on chronic disease management focused on hypertension and diabetes in African nations will be presented. Additionally, information highlighting earlier studies using a chronic disease management theoretical framework (Wagner’s Chronic Care Model and the Extended Chronic Care Model) will be included. In Chapter 3, the theoretical framework will be further explored. In Chapter 4, the methods of the study will be presented including how data analysis will be conducted. Chapter 5 will present the findings of the study. Chapter 6 will also include a discussion of the policy implications of the findings regarding chronic disease management in Ghana and provides recommendations for future research and for practice.
CHAPTER II
LITERATURE REVIEW

The Global Burden of Chronic Diseases

In September of 2011, the United Nations held a high-level meeting focusing on non-communicable disease (Aikins, Addo, Ofei, Bosu, & Agymang, 2012) in light of the increasing global prevalence of such diseases. Non-communicable diseases, also known as chronic diseases, are not passed from person to person; a disease passed from person to person is defined as a communicable disease (World Health Organization (WHO), 2015). There are four main types of non-communicable diseases: cardiovascular diseases, cancer, chronic respiratory diseases, and diabetes (WHO, 2013). Non-communicable diseases are the leading cause of death in the world resulting in 63 percent annual deaths (WHO, 2013; Misganaw, Mariam, Ali, & Araya, 2014). By 2030 diabetes, cancer, cardiovascular disease, mental illness, and chronic respiratory illness will cost low-middle income countries an estimated twenty-one trillion dollars in the costs of illness and lost productivity (Kruk et al., 2015).

The World Health Organization (WHO) states that non-communicable diseases are caused mainly by four behavioral risk factors that are prevalent aspects of economic transition, rapid urbanization, and 21st century lifestyles: tobacco use, unhealthy diet, insufficient physical activity, and excessive alcohol-use (Misganaw et al., 2014). Epidemiological transition focuses on the complex changes in patterns of health and disease, and the interactions between these patterns and their economic and demographic changes over time (National Research Council – US, 2012). Older populations are at a higher risk compared to younger populations for chronic diseases, such as diabetes (Gatimu, Milimo, & Sebastian, 2016). In developing countries such as Ghana, certain sociodemographic factors have been identified as risk factors for chronic
conditions, including gender, education, wealth and geographic location (Gatimu et al., 2016). For example, due to inequalities in education, where males were historically favored above women in Ghana, males tend to have a higher education level than women (Gatimu et al., 2016). High education is linked to sedentary lifestyles, changes in dietary intake and less physical activity, which could explain the higher prevalence of diabetes in men than women (Gatimu et al., 2016).

The WHO has advocated for a “whole-of-government approach” in a global strategic attempt that would initiate the prevention and control of non-communicable diseases (Juma, Mohamed, Wisdom, Kyobutungi, & Oti, 2016). A whole-of-government approach is a multisector approach for health at all government levels that is used to address risk factors of non-communicable diseases and underlying determinants of health (Lenucha, Drope, & Chavez, 2015). This specified government approach would focus on addressing and defining each of the social determinants of health (Juma et al., 2016).

Government services vary in fulfilling the health needs of people, globally (Murray, 2011). More specifically, non-communicable diseases have a high impact on low- and middle-income countries (Gatimu et al., 2016), where geographic disparities in disease burden further occur. A higher proportion of people with chronic diseases, for example, diabetes, can be found in urban areas rather than rural areas (Gatimu et al., 2016). Urbanized populations contribute to epidemiological transition due to increases in unhealthy dietary patterns and a decrease in physical activity (Oni et al., 2015). There is also evidence to suggest that women and people living in rural communities are underdiagnosed and undertreated for chronic diseases (Kruk et al., 2015).
The United Nations created 8 Millennium Development Goals (MDG) to improve the quality of life of people worldwide. The eight MDGs are:

1. To eradicate extreme poverty and hunger;
2. To achieve universal primary education;
3. To promote gender equality and empower women;
4. To reduce child mortality;
5. To improve maternal health;
6. To combat HIV/AIDS, malaria, and other diseases;
7. To ensure environmental sustainability; and
8. To develop a global partnership for development (WHO, 2017).

Through these goals, world leaders declared to fight poverty, hunger, disease, environmental degradation, and more (WHO, 2017). Each of the MDGs influences health and health influences each MDG (WHO, 2017). Targeting a few MDGs can mitigate the surge of non-communicable diseases (WHO, 2017). Additionally, countries worldwide are implementing programs, and innovative healthcare delivery models and expanding health coverage to contribute to the management of chronic diseases (Goeppel et al., 2016). The use of community health workers, for example, have been found to be effective in reducing blood pressure and promoting adherence to medication among patients in the United States (Kruk et al., 2015). Healthcare reform efforts such as the Affordable Care Act in the United States, have made great strides towards providing basic needs for patients with chronic diseases (Bauer, Briss, Goodman, & Bowman, 2014). Ghana, a sub-Saharan country developed a national health insurance scheme in 2003 that protects against major out-of-pocket health care costs, an important barrier to health care utilization for patients with chronic conditions (Goeppel et al., 2016). In Australia, a similar
healthcare reform initiative was created, the “Broader Health Cover” (BHC) (Hamar, Rula, Coberley, Pope, & Larkin, 2015). The BHC is intended to give health insurers the opportunity to offer programs that would keep their members healthy at a lesser cost (Hamar et al., 2015). In Brazil, health promotion programs about non-communicable diseases have been implemented to combat the diseases (Gonzalez Manso, Camara, Souza, Macial, & Baptista, 2016).

The Burden of Chronic Diseases in Sub-Saharan Africa

Data revealed that 80% of deaths caused by non-communicable diseases occur in low and middle-income countries (Misganaw et al., 2014), with chronic disease burdens increasingly growing at a disproportionate rate in Sub-Saharan Africa (Guariguata et al., 2015). By the year 2020, the largest increase in non-communicable diseases will occur in Africa (Juma et al., 2016). The prevalence of diabetes is expected to double by 2030 from 8.3% to 17.6% globally (Gatimu et al., 2016). However, in Africa, the prevalence rate is expected to increase by 98% during the next 20 years (Jaffiol, 2011).

Current chronic disease prevalence studies in Africa are underreported due to underdiagnoses. Recent studies show that only 20% of Tanzanians, for example, with hypertension and 14% of Mozambicans with hypertension were aware of their disease (Kruk et al., 2015). In Zimbabwe, the prevalence of high blood pressure was found to be 26% more among the salaried workers than the non-salaried workers (Segbefia, Oware-Gyekye, & Akpalu, 2012). An assessment in Glasgow on African migrants highlighted a lack of awareness of chronic diseases among the Namibian population (Guariguata et al., 2015).

African nations are not, however, homogenous in their experience of chronic conditions; the disease burden varies by disease and across countries. For instance, the prevalence of
diabetes is lower in Ghana, in comparison to other countries in Africa such as Nigeria, South Africa, and Kenya due to differences in population size and exposure to risk factors (Gatimu et al., 2016). South Africa has the highest prevalence of hypertension in adults 50 years of age and older, and the highest prevalence of type 2 diabetes in sub-Saharan Africa (Oni et al., 2015). The Shades of Gray, a cross-country study of health and well-being of the old populations in SAGE countries (2007-2011) report was conducted in Ghana where it was discovered that hypertension was the most commonly reported problem for people aged 50 years and old (He et al., 2012).

Within countries, regional variations exist. Urban populations in sub-Saharan Africa are more susceptible to higher prevalence of specific non-communicable diseases such as cancer, cardiovascular disease, chronic obstructive pulmonary disease, and diabetes (Misganaw et al., 2014) due to “westernization” of lifestyle and diet (Misganaw et al., 2014). Urban populations also have exceedingly low budgets for health (Segbefia et al., 2012). In Nigeria, people living in urban poor populations such as Ibadan were found to have blood pressure levels 7% higher than those residing in villages (Segbefia et al., 2012).

**Chronic Disease Management in Africa**

Chronic disease management is a public health approach designed to encourage individuals with chronic diseases to manage their health conditions to maintain their independence at full capacity (Maimela et al., 2015). Proper management of the chronic disease ensures people stay as healthy as possible through prevention and early detection to avoid health complications (Maimela et al., 2015). Managing poor health due to chronic diseases of people using the socio-ecological model as a framework includes:

- The individual level: maintaining a healthy quality of life.
- The community level: creating stability and equality among society members.
The organizational & structural level: strengthening the primary health care system to better identify chronic disease risk factors, early detection of the disease, and identification of high-risk status (Maimela et al., 2015).

The lack of resources including shortages of medication and a shortage of health personnel remains a significant obstacle in chronic disease management in low-income countries in Africa (Maimela et al., 2015). Patients are referred to hospitals where medications are in limited supply or not available, causing patients to often pay out of pocket to obtain medications from other sources (Maimela et al., 2015). This often leads to an inconvenience for patients that come from extremely poor households and may potentially cause them to default on treatment (Maimela et al., 2015). Further, the absence of proper knowledge, shortage of medication, and the scarcity of health providers, and longer wait times limits the access to healthcare patients with chronic conditions (Maimela et al., 2015). The lack of knowledge and poor chronic disease management training of health workers may result in the poor dissemination of proper health guidelines and poorer patient outcomes (Maimela et al., 2015). Furthermore, discordance between the actual risk and patients’ self-perceived risk can cause delays in seeking necessary treatment and possibly increase the adoption of poor health behaviors that predispose individuals to chronic conditions such as diabetes and hypertension (Guariguata et al., 2015). Without the availability of western medicines, quality equipment, and evidence-based health promotional materials, chronic disease management remains poor in many parts of Africa (Maimela et al., 2015).

The knowledge concerning chronic disease management also remains limited in many sub-Saharan African countries (Maimela et al., 2015). Alternative medicine is often sought, including the use of traditional healers and remedies (Maimela et al., 2015). In several countries,
individuals’ understanding, and experience of their health conditions are viewed through a cultural lens (Aikins et al., 2014). For example, it is common for certain chronic conditions to be ascribed to witchcraft (Aikins et al., 2014). This results in an additional need for health professionals to educate patients on chronic diseases and the appropriate management of them to avoid disease being associated with other alternative explanation, such as witchcraft (Maimela et al., 2015).

Low-income countries, including those in Africa, have begun implementing several strategies to curb the increasing incidence of the most common chronic conditions, such as diabetes and hypertension (Kruk et al., 2015). Campaigns targeting early diagnosis have been conducted in rural parts of Uganda (Kruk et al., 2015). One of such campaigns included a five-day multi-disease diagnostic camp which involved point-of-care screening for HIV, tuberculosis, hypertension, and diabetes (Kruk et al., 2015). In this program, simple diagnostic equipment was utilized, such as blood pressure examination and capillary blood glucose testing (Kruk et al., 2015). The campaign successfully reached seventy-four percent of the targeted population (Kruk et al., 2015).

Mobile communication technology has also been highlighted as a key strategy for combating non-communicable diseases (Bloomfield et al., 2014). With various wireless telecommunication networks all over sub-Saharan Africa, mobile health has been deemed as an appropriate prevention and disease control tool (Bloomfield et al., 2014). Many mobile HIV clinics in Kenya and Uganda, for example, have the untapped capacity to extend care to more patients (Geldsetzer, Ortblad, & Bärnighausen, 2016). It should be noted that HIV has transformed from being a disease that severely cuts life expectancy to a manageable chronic condition that is less threatening (Geldsetzer et al., 2016). This has led to the reclassification of
The Burden of Chronic Diseases in Ghana

Ghana’s disease burden has increased as chronic disease risk factors increase over time (Aikins et al., 2013). Wealthy communities are susceptible to high risks of non-communicable diseases, and poor communities endure the double burden of infectious diseases and non-communicable diseases (Aikins et al., 2014). Chronic diseases are also, more prevalent in the elderly population in Ghana (Mthembu, Brown, Cupido, Razack, & Wassung, 2014). Amongst the older population, hypertension is the most common chronic condition in the country (Kretchy et al., 2014). Urbanization, poor diets, aging populations, globalization, and weak health systems have also been implicated in chronic disease risk, morbidity, and mortality (Aikins et al., 2012).

A study found that chronic diseases in Ghana could be attributed to seven main causes: poor diets, poor lifestyle practices, heredity, physical factors, the environment, spiritual factors and psychological factors (De Graft Aikins et al., 2012). Poor diet was related to unhealthy eating, including consumption of high fat and starchy foods, canned foods, and flavorings (i.e., Maggie cubes) (De Graft Aikins et al., 2012). Similar to other parts of the world, poor lifestyles practice identified to be associated with chronic conditions in Ghana include smoking, drinking, and sedentary lifestyles (De Graft Aikins et al., 2012). Also, stress due to current lifestyles has been linked to coronary heart disease, cancer, diabetes and hypertension (Mohammed, Ghosh, Vuvor, Mensah-Armah, & Steiner-Asiedu, 2016).

*Diabetes and Hypertension in Ghana*
Diabetes and hypertension are the two most common chronic diseases in Ghana (De Graft et al., 2012). Diabetes and hypertension and other chronic diseases have been chronicled in official policy documents since the early 1990’s, although minimal results are to show for it (De Graft Aikins et al., 2012). Hypertension is defined as systolic blood pressure (SBP) greater than 140 mmHg and diastolic blood pressure (DBP) greater than 90mmHG over a sustained period (Segbefia et al., 2012).

Diabetes can be classified into the following types:

- Type 1 diabetes (due to autoimmune β-cell destruction, usually leading to insulin deficiency)

- Type 2 diabetes (due to a progressive loss of β-cell insulin secretion frequently on the background of insulin resistance)

- Gestational diabetes mellitus (GDM) (diabetes diagnosed in the second or third trimester or pregnancy that is not overt diabetes before gestation)

- Other types (American Diabetes Association, 2017).

In Ghana, diabetes prevalence ranges between 6% in the urban parts of Accra and 9% in Kumasi (Aikins et al., 2014). Diabetes has been associated with socioeconomic factors including education, employment status, wealth and social class (Gatimu et al., 2016). In one study, Ghanaians with university and secondary education were identified to be five and two times more likely to have diabetes, respectively, compared to their counterparts who had never attended school (Gatimu et al., 2016). Old age and higher levels of education were also associated with a higher prevalence of diabetes in this study (Gatimu et al., 2016).

At the Korle-Bu Teaching hospital (KBTH), one of two major teaching hospitals in the country, out of the 70% of medical cases seen at the surgical medical emergency unit, an
estimated 40%, ranging from ages 18-100 years, turned out to be hypertensive cases in 2006 (Segbefia et al., 2012). In a study recently conducted in Accra, Ghana, more than half of the study population was found to be either pre-hypertensive or hypertensive (Table 2.1; Mohammed et al., 2016). Hypertension was found to be more prevalent in males than females in this study. Individuals with higher stress and/or anxiety were more than likely to have hypertension than people who did not suffer from stress and/or anxiety (Mohammed et al., 2016). In Ghana, like other African countries, the prevalence of hypertension is low in rural areas. However there is a higher prevalence among poor people living in urban areas and among the working class (Segbefia et al., 2012).

Another study on hypertension conducted in Accra reported that a third of the study population was overweight or obese, with a higher prevalence among women than men (Aikins et al., 2014). Amongst the group, there were low levels of awareness and treatment of hypertension (Aikins et al., 2014). Of the participants who had hypertension, only 7.4% were aware that they had hypertension and 62.9% believed they did not have hypertension. Only 4% were on antihypertensive medication, and only 3.5% had adequate blood pressure control (Aikins et al., 2014). The study revealed three main points: (1) the relationship between high-fat and high-salt foods, alcohol, and hypertension was not commonly known; (2) health-promoting lifestyle practices were low, as there were low physical activity, and high consumption of fast foods, processed foods; and (3) women were less likely to know about hypertension and diabetes (Aikins et al., 2014). Table 2.1 shows the distribution of blood pressure and weight of people in Accra in 2016 (Mohammed et al., 2016).
Chronic Disease Management in Ghana

Chronic disease is a fairly new concern for Ghana, resulting in few chronic disease policies or integrated plans (Aikins et al., 2012). There is limited knowledge of non-communicable diseases in Ghana among the general population, which results in late diagnosis, and many preventable complications (Aikins et al., 2012). With the double burden of communicable and non-communicable disease, Ghana’s healthcare system has minimal resources to contribute towards the effective management of chronic diseases (Aikins et al., 2014), resulting in the lack of services for patients with hypertension and diabetes (Aikins et al., 2014).

The health care system in Ghana utilizes various methods of chronic disease management (Aikins et al., 2014). Conventional methods of chronic disease management include proper clinical management, self-management, and positive social and community support (Aikins et al., 2014).
al., 2014). Overall, however, there is a lack of literature focusing on chronic disease management in Ghana.

Organization of the Health Care Delivery System

In Ghana, the health system is divided into five tiers: Community-Based Health Planning and Services (CHPS) at the community level, health centers at the sub-district level, district hospital at the district level, regional hospital at the regional level, and teaching hospitals at the national level (Agbenyo, Nunbogu, Dongzagla, & 2017). The CHPS aim to promote primary health care and the health of communities, through Community Health Officers (CHO) who go to patient’s homes and communities for healthcare delivery, including health promotion and education (Agbenyo et al., 2017). CHO’s are also equipped with basic medicines, medical apparatus, and provide immunizations (Agbenyo et al., 2017). At the sub-district level, health centers are run by medical assistants and provide specific specialists in public health, environmental, nutrition, lab services, and midwifery (Agbenyo et al., 2017). The health centers can provide minor surgical services including drainage and incision (Agbenyo et al., 2017). The district hospital provides curative care, preventative care, and outpatient and inpatient services, in addition to health promotion (Agbenyo et al., 2017). The regional level provides specialized clinical and diagnostic care, mainly through the Ghana Health Service (GHS) and psychiatric hospitals (Ministry of Health, 2016). At the national level, the Korle-Bu, Komfo Anokye, and the Tamale Teaching hospitals act as the main referral centers and have the most sophisticated capacity (Ministry of Health, 2016).
Clinical Management of Chronic Conditions

The high prevalence of hypertensive and diabetes cases affects the health providers’ capability to effectively see and treat patients in Ghana (Segbefia et al., 2012). The high prevalence of cases causes an increase in the waiting time resulting in longer wait times for patients to see a nurse or physician (Segbefia et al., 2012). Further, most Ghanaians without health insurance are less likely to have access to chronic care, more specifically people in rural areas (Goeppel et al., 2016). The cost of chronic disease management is unaffordable for most patients in developing countries, resulting in many patients not adhering to the prescribed treatment regimen (Amoako, Laryea, Bedu-Addo, Andoh, & Awuku, 2014).

Further, access is limited, specifically regarding the provision of treatment including medications, counseling on physical activity, diet, and outpatient services (Goeppel et al., 2016). Due to the decentralized nature of the health system in the country, health care services with more capacity and sophistication, by design tend to be less accessible. For example, Figure 2.1 and 2.2 illustrate the distribution of CHPs and health centers, respectively in the Wa West district of the Upper West Region. CHPS’s compounds in Wa West district in Ghana basic health provisions are highly accessible, compared to health centers in the district, which are slightly more difficult to get to for the majority of the population compared to CPHS compounds (Agbenyo et al., 2017).
Figure 2.1. Accessibility to CPHS compounds in Wa West District in Ghana.


Figure 2.2. Accessibility to health centers in Wa West District in Ghana.

Primary caregivers and patients with chronic diseases also lack adequate communication and care coordination (Maimela et al., 2015). Physicians are expected to respect, comfort, and provide emotional and psychosocial care to each patient (Atinga, Bawole, & Nang-Beifubah, 2016). Developed by Mead and Bower, biopsychosocial care is when the physician looks beyond the single focus of biomedical care and additionally focuses on the patient’s ailment from the psychological and social perspective (Atinga et al., 2016). Patient-centered care can provide productive patient-physician information sharing and a consensus with health terms and language used which includes body language, tone, and attitude (Atinga et al., 2016). Better language can improve patient-provider communication and help empower people to understand diabetes and hypertension and the care they entail (Dickinson & Maryniuk, 2017). Encounters between healthcare professionals and patients are critical for information exchange, decision-making, and motivation (Maimela et al., 2015). However, due to the high population to provider ratios, several providers are unable to spend adequate time with patients to foster the strong patient-provider relationships that serve as the bedrock for patient-centered care (Murray, 2011). In light of constrained health system capacity to effectively manage chronic conditions, policy experts warn of an apparent gap in essential services for non-communicable diseases in Ghana (Goeppel et al., 2016).

**Self-Management**

Patient self-management aims to reduce the impact of chronic disease on physical health and improve functionality while helping individuals cope with the physiological stress of the illness (Kruk et al., 2015). Self-management includes changing daily habits and behaviors, adhering to medication schedules, and managing interactions with the whole healthcare system (Kruk et al., 2015). Chronic disease management requires motivated and supported patients and
reliable and consistent forms of communication for conversations between healthcare providers and patients (Kruk et al., 2015).

Patient empowerment and patient involvement are increasingly encouraged through enhanced patient-provider shared decision-making (Maimela et al., 2015). Methods such as a therapeutic alliance elicit a strong relationship between the physician and patient where the patient can make appropriate choices regarding their health (Atinga et al., 2016). In one study, patients with type 2 diabetes in Ho, Ghana were found to lack mental fortitude with almost a quarter of the study population expressing anxiety and worry as it pertained to their diabetes (Osei-Yeboah et al., 2016). The study found that patients’ perception of the control of their glucose level affected the quality of other aspects of their life. Their lack of understanding of their condition yielded behavioral reactions that negatively affected their mental and physical health (Osei-Yeboah et al., 2016).

Social and Community Support

Social support has benefits for patients across their lifespan (Heinze, Kruger, Reischl, Cupal, & Zimmerman, 2015). Research shows that family, friends, colleagues, neighbors, and community members can be vital support systems for people who deal with poor health (Heinze et al., 2015). The younger populations have larger social networks of friends and associates than the older population, although the older population is more likely to call on their family and friends for support (Heinze et al., 2015). As social relationships change over the course of time, sources of support additionally change in due time (Heinze et al., 2015). Different sources of support are relatively more important during different stages in an adult lifespan (Heinze et al., 2015). Positive social support produces better general and emotional health for all groups (Heinze et al., 2015). In many cases, patients with chronic diseases serve as good advisors to
other people in the community on the prevention of chronic diseases and delivering health
information in ethnic communities (Maimela et al., 2015). Reducing stigma through community
education can help people with diabetes avoid facing guilt, shame, and blame due to the stigma
of diabetes being a “lifestyle disease” (Dickinson & Maryniuk, 2017).

However, despite its importance, there is limited research available about community and
social support as it relates to chronic disease in Ghana. Related research studies that have
focused on community involvement and cooperation with a research team (Tindana et al., 2011),
and not specifically on community support of community members with pre-existing chronic
conditions. There is also a lack of research devoted specifically to the practice and policy of
chronic diseases in Ghana (Aikins et al., 2012).

Barriers to Hypertension and Diabetes Disease Management in Ghana

Even with current efforts of disease management in Ghana, there are still several barriers
to adequate management of diabetes that have been reported in Ghana (De Graft Aikins,
Awauah, Pera, Mendez, & Ogedegbe, 2015). A prominent barrier is an overall misconception
that hypertension and other chronic conditions are only found in western and developed
countries (Segbefia et al., 2012). Other barriers to adequate chronic disease management include
poor healthcare provisions; lack of clinical support, poor knowledge of the causes and
complications of diabetes; inadequate self-management, and limited psychosocial, social and
community support (De Graft Aikins et al., 2015).

In addition to these barriers, herbal or traditional medicines are widely used by citizens.
Indigenous spiritual beliefs relating to health and healthcare are common in several communities
in the country (O ‘Brian et al., 2012). These alternative indigenous medications are derived from
plants and information on their uses are often passed down from generation to generation
The utilization of traditional healers can hinder conventional clinical health management regiments if not included in a complementary manner. About 70% of Ghanaians utilize traditional healers (Kretchy et al., 2014), due to widespread beliefs in spiritual causes behind chronic and other acute conditions (O’Brian et al., 2012). Supernatural cases have been linked to diseases such as diabetes (Aikins et al., 2014). Ghanaians and other Africans have attributed diabetes to witchcraft, sorcery or evil forces (Aikins et al., 2014). A study about breast cancer treatments in Ghana found that half of the women in the study used alternative treatments before and during hospital treatments, leading to delays in the conventional treatment (O’Brian et al., 2012). Evidence suggests that 8%-40% of hypertensive patients use traditional healers in addition to conventional medicine (Kretchy et al. 2014). Similar to Ghana, studies show people in Nigeria utilize traditional beliefs and practices which create barriers to proper chronic disease management (Mills & Bertrand, 2005).

Traditional healers have an important cultural role and are readily available and accessible to Ghanaians (O’Brian et al., 2012). As an important yet informal component of the health care system in Ghana, traditional healers prescribe medications, keep records, follow up with and refer patients to other medical practitioners (O’Brian et al., 2012). A study found that traditional healers can be a valuable resource for Ghanaians if the healers are provided with proper education, training, on ailments such as non-communicable diseases (O’Brian et al., 2012). However, due to a lack of regulation and appropriate scientific testing, some of these traditional medicines, when used in chronic disease management may lead to clinical complications.

There are also a limited number of trained health professionals who can assist with chronic disease management (Segbefia et al., 2012). The “Working together for health, The
World Health Report” from the WHO estimated a scarcity of health professionals, where the number of health professionals is below the desired mark of 80% coverage globally (Murray, 2011). There are a limited number of health professionals trained to provide diabetes care (Aikins et al., 2014). In 2010, it was estimated that there was a total of 1,945 general medical practitioners and 695 specialist practitioners in Ghana (GHWO, 2010). The problem of an inadequate number of health professionals is compounded by the lack of sufficient health care facilities, resulting in citizens having to travel long distances to obtain care if there is not a facility near them (Mills & Bertrand, 2005).

The lack of health education on chronic diseases affects the overall management of the disease (Segbefia et al., 2012). Due to the high volume of patients, there is sparse time for health education on chronic diseases and its management causing a lack of knowledge and fewer adherences to recommended disease management practices (Segbefia et al., 2012). Health expectations are closely linked with adherence to conventional treatment. Without compliance, patients are more likely to experience negative health outcomes (Kretchy et al., 2014). For example, the management of diabetes, hypertension and heart disease would require a low or no salt diet (De Graft Aikins et al., 2012). Africans consume a lot of salt and often do not adhere to a low or no salt diet (Cappuccio, Kerry, Micah, Plange-Rhule, & Eastwood, 2006). A study in the Ashanti region of Ghana found that a reduction in the average salt intake in the whole community could lead to a significant reduction in population hypertension (Cappuccio et al., 2006). In the aforementioned study, 98% of participants reported that salt was added to food while cooking, and 52% of participants reported that salt was additionally added to the prepared food at the table (Cappuccio et al., 2006), indicating the need for significant community education and awareness.
To effectively manage the chronic disease burden, it is recommended that interventions should be targeted outside of the major cities and should focus on the high-risk populations (Aikins et al., 2012). Available health services should be strengthened to improve the capacity of institutions to deliver quality care and educate the population on non-communicable diseases (Aikins et al., 2012). The gap between policy rhetoric and action also needs to be bridged (Aikins et al., 2012).

According to Bosu (2013), Ghana needs to:

- Strengthen its national local political will to prevent and control non-communicable diseases.
- Finalize and implement an evidence-based action plan for prevention and control for non-communicable diseases.
- Increase resources for programs.
- Strengthen the capacity of health systems for prevention.
- Strengthen monitoring and evaluation systems.
- Strengthen the role of the Ghanaian governmental regulatory functions to combat non-communicable diseases.
- Increase access to appropriate healthcare and affordable medicines.
- Implement public health interventions.

(Bosu, 2013)

Notably missing in this list of recommendation is an inclusion of community engagement for chronic disease management, exemplifying the limited discussion of the issue in the existing literature — a gap this study intends to fill.
The Chronic Care Model and Chronic Conditions

The Chronic Care Model (CCM) has been used in many countries such as Canada (Barker, de Lusignan, Baguley, & Gagne, 2014). Studies using the CCM have proven that an essential component of improving patient care would be targeting the system of chronic disease management (Barker et al., 2014). Incorporating the six elements from the CCM – (community - resources and policies, health system – organization of health care, self-management support, delivery system design, decision support, and clinical information systems – has resulted in improved quality of care and chronic disease outcomes (Barker et al., 2014).

One element of the CCM includes providing the patient with a better delivery system design, more specifically a team comprised of various health professionals including physicians, nurses, dieticians, etc. (Barker et al., 2014). In Canada, data showed that patients who have these teams in place had better health outcomes and fewer hospital visits (Barker et al., 2014). A randomized trial done in Canada added a pharmacist to the patient healthcare team which resulted in a reduction in blood pressure for people with type 2 diabetes (Barker et al., 2014). Primary care physicians have adopted diabetes self-management educations services by offering planned visits exclusively for people with diabetes they called “diabetes days,” to help address barriers to proper diabetes care (Stellefson, Dipnarine, & Stopka, 2013). A previous implementation of the CCM in Tuscany, Italy scheduled patients with diabetes for follow-up visits with general practitioners (Barletta et al., 2016).

Another element of the CCM, self-management support, which includes self-management education, reminders, and self-monitoring has proven to enhance diabetes self-management (Barker et al., 2014). Through problem-solving and goal setting, a diabetes patient can take control of their chronic illness (Barker et al., 2014). Certified Diabetes Educators
(CDEs) provide information about medications, compliance, interpretation of care as well as other services to improve health management (Stellefson et al., 2013). Weekly automated tailored phone calls were found beneficial in physical activity in patients and a slightly positive impact on some metabolic outcomes (Stellefson et al., 2013). In the Tuscany study, nurses were trained to provide support and education to patients, to better manage their diabetes via individual or group counseling (Barletta et al., 2016).

The CCM has helped prove that when healthcare providers are given adequate tools that provide support for effective decision making concerning the patient it leads to better health outcomes for the patient (Barker et al., 2014). Evidence has shown the use of clinical flow sheets has provided patients with the opportunity to better adhere to clinical practice guidelines for diabetes (Barker et al., 2014). Training primary care physicians on evidence-based guidelines provided primary care physicians opportunities for better adherence to clinical guidelines such as the American Diabetes Association (ADA) Standards of Care (Stellefson et al., 2013). International guidelines were used to identify diagnostics for patients, which also provided recommendations that were compatible with the available resources in Tuscany (Barletta et al., 2016).

Electronic medical records (EMRs) have assisted in the monitoring and delivery or patient care (Barker et al., 2014). Clinical information systems like the EMRs are also good for assessing and effectively planning care plans for patients with diabetes (Barker et al., 2014). Using both disease registries and EMRs allowed a team of healthcare providers to review exam results and lab reports and address problems with the care of the patient (Stellefson et al., 2013). In the case where a registry was not present, healthcare teams in Tuscany set up an electronic
diabetes registry (Barletta et al., 2016). The registry was used to support the planning of care for patients and as an internal audit (Barletta et al., 2016).

Peer diabetes management groups have shown to benefit patients with type 2 diabetes (Barker et al., 2014). Community resources have not been immensely explored although community partnerships have shown to positively affect patients with diabetes (Barker et al., 2014). A community partnership between the University Pittsburg Medical Center, western Pennsylvania community hospitals and primary care physicians provided more access to funding, information systems, and administrative support (Stellefson et al., 2013).

A robust health system is needed to improve health outcomes of patients with diabetes (Barker et al., 2014). Providing providers with incentives to utilize certain tools such as flow sheets in the care and management of these patients can lead to healthier results (Barker et al., 2014). Countries worldwide can find ways to implement better health at the regional level (Barletta et al., 2016). The Tuscan Regional Health Ministry launched the “Project for proactive health care implementation at the community level, and one of their items on the 2008-2010 Regional Health Planning (Barletta et al., 2016).

The CCM is a great model to implement changes in the care for patients with chronic diseases (Barletta et al., 2016). Healthcare providers can seek new methods and plans to seek more positive health outcomes for these patients through models such as the CCM (Barker et al., 2014). Studies have resulted in positive health outcomes in patients with diabetes such as reduced average glycated hemoglobin (HbA1c) and cholesterol levels, better compliance with care, blood pressure levels, and increased patient knowledge and empowerment (Barletta et al., 2016).
The CCM was originally designed for clinical systems. However, to better accommodate prevention and promotion practices, an enhanced version of the CCM was developed titled the Expanded Chronic Care Model (Barr et al., 2003). The expanded version of the CCM includes elements like community participation, prevention efforts, and recognition of the social determinants of health, which verifies the need for more collaboration between the population health promotion field and clinical healthcare professionals to combat chronic disease (Barr et al., 2003). With more community partnership, patients with chronic diseases can experience better health outcomes (Stellefson et al., 2013).

Conclusion

Non-communicable diseases are one of the top causes of deaths in the world (WHO, 2013). In twenty years, cancer, cardiovascular disease, diabetes, mental illness, and chronic respiratory illness will cost developing countries large quantities of money (Kruk et al., 2015). Chronic disease burdens continue to grow in Sub-Saharan Africa (Guariguata et al., 2015). There is an apparent lack of health resources in Africa, which remains a barrier for chronic disease management in low-income countries in Africa (Maimela et al., 2015).

In Ghana, a West African country, diabetes and hypertension are two of the most prevalent chronic diseases (De Graft Aikins et al., 2012). Chronic diseases in Ghana have been attributed to seven main causes: poor diets, poor lifestyle practices, heredity, physical factors, the environment, spiritual factors, and psychological factors (De Graft Aikins et al., 2012). As in other Sub-Saharan African countries, chronic disease management in Ghana (Aikins et al., 2014) is largely limited by resource constraints.

While the prevalence of chronic diseases is rising in Ghana, research has not been simultaneously increasing (Aikins et al., 2014). There are sufficient gaps in the literature as it
relates to chronic diseases in Ghana (Tindana et al., 2011). In particular, the literature regarding community and social support in Ghana for the management of chronic diseases is underrepresented (Tindana et al., 2011), calling for additional research with such emphasis. This present study attempts to fill this gap in the literature and add to the growing body of literature needed to inform strategies for addressing this global epidemic and within the Ghanaian context (WHO, 2013). The next chapter discusses the conceptual underpinnings for this study.
CHAPTER III

CONCEPTUAL FRAMEWORK

Chronic Care Model

Twenty years ago, the Chronic Care Model (CCM) was created by Dr. Ed Wagner and researchers at the MacColl Institute for Healthcare Innovation in the United States of America, to address the lack of adequate care for patients with chronic illnesses (Wagner, 1998). The results of surveys and audits revealed that there was a need for better disease control and care for chronically ill patients (Wagner, 1998). Randomized trials showed a significant difference between disease management programs than standard care that was previously available through primary care (Wagner, 1998). Wagner concluded that patients with chronic illnesses required steady interactions with their healthcare providers, where a better plan to stabilize symptoms could be formed through better assessments of the patient, and critical attention to treatment guidelines (Wagner, 1998).

The CCM is a guide to improve the management of chronic illness specifically in primary care (Bodenheimer, Wagner, & Grumbach, 2002). It provides preventative care strategies by integrating healthcare professionals and multidimensional assessment of needs (Marcelli et al., 2017). The model is used as a framework to redesign the practice and policy pertaining to the delivery of care for patients with chronic illnesses (Coleman, Austin, Brach, & Wagner, 2009). Wagner questioned whether primary care was effectively managing patients with chronic illnesses, or if there needed to be a separate entity entirely, that would be available to manage these patients (Wagner, 1998) properly. The improvements to the CCM have made it possible for primary care establishments to continue to treat patients with chronic conditions more efficiently (Gee, Greenwood, & Ward, 2015).
According to Wagner, successful chronic-illness care improvement plans have three key features: a clear definition of optimal care, a roadmap for changing the system, and an effective improvement strategy (Murcko, Donie, Endsley, & Cooper, 2006). To help create a successful chronic care plan, the CCM has six independent components: community resources, the health system, self-management support, delivery system design, decision support, and clinical information systems as seen in Figure 3.1 (Gee et al., 2015).

Figure 3.1. The Chronic Care Model

Four of the components (health system organization, delivery system support, decision support and clinical information support) focus on healthcare practice strategies, while the remaining two (self-management, community) are patient-focused (Vallente, 2015). The clinical information systems provide access to data, information, and knowledge needed to improve the health of the patient (Gee et al., 2015). Specific systems are used to organize patient, population, and provider data to describe the health of the population and facilitate care (Flandt, 2006). Decision support is used to assure that patients and providers are granted access to current and
relevant evidence-based guidelines for the care of the patient (Gee et al., 2015). This includes tools for increasing provider access to evidence-based clinical guidelines and collaboration with specialists (Flandt, 2006). The delivery system design promotes an interdisciplinary approach that is patient-centered (Gee et al., 2015). Patients should be confident in the communication, coordination, and collaboration between their care team members regarding the patient’s health (Flandt, 2006). Lastly, health system support or organizational support is used to address the culture of practice and system leadership (Flandt, 2006).

The self-management support, a patient-focused element of the model, refers to giving patients necessary skills and information and confidence towards the self-management of their illness (Gee et al., 2015), which would empower as well as prepare patients to manage their health (Flandt, 2006). Research proves that there are five self-management skills that form the basis of self-management; problem-solving, decision making, resources utilization, the patients-provider relationship, and taking action (Flandt, 2006).

Table 3.1 Five Self-Management Skills

<table>
<thead>
<tr>
<th>Management Skill</th>
<th>Definition/Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Problem-Solving</td>
<td>Identifying a problem, a solution to the problem, and implementing the solution.</td>
</tr>
<tr>
<td>Decision Making</td>
<td>How to read a food label.</td>
</tr>
<tr>
<td>Resource Utilization</td>
<td>Social support and the internet.</td>
</tr>
<tr>
<td>Patient-Provider relationship</td>
<td>A relationship between a patient and their healthcare provider.</td>
</tr>
<tr>
<td>Taking Action</td>
<td>Patient readiness to change and goal setting.</td>
</tr>
</tbody>
</table>

(Flandt, 2006).

The second of the remaining two non-health system components, community resources, focuses on the importance of linkages between the community and patient support, care coordination, and community-based interventions (Flandt, 2006). All of the key components
were designed to strengthen the provider-patient relationship by stakeholders cohesively working together (Coleman et al., 2009).

Wagner believes that thriving health systems have patient-provider interactions that:

- Include well-developed processes and incentives for making changes in the care delivery system.
- Assure adequate self-management support that focuses on patients’ self-efficacy and proper skills to effectively manage their illness.
- Reconfigure the functionality of the healthcare teams to meet the needs of patients with chronic illnesses.
- Develop and implement evidence-based guidelines while supporting the guidelines with health provider education and more interaction between the healthcare team.
- Enhancing information systems leading to more disease registries and tracking systems.

In the past decade, many healthcare organizations have used the CCM (Coleman et al., 2009). The CCM has gained much recognition through its success and has been adopted by the WHO (Marcelli et al., 2017). It has been adopted to guide national quality improvement initiatives that involve group of primary care practices including, the Health Disparities Collaborative (HDC’s), Improving Chronic Illness Care (ICIC) Collaborative, and state-based and regional efforts that have worked with 1500 plus physician practices in both the United States and internationally (Coleman et al., 2009).

The CCM is based on integrated care, an umbrella term in which the WHO defines as “the management and delivery of health services so that clients receive a continuum of
preventative and curative services, according to their needs over time and across different levels of the health system (Desmedt et al., 2016). Integrated care is driven by a three-aim approach: cost savings, better patient care experience, and improved health outcomes (Desmedt et al., 2016). It has been stated that integrated care can regulate and reduce healthcare costs, despite a need for more research regarding the effect integrated care has on the cost of healthcare (Desmedt et al., 2016).

Cost-effectiveness of the CCM has been of concern for health officials (Coleman et al., 2009). Sustaining chronic conditions is known to be costly and a financial burden (Marcelli et al., 2017). Preventative health is known to potentially have cost-saving benefits that are more appealing to the expensive nature of regular primary care (Coleman et al., 2009). Although there are cost-saving benefits of particular changes resulted from the CCM, which may include clinical meetings and registries for conditions such as diabetes, the benefits are to be attained over the long-term (Coleman et al., 2009). Despite the disconnect between who inherits the financial burden of CCM implementation and who actually receives the financial benefit, there is an apparent gain in the increased quality-adjusted life-years (QALYs) by reducing illnesses such as end-stage renal disease, risk of blindness, and coronary artery disease (Coleman et al., 2009). A study showed that a treatment plan that was based on the principles of the CCM presented considerable cost reductions for the care of patients with chronic illnesses (Marcelli et al., 2017).

*The Expanded CCM*

The Expanded CCM integrates population health promotion into the prevention and management of chronic disease (Barr et al., 2003). The new model that can be seen in Figure 3.2 includes the association between the healthcare system and the community (Barr et al., 2003).
The new Expanded CCM significantly highlights the need for collaboration between the formal health system and the community (Barr et al., 2003). The model emphasizes that both the healthcare team and the patient are embedded within a community. It identifies three areas of focus: strengthening community action, creating supportive environments and building healthy public policies (Barr et al., 2003).

Figure 3.2. The Expanded Chronic Care Model

(Barr et al., 2003)

With the Expanded CCM, there is a greater emphasis on the social determinants of health and the role it plays in the lives of patients with chronic illness at the individual level, the community, and population health (Barr et al., 2003). The Expanded CCM does not only focus on improving the health of the patient with chronic illness but also puts the focus on the community to be healthy as well (Barr et al., 2003). The original CCM primarily focuses on the health system, while the Expanded CCM shares the space of the focal point between both the health system and the community with an apparent integrated flow of concepts (Barr et al., 2003). An additional change that can be found in the Expanded CCM is the replacement of the
initial four areas of focus (self-management support, decision support, delivery system design, and information systems), which now are shared between both the community and the health system instead of just under the health system (Barr et al., 2003). Additionally, information systems were changed from the previous clinical information systems (Barr et al., 2003). Lastly, the community component in the CCM was divided into three separate components in the expanded version: build healthy public policy, create supportive environments, and strengthen community action (Table 3.3 Expanded CCM Components) (Barr et al., 2003). It is anticipated that combining the efforts of community involvement and effective strategies from the healthcare system can help decrease the existing burden of chronic illness (Barr et al., 2003). Tables 3.2 and 3.3 compares and contrasts the CCM and the Expanded CCM.

Table 3.2 CCM Components.

<table>
<thead>
<tr>
<th>CCM Component</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Delivery System Design</td>
<td>Group visits.</td>
</tr>
<tr>
<td>Clinical Information system</td>
<td>Data about populations of patients.</td>
</tr>
<tr>
<td>Decision support</td>
<td>System prompts and reminders.</td>
</tr>
<tr>
<td>Self-management support</td>
<td>Education resources, skills training, psychosocial support, collaboration between provider and patient for care plan.</td>
</tr>
<tr>
<td>community resources</td>
<td>Community partnerships.</td>
</tr>
<tr>
<td>health system support</td>
<td>Visible leadership from providers</td>
</tr>
</tbody>
</table>

(Flandt, 2006).
Table 3.3 Expanded CCM Components.

<table>
<thead>
<tr>
<th>Expanded CCM Component</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-Management/ Develop Personal Skills</td>
<td>Weight management programs</td>
</tr>
<tr>
<td>Decision Support</td>
<td>Development of guidelines</td>
</tr>
<tr>
<td>Delivery System design/ Re-orient Health Services</td>
<td>Advocacy for/with vulnerable populations</td>
</tr>
<tr>
<td>Information systems</td>
<td>Community needs assessment that focuses on:</td>
</tr>
<tr>
<td></td>
<td>• Poverty rates</td>
</tr>
<tr>
<td></td>
<td>• Availability of public transportation</td>
</tr>
<tr>
<td></td>
<td>• Crime rate</td>
</tr>
<tr>
<td>Build Healthy Public Policy</td>
<td>Advocating for or developing:</td>
</tr>
<tr>
<td></td>
<td>• Smoking laws</td>
</tr>
<tr>
<td></td>
<td>• Reductions in food cost</td>
</tr>
<tr>
<td></td>
<td>• Sidewalks</td>
</tr>
<tr>
<td>Create Supportive Environments</td>
<td>Maintaining older people in their homes for as long as possible</td>
</tr>
<tr>
<td>Strengthen Community Action</td>
<td>Supporting the community in addressing the need for affordable housing.</td>
</tr>
</tbody>
</table>

(Barr et al., 2003).

Interventions guided by an appropriate theoretical framework fitting the health problem of concern can change behavior (Maimela et al., 2015). Several studies have examined the relationship between CCM components and quality of care (Coleman et al., 2009). Findings conclude that the CCM components can positively affect the care of patients (Barr et al., 2003). The CCM can additionally be used for the prevention of chronic disease as long as the clinical prevention and management of the chronic disease use similar improvement strategies (Barr et al., 2003). The Expanded CCM has the potential to improve the health of the population through positive and productive interactions among community members, health professionals and community groups (Barr et al., 2003). A study that had full community commitment to the patient helped improve the patient’s self-care and provided satisfaction not only to the chronically ill but their caregivers as well (Marcelli et al., 2017).


The Application of the CCM and Expanded CCM in this Study

The CCM and its modified version, the Expanded CCM were used as a framework for obtaining the perceptions of health professionals in Ghana on chronic disease management in the country. The Chronic Care Model has been used in several studies in the past ten years to improve the quality of care in primary care settings (Coleman et al., 2009). The full interview guide and survey were constructed, as part of a larger study on chronic disease management, to appropriately represent each of the six components of the chronic care model (Appendix A), with a significant emphasis on the role of the community as articulated by the Expanded CCM. Because this present study focuses on the role of the community in supporting the care of patients with chronic conditions and facilitating positive provider-patient relationships, only findings relating to community support are presented. For example, the four questions/items from the interview guide that are represented in the community section included:

- How does the community support the care of patients with chronic conditions? (i.e., what has been the community’s role in the care of patients with chronic conditions?)
- What type of community resources are available to help these patients manage their conditions.
- How do healthcare organizations work with communities to ensure the effective management of these patients outside of the healthcare setting?
- What additional ways would the medical community like the community to support the care of patients with chronic conditions? What additional community resources will be needed to make this happen?

Conclusion

There needs to be more attention paid to the social determinants of health for patients with chronic conditions (Marcelli et al., 2017). The CCM provides an opportunity to discover improved management plans, better assessments of the community needs and determinants of
health, increased use of information systems and databases, active patient and community involvement, and prevention of prior needed interventions (Marcelli et al., 2017). As stated by Wagner, “the chronic care model is not a quick fix or magic bullet. It is a multidimensional solution to a complex problem” (Murcko et al., 2006). The Expanded CCM highlights the significant role communities play in the health of individuals. Engaging communities in the care of individuals with chronic conditions thus has the benefit of directly influencing health outcomes through social interactions with the patients.

This chapter discussed the CCM and its modified version, the Expanded CCM (hereafter collectively referred to as the CCM) as conceptual frameworks for this study. Details about the methodological approach for this study is presented in Chapter 4.
CHAPTER IV

METHODOLOGY

The prevalence of chronic disease has been on the increase in developing countries. The purpose of this study is to gain the perspectives of health care providers on the role of the community in chronic disease management, with a focus on the management of diabetes and hypertension, in Ghana. The CCM was used as a guide for identifying the essential elements for achieving optimal management of diabetes and hypertension in Ghana.

Study Design

This study was a cross-sectional study with a concurrent transformative strategy (Creswell, 2009). A mixed methods approach was used to collect both qualitative and quantitative data, to provide substantial evidence for study results. This data collection strategy was done to strengthen the validity of the study (Creswell, 2009). Data were collected in two phases. Phase I consisted of in-person interviews with health professionals, including doctors, nurses, and ancillary staff in Kumasi, Ghana. Phase II consisted of a survey of health professionals, which also include doctors, nurses, pharmacists, dietitians and ancillary staff in Kumasi, Ghana. The survey was informed by findings from the interviews and guided by the ECCM.

Theoretical Framework

For the qualitative data, the CCM six components helped provide a framework for assessing chronic disease management by examining the organization of health care, the existing self-management support, the current decision support, the delivery system design, the clinical information systems, and the current community resources and policies (Stellefson et al., 2013). In line with the Expanded CCM (Barr et al., 2003) and in view of the paucity of literature, an
emphasis was given to the community’s role in the management of chronic diseases in Ghana for the quantitative data. Accordingly, this present study focused on findings related to the community involvement in chronic disease management.

Study Population and Sample

Health professionals, including doctors, nurses, pharmacists, dieticians and ancillary staff who work in a clinical establishment in the Komfo Anokye Teaching Hospital in Kumasi, Ghana were eligible for participation in this study. The Komfo Anokye Teaching Hospital in Kumasi is a partnering hospital for the Georgia Southern Ghana Study Abroad Program. Ghana is located in West Africa. The country has a population of 28 million people and its land mass is similar to the state of Oregon. The capital of Ghana is Accra. However, Kumasi is the largest city in the country, regarding population size. According to the CIA Fact book, in 2015 Accra had a population of 2.277 million while Kumasi had a population of 2.599 million.

Recruitment of Participants

For both the qualitative and quantitative components of the study, a purposive sampling approach with snowballing was employed. Healthcare professionals from the diabetes clinic at KATH were recruited with the help of the Komfo Anokye Teaching Hospital Research and Development Unit. Participants were asked to share the invitation to the survey with other healthcare professionals in the city who cared for patients with chronic conditions and were willing to participate in the study.

In phase one, the investigator spent a total of four weeks in Ghana, where the first leg of data collection began. Through the help of the director of Research and Development at the Komfo Anokye Teaching Hospital (KATH), a purposive sample of fifty participants were
recruited for participation in phase one (qualitative phase) of this study. At the beginning of each interview, the informed consent document was explained, and verbal consent was acquired. Voluntary participation was stressed, and participants were informed they could exclude themselves from participating in the study at any time. Interviews were conducted with audio recording devices, wherever possible and transcribed. In cases where recording was not possible, the researcher took copious notes of the interview. Participants were assigned alphanumeric codes or ID numbers and no demographic information beyond profession was collected to protect their identity and maintain confidentiality. The interviews were completed in August of 2016.

In phase two of the study, health professionals at the Komfo Anokye who saw patients with diabetes and/or hypertension were invited to participate in the study. Research participants could either take the survey in person or online at their discretion through a secured link to the web-based survey software, Qualtrics. This tool for data collection uses Transport Layer Security (TLS) encryption and assists with the recording of response data from all over the world and analysis and data reports.

Qualitative Instrument

The instrument used for the qualitative data collection included an initial section of four questions to identify the prevalence of chronic conditions in Ghana. The remainder of the instrument focuses on chronic disease management which is split up into five sections: Health system and delivery system design, clinical decision support & clinical information systems, self-management, the community, and other thoughts. The questionnaire instrument was developed from a review of the literature and modeled with the Chronic Care Model in mind.
Due to the nature of this study focusing on the role of the community, the questions in the study about the community were of immediate interest. These questions explored the role of the community in chronic disease management, the availability of community resources to support chronic disease management and the extent of collaboration between the community and the health system in the care of patients with chronic conditions. The specific interview questions were as follows:

- How does the community support the care of patients with chronic conditions? (i.e., what has been the community’s role in the care of patients with chronic conditions?)
- What type of community resources are available to help these patients manage their conditions.
- How do healthcare organizations work with communities to ensure the effective management of these patients outside of the healthcare setting?
- What additional ways would the medical community like the community to support the care of patients with chronic conditions? What additional community resources will be needed to make this happen?

The interviews averaged at about one hour, some participants had much to say, while others were quite brief. Interviews with health professionals at the Komfo Anokye Teaching Hospital in Kumasi Ghana were completed by the author and one other researcher.

Quantitative Instrument

The instrument for the Diabetes and Hypertension Management Survey was used to obtain quantitative data about healthcare professional’s perspectives on the current clinical
climate of health management of patients with chronic diseases in Ghana, focusing on diabetes and hypertension. The instrument was developed by based on an extensive literature review and from findings from the qualitative phase of the study. After expert reviews from five healthcare professionals in Ghana, the instrument was finalized and prepped for distribution to the selected research study population. An additional ten health professionals pilot-tested the survey before administration.

Quantitative Measures

The survey included different measures to examine various perceptions of healthcare professionals. The main sections of the survey included: diabetes and hypertension management, training in chronic disease management, and a section about demographics. This research examined the role the community plays in the management of patients with chronic diseases, and as such utilizes data from survey questions pertinent to community involvement in chronic disease management.

Health professionals’ perception of the current level of community involvement in the chronic disease management and the current extent of community-healthcare partnership in chronic disease management were assessed using the following questions:

(a) On a 5-point scale (from strongly disagree (1) to strongly agree (5)), please indicate your level of agreement with the following statement – “The community provides adequate support for people living with diabetes and/or hypertension”

(b) On a 5-point scale (from strongly disagree (1) to strongly agree (5)), please indicate your level of agreement with the following statement – “Healthcare organizations and
providers involve communities in the management of patients with diabetes and/or hypertension.”

Health professionals’ perception of the role the community can play in the management of diabetes and hypertension was assessed using the following:

(c) On a 5-point scale (from no role at all (1) to very important role (5)), “how much of a role can each of the following community members and entities play in the management of diabetes and hypertension in Ghana?” Participants were asked to identify the level of the role for each of the following community entities: the family, faith-based organizations (e.g. churches, mosques), traditional healers, employers/workplaces, schools, government/policymakers, chiefs/local rulers, the media, and other. These community entities emerged from the interviews and literature review as key community elements.

Additionally, a question to assess health professionals’ perception of the effectiveness of select strategies used to engage community members was used also included:

(e) On a 5-point scale (not at all effective (1) to very effective (5)), “in your opinion, how effective do you think the following strategies are at engaging community members to support the management of patients with diabetes and hypertension?”. Participants then proceeded to rate the level of effectiveness for the following strategies: Using the media (such as radio) for public education on chronic illnesses, issuing educational brochures on chronic disease management at health facility waiting areas, organizing regular health fairs and outreach programs in communities, partnering with faith-based organizations (e.g. churches and mosques) to improve the management of chronic illnesses. These
strategies emerged from the qualitative interviews and the review of the literature as the most common strategies for community engagement.

Finally, demographic and practice information including gender, age, profession and proportion of patients seen with chronic conditions were obtained.

Data Analysis

Qualitative Analysis

Audio recordings of health provider interviews were transcribed. The transcriptions were then reviewed by an additional researcher for accuracy. Transcribed data and researcher notes (in cases where audio recordings are not available) were entered into a qualitative data analysis software, Nvivo11. A thematic analysis approach was utilized, and qualitative coding will be applied to organize the data. A codebook was created that included specific definitions of codes that were used as a reference. The codebook was developed in partnership with another researcher for consistency. Themes were developed from the codes identified in the transcripts. Another researcher will additionally analyze the transcripts using the same approach for inter-coder reliability. A total of 50 questionnaire participants were collected.

Quantitative Analysis

Data collected from the surveys that were administered in person and online were cleaned and analyzed using STATA Version 15. To avoid repeated survey participants (i.e., participants who complete the survey both online and in-person), a screening question was included in both survey formats, asking each participant to indicate whether or not the participant had already
completed the survey. A total of 104 health professionals located in Kumasi, Ghana completed the survey.

Quantitative data were analyzed using descriptive statistics including means, standard deviation and frequencies. Bivariate relationships were assessed using chi-square, t-tests and Pearson correlation tests as appropriate. Multiple Correspondence Analyses (MCA) was used to assess the relationships among the different community entities and community engagement strategies and to determine whether health professionals’ demographic and professional characteristics are associated with their perception of the role of the community in the care of patients with diabetes and hypertension.

Dependent Variables
The primary dependent variables in this study included variables assessing the role of community stakeholders (family, faith-based organizations, schools, employers/workplaces, traditional healers, chief and traditional rulers, media and government/policymakers) as well as those assessing the perceived effectiveness of selected community engagement strategies (i.e. use of the media, issuing educational brochures, organizing health fairs and community outreach programs and partnering with faith-based organizations).

Independent Variables
The independent variables included demographic and professional characteristics such as gender, age, profession, and the proportion of patients seen with diabetes and/or hypertension. MCA plots were used to display the relationships among the variables graphically.

*Multiple Correspondence Analysis*
A Multiple Correspondence Analysis (MCA) was used to further explore the relationships among the community variables. The MCA is an extension of Correspondence Analysis (CA). CA is a descriptive method which allows for the relationship between a pair of variables to be displayed graphically in a low-dimensional frame. CA converts the data matrix into a graphical display by plotting rows and columns as points (Greenacre & Hastie, 1987). MCA extends CA by allowing the analytical assessment and visual display of patterns of associations among more than two categorical dependent variables. It is a scaling technique used to reduce the dimensionality (number of columns and rows) of a set of related variables. The goal is to optimize the number of dimensions to the minimum number of dimensions that explains the maximum variance in the original set of variables (Greenacre, 2002). In this regard, MCA functions just like Principal Component Analysis, except that whereas PCA is only appropriate when variables are continuous, the MCA can be used with categorical variables. This is because, there are no distribution assumptions for MCA, thus affording the researcher much flexibility to assess any categorical data (Greenacre, 2002; Panagiotakos & Pitsavos, 2004; Sourial et al., 2010).

There are other scaling approaches for use with categorical data, such as extensions to Exploratory Factor Analysis (EFA) using tetrachoric and polychoric correlation coefficients for binary data. However, the advantage MCA has over these approaches is that it allows the researchers to factor in the variable response values as well (Panagiotakos & Pitsavos, 2004; Sourial et al., 2010).

In a CA, the distance between individual row (or column) profiles and the distance to the average row (or column) profile (also known as the centroid) is measured using the chi-square metric. Column and row profiles are the relative column and row frequencies, respectively. The
weighted sum of each row (or column) profile and the average row (or column) profile is known as the inertia or total variance. A function of CA is to decompose the inertia into a smaller number of independent dimensions that explains the maximum amount of variance (Sourial et al., 2010). The reduced dimensions/variables are obtained by applying a singular value decomposition to the cells of a transformed version of the two-way contingency table. Biplots or “Maps” allow researchers to plot dimensions of the reduced matrix using geometrical methods. Often, the first two dimensions are plotted on an x-y plane, with dimension 1 representing the dimension capturing the greatest variance, and dimension 2 capturing the second largest variance. The Greenacre rule can be used to determine the number of dimensions to retain. According to this rule, only dimensions with an eigenvalue > 1/Q should be retained, where Q= the number of variables (Sourial et al., 2010).

Rows and column geometries are interpreted similarly. Columns with similar patterns of counts will cluster together. Similarly, rows with similar patterns of counts will cluster together. It should be noted that interpretation of plots should focus on the distance between row points or the distance between column point and not on the distance between row and column points as this is meaningless (Panagiotakos & Pitsavos, 2004).

The MCA extends the CA by applying a correspondence analysis to either the Burt table or indicator matrix. In an indicator matrix, value responses for each variable are converted to indicators. For example, for the gender variable, indicator variables for male (1= male; 0=female) and female (1=female and 0=male) will be created. Thus, a male was coded as “1” on the male indicator variable and “0” on the female indicator variable. In the indicator matrix, observations are presented in the rows, while indicator variables are represented in the columns (Panagiotakos & Pitsavos, 2004). The Burt matrix (the inner product of the indicator matrix) can
be thought of as a multiple contingency table, which displays contingency tables between variables in blocks (Panagiotakos & Pitsavos, 2004).

Additional variables (such as demographic variables) can be superimposed on MCA plots to allow the researcher to assess the relationship between such variables and the variables of interest (i.e. primary variables). Superimposed variables do not contribute to the inertia calculation, and do not affect the results of the MCA. Because the MCA is an exploratory data analysis methodology with no a priori hypotheses, there are not statistical significance tests that are used to evaluate findings (Panagiotakos & Pitsavos, 2004). According to Panagiotakos & Pitsavos (2004), this is because “the primary purpose of the technique is to produce a simplified (low-dimensional) representation of the information in a large frequency table (or tables with similar measures of correspondence)” (p.78). Further, correspondence analysis is thought to approximate log-linear models (Panagiotakos & Pitsavos, 2004).

**Reporting**

Findings were presented in aggregate, ensuring confidentiality of the participating organizations. Statistical significance was determined at the p<0.05 level. All analyses were completed using STATA statistical software Version 15. Microsoft Excel was used to generate charts and graphs.

**Ethical Considerations**

This research contains data collected in person from human subjects in the city of Kumasi in Ghana. The Georgia Southern University, Institutional Review Board, approved this research for category B2. Research approval was also granted by the Committee on Human Research, Publications and Ethics from the Kwame Nkrumah University of Science and Technology,
School of Medical Sciences & Komfo Anokye Teaching Hospital. The data collected analyzed the perceptions of healthcare providers on the challenges and opportunities related to chronic disease management and the community in Ghana. There were no identifiable data used in this research. All findings have been reported in aggregate and will be presented in the next chapter.
CHAPTER V

RESULTS

This chapter presents the findings of the health professional interviews and survey data following qualitative and quantitative data analysis, respectively. Results from the qualitative and quantitative analyses are presented together, wherever appropriate with the purposes of triangulating and reinforcing key findings.

Characteristics of Study Participants

Participants in the interviews were nurses (N=20) and physicians (N=30). Demographic characteristics beyond profession were not obtained for the qualitative study. Survey participants were mostly younger than 35 years (73.4%), female (55.1%) and nurses (49.5%) who worked primarily at the Komfo Anokye Teaching Hospital (89.9%). About a third reported that greater than 60% of their patients had diabetes and/or hypertension.

<table>
<thead>
<tr>
<th>Table 5.1. Characteristics of Survey Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
</tr>
<tr>
<td>-----------------------------------------------</td>
</tr>
<tr>
<td>Gender (N=107)</td>
</tr>
<tr>
<td>Male</td>
</tr>
<tr>
<td>Female</td>
</tr>
<tr>
<td>Missing</td>
</tr>
<tr>
<td>Age</td>
</tr>
<tr>
<td>18-34 years</td>
</tr>
<tr>
<td>35-44 years</td>
</tr>
<tr>
<td>45+ years</td>
</tr>
<tr>
<td>Missing</td>
</tr>
<tr>
<td>Profession</td>
</tr>
<tr>
<td>Physician</td>
</tr>
<tr>
<td>Nurse</td>
</tr>
<tr>
<td>Other</td>
</tr>
<tr>
<td>Proportion of patients seen with diabetes/hypertension</td>
</tr>
<tr>
<td>Primary Place of Work</td>
</tr>
<tr>
<td>-------------------------------</td>
</tr>
<tr>
<td>&lt;60%</td>
</tr>
<tr>
<td>60%+</td>
</tr>
<tr>
<td>Teaching Hospital</td>
</tr>
<tr>
<td>Other</td>
</tr>
</tbody>
</table>

Role of Community in the Management of Chronic Disease Management

Through coding and subsequent analysis of the qualitative data, the main themes that emerged included, (a) the lack of community support with a subtheme of stigmatization, (b) limited community resources, (c) the lack of partnership between communities and health organizations, and (d) leveraging community resources for chronic disease management through community empowerment and capacity building.

Qualitative Findings

*Lack of Community Support*

A prevalent theme that emerged was a broader lack of community support in the care of patients with chronic conditions, beyond family members or relatives. Health professionals who participated in the interviews concluded that community support was either minimal or nonexistent when managing patients with chronic illnesses.

“Community support is minimal. [There is] no mobilizing.” (Physician Participant)

“[There are] not many community resources.” (Physician Participant)

“[Community is] usually your family. That is the support system.” (Nurse Participant)

A few participants mentioned that some support provided to patients was not always positive, explaining how the community at times negatively impacted patients through stigmatization. Stigmatization was found as a subtheme, possibly contributing to the lack of community support.
available for patients. Others noted that the lack of community support was in part driven by the community’s lack of knowledge of the patient’s condition, mainly because patients were reluctant to disclose their conditions to others for fear of stigmatization.

“So some patients don’t want their children to even know that they have cancer, so they definitely don’t want their community to know. If the community could be involved fully, that would be nice. Need to educate them to take the stigma away” (Physician Participant).

“They [i.e. the community] don’t [support]. We usually hide our conditions in Ghana and don’t want people to know” (Nurse Participant).

A few health professionals, although in the minority, did mention that community support was present, through (a) instrumental support mechanisms, such as providing transportation or funds, (b) social support mechanisms, such as caregiving for the patient with the chronic illness, and (c) educational support mechanisms like organizing health screenings and health outreach programs.

“[They provide help by] raising money - especially the religious, bringing them to the hospital, [and] helping them financially.” (Physician Participant)

Quantitative Findings

*Lack of Community Support*

Data from the quantitative survey supported this theme. Almost three-quarters of survey participants (74.0%) either strongly disagreed or disagreed that the community provided adequate support for people living with diabetes and/or hypertension (Figure 5.1).
Figure 5.1. The Community Provides Adequate Support

The community provides adequate support for people living with diabetes and/or hypertension.
N=104

In bivariate analysis, health professional’s perception of the level of current community support for people living with diabetes and/or hypertension did not differ based on the demographic characteristics of the health professional (Table 5.2).

Table 5.2. Health Professionals’ Perception of The Level of Current Community Support for People Living with Diabetes And/Or Hypertension by Demographic Characteristics (N=104)

| Health Professionals’ Perception of The Level of Current Community Support for People Living with Diabetes And/Or Hypertension by Demographic Characteristics (N=104) |
|---|---|---|---|---|---|---|
| | Strongly Disagree (%) | Disagree (%) | Neutral (%) | Agree (%) | Strongly Agree (%) | p-value |
| Gender | | | | | | 0.573 |
| Male | 17.9 | 50.0 | 12.5 | 14.3 | 5.4 | |
| Female | 19.2 | 61.7 | 10.6 | 6.4 | 2.1 | |
| Age | | | | | | 0.405 |
| 18-34 years | 21.1 | 51.3 | 13.2 | 10.5 | 4.0 | |
| 35-44 years | 9.5 | 76.2 | 4.8 | 9.5 | 0.0 | |
| 45+ years | 16.7 | 33.3 | 16.7 | 16.7 | 16.7 | |
| Profession | | | | | | 0.281 |
| Physician | 27.8 | 66.7 | 5.6 | 0.0 | 0.0 | |
| Nurse | 21.2 | 46.2 | 11.5 | 15.4 | 5.8 | |
| Other | 8.8 | 64.7 | 14.7 | 8.8 | 2.9 | |
Survey respondents were also asked to indicate how much of a role they felt different community entities could play in chronic disease management. The majority of participants (86.8%), thought the family would be able to play an important role, with media following closely behind (85.9% of respondents felt the media could play an important role). About three-quarters of respondents (78.2%) felt that the government/policymakers could play an important role, followed by schools (70.0%) and faith-based organizations (69.5%). On the other end, a lower proportion of respondents felt that traditional healers (26.9%) and chiefs/local rulers (43.0%) could play a vital role in chronic disease management (Figure 5.2).

*Sample size varied by question option, ranging from 99- 106. The average sample across question options is provided.
Table 5.3 shows the correlations between the perceived degrees of community roles in chronic disease management. The correlation matrix allows us to assess the relationships between each of the community entities. All listed community entities positively and significantly correlate except four pairs that were found not to be statistically associated; traditional healers and family, employers/workplaces and family, the media and traditional healers, and the government and traditional healers. The following pairs of community entities were weakly to moderately correlated (correlation coefficient < 0.3; p<0.05): faith-based organizations and the family, the government and faith-based organizations, employers/workplaces and traditional healers, schools and traditional healers, chiefs/traditional rulers and traditional healers, and employers/workplaces and the government. All other pairings were moderately associated (correlation coefficient > 0.3 < 0.5; p<0.05).

Table 5.3. Spearman Correlation Matrix: Perceived Degree of Community Role in Chronic Disease Management

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Family (1)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Faith-Based Orgs (2)</strong></td>
<td>0.2792*</td>
<td></td>
<td></td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Traditional Healers (3)</strong></td>
<td>0.1066</td>
<td>0.4055*</td>
<td></td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Employers/Workplaces (4)</strong></td>
<td>0.1844</td>
<td>0.3938*</td>
<td>0.2134*</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Schools (5)</strong></td>
<td>0.4549*</td>
<td>0.3779*</td>
<td>0.2523*</td>
<td>0.3428*</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Government (6)</strong></td>
<td>0.4446*</td>
<td>0.2662*</td>
<td>0.1415</td>
<td>0.2939*</td>
<td>0.3863*</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Chiefs/Traditional Rulers (7)</strong></td>
<td>0.3115*</td>
<td>0.3584*</td>
<td>0.2427*</td>
<td>0.4244*</td>
<td>0.4657*</td>
<td>0.4363*</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td><strong>Media (8)</strong></td>
<td>0.373*</td>
<td>0.3064*</td>
<td>0.1796</td>
<td>0.3361*</td>
<td>0.4815*</td>
<td>0.452*</td>
<td>0.3779*</td>
<td>1</td>
</tr>
</tbody>
</table>

*p<0.05
MCA: Perceived Role of the Community in Chronic Disease Management

An MCA using the community role ratings for each of eight community entities (i.e. family, faith-based organizations, schools, media, government, employers/workplaces, chiefs and traditional healers) as primary variables resulted in the identification of two dimensions that collectively explained 83.7% of the variance in the data. The first and second dimension explained 71.8% and 11.9% of the variance, respectively. The scree plot supported the retention of two dimensions (Figure 5.3.).

*Figure 5.3. Scree Plot of Principal Inertias after MCA*

**Scree Plot of Principal Inertias after MCA**

Figure 5.4 represents an MCA plot of the perceptions of healthcare providers on how much of a role, different community entities can play in chronic disease management. The plot allows us to observe the pattern of responses and to assess possible relationships among the
variables representing each of the community entities (i.e., family, faith-based organizations, schools, media, government, employers/workplaces, chiefs and traditional healers). The variables that do not have a circle marker represent demographic variables projected on to the MCA plot as supplementary variables (i.e., they are simply superimposed on the plot and were not included in the MCA computation). However, their position on the plot allows us to see how the primary variables (the different community categories) relate to these supplemental variables.

When interpreting an MCA plot, there are a few key things to consider: (a) the location of the point relative to the x and y-axis, (b) the location of points relative to the origin and (c) the relative distance between points in the same set along a given dimension. If dimension 1 is represented by the x-axis (horizontal axis) and dimension two is represented by the y-axis (vertical axis), as is the case in Figure 5.4., values plotted closer to the x-axis indicate that those loaded heavily on dimension 1. Similarly, points occurring closer to the y-axis will indicate a loading on dimension 2. The farther away a point is from the origin, the more significant its contribution to the given dimension to which it falls. Points that are clustered together in the same dimension indicate a similar pattern of responses, suggesting that they are closely associated. On the other hand, points farther apart along a dimension have less in common.

In Figure 5.4, the most significant pattern we see is the clustering of response values. That is, for all community entities, “important” role ratings occur in the same quadrant (top-left), “neutral” role ratings co-occur (bottom right quadrant), and “limited” role ratings also co-occur (top right quadrant). Specifically, dimension 1 separates “important role” ratings from other ratings as indicated by their location on opposite ends along the x-axis. Dimension one is thus labeled as the “important role/other” dimension. Dimension 2 (y-axis) tend to separate “limited role” ratings at the top from “neutral role” ratings at the bottom, as indicated by their location on
opposite ends along the y-axis. Dimension two is therefore labeled as the “neutral/limited role” dimension.

This observed pattern in the distribution of points in the MCA plot suggests that the most important difference in the study sample was participants’ viewpoint on the community’s role – that is, whether they perceived each of these entities to have an important role to play in chronic disease management or not. This observed pattern also indicates that all the community entities are positively correlated, findings largely supported by the correlation analysis. It also supports the conceptualization of all these entities as representing dimensions of the concept of “community.”

Superimposing the demographic variables on the MCA plot also revealed additional associations. In Figure 5.4, we can see that respondents who were 45-year-olds and above and physicians were most likely to agree that faith-based organizations, employers, government, and schools had an important role to play in chronic disease management. Respondents in professions that fall under the “other” category (i.e., health professionals other than physicians and nurses) and those 18-34 years old were more likely to report that community entities, especially traditional healers and chief/traditional rulers did not that have an important role to play in chronic disease management.
Figure 5.4. Perceptions of Healthcare Providers on How Much of a Role the Community Can Play in Chronic Disease Management.

Perceptions of Healthcare Providers on How Much of a Role the Community Can Play in Chronic Disease Management.
Qualitative Findings

Community Resources for Chronic Disease Management

Community resources available to support the care of patients with chronic illnesses were found to be limited. Health professionals participating in the interviews perceived that there were few or no available community resources beyond the family dynamic, for the management of patients with chronic illnesses. The minority of participants who professed that there were community resources present identified the presence of (a) economic resources such as funding, (b) individual resources such as family members and (c) community institutional resources such as hospitals, clinics, churches, and clinics. The majority of pre-existing community resources identified by interview participants were centered on community-based medical infrastructure, consisting of community-based primary-care or preventative services such as Community-based Health Planning and Services (CHPS), community public health services and community pharmacies.

“[There are] health center[s] with personnel to check their BPs and to seek advice from.” (Physician Participant)

“Not many community resources.” (Physician Participant)

“Community pharmacists that are a first point of reference for many patients and are referred through them.” (Physician Participant)

“I don’t know many apart from them coming to main hospital. [There are] pharmacy shops to check BP for free.” (Nurse Participant)
“[A] few centers help with counseling.” (Nurse Participant)

Community-based social infrastructure to support the management of patients with chronic conditions appeared underutilized. A few identified the presence of community-based organizations like faith-based organizations (churches and mosques), fun clubs and media outlets as sources of informational support for patients, mainly through their health education and promotion programming. The family emerged as the most important provider of socioemotional, instrumental and caregiving support.

“None besides family members.” (Nurse Participant)

“Usually your family. That is the support system.” (Nurse Participant)

Qualitative Findings

*Health Organizations and Community Partnerships in Chronic Disease Management*

An additional theme that emerged in the qualitative interviews highlighted the lack of collaboration between health organizations and communities in the management of patients with chronic illnesses. A participant mentioned that the main relationship in the management of these patients was between the health organization and the patient, not involving the larger community. Health professionals believed that health organizations and communities work minimally together, and when the two entities worked together, they mainly focused on providing education to patients on a smaller scale. The lack of extensive healthcare community collaborations was blamed on limited resources. The most commonly mentioned community
partners for health education and promotion included the media, faith-based organizations, nongovernmental organizations, community-based health providers and clinics.

“This is one of the weakest challenges that we have, but we do not have the resources to do so. The best that we can currently do is go to radio station[s] and church[es] to educate the people.” (Nurse Participant)

In describing how the community and health organizations currently worked together in chronic disease management, one physician participant noted:

“There are a few {health organizations} doing medical screenings and lectures, but not on a large scale so they don’t reach everyone” (Physician Participant)

Others gave specific examples of how the health organization partnered with the community in the care of patients with chronic diseases:

“We give review times and give talks, [and provide] public health education.”

(Physician Participant)

“Ghana Medical Association organizes health week, health talks (happens once a year).” (Physician Participant)

“Churches have started doing BP checks and outreach program[s].” (Nurse Participant)
Quantitative Findings

*Health Organizations and Community Partnerships in Chronic Disease Management*

This theme was supported by the quantitative survey data. More than half (54.9%) of the survey participants either strongly disagreed or disagreed that healthcare organizations and providers involved communities in the management of patients with diabetes and/or hypertension (Figure 5.5). On the other hand, less than a quarter either agreed or strongly agreed that communities were involved in the management of patients with diabetes or hypertension.

*Figure 5.5. Healthcare organizations and Community Partnerships*

Healthcare organizations and providers involve communities in the management of patients with diabetes and/or hypertension. N=102

In bivariate analysis, a higher proportion of males, compared to females (70.3% vs. 41.8%; p<0.05) either strongly disagreed or disagreed that health organizations and providers involved communities in the management of patients with diabetes and/or hypertension (Table 5.4).
Table 5.4. Health Professionals’ Perception of the Extent to Which Health Organizations Partner with the Community by Demographic Characteristics (N=104)

<table>
<thead>
<tr>
<th></th>
<th>Strongly Disagree (%)</th>
<th>Disagree (%)</th>
<th>Neutral (%)</th>
<th>Agree (%)</th>
<th>Strongly Agree (%)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>12.8</td>
<td>57.5</td>
<td>14.9</td>
<td>10.6</td>
<td>4.3</td>
<td>0.047</td>
</tr>
<tr>
<td>Female</td>
<td>10.9</td>
<td>30.9</td>
<td>27.3</td>
<td>27.3</td>
<td>3.6</td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18-34 years</td>
<td>10.7</td>
<td>41.3</td>
<td>25.3</td>
<td>18.7</td>
<td>4.0</td>
<td>0.197</td>
</tr>
<tr>
<td>35-44 years</td>
<td>14.3</td>
<td>57.1</td>
<td>14.3</td>
<td>14.3</td>
<td>0.0</td>
<td></td>
</tr>
<tr>
<td>45+ years</td>
<td>16.7</td>
<td>16.7</td>
<td>0.0</td>
<td>50.0</td>
<td>16.7</td>
<td></td>
</tr>
<tr>
<td>Profession</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.118</td>
</tr>
<tr>
<td>Physician</td>
<td>16.7</td>
<td>61.1</td>
<td>16.7</td>
<td>5.6</td>
<td>0.0</td>
<td></td>
</tr>
<tr>
<td>Nurse</td>
<td>14.0</td>
<td>28.0</td>
<td>26.0</td>
<td>28.0</td>
<td>4.0</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>5.9</td>
<td>55.9</td>
<td>17.6</td>
<td>14.7</td>
<td>5.9</td>
<td></td>
</tr>
<tr>
<td>Proportion of Patients Seen with Diabetes/Hypertension</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.114</td>
</tr>
<tr>
<td>&lt;60%</td>
<td>9.5</td>
<td>47.6</td>
<td>25.4</td>
<td>12.7</td>
<td>4.8</td>
<td></td>
</tr>
<tr>
<td>60%+</td>
<td>14.8</td>
<td>37.0</td>
<td>14.8</td>
<td>33.3</td>
<td>0.0</td>
<td></td>
</tr>
</tbody>
</table>

Qualitative Findings

*Leveraging Community Resources and Enhancing Community Capacity for Chronic Disease Management*

A recurrent theme from the interviews was the idea that an empowered community was needed for the community to play an active collaborative role with the health system in the management of chronic conditions. Participants mentioned that before the community could sufficiently support patients with chronic illnesses, the community itself would need to be educated and empowered. Although there were a few health professionals (N=5) who were unsure of how community resources could be effectively leveraged in chronic care management, the remaining participants collectively mentioned the need for more community involvement in the form of support (socioemotional, informational and instrumental support) facilitated through
education and awareness creation. They called for community members to act as a strong support system for those living with chronic conditions, including providing social (including facilitating the formation of peer support groups), physical and financial support and encouraging them to adhere to treatment regimen.

The majority of participants called for community members to get educated on chronic conditions and to stop stigmatizing such conditions. However, they were also quick to add that it was the duty of the medical community to educate the public. As one participant put it: “We have to create awareness for them to know before they are properly able to help us” (Nurse Participant).

Below are a few exemplary quotes:

“It all depends on education, once they know about the condition, then they will be able to offer help. If they are ignorant of the disease they are unable to help us, especially stigmas that are associated with some cases like epilepsy. They believe that if they touch an epileptic patient, they will catch the disease.” (Nurse Participant)

“I think that it is all about information and the amount that they need and don't have, which would better help us all.” (Physician Participant)

According to participants, community members could also provide platforms for and facilitate the organization of health screening and educational program targeted at improving community awareness of chronic conditions. Participants noted that infrastructural and financial resources would be needed to facilitate such active and meaningful community involvement in
the care of chronic conditions, including funding for educational programming and community centers. Such centers, according to participants, could focus on providing services that allow people to “come together and share experiences.”

“Community can build a small clinic specifically for diabetics and train/pay nurses to motivate them.” (Nurse Participant)

“Money. With money comes a strengthened institution. Moreover, it is easier to provide with the resource.” (Physician Participant)

There were a few health professionals who emphasized that the strengthening of community systems should not be done in isolation of attention to patient self-management and broader changes to the health system. As one participant put it succinctly: “improve patient education, improve healthcare services. Everything!”

Quantitative Findings

Effective Strategies for Community Engagement

Based on data from the surveys, the use of media, health fairs and faith-based organizations for outreach and education purposes emerged as the most popular strategies for engaging community members, regarding their effectiveness. At least eight out of 10 responding health professionals viewed these strategies as effective. The use of brochures was less popular, with only 70% identifying its use as an effective community engagement strategy (Figure 5.6).
In your opinion, how effective do you think the following strategies are at engaging community members to support the management of patients with diabetes and hypertension? 

N= 105*

*Sample size varied by question option, ranging from 102- 107. The average sample across question options is provided.

Table 5.5 shows the correlations between the perceived effectiveness of the different community engagement strategies. Coefficient estimates showed that all of the listed engagement strategies listed (brochures, media, health fairs, and faith-based organizations) positively correlated with one another, suggesting that if a healthcare professional perceived one strategy to be an effective strategy at engaging community members, then they most likely perceived the other strategies to also to be an effective strategy.

Table 5.5. Spearman Correlation Matrix: Perceived Effectiveness of Community Engagement Strategies

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brochures (1)</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Media (2)</td>
<td>0.2698*</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Health Fairs (3)</td>
<td>0.4484*</td>
<td>0.2273*</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Faith-Based Orgs (4)</td>
<td>0.3674*</td>
<td>0.2967*</td>
<td>0.3373*</td>
<td>1</td>
</tr>
</tbody>
</table>
MCA

An MCA examining the relationship between the community engagement strategies as well as respondent demographic characteristics resulted in the identification of two dimensions that collectively explained 81.7% of the variance in the data. The first and second dimension explained 64.7% and 17.0% of the variance, respectively. The scree plot supported the retention of two dimensions (Figure 5.7).

Figure 5.7. Scree Plot of Principal Inertia after MCA (Community Engagement Strategies)

Scree Plot of Principal Inertia after MCA (Community Engagement Strategies)

Results from an MCA are best interpreted using the MCA plot. Figure 5.8 represents an MCA plot showing the relationship between the community engagement strategies assessed (i.e., brochures, health fairs, media outreach and use of faith-based organizations) regarding their perceived effectiveness. Dimension one separates effective rating from other ratings as indicated by their location on opposite ends along the x-axis. Dimension one is thus labeled as the
“effective/other” dimension. We observe a clustering of the community engagement strategies in the negative side of the x-axis (i.e., dimension; top left quadrant), suggesting an association among the community engagement strategy variables, a finding supported by the correlation analysis. This finding also supports the conceptualization of these strategies collectively as strategies for “community engagement.”

With the exception of faith-based organizations, dimension 2 (y-axis) tended to separate limited effectiveness ratings at the top from neutral ratings at the bottom, as indicated by their location on opposite ends along the y-axis. Dimension 2 is therefore labeled as the “neutral/limited effectiveness” dimension.

Superimposing demographic variables as supplemental variables on the MCA plot revealed some interesting patterns. Nurses, females, 18-34-year olds, and 45-year olds were more likely to report that faith-based organizations, brochures, health fairs, and the media were effective strategies for community engagement. On the other hand, survey respondents who listed their profession as “other” and those between the ages of 35-44 years were more likely to report that health fairs, brochures, and the media were not very effective community engagement strategies. Males and females held somewhat dissimilar opinions of the effectiveness of the assessed community engagement strategies.

Summary of Chapter

In summary, the findings revealed a lack of coordinated involvement of the community in the care of chronic conditions. The family appeared to be the primary support system for patients with chronic conditions. Healthcare providers perceived the limited role of the community to be influenced by a lack of education and awareness as well as the lack of resources. Perceptions of the role of the community varied by health provider profession and age, with health professionals
in professions other than nursing and medicine and those less than 45 years being more likely to consider the roles of the community to be minimal. A summary of the study’s findings is provided in Table 5.7 below:

Table 5.7. Qualitative Themes and Research Questions

<table>
<thead>
<tr>
<th>Question</th>
<th>Theme</th>
</tr>
</thead>
<tbody>
<tr>
<td>How does the community support the care of patients with chronic conditions? (i.e., what has been the community’s role in the care of patients with chronic conditions?)</td>
<td>Limited Community Support</td>
</tr>
<tr>
<td>What type of community resources are available to help these patients manage their conditions.</td>
<td>Community resources are limited and mostly consist of community clinics or centers.</td>
</tr>
<tr>
<td>How do health organizations currently work with communities to ensure the effective management of these patients outside of the healthcare setting?</td>
<td>Health System and Community partnerships are generally non-existent, narrowly focusing on education when they occur.</td>
</tr>
<tr>
<td>What additional ways would the medical community like the community to support the care of patients with chronic conditions?</td>
<td>The medical community would like the community to provide more financial, educational &amp; social support.</td>
</tr>
<tr>
<td>What additional community resources will be needed to make this happen?</td>
<td>Additional community resources are needed. These include facilities, funds, educational &amp; social infrastructure.</td>
</tr>
</tbody>
</table>
Figure 5.8. Perceived Effectiveness of Select Community Engagement Strategies

MCA coordinate plot: Perceived Effectiveness of Select Community Engagement Strategies

supplementary (passive) variables: gender age profession %Patients with Diabetes/Hypertension
coordinates in principal normalization

Brochures (1=Effective; 0=Neutral; -1=Limited Effectiveness)  |  Gender
Media                                                      |  Age
Health Fairs                                               |  Profession
Faith-Based Organizations                                   |  %Patients with Diabetes/Hypertension
CHAPTER VI
DISCUSSION

The main objective of this research was to understand how to improve the management of chronic diseases in Ghana by using a mixed-methods research approach and guided by the use of the Expanded Chronic Care Model as a conceptual framework for placing the role of the community into context. The qualitative interviews provided quotes from participants that helped identify themes in response to the proposed research questions: (a) How does the community and healthcare system currently work together for the care of patients with chronic illnesses? (b) What are the barriers and facilitators to community and health system partnerships? (c) How can existing community resources be used to support the chronic condition management? The quantitative survey, which focused on diabetes and hypertension – the two chronic conditions that emerged from the interviews as the most prevalent – was key for triangulation. It provided additional data to complement and support the themes found through the qualitative data, ultimately supporting the research findings. Mixing both qualitative and quantitative methods in this study allowed for a more detailed insight into healthcare professionals’ perception of the role of the community in the management of chronic diseases in Ghana.

The Expanded CCM conceptual framework advocates for more emphasis on the role of the community in improving the management of chronic illness by integrating population health promotion. Community involvement in the care of patients with chronic conditions also lends support to the effectiveness of the other four areas of focus in the CCM (self-management support, decision support, delivery system design, and information systems). Following from the Expanded CCM model, the community can be made an effective catalyst for improved chronic care management through a focus on building public health policy, creating supportive
environments, and strengthening community action – all themes that emerged in the findings of this study. Implicit in the model is the need for more collaboration between the formal health system and the community. Recognizing that patients spend more time within their social and physical communities and determining that the health of the patient is shaped significantly by their interactions with various community elements, could improve the overall management of patients with chronic diseases (Heinze et al., 2015).

The Expanded CCM was used as a guide to conceptualizing the role of the community in the management of patients with chronic diseases. The researcher aimed to provide insight of healthcare professionals on the management of patients with chronic disease as it intersects with community involvement and to potentially inform future interventions focusing on the management of these patients. Barriers to community and health system collaboration were highlighted such as, the lack of resources, insufficient health education, and the lack of broader community involvement in the management of patients with chronic conditions, including diabetes and hypertension. Health care professionals, however believed that with the proper assistance and guidance, the community could provide the necessary support to help manage patients with chronic diseases. In their view, providing more health education about specific chronic diseases to the community and patients could assist in better management by removing the stigma associated with such conditions and empowering community members to take action. Additionally, making more community resources available such as facilities, funding, and support groups could potentially allow the management of these patients to occur more efficiently and effectively.
Qualitative Findings

Differences in Provider Perceptions

In this study, providers other than nurses and physicians were more likely to consider the role of the community in chronic disease management to be limited. This observed difference may be due to some interacting factors such as patient exposure and training. Future studies are needed to explore these observed differences further. However, the findings may suggest that healthcare providers may not be on the same wavelength when it comes to the best approaches for chronic disease management, calling for more interdisciplinary collaboration and coordination among health providers. Prior research has addressed the need for more collaboration between health system stakeholders, such as pharmacy, to improve continuity of care for patients with chronic diseases (George, Zairina, 2016). Community pharmacies, for example, are said to be ideal locations for early detection and screening for chronic conditions while assisting patients in the management of their chronic conditions (George, Zairina, 2016). Interdisciplinary training during medical training, for instance, could be a way to get health professionals in the habit of interacting with one another early on in their career.

Lack of Community Support beyond the Family

An essential community resource is community support. Similar to this study, other studies have identified the family unit as the main supply of community support for patients with chronic diseases (Heinze et al., 2015). Both the qualitative and quantitative data in this study confirmed that the family played the most significant role, outside of the medical community, in the management of patients with chronic diseases. For example, 80% of survey participants agreed that the family played an important or very important role in the management of patients
with diabetes and hypertension. Beyond the family however, most participants believed that there was minimal support from the broader community.

The findings from this study suggests that broader community support is needed to effectively manage patients with chronic diseases, with a specific focus on using patient families as facilitators. The findings align with what previous studies have found about community support and patients with chronic diseases (Gebrezgi, Trepka, & Kidane, 2017). Patients in Eritrea recommended an increase in knowledge for the community, of chronic diseases such as hypertension and to increase community awareness (Gebrezgi et al., 2017). In another study, patients with chronic diseases in South Africa reported the need for leaders/traditional healers and home-based caregivers to be better trained and more involved in the management of patients with chronic diseases (Maimela et al., 2015). South African patients also believed that the community needed to be empowered through methods like information campaigns and involve the community through functional clinic committees (Maimela et al., 2015). The community also needs to be empowered to be receptive to understanding chronic diseases to avoid misconceptions like stigma (Gebrezgi et al., 2017).

In this study, stigma was mentioned to be a barrier for patients to elicit community support in the management of their chronic diseases. Different parts of Africa such as Eritrea, have found that although the family is a facilitator towards disease management, the broader community is seen as a barrier, due to community stigma and low community awareness (Gebrezgi et al., 2017). Previous research in Africa shows that concerns about community perception about their condition put undue pressure on the patient (Gebrezgi et al., 2017). Often, such misconceptions are rooted in myths, cultural traditions and beliefs. Community members in
Eritrea, for example, were found to believe that diseases such as hypertension were considered as a disease of the “old and wealthy people” (Gebrezgi et al., 2017).

Three-quarters (76%) of survey participants believed that organizing regular health fairs and outreach programs in communities will help support the management of patients with diabetes and hypertension in Ghana by increasing community awareness and empowering community members to take on a much-needed supportive role. Educational and awareness-raising activities such as health screenings, health fairs, and “health talks”, could be used by the community and patients to combat stigma by correcting the current narrative pertaining to the information circulating in communities about the origins of chronic diseases and the best way community members, especially families can care for patients with these illnesses.

Given the central role of the family, partnerships between the community and the healthcare system can be formulated and strengthened by adopting strategies that effectively leverage the patients’ family as the “bridge” or facilitator. In Ghana, community-based approaches to health care delivery have been found to improve healthcare delivery. Doing more to help the families and communities support the clinical management of chronic patients could improve the overall health outcomes of these patients. To encourage community involvement, providing services wanted by community members could potentially entice them to do more for the people in their communities with chronic diseases (Quadri, 2016).

The Relationship between the Media and Health Promotion

Traditional mass media such as television and radio can promote healthy behaviors through health education (Yepes, Maurer, Viswanathan, Gedeon, Bovet, 2016). Among survey participants, 79% believed the use of the media, like the radio, was an effective means of
engaging community members to support the management of patients with diabetes and hypertension. However, interview participants also believe that the media could be used more effectively and its potential for information dissemination and awareness creation had not fully been harnessed.

Communication technologies have positively impacted public health methods and practices, such as healthcare follow-up, interactive health-messaging and professional development in sub-Saharan countries in Africa like Senegal (Glik et al., 2014). Using media for health and social change has been defined by Singal and Rogers, through the term “entertainment-education”, which has been defined as the process of designing and implementing a media message to both entertain and educate, in order to increase audience members’ knowledge about an educational issue, create favorable attitudes, shift social norms, and change overt and behavior (Knibbe, de Vries, Hortsman, 2017). New media (mobile phones, internet, etc.) and old media (newspapers, television, radio, etc.) both need to be utilized to reach as wide of an audience as possible to disseminate health information and interventions in sub-Saharan Africa (Glik et al., 2014).

There is a growing number of SMS and email-based interventions in developing countries (Yepes, Maurer, Viswanathan, Gedeon, Bovet, 2016). SMS intervention methods for health promotion and education have been proven effective. Mobile-based interventions have been used in studies conducted in Ghana (L’Engle et al., 2018). Data showed that urban, male, younger, and more educated Ghanaians use media more often than others (L’Engle et al., 2018). Data from this previous study done in Ghana additionally highlighted that young people are less targeted or concerned about health issues and are less exposed to health messages (L’Engle et al., 2018). However, a study done in Seychelles showed that women and those in a higher SES were
more willing to receive health-related SMS (Yepes, Maurer, Viswanathan, Gedeon, Bovet, 2016). They also found that adults are more likely to listen and watch health programs on the radio and television rather than use newer forms of media to obtain health information (Yepes, Maurer, Viswanathan, Gedeon, Bovet, 2016).

The media and health promotion efforts are important factors to help advocate for disease management and prevention (Gebrezgi, Trepka, Kidane, 2017). Health organizations should provide more health coverage through the media (Gebrezgi, Trepka, Kidane, 2017). Partnerships between the media, health organizations and the community can be an effective means to educate and empower community members.

The Relationship between Faith-Based Organizations and Health Promotion

Faith-based organizations were deemed to be great assets and key components of the community, and a shared place where many community members are actively involved. 73% of survey participants believed that partnering with faith-based organizations could be an effective strategy for improving the management of patients with chronic diseases. With the church being of great importance to the community, it could be used as a prime resource for working towards better management of these patients. These findings are aligned with previous research, which explains how CHWs should collaborate with faith-based organizations in Ghana since:

- Faith-based organizations have successfully run programs for the primary prevention of CVD and cancer in developed countries, and for HIC/AIDS prevention, screening and treatment in sub-Saharan Africa.
- A large percentage of Ghanaians attend activities in faith-based organizations.
- Faith-based organizations consider it their mission to increase their parishioners’ awareness of social issues, including healthcare.
A collaboration would inherently provide many opportunities for increased success in the management of patients with chronic diseases (Abanilla et al., 2011).

Research has shown that nongovernmental organizations like the Christian Health Association of Ghana, provide 42% of the health services in the country (Abanilla et al., 2011). The integration of health services provision in faith-based organizations has the potential to be as successful as health services provided in a CHPS. (Abanilla et al., 2011). In Accra, churches possess the physical space, so areas do not have to construct a new health compound (Abanilla et al., 2011). Churches already offer their services to non-congregational members, and church affiliates are already accepted and respected within their religious communities (Abanilla et al., 2011). With faith being of such importance in Ghana, strong partnerships between faith-based organizations and the healthcare system could be an effective method for enhancing health system capacity and improving the health outcomes of patients with chronic diseases (Gebrezgi et al., 2017).

The Relationship Between the Government and Health Promotion

In 1957, Ghana became the first sub-Saharan colony in Africa to gain its independence from Great Britain (Hathcock, 2017). The National Health Insurance Scheme (NHIS) was created in 2003 by the government in Ghana to improve health-care access for Ghanaians (Mensah, Oppong, & Schmidt, 2010). The mission of the NHIS, which is regulated by the National Health Insurance Council (NHIC), is “to ensure equitable universal access for all residents of Ghana to an acceptable quality of essential health services without out-of-pocket payment being required at the point of service use” (Mensah et al., 2010). Some diseases covered by the NHIS scheme include malaria, hypertension, asthma, and diabetes (Mensah et al., 2010).
Although Ghana has a well-structured health system, more could be done to meet the health care needs of vulnerable populations (Araujo de Carvalho et al., 2015). The government of Ghana has a relatively low fiscal capacity and commitment to health (Adua, Frimpong, Li, & Wang, 2017). The government of Ghana adopted and integrated different approaches and systems to the traditional social support system, a system that was used for looking after and responding to the most vulnerable citizens (Castillo, Asante, Becerra, Dwumah, & Barnie, 2015).

A project was completed by a group of researchers following a three-day policy dialogue between the Ghana Health Service and the WHO to discuss the revision of national policies on ageing and health (Araujo de Carvalho et al., 2015). The researchers concluded that interventions need to be included in new health policies; applicable health promotion interventions included:

- Sensitizing the community to the health needs of older adults; targeting information and education efforts to the public, carers, community leaders and religious organizations.

- Integrating ageing and health in the community health workers’ program.

- Creating age-friendly health facilities.

- Broadening insurance coverage by increasing the range of services and the number of people who are eligible.

- Creating and empowering support groups to assist with screening, education, management and care of older people in communities.

(Araujo de Carvalho et al., 2015).

Some of the priority problems that identified based on diseases prevalence and impact on health included: undiagnosed and untreated hypertension, poor utilization of health-care services by older people, and inadequate preparedness of health workforce to care for older people in Ghana (Araujo de Carvalho et al., 2015). Policy-makers for Ghana developed policy briefs for each problem with recommended actions for the ministry of health and the Ghana Health Service (Araujo de Carvalho et al., 2015). However, the data used to guide this dialogue was based...
mostly on epidemiologic studies and not a health systems approach (Araujo de Carvalho et al., 2015).

Public and private healthcare systems in Ghana need to improve health promotion methods like hypertension screening and management (Lamptey et al., 2017). Ghana has partnerships between specific Ghanaian organizations to work towards the control of hypertension: The Non-Communicable Disease Control Program (NCDCP) under the Disease Control Prevention Department, and the Ghana Health Service (GHS) (Lamptey et al., 2017). However, additional healthcare resources are needed to work towards increased health promotion (Adua et al., 2017).

In the past two decades, there has been rapid economic growth and an increase in health spending in Ghana (Adua, Frimpong, Li, Wang, 2017). Despite the overall economic growth in Ghana, the government’s investments have not been sufficient enough to meet the rising healthcare costs, which has caused hospital commercialization (Adua, Frimpong, Li, Wang, 2017). Rising healthcare costs led to increased hospital service prices to generate more funds, ultimately negatively affecting patient hospital attendance and their overall health outcome (Adua, Frimpong, Li, Wang, 2017). A lack of funds additionally led Ghana to rely on low-level health interventions that focus on healthcare promotion and lifestyle modifications (Adua, Frimpong, Li, Wang, 2017). As the population of individuals with chronic diseases continues to grow in Ghana, the government needs to conduct a reassessment of the impact of healthcare spending with public healthcare policies as it pertains to health outcomes (Adua, Frimpong, Li, Wang, 2017). Countries like Eritrea are lacking in proper health funding, sufficient medical information systems, and access to basic technologies and medicines (Gebrezgi, Trepka, Kidane, 2017). However, the Eritrean government has proven a commitment to combatting hypertension
by providing adequate staffing of health professionals and free drugs looking beyond the deficit in health finances (Gebrezgi, Trepka, Kidane, 2017).

The Role of Traditional Healers

This study’s findings corroborate other research findings in other African countries with similar issues about defining the role of traditional healers in chronic disease management (Maimela et al., 2015). In one such study completed in South Africa, nurses expressed reservation about the extent to which traditional healers could collaborate with the medical system (Maimela et al., 2015). From this study, 33.9% of nurses believed that traditional healers played a minimal role and 28% of nurses believed that traditional healers played no role at all. In support of these findings, a nurse from the South Africa study expressed her perceptions about the role of traditional healers:

“… there are no meetings held with traditional healers which is a challenge because we are unable to integrate them in our services.” “lack of communication between us and the traditional healers is a challenge.” “…to wrap this up, there is no interaction at all between traditional healers and us in the clinic.” (FGD: Nurse) (Maimela et al., 2015).

Traditional medicine has not been researched as much despite its importance to healthcare systems in developing countries (Boadu and Asase, 2017). Healers are consulted for herbal medicines for the treatment and management of common and specialized diseases in Ghana (Boadu and Asase, 2017). There are currently privately owned herbal clinics in Ghana that provide an additional option for treatment (Ameade, Ibrahim, Ibrahim, Habib, Gbedma, 2018). Older age groups prefer western medicine than traditional medicine, due to their perception that modern health facilities supplied health professionals and effective medical
resources (Gyamfuah, Kumi-Kyereme, Darteh, Addo, 2015). However, many of the older population would consider using both western and herbal medicinal practices (Gyamfuah, Kumi-Kyereme, Darteh, Addo, 2015).

In Ghana, plans are in place to integrate herbal medicines into pre-existing western medicinal practices (Ameade, Ibrahim, Ibrahim, Habib, Gbedma, 2018). However, due to the mixed perceptions of health professionals when it comes to traditional medicine, more needs to be done to address ways to effectively harness the potential of herbal medicines in a manner complementary to conventional medicine. Indeed, the findings from this study suggest that there is much work to be done in this regard as health professionals, in general, appear to have a less favorable perception of the role of traditional healers in chronic disease management.

Bridging Health Systems and the Community

It is becoming increasingly evident that communities have a role to play, in partnership with the health system, in promoting population health. One suggested way of bridging communities and healthcare systems as it relates to the care of patients with chronic conditions is the use of community health workers. Community health workers (CHW), are defined as the non-professional lay workers that are properly trained to provide promotional and preventative health care services to the community (Ma et al., 2017). CHW’s can improve the health and well-being of people suffering from a chronic disease (Hsu et al., 2016). They can provide emotional and instrumental support in addition to informational support through phone calls, text messages, and visits (Kangovi et al., 2014).

The CHW’s in Ghana are comprised of community health nurses and community health volunteers (Ma et al., 2017). Ghanaian CHW’s are trained for two years and are responsible for
the community health management through the government (Ma et al., 2017). The health worker density per 1000 population is estimated to be 2.32 in Ghana, which is below the global average of 9.3 (Alhassan, Nketiah-Amponsah, Spieker, Arhinful, & Rinke de Wit, 2016). Also, there are low staff motivation levels due to poor working conditions, which impacts the recruitment and retention of CHWs (Alhassan et al., 2016). Ghana has attempted to combat this problem through monetary work incentives. However, these are not frequent due to limited health budgets in the country and limit the overall effectiveness of CHWs (Alhassan et al., 2016).

Programs and interventions implemented by CHW groups aim to target the needs of underserved populations through the training of community members as educators, supporters, and advocates who can reach out to their neighbors (Hsu et al., 2016). The community health workers support chronic patients in the compliance and management of their conditions in the community (Maimela et al., 2015). Seven core roles in improving patients’ health according to Hsu et al. (2016) include:

1. Cultural meditation;
2. Informal counseling and social support;
3. Culturally appropriate health education;
4. Advocacy for individual and community needs;
5. Assurance that people receive needed medical and social services for which they are entitled;
6. Direct social and supportive services; and
7. Support for building individual and community capacity.

The utilization of these core roles will support community health workers to improve healthcare outcomes in underserved communities and populations that are at risk for poor health outcomes
(Hsu et al., 2016). For example, improving culturally appropriate health education as it pertains to traditional medicine (Hsu et al., 2016).

In another intervention, a community-based program for hypertension control was created in Ghana; the Community-based Hypertension Improvement Project (ComHIP) (Lamptey et al. 2017). ComHIP is based on a public-private partnership between the Ghana Health services, FHI360 and the Novartis Foundation, which is supported by the Ghana Schools of Public Health and the London School of Hygiene & Tropical Medicine and consists of three elements: implementation, impact evaluation, and a cost-effectiveness evaluation (Lamptey et al., 2017). Lamptey et al. states ComHIP consists of six components:

- Community-based education on CVD factors and healthy lifestyles.
- Community-based screening and monitoring of blood pressure by licensed chemical sellers (LCS) and CHP nurses.
- Community-based diagnosis, treatment, counseling, follow up and referral of hypertension patients (when needed by CVD nurses).
- Telemedicine consultation by CVD nurse with physician and referral of patients with severe hypertension and/or organ damage to a physician.
- ICT (communication technologies) messages for healthy lifestyles, treatment adherence support and treatment refill reminders for hypertension patients.
- A cloud-based health records system linked to SMS/voice messaging for treatment adherence, reminders, and health messaging.

The private and public partnership provides an increase in the odds of the project’s success (Lamptey et al., 2017)

Redesigning the Health System to Improve Chronic Disease Management
In the developing world, 80% of deaths are attributed to non-communicable diseases (Malan, Mash, Everett-Murphy, 2016). Acute illness treatment is what healthcare facilities focus on rather than preventative services, in low and middle-income countries (Malan, Mash, Everett-Murphy, 2016). Primary care providers in low and middle-income countries need to move towards a medical treatment approach that integrates more counseling on risky lifestyle behaviors through methods such as motivational interviewing, the 5As (ask, alert, assess, assist, and arrange), and health coaching (Malan, Mash, Everett-Murphy, 2016). Chronic disease health promotion and health interventions should be formulated with a primary health care approach in mind since primary care is the main mode of obtaining health services in countries like South Africa (Maimela et al., 2015).

There are four essential elements for tackling the chronic disease epidemic: integration of services, more focus on patients and communities, better-equipped service delivery, and adoption of new technologies for communication (Kruk, Nigenda, Knaul, 2015). Primary care facilities need to shift from an episodic treatment plan to a prolonged wellness treatment plan (Kruk, Nigenda, Knaul, 2015) that are patient, family and community-centered. In Ghana, the findings from this study suggest that the extent to which these recommendations can be achieved may be limited by significant resource constraints. Research shows that patients with chronic diseases use social interactions with friends and various community members as a means to get information about certain diseases and the needed management (Gebrezgi, Trepka, Kidane, 2017). Without the presence of necessary common community meeting centers, patients face a barrier in having the necessary social interactions (Gebrezgi, Trepka, Kidane, 2017). Patients have expressed wishes for a “social center” for patients with hypertension to help improve
behavioral lifestyles and the sharing of ideas and opinions about the disease and potential complications (Gebrezgi, Trepka, Kidane, 2017).

The increase in hypertension and heart-related diseases and other chronic conditions in Ghana could be attributed to modernization and the lifestyle of today’s generation, which affects all ages (Segbefia, Oware-Gyekye, Akpalu, 2012). Ten topics of interest need to be addressed to better equip Ghanaians to better manage their chronic conditions:

1. General knowledge and belief about chronic conditions
2. Patient perception about the cause of chronic conditions
3. Beliefs on complementary or alternative health practices
4. The role of traditional herbal treatment
5. Effective health professional Communication
6. Drug information and side effects
7. Information on self-management
8. Financial management of chronic conditions
9. Complications associated with chronic conditions
10. Family and community support

There is some evidence to suggest that awareness alone is necessary but not sufficient to attain optimal chronic disease management. Research shows that Ghanaians with hypertension, for example, are aware of the existence of the disease, however, are not educated about the intricate details regarding hypertension (Segbefia, Oware-Gyekye, Akpalu, 2012). Healthcare providers, primarily nurses who take on most of the health educator role in Ghana, need to be better educated and more health education needs to be applied to hypertensive patients to avoid confusion about the disease (Segbefia, Oware-Gyekye, Akpalu, 2012). Awareness and education
need to be complemented by tangible efforts to boost community infrastructure and capacity to support the health system in the management of chronic conditions.

Recommendations

More development of health initiatives, strategies, and plans are needed that work towards the Sustainable Development Goal 3.4 – by 2030 reduce by one-third pre-mature mortality from non-communicable diseases (NCDs) through prevention and treatment and promote mental health and wellbeing (WHO 2016). With a better understanding of what patients with chronic illnesses need, medical professionals, government officials, and community members can better support them through improved health education, social support, and financial support. New improvements to the management of these patients can secure better health outcomes, provide patients more autonomy and self-efficacy, and cut overall health expenses down.

Early detection and control of the disease risk factors are imperative to reduce and prevent chronic diseases in areas where services are not abundant (Amoako, Laryea, Bedu-Addo, Andoh, & Awuku, 2014). The growing chronic disease issue in Africa can be prevented through health education about screening, behavior modification, risk factors and lifestyle changes (Guariguata, Beer, Hough, Mulongeni, Feeley, & Wit, 2015). Experts recommend a chronic disease intervention approach consisting of epidemiological surveillance, primary prevention (focusing on prevention in communities) and secondary prevention, consisting of preventing complications and improving the quality of life (De Graft Aikins, Anum, Agyemang, Addo, & Ogedegbe, 2012). Importantly, this study identified that in addition to the need for patient-centered strategies, strategies need to be family and community-centered as well.

Strengths and Limitations
There are a few noteworthy limitations of this study. The first has to do with the study population. Although data from this study was collected from one hospital in one geographic region, the data was collected from one of the two historical teaching hospitals in the country, located in the most populous city in Ghana. Healthcare professionals working in this hospital come from diverse backgrounds. There is little reason to believe that they would be characteristically different from other healthcare professionals working in urban parts of the country. On the other hand, since perceptions are often shaped by experiences, it is possible that the perceptions concerning community involvement in chronic disease management may be different for healthcare professionals located in urban and rural areas. Thus, the study’s findings, may not be generalizable beyond urban areas in Ghana. Further, study participants were generally younger, limiting the generalizability of the study’s findings to older health professionals.

Secondly, this was a self-administered survey of moderate length. Thus, there is not a way to verify responses. Further, it is possible that participants may not have had sufficient time to thoroughly think through the questions and their responses, especially since the survey was administered mostly during working hours when healthcare professionals are typically busy and focused on patient care. However, feedback from subject-matter experts and pilot-test takers assured us that the survey length was adequate, and the questions were relevant and interesting to health professionals.

Environmental conditions provided difficulty while trying to record interviews; researchers had to rely on thorough notetaking and trying whenever possible to record participant responses verbatim. The hesitance of some health professionals to speak due to possible repercussions could have led to bias the data. The lack of understanding of certain health topics
due to causes such as language barriers could have also led to a lack of adequate responses from a small segment of health professionals. However, the similarity of the findings observed in the qualitative and quantitative components of the study suggests that these limitations may have had minimal impact on the validity of the study.

Despite these limitations, there are some notable strengths of this research. First, to the best of the author’s knowledge, this exploratory, descriptive study was the first study to focus on the role of the community in the management of patients with chronic conditions in Ghana. The research was conducted within the context of a low or middle-income country (LIMC) for which there is a dearth of literature on the health system and societal capacity for the management of patients with chronic conditions. This study thus adds to the dialogue on prevalent issues and potential solutions to better managing patients with chronic diseases in Ghana. Secondly, the research was also strengthened by the research design of a mixed qualitative and quantitative study. Qualitative findings were informed by data collected from 50 interviews of health professionals in Kumasi, Ghana from a very well-established teaching hospital in the community. The qualitative data was complemented by quantitative data, which was collected by researchers using a research instrument that was informed by data from the qualitative phase and was reviewed by subject-matter experts (Ghanaian healthcare providers) and was pilot-tested by Ghanaian healthcare professionals before broader administration.

Future Research

Future research about the management of patients with chronic conditions in Ghana and other sub-Saharan African countries needs to focus on interventions that could expand resource capacity and facilitate needed community involvement. A more thorough analysis of the financial and physical resources available to the community could provide a clearer direction of
how the community can allocate resources to support disease management. Additionally, culturally-responsive and community-centered interventions that provide more health education on chronic disease management are needed. Also needed are increased funding to these communities in support of such resources that can improve the overall well-being of patients with chronic illnesses and community members.

Understanding the roles of various community entities towards better chronic disease management can provide an opportunity to develop health care plans for these patients better. Research is scarce about provider perceptions about chronic disease management and the roles the community plays in the care for these patients in Africa, more specifically in Ghana. Future research can further assess the roles of faith-based organizations and traditional healers in chronic disease management and develop a method where these entities can positively influence chronic disease management.

Conclusion

Global monitoring for health risks like chronic diseases is important in improving health outcomes of people all over the world (WHO 2016). This study identified how the role of the community is crucial in the effective management of patients with chronic diseases. To improve the management of patients with chronic diseases in Ghana, community support needs to be increased, more community resources are needed, partnerships between the health system and the community need to be strengthened, and there needs to be a focus on increasing education of patients and general people in the community. Increasing community engagement and fostering relationships between community members and local health professionals could be a potential approach in strengthening the health system and community partnerships (Alhassan, Nketiah-Amponsah, Spieler, Arhinful, Rinke de Wit, 2016). Additionally, to improve health
management, resources such as facilities, funds, education, and the social infrastructure needs to be present.

This study acknowledges the barriers present in harnessing community resources in the effective management of patients with chronic illnesses. With commitments to combat chronic disease such as “the whole-of-government approach” - a multisector approach for health at all government levels that is used to address risk factors of non-communicable diseases and underlying determinants of health (Lenucha, Drope, Chavez, 2015), the WHO has positioned itself as a global leader in working towards this mission. The United Nations has also presented itself as a key global leader by developing the 8 Millennium Development Goals (MDG), which were created to improve the quality of life of people worldwide can positively impact countries like Ghana, especially focusing on the MDG’s addressing HIV/AIDS, malaria and other diseases, and developing global partnerships for development (WHO, 2017). Specifically addressing the findings from the study, it would be beneficial for Ghana to improve the national health insurance plan that was developed in 2003, which can better protect against out-of-pocket health care costs (Goeppel, Frenz, Grabenhenrich, Keil, Tinnemann, 2016).

Additionally, to facilitate more community-healthcare partnerships, the media can be used to reach wider audiences and promote awareness through this form of outreach. Educational opportunities provided by communities and the healthcare system jointly as the findings from this research state, can be increased and better designed to reach more community members and tailored to more prevalent chronic diseases. More funding will need to be provided to elicit more community involvement and collaborations between healthcare organizations.

Developing new methods and plans that will provide the community a more definitive role in the care and management of patients with chronic diseases will help decrease the
prevalence of non-communicable diseases, increase health system capacity and will provide the opportunity for Ghana to grow and prosper. More resources will not only leverage the local people, but it will also provide more opportunities for partnerships that will ultimately lead Ghana into a new era characterized by fewer patients with chronic diseases and better management for patients with chronic diseases.
REFERENCES

Abanilla, P. K. A., Huang, K., Shinners, D., Levy, A., Ayemor, K., de-Graft Aikins, A.,
Ogedegbe, O. (2011). Cardiovascular disease prevention in Ghana: feasibility of a faith-

perspective on Ghana’s healthcare expenditure, policies, and outcomes. 8(3), 197-206.


doi:10.1007/s11524-010-9492-y

chronic non-communicable diseases: future directions in research, practice, and policy.
Ghana medical journal, 46(2), 1-3.

models of diabetes in urban poor communities in Accra, Ghana. Ethnicity & Health,
20(4), 391-408.

Assessing the impact of community engagement interventions on health worker
motivation and experiences with clients in primary health facilities in Ghana: A


Problems among Adults Aged 50 years or over in Nine Countries: A Multi-Country Study.
Plos One, 10(9). doi:10.1371/journal.pone.0138261


Sourial, N., Wolfson, C., Zhu, B., Quail, J., Fletcher, J., Karunanathan, S., ... & Bergman, H. (2010). Correspondence analysis is a useful tool to uncover the relationships among categorical variables. Journal of Clinical Epidemiology, 63(6), 638-646.


https://www.healthypeople.gov/2020/topics-objectives/topic/social-determinants-of-health


World Health Organization. (2010). Accelerating progress towards the health-related millennium developmental goals. Retrieved from:

http://www.who.int/topics/millennium_development_goals/MDG-NHPS_brochure_2010.pdf?ua=1


http://www.who.int/features/factfiles/non-communicable_diseases/en/


www.who.int/mediacentre/factsheets/fs355/en/


http://www.who.int/topics/millennium_development_goals/en/

### Appendix A

**CCM COMPONENTS WITH CORRESPONDING INTERVIEW QUESTIONS**

<table>
<thead>
<tr>
<th>CCM Component</th>
<th>Corresponding Interview Questions</th>
</tr>
</thead>
</table>
| **Delivery System**                        | 6) Do you think the current health care delivery system is equipped to effectively manage these patients?  
7) What changes are needed in the health care delivery system in order to improve the management of these patients with this chronic condition, and ultimately, their health outcomes? |
| **Design & Health System Support**          |                                                                                                                                                                                                                                |
| **Clinical Decision Support & Clinical Information Systems** | 8) Are there established clinical guidelines health providers have to follow when managing patients with [mention the identified chronic condition in Q4]? How often do health care providers adhere to such guidelines?  
9) What opportunities are available for health care providers to stay up-to-date on the latest evidence/guidelines for managing these patients?  
10) What resources do health professionals need in order to stay up-to-date on the latest evidence/guidelines for managing such patients?  
11) How is care coordinated among the numerous specialists who manage these patients?  
   a. Are there comprehensive clinical information systems in place to ensure the effective provision and coordination of care for these patients?  
      i. If not, how beneficial will such a system be to your practice of medicine? |
| **Self-Management**                         | 12) Think about the patients with [mention the identified chronic condition in Q4] you have treated in the past; how would you describe these patients’ ability to effectively self-manage their conditions?  
13) To what extent do health care providers in Ghana engage patients these patients in their (the patient’s) own care? |
<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>b. How often do health care providers collaboratively make decisions with the patient concerning their (the patient’s) health?</td>
<td>14) What can be done or is being done to empower and prepare patients to effectively manage their conditions outside of the hospital/clinic setting?</td>
</tr>
<tr>
<td>Community</td>
<td>15) How does the community support the care of patients with [mention the identified chronic condition in Q4]? (i.e., what has been the community’s role in the care of patients with [identified chronic condition]?)</td>
</tr>
<tr>
<td></td>
<td>16) Please describe the type of community resources, if any that are available to help these patients manage their conditions.</td>
</tr>
<tr>
<td></td>
<td>17) How do health care organizations work with communities to ensure the effective management of these patients outside of the health care setting?</td>
</tr>
</tbody>
</table>
### Appendix B

**DECOMPOSITION OF INERTIA AMONG COMMUNITY ROLE VARIABLES FOR THE FIRST TWO DIMENSIONS**

*Table 5.8. Decomposition of Inertia among Community Role Variables for the First Two Dimensions*

<table>
<thead>
<tr>
<th>Categories</th>
<th>Mass</th>
<th>Overall Quality</th>
<th>%Inertia</th>
<th>Coordinates</th>
<th>Squared Correlation</th>
<th>Contribution</th>
<th>Coordinates</th>
<th>Squared Correlation</th>
<th>Contribution</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Family</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Important Role</td>
<td>0.01</td>
<td>0.89</td>
<td>0.05</td>
<td>0.96</td>
<td>0.62</td>
<td>0.04</td>
<td>0.64</td>
<td>0.27</td>
<td>0.11</td>
</tr>
<tr>
<td>Neutral Role</td>
<td>0.01</td>
<td>0.80</td>
<td>0.04</td>
<td>0.96</td>
<td>0.72</td>
<td>0.04</td>
<td>-0.31</td>
<td>0.08</td>
<td>0.03</td>
</tr>
<tr>
<td>Limited Role</td>
<td>0.11</td>
<td>0.94</td>
<td>0.01</td>
<td>-0.10</td>
<td>0.91</td>
<td>0.01</td>
<td>-0.02</td>
<td>0.03</td>
<td>0.00</td>
</tr>
<tr>
<td><strong>Faith-Based Organizations</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Important Role</td>
<td>0.03</td>
<td>0.89</td>
<td>0.06</td>
<td>0.60</td>
<td>0.86</td>
<td>0.07</td>
<td>0.11</td>
<td>0.03</td>
<td>0.01</td>
</tr>
<tr>
<td>Neutral Role</td>
<td>0.01</td>
<td>0.29</td>
<td>0.02</td>
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Appendix C

DECOMPOSITION OF INERTIA AMONG COMMUNITY ENGAGEMENT STRATEGY VARIABLES FOR THE FIRST TWO DIMENSIONS

Table 5.6. Decomposition of Inertia among Community Engagement Strategy Variables for the First Two Dimensions

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