

**ENSIGN GLOBAL UNIVERSITY, KPONG
EASTERN REGION, GHANA**

**FACULTY OF PUBLIC HEALTH
DEPARTMENT OF COMMUNITY HEALTH**

**ASSESSMENT OF KNOWLEDGE, INFLUENCING FACTORS, AND SELF-
MANAGEMENT PRACTICES AMONG ADULTS LIVING WITH DIABETES AND
HYPERTENSION IN ASHAIMAN, GHANA**

BY

JOSEPHINE NYANKWAYEH BEMPONG

(247100316)

NOVEMBER, 2025

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**A THESIS SUBMITTED TO THE DEPARTMENT OF COMMUNITY HEALTH, FACULTY
OF PUBLIC HEALTH, ENSIGN GLOBAL UNIVERSITY IN PARTIAL FULFILLMENT OF
THE REQUIREMENTS FOR THE MASTER OF PUBLIC HEALTH DEGREE**

NOVEMBER, 2025

DECLARATION

I hereby declare that this submission is my own work and that, to the best of my knowledge and belief, it contains no material previously published or written by another person nor material which to a substantial extent has been accepted for the award of any other degree or diploma at Ensign Global University, Kpong or any other educational institution, except where due acknowledgment is made in the thesis.



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DEDICATION

I dedicate this work to the Almighty God whose grace and guidance have sustained me throughout this academic journey. To my parents and family, whose love, prayers, and unwavering support have been my greatest source of strength, I owe immense gratitude. This work is also dedicated to all individuals living with non-communicable diseases in Ashaiman, whose resilience inspired this study.

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LIST OF ABBREVIATIONS

Abbreviation	Meaning
NCDs	Non-Communicable Diseases
DMSES	Diabetes Management Self-Efficacy Scale
DALYs	Disability-Adjusted Life Years
WHO	World Health Organization
LMICs	Low- and Middle-Income Countries
SEM	Socio-Ecological Model
IRB	Institutional Review Board
GHS	Ghana Health Service
OPD	Outpatient Department
MoH	Ministry of Health (Ghana)
NGO	Non-Governmental Organization
PHC	Primary Health Care

ABSTRACT

Background: Non-communicable diseases (NCDs), such as hypertension, diabetes, and cardiovascular diseases, are increasingly prevalent in Ghana and present a significant public health challenge. Effective management of NCDs requires not only access to healthcare but also adequate patient knowledge and strong self-management practices. In densely populated urban areas like Ashaiman, understanding how individuals manage their conditions is critical to designing responsive interventions.

Aim: This study aims to assess the knowledge, influencing factors, and self-management practices among adults living with diabetes and hypertension in Ashaiman, Ghana.

Methodology: A quantitative cross-sectional survey was conducted among adults living with diabetes and hypertension in Ashaiman, Ghana. Participants were recruited from selected public and private health facilities, including Ashaiman Polyclinic, Zenu Polyclinic, Adusei Hospital and Ashaiman Municipal Hospital, as well as community settings such as local markets. Recruitment followed a census approach where all eligible NCD patients available during the study period were enrolled, while additional respondents were identified in community spaces to capture a wider population. Analysis was carried out in STATA version 18. Descriptive statistics summarised socio-demographic, knowledge, and practice variables. Associations between categorical and continuous variables were explored using chi-square tests and fishers test.

Results: The study involved 93 adults living with diabetes and hypertension in Ashaiman, Ghana, mostly females (75.3%) aged 51–60 years (37.6%). Nearly half (44.1%) had both conditions, and most (72.1%) had Type 2 diabetes. Overall knowledge was high, with 80.6% demonstrating good understanding and 89.3% having received dietary advice, 51.6% had good practice, 53.8% reported weight loss, and 47.3% exercised weekly, but only 30.1% owned glucometers. Education and ethnicity significantly influenced practice ($p < 0.05$): good practice was highest among those with primary education (83.3%). Age, sex, and self-efficacy showed no significant effect. Overall, while knowledge levels were strong, consistent self-management practices remained limited, underscoring the need for culturally tailored, education-sensitive interventions in chronic disease care.

Conclusion: The study concludes that while most adults living with diabetes and hypertension in Ashaiman demonstrate fair awareness of their conditions, this knowledge does not consistently translate into effective self-management practices. Educational attainment and ethnicity were

found to significantly influence adherence to recommended practices, while other sociodemographic factors showed no meaningful association. The findings highlight the need for continuous health education, culturally tailored communication, and community-based support to enhance treatment compliance and reduce complications. Strengthening health-system engagement and empowering patients through targeted behavioral interventions remain essential for improving chronic-disease outcomes in Ghana.

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CHAPTER ONE

1.0 INTRODUCTION

1.1 Background

Over the past century, the global health landscape has shifted dramatically from a dominance of infectious diseases to the growing burden of non-communicable diseases (NCDs) (WHO, 2024). Among these, diabetes and hypertension have emerged as the leading causes of morbidity and mortality worldwide (Okai *et al.*, 2020). Together, they account for a substantial proportion of the 74% of global deaths attributed to NCDs, and their prevalence continues to rise with urbanisation, ageing populations, and lifestyle transitions (World Health Organization, 2018; Biswas and Roy, 2024). Hypertension affects more than one billion people globally, while diabetes affects an estimated 537 million adults, with projections suggesting a 46% increase by 2045 if current trends persist (WHO, 2024). These two chronic conditions are also major contributors to complications such as stroke, ischemic heart disease, chronic kidney disease, and premature deaths, underscoring their significance as global public health priorities.

In Sub-Saharan Africa, the situation is particularly concerning. The region is projected to record one of the steepest increases in hypertension and diabetes prevalence worldwide, with nearly half of all deaths by 2030 expected to be attributable to these conditions (Nyaaba *et al.*, 2020). Hypertension prevalence in many African countries ranges between 25% and 35% among adults, while diabetes prevalence is estimated between 3% and 6%, though under-diagnosis remains widespread (Stephani, Opoku and Beran, 2018). Limited health system capacity, shortages of diagnostic tools, high costs of medication, and weak follow-up services undermine effective prevention and management. Consequently, hospital admissions and deaths from complications such as stroke, kidney failure, and heart disease are rising, with hypertension and diabetes jointly

contributing to a growing proportion of disability-adjusted life years (DALYs) in the region (Tewabe *et al.*, 2025).

Ghana mirrors these regional patterns. Over the past two decades, both hypertension and diabetes have become increasingly prevalent among adults. National surveys and facility-based studies show hypertension prevalence ranging between 25% and 36%, while diabetes prevalence is estimated at 6% to 9%, with higher rates in urban areas (Opoku *et al.*, 2023; Dowou *et al.*, 2024). These conditions now rank among the top causes of outpatient visits and hospital admissions. For example, hypertensive complications are a leading contributor to stroke cases, while diabetes is strongly linked with chronic kidney disease and lower-limb amputations (Okai *et al.*, 2020; Bossman *et al.*, 2021). Despite their growing contribution to morbidity and mortality, national health services have historically prioritised infectious diseases, maternal health, and child survival, leaving gaps in the integration of hypertension and diabetes care into primary healthcare (Dowou *et al.*, 2024).

Poor self-management practices remains a central driver of complications associated with hypertension and diabetes. Effective control of these chronic conditions requires strict adherence to medication, diet, physical activity, and regular monitoring, yet evidence consistently shows that adherence is suboptimal in Ghana and across Africa. A systematic review in Ghana reported that patients with type 2 diabetes adhered to dietary recommendations on average only 3.9–4.4 days per week, engaged in physical activity 4.2–4.8 days per week, and monitored blood glucose less than twice per week, while medication adherence varied widely between 33.5% and 84.5% (Opoku *et al.*, 2023). In northern Ghana, 73.3% of hypertensive patients had poor knowledge of their condition, with forgetfulness and high pill burden cited as major reasons for missed medication doses (Okai *et al.*, 2020). Similar findings have been reported across Sub-Saharan Africa. In Nigeria, only 14.3% of elderly hypertensive patients achieved good medication adherence, with

financial constraints and weak family support as leading barriers (Olaniran *et al.*, 2023). A metaanalysis of diabetic self-management in Africa further showed that less than half of patients practiced recommended daily foot care, largely due to lack of education and unaffordable supplies (Tewabe *et al.*, 2025). These gaps in adherence translate into preventable complications including stroke, ischemic heart disease, and chronic kidney disease, leading to higher rates of hospitalisation, disability, and premature mortality in both Ghana and the wider region.

In underserved urban communities like Ashaiman, the challenges are even more pronounced. The municipality is characterised by overcrowding, poor housing, high unemployment, and limited healthcare infrastructure. Research indicates that residents often contend with low health literacy, poor access to medicines, and limited community-based support systems for managing chronic diseases (Kushitor and Boatemaa, 2018). These systemic barriers exacerbate poor selfmanagement practices of diabetes and hypertension, increasing the risk of complications and deepening the social and economic burden on affected households.

Taken together, these trends highlight the urgent need to assess knowledge levels, identify influencing factors, and evaluate self-management practices among adults living with diabetes and hypertension in Ashaiman. Such evidence is crucial for designing targeted, culturally responsive, and sustainable interventions that can reduce complications and improve long-term outcomes for patients in urban Ghana.

1.2 Problem statement

Diabetes and hypertension are now among the most significant contributors to adult morbidity and mortality in Ghana, yet evidence on how patients in disadvantaged urban settings manage these conditions remains very limited. While national and multi-site studies have established high prevalence and poor control of both conditions (Bosu 2021; Opoku *et al.* 2023; Okai *et al.* 2020),

there is little insight into the everyday challenges of knowledge, adherence, and self-management practices in municipalities characterized by poverty and fragile infrastructure.

Ashaiman represents one such context. The municipality is marked by rapid population growth, informal employment, and inadequate housing, conditions that create barriers to sustained selfmanagement of chronic disease (Kushitor and Boatemaa 2018). Facility-based data reinforce the scale of the challenge: a 2024 New Crystal Health Services report identified hypertension as the leading cause of morbidity in Ashaiman, yet detailed information on how residents adhere to treatment, diet, physical activity, or monitoring remains absent (New Crystal Health Services 2024).

This lack of localised evidence is critical because non-adherence to recommended selfmanagement practices is a central driver of complications. Poor adherence leads to uncontrolled blood glucose and pressure levels, which in turn contribute to avoidable strokes, ischaemic heart disease, kidney failure, and increased hospitalisation (Okai *et al.* 2020; Kazibwe *et al.* 2024). Yet most of what is known about self-management practices in Ghana comes from national reviews or facility audits, which may mask the unique constraints faced by residents of low-income, highdensity areas like Ashaiman.

Without Ashaiman, specific data on what patients know, the barriers they face, and how they manage their conditions aren't known. Policy makers and municipal health teams must continue to rely on general national averages. This limits the ability to design context-specific interventions that could improve adherence, reduce complications, and lessen the social and economic burden of diabetes and hypertension in one of Ghana's most urbanised and vulnerable communities.

1.3 Rationale of the study

Hypertension and diabetes are increasingly dominating the health burden in low- and middle-income countries (LMICs), including Ghana. While national health efforts have historically focused on communicable diseases, the rising prevalence of hypertension and diabetes presents an urgent public health challenge (Bosu 2021; Kazibwe *et al.* 2024). Effective management of chronic conditions such as hypertension and diabetes depends heavily on patients' ability to engage in consistent self-management practices such as medication adherence, dietary adjustments, physical activity, and regular monitoring. However, these behaviours are shaped by a range of factors including knowledge, health beliefs, socioeconomic status, access to care, and social support (Opoku *et al.* 2023; Asante, Frimpong and Aziz 2023; Bossman *et al.* 2021). Without adequate knowledge and support structures, individuals living with chronic diseases are more likely to experience complications, disability, and reduced quality of life (Okai *et al.* 2020).

Ashaiman is characterised by limited access to quality healthcare services, high levels of poverty and unemployment, and generally low health literacy. These contextual challenges can significantly undermine individuals' ability to manage diabetes and hypertension effectively. Facility-based evidence confirms the scale of the problem: hypertension has been reported as the leading cause of morbidity in Ashaiman, yet little peer-reviewed research has examined how residents with hypertension and diabetes understand their conditions, the factors that influence their self-management behaviours, and the extent to which they engage in recommended practices (New Crystal Health Services 2024).

Understanding these specific barriers and facilitators to self-management practices in Ashaiman is therefore crucial for designing interventions that are both effective and contextually appropriate. This study will contribute evidence to support the development of patient-centred and community-based strategies to improve chronic disease outcomes in Ghana. Its findings will be

relevant to public health professionals, clinicians, policymakers, and non-governmental organisations working to combat the growing burden of diabetes and hypertension in under-resourced urban communities.

1.6 Research questions

1. What is the level of knowledge of diabetes and hypertension among adults living with diabetes and hypertension in Ashaiman?
2. What is the level of engagement in self-management practices among adults living with diabetes and hypertension in Ashaiman?
3. What factors influence self-management practices among adults with diabetes and hypertension in Ashaiman?

1.4 General objectives

To assess the knowledge, influencing factors, and self-management practices among adults living with diabetes and hypertension in Ashaiman.

1.5 Research objectives

1. To assess the level of knowledge regarding self-management practices among adults living with diabetes and hypertension in Ashaiman.
2. To identify the factors influencing self-management practices among adults living with diabetes and hypertension in Ashaiman
3. To assess the level of self-management practices among adults living with diabetes and hypertension in Ashaiman

1.7 Conceptual framework

This study is underpinned by the Socio-Ecological Model (SEM), a model widely used to understand the multi-level influences on health behaviors and outcomes. The SEM recognizes that individual behavior is shaped by multiple, interacting layers of influence, ranging from personal characteristics to broader societal structures (Kilanowski, 2017). Its relevance to chronic disease self-management lies in its holistic approach, highlighting that knowledge and behavior are not formed in isolation but are deeply embedded in the social and environmental contexts in which individuals live. For the purpose of this study, the conceptual framework will only involve the individual and interpersonal levels.

Individual level: This includes personal attributes such as knowledge, beliefs, attitudes, health literacy, and self-efficacy, which are crucial in the adoption of self-management practices for diabetes and hypertension. For example, individuals with greater understanding of their condition are more likely to adhere to medication, engage in healthy eating, and monitor symptoms (Amoah *et al.*, 2021; de-Graft Aikins *et al.*, 2022). In this study, diabetes self-efficacy was measured using the Diabetes Management Self-Efficacy Scale (DMSES), a validated tool widely applied in both high- and low-income settings. The DMSES assesses patients' confidence in carrying out key selfmanagement tasks such as adhering to diet, maintaining physical activity, monitoring blood glucose, and taking medications. Each item is rated on a Likert scale, with higher scores indicating greater self-efficacy.

Interpersonal level: This level focuses on the influence of social networks including family, peers, and caregivers, on health behavior. In chronic disease management, social support has been shown to enhance treatment adherence and emotional well-being, while its absence can hinder self-care

(Eriksson *et al.*, 2025). In the Ghanaian context, communal ties are strong, but support for NCD self-care is often inconsistent or informal (Sarfo *et al.*, 2020).

By applying the Socio-Ecological Framework, this study acknowledges that knowledge and selfmanagement practices are not merely personal choices, but are shaped by a complex web of interpersonal, community, institutional, and policy factors. Each level of the framework offers valuable insight into the conditions that either support or inhibit effective diabetes and hypertension management. This multidimensional approach provides a good understanding of the challenges faced by adults living with NCDs and can inform more responsive health interventions.

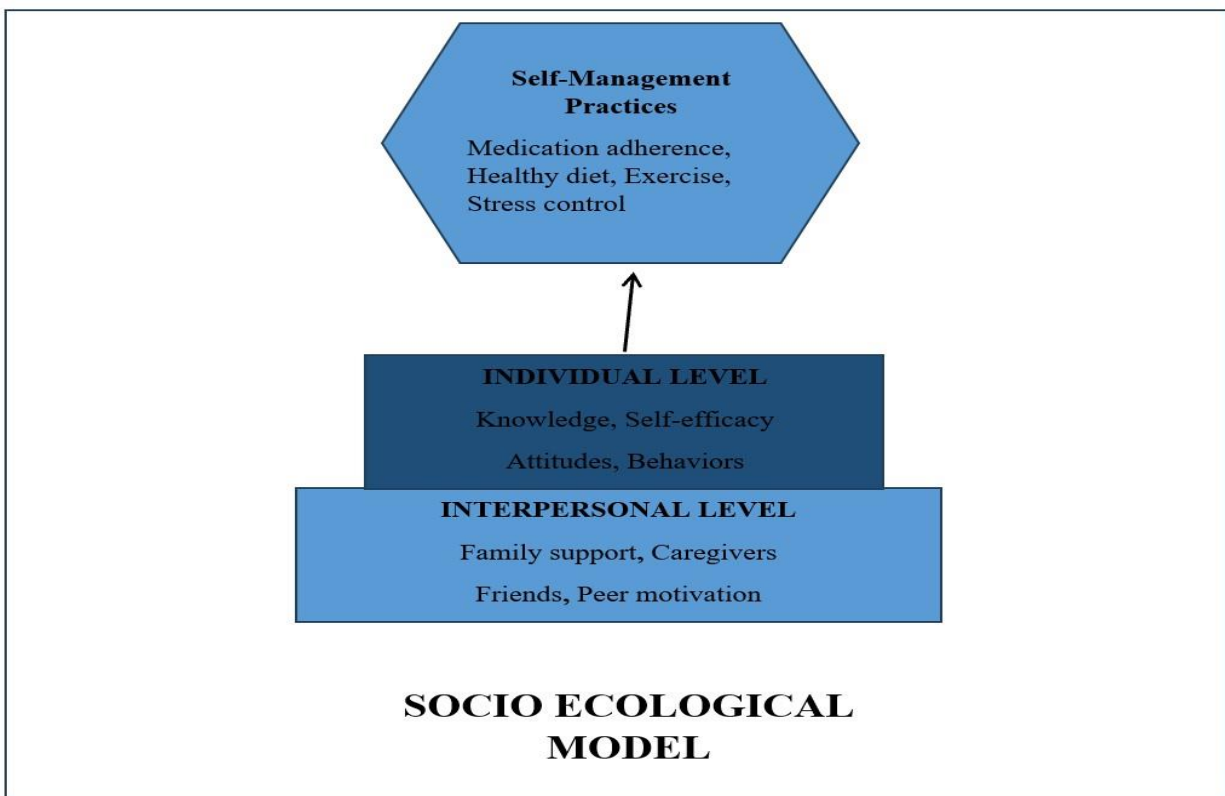


Figure 1.1 Conceptual framework

Source: Author's Construct (Adapted from Urie Bronfenbrenner, Author of Socio-Ecological Model)

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Introduction

This chapter reviews existing literature relevant to the study. It begins with an overview of the global and local burden of non-communicable diseases (NCDs), focusing on diabetes and hypertension as leading chronic conditions. It then examines concepts and definitions of selfmanagement practices, highlighting global, African, and Ghanaian perspectives on adherence to medication, diet, physical activity, and symptom monitoring. The chapter further explores the role of knowledge in shaping self-management behaviours, identifies patterns and gaps in practice, and considers the contextual factors that influence outcomes. Through this review, the chapter establishes the empirical and theoretical foundation for understanding self-management of diabetes and hypertension in Ashaiman and justifies the relevance of the present study.

Non-communicable diseases (NCDs) such as hypertension and diabetes have become the foremost challenge to global health in the twenty-first century, accounting for more than 70% of deaths worldwide and disproportionately affecting low- and middle-income countries where over 80% of premature NCD-related deaths occur (World Health Organization 2024; Nyaaba *et al.* 2020). Unlike infectious diseases, these conditions are chronic and demand long-term management strategies that extend beyond biomedical care to include sustained patient engagement and effective self-management. The rising burden is fuelled by demographic transitions, lifestyle changes, and health system weaknesses, trends that are especially acute in urban poor communities. In Ghana, evidence shows increasing prevalence of hypertension and diabetes, with urban areas such as Ashaiman facing heightened risk due to poverty, overcrowding, and limited access to quality health services (Dowou *et al.* 2024). These realities highlight the need to

understand how knowledge, personal and contextual factors, and self-management practices shape outcomes for adults living with diabetes and hypertension, providing the rationale for the present review.

2.2 Definitions and measures of self-management practices among adults with diabetes and hypertension

Self-management practices refer to the set of daily activities and behaviours undertaken by individuals to control the symptoms, treatment, and lifestyle adjustments associated with chronic diseases. For non-communicable diseases (NCDs), these include adherence to prescribed medications, maintaining a balanced diet, engaging in regular physical activity, avoiding harmful behaviours such as smoking and excessive alcohol use, monitoring symptoms, and attending scheduled medical appointments (Tewabe *et al.*, 2025). Effective self-management is critical for preventing complications, reducing hospitalisations, and improving quality of life, especially since most NCDs are long-term and progressive in nature. The literature consistently demonstrates that patients who adhere to recommended self-care behaviours experience improved clinical outcomes, yet the degree of adherence varies widely across settings. (Sarfo *et al.* 2020)

Adherence to self-management trends and patterns

Globally, adherence to diabetes and hypertension self-management practices remains inconsistent. In high-income countries, structured support programs and digital health tools have facilitated better outcomes, but even in these contexts, challenges such as medication fatigue, psychological distress, and lifestyle inertia affect long-term adherence. A systematic review by Shrivastava *et al.* (2021) found that adherence to recommended dietary and physical activity regimens among patients with type 2 diabetes was frequently below optimal levels, despite high levels of disease awareness. The findings highlighted that knowledge alone is insufficient; behavioural change

requires supportive environments and sustained motivation. Another review of cardiovascular selfmanagement practices in Europe revealed that while over 70% of patients adhered to medication schedules, fewer than half engaged consistently in recommended exercise, underscoring the difficulty of sustaining lifestyle modifications compared to pharmacological adherence (Gallant, 2020). These global patterns suggest that adherence is a multidimensional issue, influenced as much by personal willpower as by structural enablers such as healthcare access and cultural norms.

Adherence to medication and self-monitoring

In Sub-Saharan Africa, adherence to self-management practices is even more constrained due to systemic challenges. Studies consistently report low adherence to medication, diet, and monitoring regimens, with socioeconomic hardship emerging as the most common barrier. Stephani *et al.* (2018), in a systematic review of diabetes self-management in the region, found that knowledge of self-care practices was poor and practices were fragmented, with major gaps in glucose monitoring, dietary regulation, and foot care. More recent findings corroborate this picture. A 2025 meta-analysis across African countries estimated that only 46.9% of diabetic patients practiced adequate foot care, citing lack of patient education, unaffordable medical supplies, and limited provider engagement as key constraints (Tewabe *et al.*, 2025). Similarly, Olaniran *et al.* (2023) in Nigeria reported that medication adherence among elderly hypertensive patients was as low as 14.3%, with forgetfulness and financial limitations identified as the primary causes. These findings illustrate that self-management adherence in African contexts is shaped by both individual and structural barriers, with affordability and access playing central roles.

Adherence to diet and physical activity

Lifestyle practices such as diet and physical activity present further challenges in the region. In

Kenya, Kimani *et al.* (2019) showed that while a majority of hypertensive patients reported following prescribed medications, less than half adhered consistently to recommended dietary changes or physical activity regimens. The study concluded that lifestyle interventions are often less emphasised in routine clinical care, resulting in weak adherence. Evidence also suggests that cultural and social norms influence practice. For instance, sugary foods and alcohol consumption are often deeply embedded in social gatherings, making it difficult for individuals to maintain restrictions. In Rwanda, although new interventions such as the GororokApp digital platform have shown promise in supporting patients' dietary adherence and monitoring (Ndahiriwe *et al.*, 2024), such innovations remain limited in reach and scalability across the continent.

Turning to Ghana, adherence to self-management practices remains suboptimal across multiple domains. A systematic review by Opoku *et al.* (2023), encompassing twelve studies, found that on average, patients adhered to dietary recommendations only 3.9–4.4 days per week and engaged in physical activity 4.2–4.8 days per week. Self-monitoring of blood glucose was especially poor, averaging between 0.5–2.2 days per week, while foot care ranged from 2.9–5.0 days per week. Medication adherence varied widely across studies, with estimates ranging from 33.5% to 84.5%. These findings indicate significant variability in practices, reflecting the interplay of personal, financial, and systemic constraints. Okai *et al.* (2020) similarly reported that in northern Ghana, 73.3% of hypertensive patients had poor knowledge of their condition, and adherence to medication was undermined by forgetfulness and pill burden. This pattern of partial adherence across practices reflects the complexity of sustaining multiple simultaneous self-management behaviors. Other Ghanaian studies reveal similar trends. Bossman *et al.* (2021), in a phenomenological study of diabetic patients, found that while most participants were aware of dietary practices, there was limited knowledge and practice regarding foot care. The authors argued

that diabetes education in Ghana remains overly focused on diet and medication adherence while neglecting other equally important self-care dimensions. Sarfo *et al.* (2020), studying stroke survivors with diabetes, observed that many patients failed to consistently monitor blood sugar or blood pressure due to limited access to equipment and poor follow-up mechanisms. These findings highlight systemic gaps in the design of self-management support within Ghana's healthcare system. Moreover, urban poor settings such as Ashaiman face unique barriers, including overcrowding, poverty, and limited access to consistent healthcare services, which exacerbate these challenges (Kushitor & Boatemaa, 2018).

Critically, Ghanaian evidence suggests that self-management practices are often fragmented. Patients may adhere to one domain (such as medication) while neglecting others (such as diet, exercise, or monitoring). This partial adherence is not unique to Ghana but reflects a wider challenge in chronic disease care globally, where lifestyle practices are harder to sustain compared to pharmacological regimens (Shrivastava, Shrivastava and Ramasamy 2021). The consequences are significant, as poor adherence contributes to higher rates of complications, hospital admissions, and premature mortality (Kazibwe *et al.* 2024). In Ghana, systematic reviews and facility-based studies confirm that inconsistent self-management of hypertension and diabetes leads to uncontrolled disease and progression to complications such as stroke, kidney failure, and cardiovascular disease (Opoku *et al.* 2023; Asante, Frimpong and Aziz 2023). Addressing this requires an approach that goes beyond patient education to include resource provision, consistent follow-up, and integration of community-based support systems.

2.3 Knowledge of Diabetes and Hypertension self-management practices

Effective self-management of diabetes and hypertension hinges fundamentally on patients' knowledge, thus the understanding of their condition, the rationale for lifestyle modifications, and

the tools required to implement such changes. Without adequate knowledge, individuals may remain passive recipients of care rather than active participants, perpetuating poor adherence and suboptimal control. Globally, self-management education forms a cornerstone of managing chronic illnesses such as diabetes and hypertension, with robust evidence demonstrating that empowered patients achieve better outcomes. Yet, disparities in health literacy, resource access, and education undermine these interventions, particularly in underserved and low- and middleincome settings (Toniolo *et al.*, 2024).

At the global level, several systematic reviews and intervention studies have underscored the critical role of knowledge in shaping self-management behaviour. For instance, educational interventions in Africa have been shown to significantly improve hypertensive self-management practices, including medication adherence and lifestyle modifications (Ukoha-Kalu *et al.* 2023). In Ghana, community studies (e.g. Navrongo HDSS) reveal that although knowledge and attitudes toward hypertension are relatively high after community dissemination efforts, behaviours such as regular monitoring, symptom checks, and adherence to lifestyle changes lag behind (Singh *et al.* 2024). Evidence from counseling and health education interventions in LMIC settings further confirms that when education is paired with follow-up support, improvements in diet, physical activity and medication adherence are more likely (Debela *et al.* 2023). Moreover, health literacy and social support have been identified as strong predictors of medication adherence among people living with hypertension, underscoring that knowledge alone is insufficient without enabling environments (Guo *et al.* 2023).

Moving to the African context, knowledge deficits remain a recurring theme, often exacerbated by systemic challenges. A comprehensive scoping review of nurses' roles in NCD management across

Africa revealed variability in provider knowledge, which inevitably affects patient education and support (Toniolo *et al.*, 2024). Weak provider knowledge narrows the capacity for effective patient counselling, thereby limiting knowledge transmission to patients.

Turning to Ghana, recent empirical studies expose persistent gaps at the patient level. Johnson *et al.* (2025), in a study conducted in the Ho Municipality, found that knowledge of diabetes selfmanagement among type 2 diabetes patients was alarmingly low, only 47% of the maximum score was achieved. This was reflected in correspondingly poor self-management practices, with knowledge statistically explaining 20% of the variance in behaviour (Johnson *et al.*, 2025). The findings point clearly to the need for more robust educational strategies tailored to patient needs.

In a different Ghanaian context, Danquah *et al.* (2023) assessed knowledge of NCDs among residents in rural Afigya-Kwabre South District. They found that while most respondents (77.7%) knew that NCDs are non-transmissible, only slightly over one-third recognized major risk factors such as unhealthy diets, physical inactivity, and alcohol use (Danquah *et al.*, 2023).

From the literature review, even where basic disease awareness exists, deeper comprehension of self-management practices and modifiable risk factors is limited. This deficit, in turn, influences actual practice. These findings reveal that knowledge is necessary but not sufficient. Enhancing patient knowledge without addressing motivational, systemic, and resource-related factors may yield limited impact. Yet, without baseline knowledge, other interventions may falter. Thus, interventions in settings like Ashaiman must integrate educational components with tailored support mechanisms. Literature establishes that knowledge of NCD self-management is foundational but plays a partial role in the sustainable management of these conditions. Addressing knowledge gaps is thus crucial, yet must be embedded within a broader strategy that targets behavioral drivers, contextual barriers, and healthcare system support.

2.4 Factors influencing self-management practices

While knowledge forms the foundation of effective diabetes and hypertension self-management, it does not act in isolation. Self-care behaviour is shaped by a web of influences ranging from individual attributes and interpersonal relationships to broader community, institutional, and policy environments. The socio-ecological model (SEM) is often applied to understand these layers, recognising that patients' choices are embedded within family, social, and structural contexts (Kilanowski, 2017). Identifying the factors that enable or constrain self-management practices is therefore central to designing interventions that are not only informative but also sustainable and contextually appropriate.

Individual-level factors influencing self management

Globally, studies have consistently shown that individual-level factors such as health literacy, self-efficacy, and motivation are crucial determinants of chronic disease self-management. For example, a systematic review of diabetes self-management education programs found that improvements in patient outcomes were strongly mediated by perceived self-efficacy (Shrivastava *et al.*, 2021). Similarly, socioeconomic status, including income and educational attainment, exerts a profound influence on self-care. Patients with higher income are more likely to afford healthy diets, medications, and diagnostic monitoring tools, while limited education may hinder comprehension of medical advice. Gender and age also shape behaviours, with younger adults sometimes demonstrating lower adherence due to competing priorities, and women often reporting heavier social and caregiving burdens that affect their ability to prioritise personal health (World Health Organization, 2024).

Interpersonal and social networks

Interpersonal and social networks further influence self-management practices. Strong family support has been shown to enhance treatment adherence and emotional wellbeing, while social isolation and stigma undermine engagement. For instance, research on cardiovascular disease management revealed that spousal and peer encouragement significantly improved dietary and exercise behaviours, whereas lack of support was linked with higher dropout from lifestyle programs (Gallant, 2020). These dynamics highlight that self-management practices is rarely an individual act but often a negotiated practice within households and communities.

Social support is another key influence in Ghana. While communal ties are strong, support for diabetes and hypertension self-management is often inconsistent or informal. Sarfo *et al.* (2020) noted that stroke survivors with diabetes relied heavily on family members for monitoring and adherence, but gaps in caregiver knowledge often limited the quality of support provided. Organizational factors also matter, Aryeetey *et al.* (2020) reported that weak institutional support for self-management education in Ghana's urban clinics restricted patients' opportunities to acquire and sustain self-management practices. At the policy level, Ghana has made efforts to integrate NCD care into primary health services, but implementation gaps persist, particularly in resource-constrained urban municipalities like Ashaiman (Dowou *et al.*, 2024).

At the community level, the presence or absence of health-promoting infrastructure, cultural norms, and social capital strongly affect self-management. Access to exercise facilities, local health clinics, and affordable fresh foods can facilitate adherence, while urban environments with poor housing, overcrowding, and limited services discourage sustained engagement. Studies in

South Asia illustrate how cultural perceptions of body weight, diet, and exercise either reinforce or challenge biomedical recommendations, underscoring the importance of tailoring interventions to cultural realities (Zavala *et al.*, 2023).

Institutional factors

Institutional factors are equally significant. Health system capacity often determines the extent to which patients can put their knowledge into practice. A 2024 scoping review on the role of nurses in Africa's NCD response highlighted how inadequate training and high workloads limited their ability to provide consistent counselling and follow-up (Toniolo *et al.*, 2024).

In the African context, the interaction of poverty, weak health systems, and cultural beliefs produces barriers and facilitators. A systematic review by Stephani *et al.* (2018) found that across Sub-Saharan Africa, major barriers to diabetes self-management included low knowledge, high cost of medicines, and inadequate health literacy, compounded by infrastructural deficits. More recent evidence continues to confirm these challenges. For example, a meta-analysis of foot care practices in Africa reported that fewer than half of patients engaged in recommended daily foot care, largely due to lack of education, inadequate provider counselling, and financial hardship (Tewabe *et al.*, 2025). Similarly, qualitative studies in Nigeria and Kenya show that while patients often recognise the importance of dietary and medication adherence, financial constraints and weak health insurance coverage limit their ability to consistently act on this knowledge (Kimani *et al.*, 2019; Olaniran *et al.*, 2023). On the positive side, family networks and religious groups frequently provide encouragement and accountability, suggesting that community-based approaches can be powerful enablers when harnessed effectively (Toniolo *et al.*, 2024).

Ghana presents similar findings. Individual knowledge gaps remain widespread, as shown in recent Ghanaian studies reporting inconsistent understanding of dietary guidelines, physical activity, and

blood glucose monitoring among persons with diabetes and hypertension (Johnson *et al.* 2025; Lamptey *et al.* 2023; Asante, Frimpong and Aziz 2023; Asiedu *et al.* 2024).

Yet, even where knowledge exists, socioeconomic factors limit practice. A study in Accra found that 73.3% of hypertensive patients demonstrated poor knowledge of their condition, with forgetfulness and high pill burden as major contributors to non-adherence (Okai *et al.*, 2020). Poverty and unemployment in urban poor areas like Ashaiman mean that many residents cannot afford routine medications or recommended diets. Structural constraints, such as shortages of NCD clinics and under-resourced health facilities, further compound these challenges. Literature indicates that self-management practice is a multifaceted process shaped by factors far beyond individual knowledge. Addressing barriers requires a holistic approach that not only improves knowledge but also builds enabling environments across interpersonal, community, institutional, and policy levels.

2.5 Summary

The review of literature demonstrates that self-management practices of diabetes and hypertension is a cornerstone of effective chronic care, but one that is shaped by complex interactions of knowledge, behaviour, and systemic support. Globally, evidence affirms that patients who are well-informed and supported through structured programs achieve improved health outcomes. However, disparities in adherence to medication, diet, exercise, and monitoring remain widespread, even in high-resource settings, reflecting the challenges of sustaining long-term behavioural change. In Sub-Saharan Africa, these difficulties are compounded by poverty, fragile health systems, and cultural norms that constrain adherence, resulting in consistently low levels of self-management practices across multiple studies.

In Ghana, the literature reveals similar patterns. Patients may demonstrate commitment in one aspect, such as medication, but fall short in others such as diet, physical activity, or symptom monitoring. Studies underscore persistent gaps in knowledge, structural barriers linked to affordability and access, and limited institutional support for continuous self-management education. These deficits are most pronounced in underserved urban communities such as Ashaiman, where poverty, overcrowding, and weak health infrastructure intersect to undermine consistent practice. While knowledge is critical, it is not sufficient on its own. Self-management practices is influenced by individual, interpersonal, community, and policy-level factors that require a multi-layered response. This study, therefore, seeks to fill an important gap by providing evidence to inform targeted and culturally appropriate interventions.

CHAPTER THREE

3.0 METHODOLOGY

3.0 Introduction

This chapter outlines the methodological approach adopted to investigate knowledge, influencing factors, and self-management practices among adults living with diabetes and hypertension in Ashaiman, Ghana. It describes the study design, study site, population, and eligibility criteria, as well as the sampling methodology and procedures used to recruit participants. The chapter further explains the data collection tools and processes, data handling measures, and statistical techniques applied in the analysis. Ethical considerations and plans for dissemination of findings are also presented. Together, these sections provide a clear framework for how the study was conducted and ensure the reliability, validity, and ethical integrity of the research.

3.1 Study Design

This study employed a quantitative cross-sectional design to assess knowledge, influencing factors, and self-management practices among adults living with diabetes and hypertension in Ashaiman, Ghana. The cross-sectional design is appropriate for obtaining data at a single point in time and will allow for a cost-effective, time-efficient, and statistically sound approach to examining health behaviors.

3.2 Study Site

The study was conducted in Ashaiman, a densely populated urban municipality in the Greater Accra Region of Ghana. For the purpose of this study, data will be collected from selected public and private health facilities within the Ashaiman Municipality that provide outpatient care to individuals living with diabetes and hypertension. As of 2024, the municipality hosts approximately 17 private and quasi-governmental health facilities, including well-known centers

such as St. Martin’s Memorial Hospital, Pleasant Medical Centre, and New Crystal Health Services. The selection of these facilities will be based on their high outpatient attendance for NCD-related care, accessibility to residents across different sub-areas of the municipality, and willingness to participate in the research. Their inclusion will help ensure a representative sample of the adult NCD population in Ashaiman.

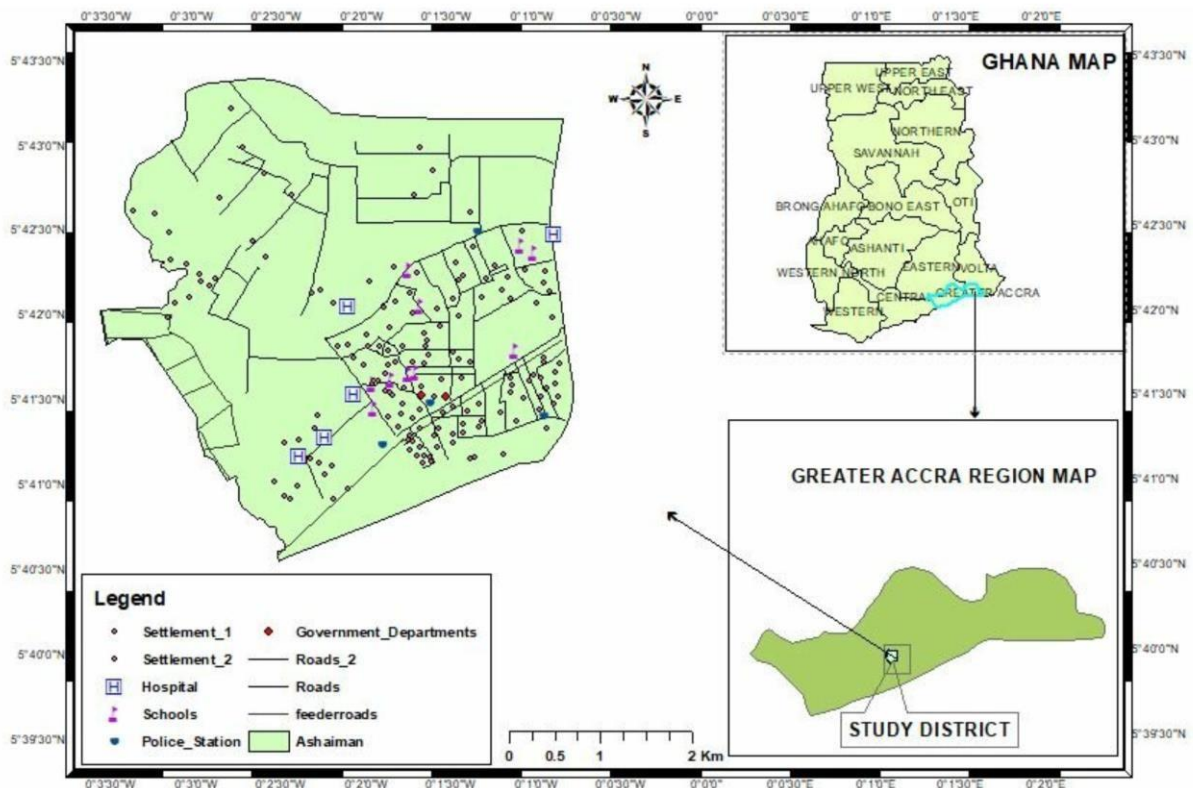


Figure 3.1 Map of Ashaiman

Source: (Osae *et al.* 2022)

3.3 Study Population

The study population will consist of adult residents of Ashaiman aged 18 years and above who have been clinically diagnosed with diabetes, hypertension or both. Participants must have lived

in the community for at 6 months to ensure familiarity with the local environment and access to healthcare services.

3.4 Inclusion Criteria

- Adults (18 years and older) with a diagnosis of at least one NCD.
- Residents of Ashaiman for a minimum of 6 months.
- Individuals who are aware of their NCD diagnosis and currently manage their condition either through formal or informal care.

3.5 Exclusion Criteria

- Individuals who are severely ill or cognitively impaired and unable to participate in the interview.
- Temporary residents or visitors receiving care at the time of data collection.

3.6 Sampling methodology and size

Public and private health facilities within Ashaiman known for providing outpatient NCD care were selected for recruitment. At facilities such as Ashaiman Polyclinic, all available NCD patients were recruited during the study period, ensuring that no eligible participant was excluded. At the Ashaiman Municipal Hospital diabetes clinic, about 40 clients were identified and enrolled. Recruitment also extended into community settings including the Ashaiman main market, Zenu market, and Atadeka market, where approximately 96 respondents were recruited.

The recruitment process, however, was not without considerable challenges. Because NCDs are a sensitive topic, many potential participants were reluctant to disclose their condition in public spaces such as markets. This reluctance often stemmed from fear of stigma, leading to refusals or incomplete responses. In addition, researchers had to walk long distances across different localities

to trace eligible respondents, only to face missed appointments or withdrawals from individuals who had initially agreed to participate. Despite these difficulties, persistent follow-up, repeated visits, and careful reassurance of the respondents, we were able to secure some numbers. After data cleaning 93 responses were valid for analysis.

3.7 Sampling Procedure

3.8 Data Collection Methods and Instruments

Data for this study was collected using a structured questionnaire developed specifically to assess the knowledge, influencing factors, and self-management practices among adults living with diabetes and hypertension in Ashaiman, Ghana. The data collection method employed a face-to-face interview technique, allowing for direct interaction between the interviewer and respondents, and enabling clarification of questions where necessary. The interview guide was divided into three key sections:

Section A: Demographic Information

This section collected background data on participants, including age, sex, marital status, occupational level, educational attainment, and duration since NCD diagnosis.

Section B: Knowledge of Self-management practices

This section comprised statements designed to assess participants' knowledge and perceptions about NCD self-management practices. Items covered topics such as medication adherence, the role of diet and physical activity, importance of regular check-ups, effects of alcohol and smoking, and stress management.

Section C: Self-Management Practices

This section evaluated the frequency of specific self-management behaviors, including medication adherence, attendance at medical appointments, symptom monitoring, health-seeking behavior, risk avoidance (e.g., smoking and alcohol), and healthy eating.

3.9 Data Handling

All data was collected using KoBoCollect on encrypted tablets and backed up daily to a secure server. Access was restricted to myself and the project supervisor.

3.10 Statistical Analysis

Data was analyzed using STATA version 18. Descriptive statistics (means, frequencies, and proportions) were used to summarize demographic characteristics, knowledge levels, and selfmanagement practices. Chi-square tests and Fishers-tests explored associations between sociodemographic variables and self-management practices. Results were presented in tables, charts, and graphs.

3.11 Dissemination of Results

Findings will be disseminated to stakeholders including the Ghana Health Service, Ashaiman Municipal Health Directorate, local NGOs, and community leaders. A copy will be submitted to the Ensign Global University Library. There will also be presentations at community gatherings. Manuscripts will be prepared for submission to peer-reviewed public health journals and presented at academic and policy forums.

3.14 Ethical Considerations

Ethical approval was sought from the Institutional Review Board (IRB) of Ensign Global

University. Written permissions were obtained from Ashaiman Municipal Health Directorate and participating health facilities. Informed consent was obtained from all participants before data collection (Appendix I). Participants were assured of the confidentiality and anonymity of their responses, and their right to withdraw at any point without penalty. The study posed no harm to respondents, and they did not receive any compensation, however it revealed insights that will help improve self-management practices amongst patients with diabetes and hypertension.

CHAPTER FOUR

4.0 RESULTS

4.1 Introduction

This chapter presents the findings of the study on knowledge, influencing factors, and selfmanagement practices among adults living with diabetes and hypertension in Ashaiman, Ghana. The results are organized into sections beginning with the socio-demographic characteristics of respondents, followed by clinical and knowledge-related findings, self-management practices, and self-efficacy levels. The chapter further examines factors associated with self-management practices using statistical tests to identify significant relationships. Tables and figures are used to summarize the data and provide a clear representation of the study outcomes.

4.2 Demographics Characteristics

The age distribution shows that (37.6%) of respondents were aged 51–60 years, followed by those aged 61–70 years (25.8%). Participants aged 41–50 years (21.5%), while the least represented group of respondents were aged 70 years and above (15.1%).

The sex distribution was predominantly female (75.3%), with males constituting 24.7% of the sample. Regarding marital status, more than half (54.8%) of respondents were currently married or living together, while widows (25.8%), divorced/separated (10.8%), and never-married (8.6%) individuals formed smaller proportions.

In terms of employment status, (63.4%) of respondents were currently employed, (21.5%) were unemployed, and (15.1%) were retired, indicating that most participants remained economically active. Educational attainment varied: (45.2%) had completed Middle/JHS, followed by (18.3%)

with secondary education. Smaller proportions reported no formal education (17.2%), primary education (12.9%), or tertiary education (6.5%).

Ethnically, the Ewe group formed the largest proportion (29.0%), followed closely by other ethnic groups (28.0%) and Akan (24.7%). Minority representations included Ga-Dangme (11.8%), MoleDagbani/Grussi/Gruma/Mande (4.3%), and Guan (2.2%). Religion was overwhelmingly Christian (87.1%), while Islam accounted for (12.9%).

With respect to disease duration, (29.1%) of participants had lived with their condition for 6 months to 1 year, (19.3%) for 2–3 years, and (18.3%) for more than 10 years. Smaller shares had been diagnosed for 4–5 years (16.1%), 6–7 years (8.6%), or 8–10 years (8.6%).

In terms of condition type, (44.1%) of respondents reported having both diabetes and hypertension, (38.7%) had hypertension only, and (17.2%) had diabetes only. Overall, these results depict a study population that was mainly middle-aged to older adults, predominantly female, Christian, and currently employed, with most having attained at least a basic form of education.

The majority (72.1%) of respondents had Type 2 diabetes, while (20.4%) were diagnosed with Type 1, and only (7.5%) had gestational diabetes. This pattern aligns with global and national evidence showing Type 2 diabetes as the most prevalent form, especially among adults.

Table 1 Demographic Characteristics

Variable/Response	Frequency	Percentage
Age		
51–60	35	37.6%
61–70	24	25.8%
41–50	20	21.5%
70+	14	15.1%
Sex		
Female	70	75.3%
Male	23	24.7%

Marital Status		
Currently married/living together	51	54.8%
Widowed	24	25.8%
Divorced/Separated	10	10.8%
Never married	8	8.6%
Employment Status		
Currently employed	59	63.4%
Currently unemployed	20	21.5%
Retired	14	15.1%
Education		
Middle/JHS	42	45.2%
Secondary	17	18.3%
None	16	17.2%
Primary	12	12.9%
Tertiary	6	6.5%
Ethnicity		
Ewe	27	29.0%
Other	26	28.0%
Akan	23	24.7%
Ga-Dangme	11	11.8%
Mole-Dagbani/Grussi/Gruma/Mande	4	4.3%
Guan	2	2.2%
Religion		
Christianity	81	87.1%
Islam	12	12.9%
Duration of Disease		
6 months–1 year	27	29.0%
2–3 years	18	19.3%
>10 years	17	18.3%

4–5 years	15	16.1%
6–7 years	8	8.6%
8–10 years	8	8.6%
Condition		
Hypertension only	36	38.7%
Diabetes only	16	17.2%
Both Hypertension & Diabetes	41	44.1%

4.2 Level of Knowledge on Diabetes and Hypertension

Table 4.2 presents respondents' background knowledge and exposure to diabetes and hypertension-related advice. Slightly more than half of participants (55.9%) reported having a family history.

In terms of lifestyle-related counselling, most participants (89.3%) indicated that they had received dietary advice, reflecting widespread health education efforts. Similarly, (59.1%) had received advice to reduce sugar intake, while fewer (20.4%) had been advised to limit alcohol consumption and very few respondents (2.2%) reported being advised to stop smoking.

Encouragingly, a large proportion (78.5%) had been advised to engage in regular physical exercise. Overall, these results indicate that while health education and dietary counselling were relatively well-integrated into patient care, advice on alcohol reduction and smoking cessation remained limited, highlighting potential areas for improvement in patient counselling concerning diabetes and hypertension education.

Table 2 Knowledge on self-management practices

Variable/Response	Frequency	Percentage
Family history of diabetes/hypertension		
Yes	52	55.9%
No	27	29.0%
Don't know / Missing	14	15.1%
Type of diabetes		
Type 1	19	20.4%

Type 2	67	72.1%
Gestational	7	7.5%
Received dietary advice		
Yes	83	89.3%
No	10	10.8%
Received advice to reduce sugar		
Yes	55	59.1%
No	38	40.9%
Received advice to reduce alcohol		
Yes	19	20.4%
No	74	79.6%
Received advice to stop smoking		
Yes	2	2.2%
Received advice to do exercise		
Yes	73	78.5%
No	20	21.5%

4.3 Overall knowledge level on Diabetes and Hypertension

An overall knowledge score was then computed by summing the individual item scores for each respondent.

As shown in Figure 4.1, the majority of respondents (80.6%) demonstrated good knowledge of diabetes and hypertension, whereas a smaller proportion (19.4%) had poor knowledge.

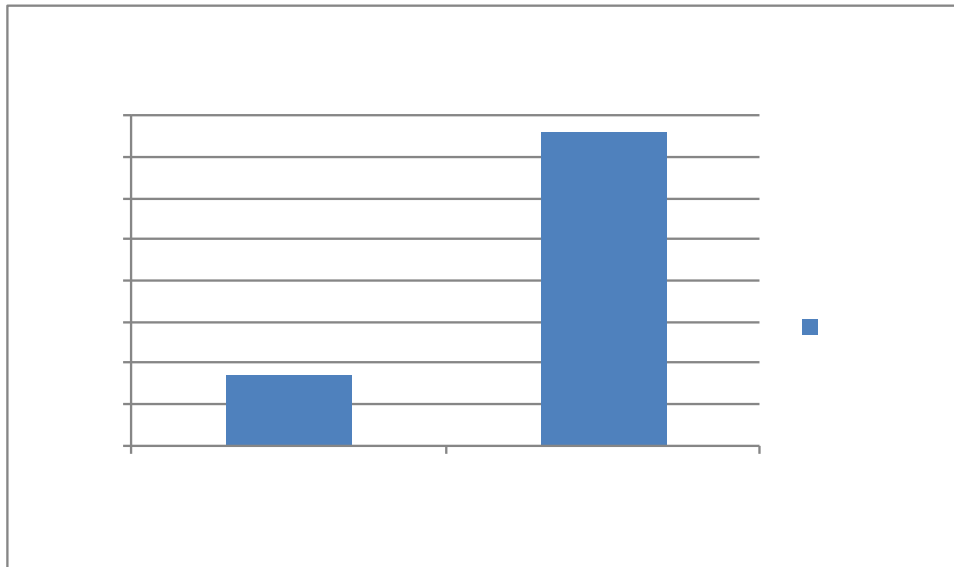


Figure 1 Distribution of knowledge level on Diabetes and Hypertension

4.4 Self-management practices among adults living with Diabetes and Hypertension in Ashaiman

In terms of diet, 41.9% of respondents reported following the recommended diet three to five days per week, while (32.3%) did so only one to two days weekly. Regarding sugar management, (33.3%) had completely stopped sugar intake, and (32.3%) limited their use to about three tablespoons per week, indicating fair effort toward moderation. Only a small proportion (4.3%) consumed a single 300ml sugar-sweetened beverage weekly, suggesting relatively low sugar consumption overall.

Concerning alcohol, (36.6%) reported having a history of drinking but were not current drinkers (i.e. had not consumed any alcohol in the last 30 days), while (35.5%) still consumed alcohol.

Weight management patterns were encouraging, with (53.8%) reporting weight loss, while (25.8%) maintained their weight.

For smoking, (55.9%) had stopped smoking, and (44.1%) had never smoked, showing that tobacco use was not widespread among participants. Exercise levels were modest, (47.3%) engaged in physical activity once weekly, while (32.3%) did so three or more times weekly.

With respect to salt intake, (36.6%) never added salt at the table, but (31.2%) reported that salt was always added during cooking in their households. Ownership of self-monitoring tools were limited; only (30.1%) owned a glucometer, and (31.2%) reported using technology for disease management.

Table 3 Self-management practices

Variable/Response	Frequency	Percentage
Follow the recommended diet		
1–2 days a week	30	32.3%
3–5 days a week	39	41.9%
Six days a week	14	15.1%
Never	10	10.8%
Sugar practice		
Stop sugar intake	31	33.3%
Use sugar substitutes	23	24.7%
Takes only 3 tablespoons of sugar a week	30	32.3%
Takes only one 300ml SSB a week	4	4.3%
Other	5	5.4%
Alcohol practice (<=30)		
Never drank alcohol	26	28.0%
No (but have history of drinking)	34	36.6%
Yes (currently drink)	33	35.5%
Weight practice		
No, I gained weight	19	20.4%
No, I maintained my weight	24	25.8%
Yes, I lost some weight	50	53.8%
Smoking cessation		
Never smoked	41	44.1%

Yes (stopped smoking)	52	55.9%
Exercise		
Once a week	44	47.3%

Twice a week	19	20.4%
Three or more times a week	30	32.3%
Adding salt to food		
Always	17	18.3%
Often	7	7.5%
Sometimes	18	19.4%
Rarely	17	18.3%
Never	34	36.6%
Salt added during cooking		
Always	29	31.2%
Often	20	21.5%
Sometimes	26	28.0%
Rarely	7	7.5%
Never	5	5.4%
Don't know	6	6.5%
Processed food consumption		
Always	1	1.1%
Often	5	5.4%
Sometimes	31	33.3%
Rarely	22	23.7%
Never	33	35.5%
Don't remember	1	1.1%
Perceived salt intake		
Far too little	16	17.2%
Too little	35	37.6%

Just the right amount	41	44.1%
Too much	1	1.1%
Blood sugar monitoring (last 6 months)		
Daily / Almost every day	3	3.2%
Weekly	14	15.1%
Two times a month	10	10.8%
Monthly	41	44.1%
Thrice in six months	7	7.5%
Twice in six months	1	1.1%
Once	2	2.2%
Never	14	15.1%
Don't know	1	1.1%
Owns glucometer		
Yes	28	30.1%
No	65	69.9%
Use technology for management		
Yes	29	31.2%
No	64	68.8%

The bar chart illustrates the distribution of self-management practice levels among adults living with diabetes and hypertension in Ashaiman.

The composite practice score was derived by combining multiple behavioural indicators; adherence to diet, exercise frequency, medication compliance, smoking cessation, and monitoring of blood glucose or blood pressure into a single index. Respondents were then categorised based on their practice score using a 60% cut-off point. Those scoring below 60% were classified as having poor practice, while those scoring 60% or above were considered to have good practice. As shown in the chart, (51.6%) of respondents demonstrated good practice, compared to (48.4%) of respondents who exhibited poor practice.

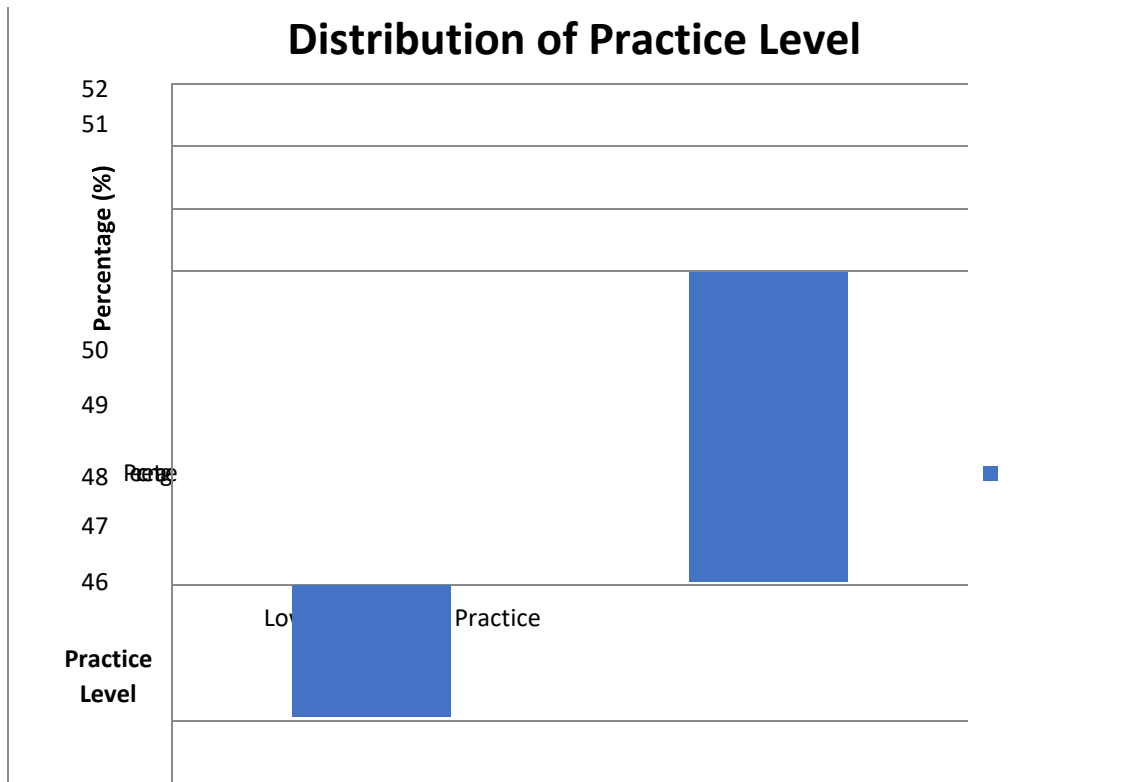


Figure 2 Distribution of self-management practices on Diabetes and Hypertension

4.5 Factors influencing self-management practices among adults living with Diabetes and Hypertension in Ashaiman

The findings indicated that educational level and ethnicity were the only factors significantly associated with self-management practices ($p < 0.05$). Respondents with primary education had the highest proportion of good practice (83.3%), while those with no formal education recorded the lowest (31.2%). Similarly, ethnicity showed a notable pattern ($p = 0.027$). A higher proportion of Ga-Dangme (72.7%) and Ewe (59.3%) respondents reported good practices compared to the Akan (39.1%) and other ethnic groups (34.6%).

Although not statistically significant, differences were observed across other factors. For instance, female respondents (55.7%) reported good self-management practices than males (39.1%).

Likewise, the proportion of good practice increased with age, from (31.2%) among those aged 41–50 years to (72.7%) among those aged 70 years and above.

Regarding employment status, retired participants exhibited a higher rate of good practice (78.6%) compared to those employed (46.6%) or self-employed (45.0%).

Self-efficacy, measured using the Diabetes Empowerment Scale (DES) composite, was not significantly associated with practice levels ($p = 0.726$), although respondents with higher self-efficacy ($\geq 60\%$) had slightly good practices (53.7%) than those with lower efficacy (50.0%).

Access to monitoring/technology tools (i.e. glucometer and blood pressure machines) and social support also showed no significant association. However, respondents using glucometers (57.9%) or digital tools such as phones/apps (56.2%) had somewhat good practices compared to those relying solely on blood pressure monitors (44.4%). Similarly, those supported by family (56.8%) or friends (52.9%) exhibited higher good practice proportions than those relying on other support sources (44.0%).

Table 3 Bivariate analysis between socio-demographic variables and self-management practices among adults living with Diabetes and Hypertension in Ashaiman

Variable	Category	Poor Practice n(%)	Good Practice n(%)	Total n(%)	p-value
Age	18–40	8 (50.0)	8 (50.0)	16 (100)	0.001
	41–50	11 (68.8)	5 (31.2)	16 (100)	
	51–60	13 (41.9)	18 (58.1)	31 (100)	
	61–70	10 (52.6)	9 (47.4)	19 (100)	
	70+	3 (27.3)	8 (72.7)	11 (100)	

Sex	Female	31 (44.3)	39 (55.7)	70	0.
	Male	14 (60.9)	9 (39.1)	23	(100)
Education	None	11 (68.8)	5 (31.2)	16	0.
	Primary	2 (16.7)	10 (83.3)	12	(100)
	Secondary	6 (35.3)	11 (64.7)	17	(100)
	Tertiary	4 (66.7)	2 (33.3)	6	(100)
	Middle/Other	22 (52.4)	20 (47.6)	42	(100)
	Marital Status	Married/Living together	25 (49.0)	26 (51.0)	51
Divorced/Separated		5 (50.0)	5 (50.0)	10	(100)
Never married		4 (50.0)	4 (50.0)	8	(100)
Widowed		11 (45.8)	13 (54.2)	24	(100)
Employment	Currently employed	31 (53.4)	28 (46.6)	59	0.
	Self-employed	11 (55.0)	9 (45.0)	20	(100)
	Retired/Other	3 (21.4)	11 (78.6)	14	(100)
Ethnicity	Akan	14 (60.9)	9 (39.1)	23	0.
	Ewe	11 (40.7)	16 (59.3)	27	(100)
	Ga-Dangme	3 (27.3)	8 (72.7)	11	(100)
	Guan	0 (0.0)	2 (100)	2	(100)
	Mole-Dagbani	0 (0.0)	4 (100)	4	(100)
	Other	17 (65.4)	9 (34.6)	26	(100)
Religion	Christianity	38 (46.9)	43 (53.1)	81	0.
					(100)

	Islam	7 (58.3)		5 (41.7)	12 (100)
Duration of Diagnosis	<5 years	16 (64.0)		9 (36.0)	25 (100) 0.
	5–10 years	16 (45.7)		19 (54.3)	35 (100)
	11–15 years	8 (50.0)		8 (50.0)	16 (100)
	16+ years	5 (29.4)		12 (70.6)	17 (100)
					27 (100) 0.
Technology Access	BP only	15 (55.6)		12 (44.4)	27 (100) 0.
	Glucometer only	8 (42.1)		11 (57.9)	19 (100)
	Both BP + Glucometer	8 (53.3)		7 (46.7)	15 (100)
	Phone/Apps	7 (43.8)		9 (56.2)	16 (100)
	Other	7 (43.8)		9 (56.2)	16 (100)
Social Support	Family	16 (43.2)		21 (56.8)	37 (100) 0.
	Friends	8 (47.1)		9 (52.9)	17 (100)
	Church	7 (50.0)		7 (50.0)	14 (100)
	Others	14 (56.0)		11 (44.0)	25 (100)
					52 (100) 0.
Self-Efficacy (DES Composite, 60% cutoff)	Low (<60%)	26 (50.0)		26 (50.0)	52 (100) 0.
		19 (46.3)	22 (53.7)	41 (100)	

CHAPTER FIVE

5.0 DISCUSSION

5.0 Introduction

This chapter provides a detailed discussion of the study's key findings in relation to existing empirical literature and theoretical perspectives. It interprets the statistical results presented in chapter four to explain the patterns and relationships observed between knowledge, selfmanagement practices, and influencing factors among adults living with diabetes and hypertension in Ashaiman. The discussion situates these findings within the broader context of public-health research on chronic disease management in Ghana and comparable settings, highlighting similarities, differences, and implications for policy and practice. The chapter concludes by identifying knowledge gaps and areas for further research that could enhance chronic-disease selfmanagement at both community and institutional levels.

5.1 Knowledge of self-management practices among Adults Living with diabetes and hypertension

The study found that the majority of adults living with diabetes and hypertension in Ashaiman demonstrated good knowledge of self-management practices (80.6%), while only 19.4% exhibited poor knowledge. This generally good level of knowledge suggests that patients are increasingly aware of how lifestyle modification contributes to controlling these chronic conditions. The result reflects the impact of continuous public health education, facility-based counselling, and national NCD campaigns that emphasise diet, exercise, and adherence as essential components of chronic disease care.

This finding aligns with Asante *et al.* (2023), who reported that more than 70% of adults with hypertension and diabetes in Akatsi South District had adequate knowledge of disease control and

lifestyle adjustment. Similarly, Dowou *et al.* (2024) found that respondents in Accra Metropolis possessed moderate-to-high understanding of their conditions, which they attributed to repeated contact with primary healthcare providers and growing community sensitisation. Both studies emphasised that consistent exposure to health information during clinic visits significantly improves patients' ability to recall and apply self-care messages.

The high proportion of respondents who received dietary advice (89.3%) and counselling to reduce sugar intake (59.1%) demonstrates that nutritional education is well integrated into diabetes and hypertension care in Ashaiman. This corroborates findings by Bossman *et al.* (2021) and Toniolo *et al.* (2024), who observed that dietary counselling forms the most accessible and routine aspect of patient education for NCDs in Ghana and Italy respectively. Diet modification, particularly reduced salt and sugar intake, and has been widely promoted in Ghana through the *Healthy Eating and Active Living* campaign spearheaded by the Ghana Health Service (GHS) and partners such as WHO. The results therefore reflect the success of such initiatives in reaching facility-based patients.

However, the relatively low proportion of participants who received advice on alcohol reduction (20.4%) and smoking cessation (2.2%) reveals a gap in comprehensive lifestyle counselling. This shortfall mirrors observations from Opoku *et al.* (2023), who reported that while most Ghanaian hypertensive and diabetic patients were familiar with diet and medication management, fewer were educated about the cardiovascular risks associated with alcohol and tobacco use. Similarly, Okai *et al.* (2020) noted that clinicians often prioritised diet and medication adherence over behavioural risk factors during consultations due to time constraints and patient load. This imbalance underscores the need for more holistic education that includes all modifiable risk factors, not just nutrition.

The high rate of counselling on physical activity (78.5%) is another positive sign. Regular exercise has been shown to enhance glycaemic control, weight management, and blood pressure regulation. The finding echoes Shrivastava *et al.* (2021), who found that patients exposed to repeated lifestyle counselling showed better adherence to exercise and diet recommendations. Moreover, Gallant (2020) argued that self-efficacy—confidence in one’s ability to perform recommended behaviours—is strongly correlated with the frequency of counselling received. In this study, the predominance of exercise and diet counselling likely contributed to the good knowledge scores observed.

Nevertheless, knowledge does not always equate to consistent behaviour change. Kushitor and Boatemaa (2018) highlighted that in Ghana, even when knowledge is high, structural barriers such as financial limitations, limited access to healthy food, and inadequate community facilities often constrain self-management practices. Thus, while the high knowledge rate in Ashaiman (80.6%) is encouraging, it must be interpreted within a context where economic and social constraints may limit translation into action.

The presence of a family history of hypertension or diabetes among more than half of participants (55.9%) could also partly explain the elevated knowledge levels. As Tewabe *et al.* (2025) observed in Ethiopia, individuals with affected relatives are more likely to seek information about risk reduction and disease management. Family discussions and shared healthcare experiences may therefore serve as informal education sources reinforcing facility-based knowledge.

Overall, these findings illustrate a growing awareness of chronic disease management among adults in Ashaiman, largely shaped by clinic-based health education, familial exposure, and national NCD communication strategies. However, the low emphasis on alcohol and tobacco counselling suggests a partial approach to patient education that may leave some behavioural risk factors unaddressed. Strengthening comprehensive, multidisciplinary education that includes diet,

exercise, and all forms of lifestyle modification will be essential to sustaining and expanding patients' capacity for effective self-management.

Effective self-management practices is the cornerstone of chronic disease control and remains a principal strategy recommended by the World Health Organization (2018; 2024) and the Ghana Health Service (GHS 2024) for reducing morbidity and premature mortality from noncommunicable diseases. The findings from Ashaiman reveal moderate but encouraging adherence to self-care behaviours among adults living with diabetes and hypertension. Although most respondents possessed good knowledge of their conditions (80.6%), translating that knowledge into consistent daily practice proved partial, reflecting both behavioural effort and contextual barriers that characterise many urban communities in Ghana.

5.2 Level of self-management practices among adults living with diabetes and hypertension in Ashaiman

Effective self-management practice is the cornerstone of chronic disease control and remains a principal strategy recommended by the World Health Organization (2018; 2024) and the Ghana Health Service (GHS 2024) for reducing morbidity and premature mortality from noncommunicable diseases. The findings from Ashaiman reveal moderate but encouraging adherence to self-care behaviours among adults living with hypertension and diabetes. Although most respondents possessed good knowledge of their conditions (80.6%), translating that knowledge into consistent daily practice proved partial, reflecting both behavioural effort and contextual barriers that characterise many urban communities in Ghana.

Diet modification emerged as one of the strongest aspects of self-care, with 41.9% of participants following recommended diets three to five days weekly and 32.3% doing so one to two days weekly. Similar patterns have been reported by Opoku *et al.* (2023) and Bossman *et al.* (2021), who observed that while most Ghanaian patients understand dietary guidance, adherence is

constrained by the affordability of healthy foods, limited access to fresh produce, and entrenched cultural food preferences. In an urban settlement like Ashaiman—characterised by informal markets and heavy reliance on street foods—economic limitations and convenience often hinder strict dietary adherence.

Efforts toward sugar reduction were more encouraging, with 33.3% of respondents having completely eliminated added sugar and another 32.3% restricting their intake to small amounts weekly. This improvement corresponds with the findings of Dowou *et al.* (2024) in Accra, where continuous nutrition counselling resulted in measurable reductions in sweetened-food consumption and improved glycaemic control. Such results suggest that consistent clinic-based health education is yielding gradual behavioural change, though reinforcement through peer education and routine follow-up is still needed to maintain progress.

Despite widespread counselling, alcohol consumption remained relatively high, as 35.5% of respondents were still current drinkers, while 36.6% had ceased drinking. This persistence mirrors findings by Okai *et al.* (2020) and Asante *et al.* (2023), who identified sociocultural acceptance, stress coping, and misconceptions about “moderate drinking” as key barriers to abstinence among hypertensive and diabetic adults. Behaviour-change interventions may therefore require culturally sensitive communication that links alcohol use directly to the biological risk of uncontrolled blood pressure and hyperglycaemia. Tobacco use, however, appeared minimal; 55.9% had stopped smoking and 44.1% had never smoked. This outcome aligns with GHS (2024) data indicating declining smoking prevalence nationally and supports Toniolo *et al.* (2024), who attributed similar patterns among diabetic patients in Europe to strong anti-tobacco legislation and routine physician reinforcement. Ghana’s relatively low smoking rate may thus reflect successful health policies coupled with cultural disapproval of smoking, particularly among women.

Exercise participation was modest but promising, as 47.3% of respondents engaged in physical activity once weekly and 32.3% three or more times weekly. Although these levels remain below the WHO (2024) recommendation of at least 150 minutes of moderate activity weekly, they demonstrate increasing awareness of exercise benefits. Shrivastava *et al.* (2021) reported comparable trends in India, noting that irregular schedules, fatigue, and unsafe environments commonly limit consistent physical activity. In Ashaiman, these barriers likely coexist with physically demanding occupations that patients do not perceive as exercise, reinforcing Gallant's (2020) argument that self-efficacy—confidence in one's ability to act—is critical for consistent behavioural change.

Weight management outcomes were encouraging, as 53.8% of participants reported weight loss and 25.8% maintained stable weight, demonstrating the gradual effect of lifestyle modification counselling. Dowou *et al.* (2024) reported similar improvements among Ghanaian patients who attended structured lifestyle-modification sessions, indicating that sustained education and clinic follow-up can yield tangible improvements. Nonetheless, long-term maintenance remains a challenge and may require continuous motivation through support groups or nurse-led home visits. Salt restriction practices were partly adhered to, with 36.6% of respondents avoiding salt at the table while 31.2% still added salt during cooking. Bossman *et al.* (2021) similarly observed that household cooking traditions often override individual dietary advice, as meal preparation is typically communal. The persistence of such practices suggests that interventions focusing solely on the patient may be insufficient; instead, family-based health education that includes caregivers and household cooks may have greater impact on sodium reduction.

Self-monitoring and technology use were the weakest aspects of self-management, with only 30.1% owning a glucometer and 31.2% using mobile or digital tools for disease tracking. These limitations are consistent with findings by Tewabe *et al.* (2025) and Stephani *et al.* (2018), who

highlighted the unaffordability of home-based monitoring devices and lack of digital literacy in low-income settings. Without accessible self-monitoring tools, patients remain dependent on periodic facility visits for feedback, which can delay necessary lifestyle adjustments. Nyaaba *et al.* (2020) and Kushitor and Boatemaa (2018) both emphasised the importance of community-level self-care infrastructure, suggesting that subsidies, nurse follow-ups, and mobile-health integration are crucial for effective NCD management in Ghana.

The findings portray a population that is knowledgeable yet inconsistently adherent. The highest compliance was observed in dietary management, sugar reduction, and weight control—areas directly reinforced during clinic visits—whereas behaviours requiring personal resources or systemic support, such as exercise, salt restriction, and home monitoring, were less consistent. This imbalance reflects the broader challenge identified by Kushitor and Boatemaa (2018), that Ghana's health-education programmes often raise awareness but do not adequately address the structural and socioeconomic determinants that constrain sustained behaviour change.

Therefore, while the Ashaiman findings signal encouraging progress, they also affirm that knowledge alone is insufficient to guarantee adherence. Translating awareness into sustained selfcare requires multi-level support—financial accessibility, community reinforcement, and family engagement. As Gallant (2020) and Dowou *et al.* (2024) both note, effective chronic disease control depends not only on what patients know but also on the environmental and social conditions that empower them to act. The evidence from Ashaiman thus underscores the need for integrated, patient-centred approaches that align clinical education with daily realities, enabling adults with hypertension and diabetes to transform awareness into consistent, life-sustaining practice.

5.3 Factors influencing self-management practices among adults living with diabetes and hypertension in Ashaiman

The analysis identified education and ethnicity as the only factors significantly associated with self-management practices among adults living with hypertension and diabetes in Ashaiman. Respondents with primary education demonstrated the highest levels of good practice (83.3%), while those without formal education recorded the lowest (31.2%). This pattern affirms the consistent link between education and chronic-disease self-management documented across several studies. According to Opoku *et al.* (2023) and Bossman *et al.* (2021), patients with higher literacy levels are more likely to understand medical instructions, interpret blood-pressure or glucose readings accurately, and make informed lifestyle choices. In the Ghanaian context, limited literacy often constrains patients' ability to follow treatment schedules or adjust diets effectively. Dowou *et al.* (2024) similarly observed that comprehension of counselling messages is a crucial determinant of adherence, suggesting that health education materials must be simplified and translated into local languages to close this gap.

Ethnicity also showed a statistically significant association ($p = 0.027$). Respondents from GaDangme (72.7%) and Ewe (59.3%) communities reported higher rates of good practice than Akan (39.1%) and other ethnic groups (34.6%). This outcome reflects the influence of sociocultural norms on health behaviour. Asante *et al.* (2023) and Nyaaba *et al.* (2020) have both highlighted that cultural perceptions of illness, diet, and traditional remedies vary by ethnic background and can shape how individuals prioritise medical advice. In coastal and peri-urban settings such as

Ashaiman, Ga-Dangme and Ewe populations often benefit from closer proximity to health facilities and community-based screening initiatives, which may partly explain their higher engagement in recommended practices. Conversely, groups with stronger adherence to traditional food habits or

herbal treatments may delay lifestyle changes, resulting in poorer overall selfmanagement practices.

Although sex did not reach statistical significance, the data suggested that women (55.7%) were more likely than men (39.1%) to practice good self-management. Similar gender trends have been reported by Okai *et al.* (2020) and Gallant (2020), who attributed women's higher adherence to their greater health-seeking behaviour and stronger participation in community support networks. Men, by contrast, often exhibit lower health awareness and are less likely to attend follow-up appointments or modify diet and alcohol consumption patterns. This behavioural divergence underscores the importance of gender-responsive interventions that address male health attitudes, particularly in urban Ghana where social norms discourage men from openly engaging in preventive care.

Age patterns also aligned with global evidence. The likelihood of good self-management rose progressively from 31.2% among respondents aged 41–50 years to 72.7% among those aged 70 years and above. Shrivastava *et al.* (2021) and Tewabe *et al.* (2025) have both shown that older adults tend to exhibit better adherence due to heightened health consciousness, routine lifestyle stability, and greater exposure to repeated counselling. Younger adults, meanwhile, balance demanding work schedules and family obligations that restrict consistent adherence. In Ashaiman, where many middle-aged residents engage in informal trading or manual labour, time and fatigue may explain the lower adherence among younger groups.

Employment status revealed a similar pattern: retired respondents had a higher proportion of good practice (78.6%) compared to those still working (46.6%) or self-employed (45.0%). This supports findings by Bossman *et al.* (2021), who reported that retirees often have more time for clinic visits, exercise, and meal planning. By contrast, active workers may struggle to follow medication and diet regimens consistently because of irregular working hours and financial pressures. Dowou *et*

al. (2024) observed that occupational instability can compromise adherence, especially when clinic appointments conflict with income-earning activities.

Interestingly, self-efficacy, measured through the Diabetes Empowerment Scale, was not statistically associated with practice ($p = 0.726$), even though respondents with higher self-efficacy ($\geq 60\%$) showed slightly better adherence (53.7%) than those with lower scores (50.0%). This modest difference diverges from the theoretical expectation proposed by Gallant (2020) that confidence and motivation drive self-care behaviour. The lack of strong association in this study could stem from contextual limitations: individuals may feel confident yet face structural barriers such as limited resources, competing priorities, and lack of social support that prevent them from acting on their intentions. Stephani *et al.* (2018) likewise observed that in resource-constrained environments, external barriers often dilute the behavioural influence of psychological readiness. Ownership of self-monitoring tools such as glucometers and blood-pressure machines was also not statistically significant but displayed a positive trend. Participants who used glucometers (57.9%) or digital applications (56.2%) practiced good self-management than those relying solely on manual monitoring (44.4%). Tewabe *et al.* (2025) explained that self-monitoring reinforces accountability and promotes real-time adjustments in behaviour, though affordability and supply remain obstacles. The Ghana Health Service (2024) has emphasised that expanding community access to affordable diagnostic devices is essential for sustaining patient autonomy in chronic disease care.

Social support similarly showed no statistical association, but respondents supported by family (56.8%) or friends (52.9%) demonstrated better adherence than those depending on other sources (44.0%). This observation is consistent with Kushitor and Boatemaa (2018) and Nyaaba *et al.* (2020), who both highlighted that family involvement and peer encouragement strengthen motivation and reduce treatment fatigue. The Ghanaian social structure, where caregiving is

typically family-centred, provides an enabling context for such support. Strengthening community-based peer groups or family education initiatives could therefore enhance selfmanagement outcomes beyond clinical counselling alone.

Overall, these findings reveal that self-management practices in Ashaiman are shaped more by social and educational determinants than by individual motivation or access to technology. Education empowers patients to interpret and apply medical information, while ethnicity and social support influence the cultural context in which that knowledge is enacted. The apparent absence of statistical associations for other variables underscores that self-management practice is multifaceted—anchored not only in personal awareness but in the social, economic, and cultural environment. As Gallant (2020) and Nyaaba *et al.* (2020) both emphasise, chronic-disease control thrives when health systems move beyond patient education to address the enabling conditions that allow individuals to practise what they know. The Ashaiman findings therefore reaffirm the need for integrated, context-sensitive interventions that combine literacy-friendly education, culturally tailored counselling, and family engagement to sustain effective self-care among adults living with hypertension and diabetes.

CHAPTER SIX

6.0 CONCLUSION AND RECOMMENDATIONS

6.1 Introduction

This chapter presents the conclusions drawn from the study's major findings and outlines actionable recommendations. It summarizes how the research objectives were achieved and highlights the key relationships identified between knowledge levels, influencing factors, and selfmanagement practices among adults living with diabetes and hypertension in Ashaiman. The conclusions are derived directly from the data analysis and discussion in the preceding chapters.

The recommendations are designed to guide health policymakers, practitioners, and community stakeholders in developing targeted interventions that improve chronic disease education, strengthen patient support systems, and enhance treatment adherence.

6.2 Conclusion

The results revealed that while awareness and understanding of both conditions were relatively high, consistent translation of this knowledge into everyday self-care behaviour was incomplete. Most participants demonstrated good knowledge (80.6%) and a clear understanding of dietary, exercise, and medication principles, yet adherence was moderate and varied across domains. Diet modification and sugar reduction were the strongest practices, whereas exercise regularity, salt restriction, and use of self-monitoring tools lagged behind.

The findings reaffirm that knowledge alone does not ensure compliance. Behavioural adherence was shaped by structural, socioeconomic, and cultural realities. Education and ethnicity emerged as the key determinants of effective self-management practices, with individuals possessing primary or higher education demonstrating better adherence than those with no formal schooling. Similarly, Ga-Dangme and Ewe respondents displayed stronger self-care behaviors compared to other ethnic groups, reflecting the role of cultural norms, household habits, and access to local health education. Although self-efficacy, technology use, and social support did not show significant statistical associations, their positive trends suggest that psychological confidence and supportive environments contribute meaningfully to better outcomes.

Overall, the study concludes that chronic-disease self-management in Ashaiman is progressing but uneven. Patients are increasingly knowledgeable and motivated, but limited by systemic barriers—financial constraints, inconsistent follow-up, and inadequate access to tools and counselling. Strengthening patient empowerment requires a multi-layered approach that addresses not only

individual awareness but also the broader social and environmental factors influencing daily health behavior. The evidence suggests that sustainable self-management practices will depend on improved health communication, targeted education, community involvement, and institutional support.

6.2 Recommendations

1. Participants should be encouraged to keep up their self-management practices by giving some incentives to those that honor their medical appointments consistently.
2. The Public and Private Institutions should visit the homes of their clients to know their living conditions and to educate the household on how to help their relatives manage their conditions.
3. Health promotion campaigns should consider cultural and ethnic differences in attitudes toward disease and treatment. Local leaders, faith-based organizations, and traditional councils can be engaged to disseminate culturally appropriate messages that encourage positive health-seeking behaviors across all ethnic groups in the municipality.
4. The Ghana Health Service should incorporate simplified, language-specific educational materials into diabetes and hypertension clinics. Visual aids, local-language counselling, and peer-led sessions should be used to accommodate patients with limited literacy.
5. The Ministry of Health, through the National NCD Program, should strengthen lifestylesupport initiatives within communities. Regular physical activity clubs, diet demonstrations, and health walks can be coordinated through local health centres to make exercise and nutrition education practical, affordable, and culturally relevant.

6. The National Health Insurance Scheme should consider including basic self-monitoring kits under its benefits package. Public–private partnerships could also be pursued to provide affordable diagnostic devices to households, enabling patients to monitor blood glucose and blood pressure levels consistently between clinic visits.

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APPENDICES

APPENDIX I: INFORMED CONSENT FORMS

A1: Informed Consent for NCD Survey

Title of Study: Assessment of Knowledge, Attitudes, and Self-Management Practices among Adults Living with Diabetes and Hypertension in Ashaiman, Ghana.

Background of the Research: In this study, I want to understand how knowledge and resources affect how you manage your diagnosed NCD. Your contribution to this study will help me determine the gaps in skills and tools for self-management of NCDs. I will use the results to develop recommendations and educate people with similar conditions.

Participant's involvement:

- **Duration/what is involved:** In this section of data collection, you will share your demographic characteristics, lifestyle practices, diet, and the history of your diagnosis of diabetes and hypertension, and your practices or how you are coping with the condition. You will also be asked to discuss the barriers and facilitators of your management of your diabetes and hypertension. The session will be a face-to-face interview with a researcher or research assistant. Each interview will take about 20 minutes to complete.
- **Potential risks:** In the survey, you may have to discuss uncomfortable topics, such as the NCD diagnosis, history, and emergencies.
- **Benefits:** You will not receive any direct benefit, but your data will help develop interventions for others.

- **Costs:** You will not have to pay money to participate in this research.
- **Compensation:** You will be provided a medication monitor as a gift for your time and participation. You will receive this gift after you have completed your interview.
- **Confidentiality:** I will record your name and contact information so that I match your blood sample with your other data and share the gift card and reports with you. However, personal information and interview notes will be kept safe on the Kobo Collect server.
- **Voluntary participation/withdrawal:** Although I encourage that you participate in all parts of the study, please remember that your participation is voluntary, and you have the right to withdraw from the study at any time without a penalty and without having to give any reasons. You may also refuse to respond to questions you do not wish to answer.
- **Outcome and Feedback:** I will only share your responses in the final report. Your personal identity, information, and experiences will not be shared with the public.
- **Funding information:** Carnegie African Diaspora Fellowship is funding this work.

Contact for clarification: If you have questions or concerns regarding this study, you may contact me: Josephine Nyankwayeh Bempong, (MPH at Ensign Global University, Email: josephine.bempong@st.ensign.edu.gh, +233 54 830 6592)

For questions about your rights as a research participant or to discuss problems, complaints, please contact the IRB Director, Mr. Patrick Kuma, at Ensign Global College, Ghana, at pat.kuma@ensign.edu.gh

I have read (or have had read to me) the contents of this consent form and have been encouraged to ask questions. I have received answers to my questions. I agree to participate in this study. I have received (or will receive) a signed copy of this form for my records and future reference.

Subject Name (Printed by Subject)

Signature of Subject

Date

Person Obtaining Consent

I have read this form to the subject and/or the subject has read this form. I will provide the subject with a signed copy of this consent form. An explanation of the research was given and questions from the subject were solicited and answered to the subject’s satisfaction. In my judgment, the subject has demonstrated comprehension of the information. I have given the subject adequate opportunity to read the consent before signing.

Name and Title (Print)

Signature of Person Obtaining Consent

Date

Appendix II: QUESTIONNAIRE

I am conducting a study; the purpose is to ascertain the knowledge, influencing factors, and selfmanagement practices among adults living with diabetes and hypertension in Ashaiman, Ghana. Information provided will be used only for the purpose of the research and will be kept confidential to the best of our ability. No information that will reveal your identity will be included when the results of the research are discussed or published.

Section A: Demographic Information

Please answer the following questions by selecting the appropriate option or filling in the blank space.

1. What is your age?
 - a. 50-60 []
 - b. 61-70 []
 - c. 71-80 []
2. What is your sex?
 - a. Male []
 - b. Female []
3. What is your current marital status?
 - a. Never married [] Currently married or living together
 - b. Divorced/Separated []
 - c. Widowed []
4. What is your occupational level?
 - a. Employed in the Private sector []
 - b. Employed in the government sector []

- c. Unemployed []
 - d. Self-employed []
5. What is your level of education
- a. None []
 - b. Primary []
 - c. Secondary []
 - d. Tertiary []
6. What is your ethnic group

- [1] Akan
- [2] Ga-Dangme
- [3] Ewe
- [4] Guan
- [5] Mole-Dagbani/Grussi/Gruma/Mande
- [6] Other

7. What is your religion
- a) Christianity
 - b) Traditional
 - c) Islam
 - d) Others, if so, please specify

8. How long ago were you diagnosed with diabetes?
- a. 2-3 years []
 - b. 4-5 years []
 - c. 6-7 years []
 - d. 8-10 years []
 - e. >10 years []

Self-Management of Diabetes, Hypertension, and NCDs. Questionnaire adopted from ([Ghimire, 2017](#))

<i>Ncd_Diag_Note</i>	Have you ever been told/diagnosed by a medical professional that you have any of the following conditions? (Provide answers to all)	[Enumerator Note]
<i>Ncd_Diag01</i>	Heart Disease (Angina, Abnormal Heart Rhythm)?	[0] No [1] Yes
<i>Ncd_Diag02</i>	Stroke?	[0] No [1] Yes
<i>Ncd_Diag03</i>	Chronic Lung Disease (Chronic Bronchitis or Emphysema)?	[0] No [1] Yes
<i>Ncd_Diag04</i>	Hypertension (High Blood Pressure)?	[0] No [1] Yes
<i>Ncd_Diag05</i>	Cancer or a Malignant Tumour (e.g., Breast, Prostate)?	[0] No [1] Yes
<i>Ncd_Diag06</i>	Asthma?	[0] No [1] Yes
<i>Ncd_Diag07</i>	Arthritis?	[0] No [1] Yes
<i>Ncd_Diag08</i>	Kidney Disease?	[0] No [1] Yes
<i>Ncd_Diag09</i>	Liver Disease?	[0] No [1] Yes
<i>Ncd_Diag10</i>	High Blood Cholesterol?	[0] No [1] Yes
<i>Ncd_Diag11</i>	Obesity?	[0] No [1] Yes
<i>Diabetes</i>	Have you ever been diagnosed with diabetes, or have you ever been told by a medical personnel that you have diabetes?	[0] No [1] Yes

<i>Diabetes_Famil</i>	Now I would like to ask you about your family. Do you have a close blood relative i.e., grandparents, parents, siblings, offspring, who has ever had diabetes/sugar disease?	[1] Yes [2] No [88] Don't know
<i>Note_Diabetes_Diag</i>	Now, let's talk about your diabetes diagnosis.	[Enumerator Note]
<i>Diabetes_Type</i>	What type of diabetes do you have?	[1] Type 1 (insulin-independent) [2] Type 2 (insulin-resistant) [3] Gestational diabetes [88] Don't know
<i>Diabetes_Who</i>	Who told you that you have diabetes?	[1] Doctor [2] Medical Assistant/SACMO [3] Nurse/Paramedic/midwife [4] Nutrition worker/Nutritionist [5] Community health care provider (CHCP) [6] Health Assistant/Family Welfare Assistant (FWA) [7] NGO outreach worker [8] Traditional healer/Religious leader [9] Family members [10] Other (friends etc.) [11] Pharmacist/Chemist/Dispensary
<i>Diabetes_First</i>	When were you first told you had diabetes?	[1] Within the past month [2] Within the past 6 months [3] Within the past year [4] More than 1 year ago

- [1] Never
- [2] Once
- [3] Once every six month
- [4] Once every three month

Diabetes_Times How often did you have your blood sugar checked in the last six months? [5] Once every two month es_first} [6] Monthly [7] Two times a month [8] Weekly [9] Daily/Almost every day [88] Don't know

Diabetes_Treat Are you currently or have you ever received any treatment or advice for your diabetes? [0] No [1] Yes

Glucometer Do you have a device (glucometer) at home to monitor your blood sugar levels? [0] No [1] Yes

Note_Diabetic_Tx Now, let's talk about the diabetes treatment and advice you have received. [Enumerator Note]

Drug Are you currently or have you ever received drugs (pills or tablets) for your diabetes? [0] No [1] Yes

<i>Drug_Who</i>	Who gave you advice or treatment to take \${drug} the drug?	=1	[1] Doctor [2] Medical Assistant/SACMO [3] Nurse/Paramedic/midwife [4] Nutrition worker/Nutritionist [5] Community health care provider (CHCP) [6] Health Assistant/Family Welfare Assistant (FWA) [7] NGO outreach worker [8] Traditional healer/Religious leader [9] Family members [10] Other (friends etc.) [11] Pharmacist/Chemist/Dispensary
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<i>Insulin</i>	Are you currently or have you ever received Insulin (i.e. injections) for your diabetes?	[0] No [1] Yes
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<i>Insulin_Who</i>	Who gave you advice or treatment to take \${insulin} the insulin?	}=1	[1] Doctor [2] Medical Assistant/SACMO [3] Nurse/Paramedic/midwife [4] Nutrition worker/Nutritionist [5] Community health care provider (CHCP) [6] Health Assistant/Family
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	Welfare Assistant (FWA) [7] NGO outreach worker [8] Traditional healer/Religious leader [9] Family members [10] Other (friends etc.) [11] Pharmacist/Chemist/Dispensary
Diabetes_Suger Are you currently or have you ever received advice to reduce sugar consumption for your diabetes?	[0] No [1] Yes
Have you been able to make changes to your diet, Sugar, SSB, or refined carbohydrates (takes only one 300ml of SSB a week and at most 3 tablespoons of sugar a week?)	[0] No [1] Yes
Diabetes_Suger_Who Who provided the advice to reduce sugar consumption?	[1] Doctor [2] Medical Assistant/SACMO [3] Nurse/Paramedic/midwife [4] Nutrition worker/Nutritionist [5] Community health care worker (CHCP) [6] Health Assistant/Family Welfare Assistant (FWA) [7] NGO outreach worker [8] Traditional healer/Religious leader [9] Family members [10] Other (friends etc.) [11] Pharmacist/Chemist/Dispensary

Are you currently or have you ever

[0] No [1] Yes

Diabetes_Diet received any other dietary advice for your diabetes?

Are you able to follow the recommended dietary advice at least six days a week	[0] No [1] Yes
Diabetes_Diet_Who Who provided the dietary advice?	[1] Doctor [2] Medical Assistant/SACMO [3] Nurse/Paramedic/midwife [4] Nutrition worker/Nutritionist [5] Community health care [6] Health Assistant/Family Welfare Assistant (FWA) [7] NGO outreach worker [8] Traditional healer/Religious leader [9] Family members [10] Other (friends etc.) [11] Pharmacist/Chemist/Dispensary
Diabetes_Alcohol Are you currently or have you ever received advice to reduce alcohol consumption for your diabetes?	[0] No [1] Yes
Have you been able to reduce your alcohol intake	[0] No [1] Yes

Diabetes_Alcohol_Who Who provided the advice to reduce alcohol consumption?

[1] Doctor
 [2] Medical Assistant/SACMO
 [3] Nurse/Paramedic/midwife
 [4] Nutrition worker/Nutritionist
 [5] Community health care provider (CHCP)
 [6] Health Assistant/Family Welfare Assistant (FWA)
 [7] NGO outreach worker
 [8] Traditional

healer/Religious leader [9]
 Family members
 [10] Other (friends etc.)
 [11] Pharmacist/Chemist/Dispensary

Diabetes_Weight Are you currently or have you ever received advice to reduce weight for your diabetes?

[0] No
 [1] Yes

[1] Doctor
 [2] Medical Assistant/SACMO
 [3] Nurse/Paramedic/midwife
 [4] Nutrition worker/Nutritionist
 [5] Community health care provider (CHCP)

Diabetes_Weight_Who Who provided the advice to reduce weight?

[6] Health Assistant/Family Welfare Assistant (FWA)
 [7] NGO outreach worker
 [8] Traditional healer/Religious leader
 [9] Family members
 [10] Other (friends etc.)

		[11] Pharmacist/Chemist/Dispensary
	Have you been able to lose weight 1-3kg or more	[0] No [1] Yes
<i>diabetes_smoking</i>	Are you currently or have you ever received advice to stop smoking or taking other forms of tobacco for your diabetes?	[0] No [1] Yes
	Have you been able to stop smoking?	[0] No [1] Yes
<i>diabetes_smoking_who</i>	Who provided the advice to stop smoking or taking other forms of tobacco?	$\{diabetes_smoking_who\}$ [1] Doctor [2] Medical Assistant/SACMO [3] Nurse/Paramedic/midwife [4] Nutrition worker/Nutritionist [5] Community health care provider (CHCP) [6] Health Assistant/Family Welfare Assistant (FWA) [7] NGO outreach worker [8] Traditional healer/Religious leader [9] Family members [10] Other (friends etc.) [11] Pharmacist/Chemist/Dispensary
<i>diabetes_exercise</i>	Are you currently or have you ever received advice to start or do more exercise for your diabetes?	[0] No [1] Yes

	Are you able to exercise 5 or more sessions of moderate or vigorous activity per week	[0] No [1] Yes
<i>diabetes_exercise_who</i>	Who provided the advice to start or do more exercise?	[1] Doctor [2] Medical Assistant/SACMO [3] Nurse/Paramedic/midwife [4] Nutrition worker/Nutritionist [5] Community health care [6] Health Assistant/Family Welfare Assistant (FWA) [7] NGO outreach worker [8] Traditional healer/Religious leader [9] Family members [10] Other (friends etc.) [11] Pharmacist/Chemist/Dispensary
<i>diabetes_tension_n</i>	Are you currently or have you ever received advice about to reduce stress/tension for diabetes?	[0] No [1] Yes
<i>diabetes_tension_who</i>	Who provided the advice about reducing stress/tension?	[1] Doctor [2] Medical Assistant/SACMO [3] Nurse/Paramedic/midwife [4] Nutrition worker/Nutritionist [5] Community health care [6] Health Assistant/Family Welfare Assistant (FWA)

<i>Ads_2</i>	How Much Control Over Your Diabetes Do You Have?	[1] Total Control [2] Large Control [3] Moderate Control [4] Slight Control [5] None At All
<i>Ads_3</i>	How Much Uncertainty Do You Currently Experience In Your Life As A Result Of Being Diabetic?	[1] Not At All [2] Slight Amount [3] Moderate Amount [4] Large Amount [5] Extremely Large Amount
<i>Ads_4</i>	How Likely Is Your Diabetes To Worsen Over The Next Several Years?	[1] Not Likely At All [2] Slightly Likely [3] Moderately Likely [4] Very Likely [5] Extremely Likely
<i>Ads_5</i>	Do You Believe That Achieving Good Diabetic Control Is Due To Your Efforts As Compared To Factors Which Are Beyond Your Control?	[1] Totally Because Of Me [2] Mostly Because Of Me [3] Partly Me And Partly Other Factors [4] Mostly Because Of Other Factors [5] Totally Because Of Other Factors
<i>Ads_6</i>	How Effective Are You In Coping With Your Diabetes?	[1] Extremely Effective [2] Very Effective [3] Moderately Effective [4] Slightly Effective [5] Not At All
<i>Ads_7</i>	To What Degree Does Your Diabetes Get In The Way Of You Developing Life Goals?	[1] None At All [2] Slight Amount [3] Moderate Amount [4] Large Amount [5] Total Amount

<i>Family_Support</i>	Do You Feel Supported By Your Family In Managing Your Diabetes?	[1] Not At All [2] Slight Amount [3] Moderate Amount [4] Large Amount
		[5] Extremely Large Amount
<i>Family_Abuse</i>	Have You Ever Experienced Any Physical, Mental, Or Social Abuse Because Of Your Diabetes?	[1] Not At All [2] Slight Amount [3] Moderate Amount [4] Large Amount [5] Extremely Large Amount
<i>Note_Des_Sf</i>	Now, Let's Talk About Your Diabetes Self-Efficacy.	[Enumerator Note]
<i>Des_Note</i>	Check The Box That Gives The Best Answer For You.	[Enumerator Note]
	In General, I Believe That I:	
<i>Des_1</i>	...Know What Part(S) Of Taking Care Of My Diabetes That I Am Dissatisfied With	[1] Strongly Disagree [2] Somewhat Disagree [3] Neutral [4] Somewhat Agree [5] Strongly Agree
<i>Des_2</i>	...Am Able To Turn My Diabetes Goals Into A Workable Plan	[1] Strongly Disagree [2] Somewhat Disagree [3] Neutral [4] Somewhat Agree [5] Strongly Agree
<i>Des_3</i>	...Can Try Out Different Ways Of Overcoming Barriers To My Diabetes Goals	[1] Strongly Disagree [2] Somewhat Disagree [3] Neutral [4] Somewhat Agree [5] Strongly Agree

<i>Des_4</i>	...Can Find Ways To Feel Better About Having Diabetes	[1] Strongly Disagree [2] Somewhat Disagree [3] Neutral [4] Somewhat Agree [5] Strongly Agree
<i>Des_5</i>	...Know The Positive Ways I Cope With Diabetes-Related Stress	[1] Strongly Disagree [2] Somewhat Disagree [3] Neutral [4] Somewhat Agree [5] Strongly Agree
<i>Des_6</i>	...Can Ask For Support For Having And Caring For My Diabetes When I Need It	[1] Strongly Disagree [2] Somewhat Disagree [3] Neutral [4] Somewhat Agree [5] Strongly Agree
<i>Des_7</i>	...Know What Helps Me Stay Motivated To Care For My Diabetes	[1] Strongly Disagree [2] Somewhat Disagree [3] Neutral [4] Somewhat Agree [5] Strongly Agree
<i>Des_8</i>	...Know Enough About Myself As A Person To Make Diabetes Care Choices That Are Right For Me	[1] Strongly Disagree [2] Somewhat Disagree [3] Neutral [4] Somewhat Agree [5] Strongly Agree
<i>Salt_Note</i>	With The Next Questions, We Would Like To Learn More About Salt In Your Diet.	[Enumerator Note]
<i>Salt_01</i>	How Often Do You Add Salt Or A Salty Sauce (E.G., Ketchup, Hot Sauce, And Barbecue Sauce) To Your Food Right Before You Eat It Or As You Are Eating It?	[1] Always [2] Often [3] Sometimes [4] Rarely [5] Never [88] Don't Know

<i>Salt_02</i>	How Often Is Salt, Salty Seasoning Or A Salty Sauce Added In Cooking Or Preparing Foods In Your Household?	[1] Always [2] Often [3] Sometimes [4] Rarely [5] Never [88] Don't Know
<i>Salt_03</i>	How Often Do You Eat Processed Food High In Salt? By Processed Food High In Salt, I Mean Foods That Have Been Altered From Their Natural State, Such As Packaged Salty Snacks, Canned Salty Food Including Pickles And Preserves, Salty Food Prepared At A Fast Food Restaurant, Cheese, Bacon, And Processed Meat, Koobi, Kako.	[1] Always [2] Often [3] Sometimes [4] Rarely [5] Never [88] Don't Know
<i>Salt_04</i>	How Much Salt Or Salty Sauce Do You Think You Consume?	[1] Far Too Much [2] Too Much [3] Just The Right Amount [4] Too Little [5] Far Too Little [88] Don't Know

Dqq_Note1 Read: Now I'd Like To Ask You Some [Enumerator Note]
Yes-Or-No Questions About Foods And
Drinks That You Consumed Yesterday
During The Day Or Night, Whether You
Had It At Home Or Somewhere Else.

First, I Would Like You To Think About
Yesterday, From The Time You Woke
Up Through The Night. Think To
Yourself About The First Thing You Ate
Or Drank After You Woke Up In The
Morning ... Think About Where You
Were When You Had Any Food Or
Drink In The Middle Of The Day ...
Think About Where You Were When

You Had Any Evening Meal ... And Any
Food Or Drink You May Have Had In
The Evening Or Late-Night... And Any
Other Snacks Or Drinks You May Have
Had Between Meals Throughout The
Day Or Night.

I Am Interested In Whether You Had
The Food Items I Will Mention Even If
They Were Combined With Other
Foods.

Please Listen To The List Of Foods And
Drinks, And If You Ate Or Drank Any
One Of Them, Say Yes.

Dqq_Note2 Yesterday, Did You Eat Any Of The [Enumerator Note]
Following Foods:

Dqq_1 Bread, Rice, Waakye, Jollof, Fried Rice, [0] No
[1] Yes
Omutuo, Or Rice Porridge?

Dqq_2 Kenkey, Banku, Tuo Zaafi, Hausa Koko, [0] No
Akple, Roasted Maize, Boiled Maize, Or [1] Yes
Tom Brown?

<i>Dqq_3</i>	Fufu, Gari, Kokonte, Cassava, Yam, Cocoyam, Plantain, Or Sweet Potato?	[0] No [1] Yes
<i>Dqq_4</i>	Beans, Or Bambara Beans?	[0] No [1] Yes
<i>Dqq_Note3</i>	Yesterday, Did You Eat Any Of The Following Vegetables:	[Enumerator Note]
<i>Dqq_5</i>	Carrots, Or Sweet Potatoes That Are Orange Inside?	[0] No [1] Yes
<i>Dqq_6.1</i>	Cocoyam Leaves, Amaranth Leaves, Ademe, Ayoyo, Potato Leaves, Cassava Leaves, Or Bokoboko?	[0] No [1] Yes
<i>Dqq_7.1</i>	Tomatoes, Okro, Garden Eggs, Or Cabbage?	[0] No [1] Yes
<i>Dqq_7.2</i>	Sweet Green Pepper, Lettuce, Cucumber, Or Mushrooms?	[0] No [1] Yes
<i>Dqq_Note4</i>	Yesterday, Did You Eat Any Of The Following Fruits:	[Enumerator Note]
<i>Dqq_8</i>	Mango, Papaya, Or African Star Apple?	[0] No [1] Yes
<i>Dqq_9</i>	Orange Or Tangerine?	[0] No [1] Yes
<i>Dqq_10.1</i>	Banana, Pineapple, Avocado Pear, Watermelon, Apple, Or Guava?	[0] No [1] Yes
<i>Dqq_10.2</i>	Coconut, Soursop, Velvet Tamarind, Baobab, Ebony Fruit, Or Shea Fruit?	[0] No [1] Yes
<i>Dqq_Note5</i>	Yesterday, Did You Eat Any Of The Following Sweets:	[Enumerator Note]

<i>Dqq_11</i>	Cakes, Biscuits, Rock Bun, Toogbee Or Bofrot?	[0] No [1] Yes
<i>Dqq_12</i>	Toffees, Chocolates, Ice Cream, Or Fanyogo?	[0] No [1] Yes
<i>Dqq_Note6</i>	Yesterday, Did You Eat Any Of The Following Foods Of Animal Origin:	[Enumerator Note]
<i>Dqq_13</i>	Eggs?	[0] No [1] Yes
<i>Dqq_14</i>	Cheese Curds Or Wagashi?	[0] No [1] Yes
<i>Dqq_15</i>	Brukina Or Drink Yogurt?	[0] No [1] Yes
<i>Dqq_16</i>	Sausages Or Corned Beef?	[0] No [1] Yes
<i>Dqq_17</i>	Beef, Goat, Sheep, Liver, Or Intestine?	[0] No [1] Yes
<i>Dqq_18</i>	Pork, Grasscutter, Rabbit, Or Bush Meat?	[0] No [1] Yes
<i>Dqq_19</i>	Chicken, Gizzard, Or Guinea Fowl?	[0] No [1] Yes
<i>Dqq_20</i>	Fish, Dried Fish, Koobi, Anchovies, Smoked Herring, Crab, Or Shrimp?	[0] No [1] Yes
<i>Dqq_Note7</i>	Yesterday, Did You Eat Any Of The Following Other Foods:	[Enumerator Note]
<i>Dqq_21</i>	Groundnuts, Kuli Kuli, Groundnut Paste, Groundnut Soup, Agushi Stew, Neri Soup, Or Cashews?	[0] No [1] Yes

<i>Dqq_22</i>	Packaged Yellow Plantain Chips Or Potato Chips Or Pringles?	[0] No [1] Yes
<i>Dqq_23</i>	Indomie?	[0] No [1] Yes
<i>Dqq_24</i>	French Fries, Fried Yam, Fried Potato, Atomo, Spring Rolls, Fried Chicken, Or Fried Fish?	[0] No [1] Yes
<i>Dqq_Note8</i>	Yesterday, Did You Have Any Of The Following Beverages:	[Enumerator Note]
<i>Dqq_25</i>	Tin Milk Or Powdered Milk?	[0] No [1] Yes
<i>Dqq_26</i>	Milo, Tea With Sugar, Or Coffee With Sugar?	[0] No [1] Yes
<i>Dqq_27</i>	Fruit Juice, Fruit Drinks, Or Sobolo?	[0] No [1] Yes
<i>Dqq_28</i>	Soft Drinks Or Malts, Such As, Coke, Fanta, Sprite, Alvaro, Or Malta Guinness?	[0] No [1] Yes
<i>Dqq_29</i>	Yesterday, Did You Get Food From Any Place Like... Kfc, Papaye, Pizza Inn, A Mall Food Court, Or Other Places That Serve Burgers Or Pizza?	[0] No [1] Yes

Section E. Resources and Technology use and needs among patients.

9. Do you use any technology to help you manage your condition? Yes [] No [] 10.

If yes to Q26, what technology do you currently use to manage your condition?

11. If yes to Q26, what materials do you currently use?

Appendix III: Introductory Letter from Ashaiman Municipal Health Directorate



GHANA
HEALTH
SERVICE

REGIONAL HEALTH DIRECTORATE,
GREATER ACCRA

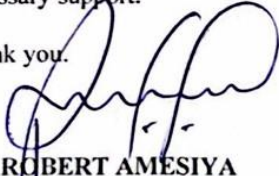
P.O. BOX 184
ACCRA – GREATER ACCRA
Digital Address: GR-076-0430
Quote this number and date on all correspondence
My Ref: GHS/GAR/RHD/ORD/2024
Your Ref:
Date: 28th July, 2025

THE MUNICIPAL DIRECTORS OF HEALTH SERVICE
- ASHAIMAN
- KPONE KATAMANSO

RE: LETTER OF INTRODUCTION

Kindly find attached a letter with Reference No. ENSIGN/00 dated 23rd July, 2025 from Ensign Global College, Kpong-Ghana on the above subject matter for your information and necessary support.

Thank you.



DR. ROBERT AMESIYA
Ag. REGIONAL DIRECTOR OF HEALTH SERVICE
GREATER ACCRA

Cc: The Ag. Deputy Director, Clinical Care

Appendix IV: Ethical Clearance from Institutional Review Board Secretariat



OUR REF: ENSIGN/IRB/EL/SN-316/02
YOUR REF:

August 4, 2025

INSTITUTIONAL REVIEW BOARD SECRETARIAT

Josephine Nyankwayeh Bempong
Ensign Global University
Kpong.

Dear Josephine,

ETHICAL CLEARANCE TO UNDERTAKE POSTGRADUATE RESEARCH

At the General Research Proposals Review Meeting of the *INSTITUTIONAL REVIEW BOARD (IRB)* of Ensign Global University held on Friday, August 1, 2025, your research proposal entitled "**Assessment of Knowledge, Influencing Factors, and Self-Management Practices Among Adults Living with Non-Communicable Diseases in Ashaiman, Greater Accra Region-Ghana**" was considered.

You have been granted Ethical Clearance to collect data for the said research under academic supervision within the IRB's specified frameworks and guidelines.

We wish you all the best.

Sincerely,

A handwritten signature in black ink, appearing to read "Rebecca Acquah-Arhin".

Dr. (Mrs.) Rebecca Acquah-Arhin
IRB Chairperson