

**UNIVERSITY OF GHANA**  
**COLLEGE OF HUMANITIES**

**SOCIO-DEMOGRAPHICS AND BEHAVIOURAL RISK FACTORS**  
**OF NON-COMMUNICABLE DISEASES IN GHANA**

**BY**

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**THIS THESIS IS SUBMITTED TO THE UNIVERSITY OF GHANA,  
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## ACCEPTANCE

Accepted by the College of Humanities, University of Ghana, Legon, in partial fulfillment of the requirement for the award of PhD in Population Studies Degree.

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### DECLARATION

I hereby declare that, except for references to other people's work, which have been duly acknowledged, this is the result of my own research undertaken under supervision, and it has neither in part nor in whole been presented for another degree.



17<sup>th</sup> October 2025

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Akosua Afriyie Osei-Appaw

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Date



### **DEDICATION**

This work is dedicated to my mother, Mrs. Patricia Osei-Appaw, who supported me throughout the process. It is also dedicated to my husband, Philip Bright Mensah Junior (Esq) and to my kids Zoe Efua Gyanba Mensah and Valerie Efua Aseda Mensah who are my main motivators. Finally, I dedicate this to the blessed memory of Professor Jacob Plange-Rhule and Martin Ekow Bruce Junior, continue to rest in perfect peace.



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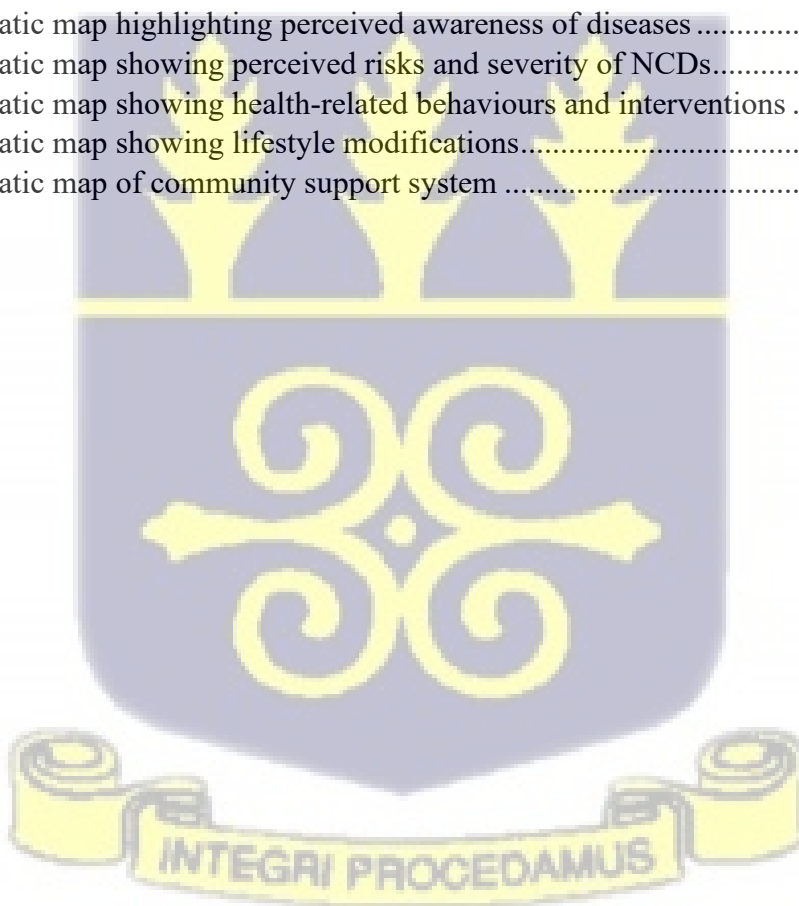
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## LIST OF ABBREVIATIONS

| Abbreviation | Meaning                                                                              |
|--------------|--------------------------------------------------------------------------------------|
| BMI          | Body Mass Index                                                                      |
| CHPS         | Community-Based Health Planning and Services                                         |
| CVDs         | Cardiovascular Diseases                                                              |
| DCT          | Data Collection Team                                                                 |
| DTT          | Demographic Transition Theory                                                        |
| ECH          | Ethical Committee for Humanities                                                     |
| ENN          | Emergency Nutrition Network                                                          |
| FGD          | Focus Group Discussions                                                              |
| HBM          | Health Belief Model                                                                  |
| IHME         | Institute for Health Metrics and Evaluation                                          |
| LMICs        | Low- and Middle-Income Countries                                                     |
| MCAR         | Missing Completely at Random                                                         |
| mhGAP        | Mental Health Gap Action Programme                                                   |
| MOH          | Ministry of Health                                                                   |
| NCDs         | Non-Communicable Diseases                                                            |
| NDPC         | National Development Planning Commission                                             |
| NHIA         | National Health Insurance Authority                                                  |
| NHIS         | National Health Insurance Scheme                                                     |
| NR-NCDs      | Nutrition-Related Non Communicable Diseases                                          |
| PHC          | Primary Health Care                                                                  |
| SGD          | Sustainable Development Goals                                                        |
| SSA          | sub-Saharan Africa                                                                   |
| WHO          | World Health Organization                                                            |
| WHO-PEN      | World Health Organization Package of Essential Noncommunicable Disease Interventions |

## ABSTRACT

**Introduction:** Studies on non-communicable diseases have explored their prevalence and management. Whilst they provided valuable insights on NCDs globally, within sub-Saharan Africa and in Ghana, very few studies have delved into gender differences, using an intersectional approach to ascertain barriers to adherence and community-based perceptions of risks and interventions associated with hypertension, diabetes, and mental health disorders. This thesis explored these research areas among the adult population of Ghana.

**Methodology:** The study was done using both qualitative and quantitative research methods. The quantitative data helped in exploring gender-specific socio-demographic predictors of hypertension, diabetes and mental health disorders as well as adherence to recommended lifestyle choices associated with hypertension. The dataset used was the nationally representative World Health Organization's Study on Global Ageing and Adult Health (SAGE) Ghana survey Wave 2. Of the 4735 participants, 59% were females. Persons aged 50 years and above were 76%, since this age category was oversampled. The key non-communicable diseases that affected majority of the participants in this study were hypertension, diabetes and mental health disorders. For the quantitative, bivariate analysis was first conducted using t-tests to ascertain relationships between variables and subsequently, logit regressions employed for the multivariate analysis to help in predicting likely associations between the independent variables and the binary outcome variables. The multinomial regression was done to identify socio-demographic characteristics likely to predict adherence to recommended lifestyle choices. The qualitative data explored community perceptions on risks and interventions associated with hypertension, diabetes, and mental health disorders. This was done using 6 Focus Group Discussions (FGDs) in the Adentan Municipal Assembly. The transcripts were analyzed using thematic network analysis. Participants from the

FGDs were categorized into three age categories, 18-34 years, 35-49 years and 50 years and above for both males and females.

**Results:** The study outlined the socio-demographic characteristics predicting the NCDs under study for males and females. For males, these were educational status ( $C=0.88^{**}$   $SE=0.38$ ), place of residence ( $C=0.86^{***}$   $SE=0.25$ ) and age ( $C=-0.95$   $SE=0.45$ ) for hypertension, educational status ( $C=1.39^{**}$   $SE=0.66$ ) and employment status ( $C=-0.86^{***}$   $SE=0.18$ ) for diabetes and ethnicity ( $C=1.41^{***}$   $SE=0.32$ ) and religion ( $C=1.29^{***}$   $SE=0.38$ ) for mental health disorders. For females, age ( $C=-1.70^{***}$   $SE=0.45$ ), place of residence ( $C=0.66^{***}$   $SE=0.17$ ), wealth status ( $C=0.63^{***}$   $SE=0.23$ ) and ethnicity ( $C=0.45^{**}$   $SE=0.21$ ) were significant predictors of hypertension. Age ( $C=-2.39^{**}$   $SE=1.03$ ) and place of residence ( $C=0.84^{**}$   $SE=0.3$ ) for diabetes and employment status ( $C=-0.86^{***}$   $SE=0.18$ ) and religion ( $C=1.29^{***}$   $SE=0.38$ ) for mental health disorders. The findings also show a high prevalence rate of hypertension with approximately 12% being aware they had hypertension and about 13% unaware of their hypertension status. Checked hypertension status revealed 3.4% in hypertension (uncontrolled), 8.4% in hypertension (controlled), 11.4% in hypertension (unaware) and 76.8% in no hypertension (true) groups. There was a significant relationship between diet and persons in the hypertension (uncontrolled) and hypertension (unaware) groups where consuming five or more fruit and/or vegetable servings per day had the likelihood of decreasing systolic blood pressure readings holding all other variables constant. Wealth status was a significant factor of adherence to recommended lifestyle practices for poor males in the hypertension (uncontrolled) and hypertension (controlled) groups where they were less likely to comply. Rich females in the hypertension (controlled) group were more likely to comply with the recommended lifestyle choices per the data. Under perceived risks and interventions as an organizing theme, participants highlighted in alignment with the

biopsychosocial model how psychological factors, lifestyle choices, family history, lifelong ‘chronic’ diseases and spiritual factors were risk factors for developing and managing NCDs. In line with the perceived associated risks, the perceived interventions recommended by the respondents included orthodox treatment, herbal treatment, wellness strategies and prayers.

**Conclusions:** The study identified gender differences on the predictors of NCDs. These are very informative when designing appropriate gender-specific interventions in the prevention and management of NCDs. The findings on the risk factors of NCDs for males and females, adherence to recommended lifestyle choices and perceived risks and interventions for NCDs were multifaceted. A comprehensive approach is needed to contribute to the prevention and management of NCDs.

**Keywords:** Non-communicable diseases, hypertension, diabetes, mental health disorders



## CHAPTER ONE: INTRODUCTION AND BACKGROUND

### 1.1 Introduction

The overarching aim of this thesis is to understand better the perceptions of people on what Non-Communicable Diseases (NCDs) are, the risk factors associated with these NCDs and their perception of how to treat such diseases. This chapter serves as background to contextualize and situate the study. For the purposes of this study, the NCDs of interest are Hypertension, Diabetes Mellitus (type 2) and Mental Health Disorders. The disease burden of the NCDs of interest in Ghana is also highlighted in reference to policies and steps taken to control and manage NCDs in the country.

### 1.2 Background to the study

Non-communicable diseases (NCDs), according to the World Health Organization (2023) are diseases which cannot be passed on from one person to another. They usually persist over a long period of time, hence often referred to as ‘chronic’ diseases. Although there are different types of NCDs, the main one’s accounting for about 80% of premature deaths are Cardiovascular Diseases (CVDs), Cancers, Chronic Respiratory Diseases and Diabetes (WHO, 2023b). Extensive research done by the World Health Organization (WHO) suggests that NCDs occur due to the interplay of genetic, environmental, and behavioural factors. Whilst all three contributory factors are important, this study highlights how socio-demographic and behavioural factors increase the risks associated with the NCDs of interest in this study (diabetes, hypertension, and mental health disorders) and consequently perceived community interventions to effectively manage them.

Undoubtedly, NCDs are affecting both global health and economies as suggested by Narayan et al. (2010). The ever-increasing cases of morbidity and mortality from the top four

NCDs including Cardiovascular Diseases, Cancers, Diabetes and Chronic Respiratory Diseases raise concerns on how to prevent and manage NCDs. In 2011, 63% of deaths globally were NCD related (Bloom et al. 2011). This rose steadily to 74% in 2023 according to the records of the World Health Organization (2023). The increasing numbers have negative consequences, especially for low and middle-income countries (LMICs) with relatively younger populations in their productive or working ages and weaker health systems. These LMICs are also experiencing rapid population growth and are already battling communicable diseases amidst poor sanitary conditions (Habib & Saha, 2010a). All these together with the incidence of road traffic crashes contribute to the triple burden of disease (Kumar & Preetha, 2012).

Whilst the statistics on morbidity and mortality from NCDs raise a lot of concerns, it is essential to understand the underlying factors associated with the increase of NCDs. The World Health Organization (2023) assert that the risk factors associated with NCDs are metabolic and modifiable or behavioural in nature. The metabolic risk factors including raised blood pressure, obesity, hyperglycemia (high blood glucose levels) and hyperlipidemia (high fat levels in the blood) increase the risks of having an NCD. The modifiable or behavioural risk factors, often linked to lifestyle choices, including tobacco use, physical inactivity, unhealthy diets, and the harmful use of alcohol also perpetuates the risk of NCDs.

Whilst Cardiovascular Diseases, Cancers, Chronic Respiratory Diseases and Diabetes are the leading causes of morbidity and mortality globally, the case of sub-Saharan Africa (SSA) deviates slightly. Data gathered by the CDC (2022) suggests mental health disorders, cardiovascular diseases and neoplasia are among the top NCDs affecting persons in SSA, both males and females. An increase in the burden of NCDs influenced by unhealthy diets, physical inactivity, obesity, air pollution, dyslipidaemia among others over the last two decades on the

continent according to Bigna & Noubiap (2019) is also worrying. Concerns have been raised about gender variations of the occurrences of these risk factors and their associated diseases. While females generally live longer than males, it was estimated in 2017 that over 22 million females were living with CVDs in Africa with a stark increase in CVD-related mortality from 2007 till 2017 (Institute for Health Metrics and Evaluation (IHME), 2018). Whilst this is worrying, the CDC projects an increase in the incidence of morbidity and mortality in SSA compared to all other countries combined. This calls for concerted efforts to prevent and manage NCDs.

Whilst limited population-based data on NCDs in Ghana is available, the Ministry of Health (2022) in its National Policy on Non-Communicable Diseases asserts that there is a rise in the incidence of NCDs and its associated risk factors. Socio-demographic factors including sex, educational level, age and others play a critical role in understanding the variations of occurrences and severity of these diseases. According to NCD Alliance (2023), although women are more exposed to NCDs, they are generally faced with limited access to quality health care services particularly in low-income areas. Together with the fact that NCDs kill two out of every three women according to the same source, it is imperative to better understand the burden of NCDs through a gender lens to further address these inequalities.

In addressing the rise of NCDs and its attendant problems, the WHO calls for health promotion through prevention and control. Several initiatives are being implemented at the global, regional, national, and local levels. Notable among them is the Sustainable Development Goal (SDG) Target 3.4 on NCDs and mental health disorders which aims to reduce by one third premature mortality from non-communicable diseases through prevention and treatment whilst promoting mental health and well-being (WHO, 2023a). This requires a multi-sectoral and comprehensive approach which according to Budreviciute et al. (2020) includes global health

strategies with actionable targets, national health policies, social awareness management strategies and individual lifestyle management strategies. However, according to the authors, the most effective preventive strategy is lifestyle changes associated with behavioural risk factors including physical activity, tobacco use, diet and controlling metabolic disorders. To contribute to this strategy, this study attempts to identify gender-specific socio-demographic determinants of the NCDs of interest, how the study population adheres to recommended lifestyle choices associated with hypertension only and to understand how communities perceive the associated behavioural risk factors and unorthodox interventions available to them at the local level.

### 1.3 Statement of the problem

Non-Communicable Diseases in the past were referred to as ‘diseases of the rich’ due to their association with people in the higher economic brackets (Budreviciute et al., 2020). In recent times, these diseases transcend economic, racial, social, and physical boundaries with their attendant problems. The social and behavioural risk factors associated with these diseases are however not fully explored within the Ghanaian context. For a long time, infectious diseases have been prioritized within the healthcare fabric of the country, increasing the burden of hypertension, diabetes and mental health disorders. Despite this huge gap, very few studies within the country have conducted community-based studies to understand how individuals and communities perceive the risk factors and interventions of these NCDs. Additionally, national policies and strategies are mostly biomedical, leaving out possible socio-economic and psychological interventions.

In addressing these issues, the statement of the problem addresses emerging issues from the global context, touching on cases within sub-Saharan Africa and zeros into Ghana.

### *1.3.1 Increase in urbanization and modifiable risk factors*

Globally, the world has been experiencing rapid urbanization which comes along with its own opportunities and challenges. Despite NCDs accounting for over 70% of all deaths, modifiable risk factors seem to be on the increase particularly in urban areas. Lifestyle factors including consuming unhealthy diets, physical inactivity and the use of tobacco and alcohol are often associated with urbanization according to Popkin (2017), even though males and females experience these risk factors differently where males are more likely to engage in tobacco and alcohol use. According to Khorrami et al. (2017), urbanization has a significant influence on changing lifestyles. Per their analysis, the Islamic Republic of Iran experienced in 2009 an increase in the risk factors of NCDs as urbanization increased. In discussing urbanization and risk factors, there are marked gender differences in behavioural health risks, access to health services and health promotion behaviours. In India, as urbanization increased, smoking in men also increased whilst in China, urbanization was closely linked to risk factors including unhealthy diets, physical activity, and obesity (Khorrami et al., 2017).

Per the findings of the World Health Organization (2012), urbanization usually caused by migration leaves the migrants susceptible to a myriad of illnesses and diseases. A survey conducted by the World Health Organization in 2012 in Egypt with 459 persons living in a semi-urban slum area and 291 in an urban area showed that tobacco use in the slum areas was 29.7%, higher than that of the urban areas with 15.6%. In the same survey, only 5.7% of residents in the slum areas compared to 37.8% of urban residents consumed fresh fruits and vegetables. This goes on to highlight how urban residents tend to engage more in behavioural risk factors associated with NCDs.

Mukanu et al. (2021) in a study done in Zambia highlight how the country is experiencing Nutrition-Related NCDs (NR-NCDs). According to the authors, these NR-NCDs contributed to 29% of all deaths within the country. At the heart of this is the nutrition transition where people are consuming more westernized and processed foods, leaving behind traditional foods. This has contributed to an increase in the incidence of risk factors where 90% of adults in Zambia consume less than 5 fruits or vegetables servings a day, 24.2% considered overweight and 7.5%, obese (Mukanu et al., 2021).

The urbanization process in Ghana has also contributed to inequalities in health ranging from unsanitary living conditions and inadequate access to recreational facilities. Residents in urban areas are prone to adopting sedentary lifestyles whilst being heavily dependent on processed foods. This contributes to their susceptibility to hypertension, diabetes and mental disorders. Few studies in Ghana have however conducted studies to examine the socio-demographic determinants and modifiable risk factors of males and females in urban areas predicting hypertension, diabetes and mental disorders.

### *1.3.2 Loss of productive workforce*

Non-Communicable Diseases have gained a lot of prominence globally due to their impact on morbidity and mortality. Whilst this is worrying, its impact on labour and being productive cannot be underestimated. As reiterated by Budreviciute et al. (2020), although NCDs are often associated with the aged, the narrative is changing. Working-age adults are burdened with premature morbidity and mortality from NCDs (Bloom et al., 2011). In a longitudinal study in China done by Zhao et al. (2023), they identified the influence of NCDs on the decision of the working age group to participate in the labour force, the number of hours people with NCDs spend working and the actual income they earn participating in the labour force whilst battling such

NCDs. They highlight the potential spillovers of low income from those affected by NCDs to the household levels which in turn perpetuate poverty and have negative consequences for economic and social development. The Pan American Health Organization (2023) also highlights the indirect economic burden placed on the working population which often presents as premature mortality leading to the loss of significant working hours, absenteeism, presenteeism or working at a lower capacity and sometimes, forceful exit from the labour force. Males, according to Beaglehole et al., (2011) take up jobs in the formal sector compared to females who are at the receiving end of unpaid domestic work and caregiving duties, limiting their ability to effectively manage chronic diseases if they arise.

Findings from the WHO & UNDP (2016) suggest that women and girls are disproportionately affected by these NCDs. Although they may not directly have these diseases, dropout rates for girls increases whilst labour force participation for women is often threatened. This is because girls and women are usually caretakers of persons living with NCDs in their families. Although, there are similar idiosyncrasies in Ghana, few studies highlight the differences between socio-demographic predictors of males and females including those within the productive workforce and how it affects productivity. This makes it impossible to design gender-sensitive strategies at both the workplace and at the community level.

### *1.3.3 Non-communicable diseases as a cause and effect of poverty*

Lifestyle choices are associated with the risk of having an NCD. This is predicated on the assumption that individuals have the option of making a choice to be healthy or otherwise. It is assumed that an individual who fails to avoid such risks by adopting healthier lifestyle choices lacks discipline with little to no self-control (Manderson & Jewett, 2023). The authors go on to

explain how political, economic, social, and commercial determinants of health are relegated to the background and emphasis placed on the individual's agency. They associate this occurrence with poverty or the unavailability of resources, which places individuals at a disadvantage where they no longer have the free will to make choices to improve their health, nutrition, and physical activity.

A systematic review done by the Johns Hopkins Bloomberg School of Public Health highlights how NCDs do not only have the likelihood of increasing the risk of morbidity and mortality but also having an NCD increases the chances of being poor especially in LMICs. After reviewing 283 studies done in Africa, Asia, Latin America between 1968 and 2017, it was noticed that after the year 2000, people in the lower socio-economic brackets would have a higher risk of developing diabetes, stroke, heart conditions and cancer. This same population was estimated to have a higher exposure to risk factors including tobacco use, alcohol use, elevated blood pressure and higher Body Mass Index (BMI) (Howard & Benham, 2018).

Due to the devastating effects of NCDs on the general populace, one of the targets for the 2030 Agenda for Sustainable Development is to reduce by one third the risk of death from any one of the top NCDs especially for the productive working force aged 30 to 70 years (World Health Organization, 2023e). This is an attempt to reduce the socio-economic impact of the disease at the individual and household levels, particularly in LMICs where NCDs are known to perpetuate poverty.

Within SSA, the existing weaknesses within the health care system coupled with limited coverage of health insurance often contributes to delayed treatment of NCDs. According to de-Graft Aikins et al., (2012), people with limited financial autonomy often experience delayed

treatment of hypertension and diabetes. The situation in Ghana is dire especially because although the National Health Insurance Scheme (NHIS) covers treatment for hypertension, diabetes and some mental disorders, there are differential challenges in health care centers across the country. This translates into wealthier individuals with the ability to afford private insurance being more likely to be diagnosed and treated for NCDs leaving behind poorer groups with no access to insurance. There are however limited studies specific to Ghana highlighting how gender interacts with wealth and NCDs. This is crucial for formulating strategies likely to break the effect on poverty on NCDs.

#### *1.3.4 Intersection between wealth, gender and hypertension*

According to the WHO (2023), hypertension is the leading risk factor of cardiovascular diseases globally. However, there are marked differences between males and females and among different socio-economic groups. The exposure to risk factors differs between males and females particularly in their interactions with the modifiable risk factors including diet, physical activity, tobacco use, and alcohol use as well as their adherence to the recommended lifestyle modification suggested by the WHO.

The interactions also may differ by how different socio-economic groups, males and females seek care and treatment for hypertension. Marmot & Bell (2019) postulate that lower socio-economic groups are more likely to experience high rates of hypertension due to a myriad of factors including wealth status and low health literacy. On the other hand, individuals in higher socio-economic groups are more likely to have access to better management strategies. In addition, whilst males are more likely to develop hypertension due to stress, tobacco and alcohol use,

females are more likely to develop hypertension in their old age from hormonal changes and limited adherence to medication (Popkin, 2017).

The current scholarship in SSA highlights how poorer groups remain undiagnosed whereas richer groups are more likely to have developed hypertension due to their lifestyle compounded by sedentary lifestyles and consuming higher proportions of processed foods against traditional high-fibre diets (Agyemang et al., 2016). The situation in Ghana does not deviate much where hypertension continues to be one of the highly prevalent NCDs in the country in terms of morbidity and mortality (GSS, 2021). Despite this finding, the literature is missing how gender and wealth interact with hypertension to provide a comprehensive analysis of the differences and the perceived risks and interventions individuals and communities associate with managing the condition. This study addresses this gap using an intersectional, mixed-methods approach.

#### *1.3.5 The Ghanaian context*

Considering the effects of NCDs on the productive workforce, developing countries especially are unable to reap the benefits of the Demographic Transition Theory (DTT). This, according to the WHO & UNDP (2016) affects development in a much broader sense. In economies where experienced and skilled labour is needed to propel development, the insurgence of NCDs makes it almost impossible for governments to reap the benefits of investing in the education of the youth and workforce. In Ghana, 43% of all deaths were NCD related in 2016 with cardiovascular diseases accounting for 19% and diabetes 3% of these deaths with a prevalence of 21%, higher than the global average of 18% (World Health Organization, 2018).

In developing countries, including Ghana, the cost of treating NCDs is astronomical. Given that the cost of treatment is mostly not covered by public health insurance schemes or other social

programmes to reduce the cost of healthcare, this often falls on the individuals and/or households, thus depleting household income and savings (Howard & Benham, 2018). According to the WHO (2023b), this increases household expenditure as treatment costs are often lengthy and expensive, further plunging already vulnerable groups into poverty. In the Ghanaian context, de-Graft Aikins et al. (2012) highlight how the high cost of medicines among other things negatively affects poorer communities, further plunging them deeper into poverty.

The incidence of rapid urbanization coupled with ageing and lifestyle choices are some of the factors leading to an increase in the burden of NCDs in the country (Ministry of Health, 2022). Data presented by the Ministry of Health (2022) suggests that among adults in Ghana, less than 5% consume three fruits and vegetables servings a day as prescribed by the WHO. In addition, about 41% of adults do not engage in any vigorous physical activity which places them at a higher risk of having an NCD. With continued urbanization and modernization of the country, these figures are likely to go up consistently with the analysis of Khorrami et al. (2017) where urbanization contributed to the consumption of high calorie foods and a reduction in physical activity which consequently led to obesity and other illnesses.

Until recently, there was no national programme instituted at the Primary Care Level to detect and reduce the burden of diseases. The World Health Organization Package of Essential Noncommunicable Disease Interventions (WHO-PEN) was instituted in December 2022 to build the capacity of primary healthcare workers for the early detection of NCDs, followed by the right management and referrals (World Health Organization, 2022). Whilst this is laudable, this initiative is being carried out in only six (6) regions out of the 16 regions of the country including Central, Eastern, Ashanti, Bono, Savannah, and Northern Regions. Again, emphasis is placed on

diagnosis and treatment as against prevention and control highlighting the inadequacy of social protection programmes covering the prevention and management of NCDs at the local level.

Although there is an extensive body of evidence which shows how socio-demographic and behavioural risk factors contribute to NCDs, there's very limited research in Ghana which adequately examines how these factors function separately for males and females. The current literature in SSA also heavily highlights the collective risk exposure to NCDs as well as access to health resources. This does not tell the full story. In the global context, there are studies which highlight gendered differences of NCD risk exposure and prevalence, which is lacking in studies done in SSA and Ghana. In this regard, a study done by Li J, Pandian V, Davidson PM, Song Y, Chen N, Fong DYT (2025) across 204 countries and territories between 1990 and 2021 concludes that although the prevalence of some NCDs is generally higher for females, the disability adjusted life years and mortality is higher for males. The study also highlights how certain risk factors including physical inactivity differs between males and females. Such gendered studies bring to the fore the importance of having similar studies done in the Ghanaian context to understand the differences in specific social, cultural and economic contexts, to better reflect the local setting.

Drawing on this global narrative which demonstrates gender-specific patterns in risk exposure to NCDs, studies including that done by Yaya et al., (2018) in a multi-country analyses done in SSA suggests socioeconomic differences in both metabolic and behavioural risk factors of NCDs. Additionally, Kunna et al., (2017) in a study in Ghana identifies wealth as a contributory factor to inequalities in NCD risk and prevalence. These findings highlight the important role wealth plays in conferring different risks on males and females. However, they do not explicitly model how gender and wealth interact to be able to understand on a deeper level any layered vulnerabilities which may exist.

In understanding community perceptions of risk factors of NCDs and their associated interventions, qualitative studies done in Ghana including that by Mensah et al., (2022) suggest that a multiplicity of beliefs, norms and structural factors contributes to how community members perceive the risk factors of NCDs. That notwithstanding, there is a critical gap in not only understanding but also integrating these community perceptions with quantitative population-based data. However, such insights are important in putting into context these findings, juxtaposing them to the lived experiences of people and their perceptions on diet and physical activity among others. The existing literature in Ghana relies heavily on quantitative analysis leaving out a critical part, the voice of the people. Using the integrated approach of quantitative and qualitative findings together with a gendered analysis, provides a more comprehensive analysis to better understand the problems at hand. It also provides a more streamlined approach of proposing policy interventions which address socio-cultural and economic barriers, making these interventions more probable of being accepted at the community level.

#### **1.4 Purpose of the study**

The purpose of this study is to examine the prevalence of Non-Communicable Diseases in Ghana, paying attention to hypertension, diabetes, and mental health disorders conditions. Again, this study also focuses on the socio-demographic and behavioural risk factors of NCDs in Ghana. Whilst investigating the prevalence of these diseases and the risk factors, the findings from the study will help in identifying the perceived risk factors, whilst exploring the perceived interventions associated with hypertension, diabetes and mental health disorders.

Understanding the risk factors is likely to raise awareness but also help in developing achievable and pragmatic interventions to control and manage the prevalence of these diseases.

This would also contribute to existing knowledge on both traditional and modern treatment methods adopted at the community level and the perception of their effectiveness.

Generally, this study seeks to provide valuable insights into public health policies to guide policymakers and healthcare providers at the national, regional, and local levels thus contributing significantly to improving public health and the general wellbeing of Ghanaians.

This study established that the existing body of literature identifies the socio-demographic and behavioural risk factors contributing to the prevalence of NCDs. This notwithstanding, there is a missing link on gender differences of the risk factors particularly in Ghana. Although wealth is also identified as a possible contributory factor to the risk of NCDs, the paucity of studies analyzing the interaction between wealth and gender for a more nuanced understanding as well as the heavy reliance on quantitative data makes this study even more important. This study addresses these gaps by analyzing the socio-demographic determinants of hypertension, diabetes and mental health disorders for males and females separately thereby contributing to the global literature and more importantly within the Ghanaian context on health and gender, where it is rarely done.

Again, using the intersectionality approach goes a step further to understand layered differences between the different wealth categories for both males and females. This approach is rarely used in the Global South, although it is critical in identifying differentiated risks and vulnerabilities to help in better addressing the risks of NCDs. Combining this with the lived experiences of community members, amplifies the novelty of this study within the Ghanaian context especially due to the over-reliance of existing research on quantitative data. This study not only addresses the academic gap in the contextualization of NCD risk and interventions across different population sub-groups but also contributes to the policy implications especially within the Ghanaian context

## 1.5 Research objectives

In line with the above, the objectives of this research are to;

- Examine gender-specific variations of socio-demographic determinants of hypertension, diabetes, and mental health disorders
- Assess individual's adherence to recommended lifestyle choices associated with hypertension
- Explore community perceptions of risk factors and interventions associated with hypertension, diabetes, and mental health disorders among the adult population of Ghana.

## 1.6 Definition of terms

The different terms used in this study are explained below. These explanations are adapted from the World Health Organization, unless stated otherwise.

### 1.6.1 Hypertension

Hypertension, otherwise known as high blood pressure, refers to a condition where the pressure in the blood vessels is high. This often presents as 140/90 mmHg and above. Unlike other diseases, people with hypertension may not have any symptoms. However, this condition increases with metabolic and lifestyle changes including old age, genetics, obesity, physical inactivity, high-salt intake, and excessive consumption of alcohol.

### 1.6.2 Diabetes

This is a metabolic disease which is presented as high blood glucose or blood sugar levels. When left untreated, diabetes has the tendency of damaging different organs including the heart,

blood vessels, kidneys, nerves, and the eyes. Adults usually experience type 2 diabetes which often makes their bodies resistant to insulin. The most common type of diabetes in children is juvenile or type 1 diabetes where the pancreas does not produce enough insulin by itself.

### *1.6.3 Mental health disorders*

Mental health is a complex term. However, it is generally referred to as the state of complete mental well-being which enables people to cope with the stresses of life, realize their abilities, learn well and work well, and contribute to their community. Mental health disorders are not a stand-alone concept but form an integral part of one's wellbeing as a fundamental human right. Whilst mental health disorders can often be misconstrued as the absence of mental disorders, its occurrence and intensity differ from one person to the other and is often influenced by varying degrees of stressors under different social and clinical contexts. The level of exposure to social, economic, environmental, and geopolitical stressors including parenting, poverty, and violence among others has the potential to exacerbate mental health disorders. Whilst there is a myriad of mental health disorders, for purposes of this study, the mental health disorders of interest are depression, anxiety and suicidal ideation.

### *1.6.4 Tobacco use*

Walker et al. (1990) define tobacco use as the habitual use of the tobacco plant leaf and its products. By this definition, the authors referred to the use of tobacco by inhaling smoke using cigarettes, pipes, and cigars. By extension, tobacco products that are chewed, sniffed, or sucked are referred to smokeless tobacco use.

#### *1.6.5 Alcohol use*

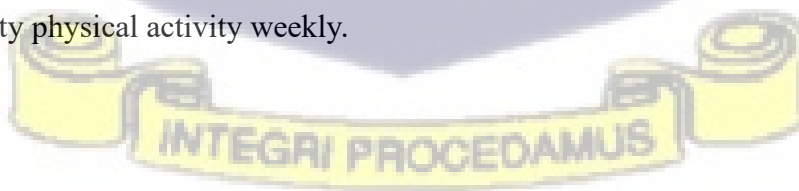
The WHO postulates that the harmful use of alcohol contributes to the high burden of disease with social and economic costs. Whilst the definition of standard alcohol consumption varies in different socio-cultural settings, the harmful use of alcohol is widely known to cause more than 200 diseases and injuries. It also has the tendency of contributing to mental and behavioural disorders and other NCDs including cancers, cardiovascular diseases and liver cirrhosis.

#### *1.6.6 Diets*

Healthy dietary practices include consuming fruits and vegetables, reducing salt and sugar intake and balancing energy intake and energy expended. Attention is placed on the intake of fruits and vegetables for this study. Specifically, consuming 400g or five portions of fruits and/or vegetables.

#### *1.6.7 Physical activity*

This refers to movement of the body generated by skeletal muscles and requires energy to expend. It includes all movement from leisure to transportation in between places including work and usually range from moderate to vigorous intensity. Physical activity, when done regularly, helps in preventing and managing NCDs including stroke, diabetes, some cancers, hypertension and heart disease. Ideally, adults aged 18-64 years should have at least 150-300 minutes of moderate-intensity physical activity weekly.



### 1.7 Significance of the study

Population-based data on NCDs in Ghana, as stated by de-Graft Aikins et al., (2012) is limited. This was reiterated by the Ministry of Health (2022) in the National Policy on Non-Communicable Diseases. To be able to understand the priority areas for policy intervention and action, it is essential to conduct population-based studies to understand the nuances of NCDs and how the general populace responds to them. de-Graft Aikins et al. (2012) go on to suggest the need to conduct more qualitative and ethnographic studies for a better understanding of the complexities which exist between NCDs and the populace. This study is an attempt to fill in the gap of how communities perceive the risk factors of diabetes, hypertension and mental health disorders as well as understand the unorthodox interventions they turn to in a bid to reduce the high costs of treatments in formal health institutions.

Findings made as part of compiling data for the National Policy on NCDs in Ghana suggest that there's low awareness levels among individuals, communities, and the general populace about what NCDs are, and the risk factors associated with them. This comes to light even after it has been established that there's a significant burden of NCDs particularly diabetes and hypertension in both rural and urban Ghana of 28% and 51% respectively for women and 22% and 34% respectively for men (Ministry of Health, 2022). Such high prevalence rates coupled with low awareness of risk factors call for comprehensive efforts to understand the magnitude of the burden of NCDs in Ghana. Similarly, understanding the different predictors of NCDs for males and females helps in identifying existential risk profiles by sex and serves as a guide to making tailored policy recommendations to promote health equity, reduce the burden economic burden on individuals, households and families, promote health equity and improve messaging on public health awareness campaigns.

Conducting this study significantly contributes to both academic knowledge and policy interventions. It addresses an important knowledge gap in academia by presenting a gender-specific and intersectional analysis of gender, wealth and hypertension status which is not commonly investigated in sub-Saharan Africa and Ghana. The study also highlights the ability to combine epidemiological and community-based perspectives in NCD research in Ghana which is not common. The findings from this study are a crucial first step in identifying critical thematic areas for both policy makers, population scientists and health practitioners to focus on for comprehensive interventions. The study situates Ghana's experience within the larger global context, augmenting debates on inequalities in health particularly NCDs in LMICs

### **1.8 Assumptions and delimitations**

This study is based on the following assumptions and delimitations.

#### *1.8.1 Assumption*

The assumptions for this study are centered on the qualitative data collection aspect since the quantitative data to be used has already been collected. The study assumed that all the data collected, and information provided by the research participants as at the time of collection is accurate.

#### *1.8.2 Delimitations*

It is important to note that whilst findings made from the quantitative data are generalizable, that of the qualitative data are not. They are only specific to the cross-section of community members who participated in the FGDs, giving a deeper understanding of their perceptions on hypertension, diabetes, and mental health disorders.

### **1.9 Organization of chapters**

This study is organized under seven chapters. Chapter one sets the tone of the study with the introduction and background statement of the problem. In chapter two, a literature review is done to ascertain what has already been done on the subject matter. The methodology is presented in chapter three. Chapters four, five and six answers the research objectives whilst chapter seven, the final chapter, highlights the key findings from the study, conclusion, and recommendations.

### **1.10 Conclusion**

This chapter served as an introduction to the study. In stating the background, problem statement and objectives, it provided the necessary backdrop to contextualize the study whilst laying the foundation on what to expect in the ensuing chapters.



## CHAPTER TWO: LITERATURE REVIEW

### 2.1 Introduction

This chapter reviews relevant literature including the theoretical underpinnings of the study and lays the foundation for the study. It provides context, identifies gaps and uses the information to conceptualize the study. The chapter begins with a global perspective of NCDs, a critical first step to establishing existing research done on the subject matter, creating a baseline and identifying gaps from which the analysis will be based on. The chapter also highlights relevant modifiable and socio-demographic risk factors associated with NCDs in general but prioritizing hypertension, diabetes and mental disorders. The chapter concludes by highlighting identified knowledge gaps and how the study is conceptually framed to justify this study.

### 2.2 Global overview of burden of non-communicable diseases

Non-communicable diseases (NCDs) are a threat to health globally according to Abel & McQueen (2013) and has gained traction over the years. They have been the focus of public health transformation lately due to their associated increase in morbidity and mortality. As a fundamental part of the discourse on diseases by the WHO, non-communicable diseases are defined as “...a group of conditions that are not mainly caused by an acute infection, result in long-term health consequences and often create a need for long-term treatment and care.” (Pan African Health Organization, 2024).

By this definition, there are several NCDs. However, cardiovascular diseases, chronic respiratory diseases, cancers and diabetes (type 2) according to the Centers for Disease Control and Prevention (2022), are the leading causes of morbidity and mortality globally. Habib & Saha (2010) estimated that in 2005, there were about 35 million deaths from NCDs, representing 60% of all deaths globally. Out of this estimate, NCD mortality in low- and middle-income (LMICs)

was about 80%, with 16 million deaths occurring in people aged 70 years and below. A systematic analysis done by Forouzanfar et al. (2016) gave further insight into the global prevalence of mortality from these diseases where cardiovascular diseases accounted for 17.9 million deaths, cancers for 9 million, respiratory diseases for 3.9 million and diabetes for 1.6 million deaths worldwide in 2015. These numbers are staggering and if efforts are not intensified, morbidity and mortality from NCDs are likely to overtake infectious diseases by 2035 (WHO, 2018).

Assessing the burden of NCDs in sub-Saharan Africa is riddled with inadequate, unreliable and inefficient statistical systems, which according to Gouda et al. (2019) poses a threat in predicting the prevalence of these diseases. Despite this setback, Habib & Saha (2010b) predicted in 2010 approximately 70% of all deaths in SSA being associated with NCDs. This is partly due to the continent experiencing urbanization alongside Omran's epidemiological transition where communicable diseases including maternal mortality, malaria, cholera and many others co-exist with non-communicable diseases such as cardiovascular diseases, cancers, and in recent times, mental health disorders and substance use disorders (Gouda et al., 2019).

Urbanization has contributed to a rising burden in cardiovascular diseases in SSA associated with lifestyle choices or modifiable risk factors including unhealthy diets, inadequate physical activity and obesity (Bigna & Noubiap, 2019). Within SSA, there are different socio-demographic groups experiencing the burden of NCDs differently by virtue of their social identity, which makes it even more important to intensify targeted preventive and management strategies. Males and females, for instance, experience health differently due to biological factors with different vulnerabilities and exposure risks (Pan American Health Organization, 2024).

To proactively manage NCDs, the Global NCD compact 2020-2030 was established by WHO to address NCD-related Sustainable Development Goal targets, specifically Goal 3 Target 4

to “reduce by one-third premature mortality from non-communicable diseases through prevention and treatment and promote mental health and well-being” (World Health Organization, 2023a).

This roadmap has brought together Governments from across the world, encouraging member states of the WHO to adopt evidence-based policies to improve the outcome of NCDs globally. As part of this initiative, Ghana launched the Global NCD Compact to address non-communicable diseases, including mental health disorders, in 2022 under the Ministry of Health to reduce preventable deaths from NCDs (MoH, 2024).

As the prevalence of non-communicable diseases continues to rise with their attendant health and socio-economic challenges, prevention and management remain at the forefront of efforts to reduce morbidity and mortality. This occurrence highlights the importance of continuous efforts for early detection and management for different socio-demographic and economic groups to improve overall health.

### **2.3 Non-communicable diseases in Ghana**

Generally, much attention has not been given to NCDs in Ghana nationally, partly due to financial constraints and lack of political will. Despite this, there have been varied and scattered attempts to prevent and manage NCDs through national policies including the NCD policy in 2012 and an updated policy document in 2024 to meet international guidelines and regulations. In the 2012 NCD policy of Ghana, NCDs were grouped into these four categories;

- Chronic non-communicable diseases with shared common risk factors: cardiovascular diseases, diabetes mellitus, cancers, chronic obstructive pulmonary disease
- Non-communicable diseases of genetic origin: sickle cell disease and other haemoglobinopathies
- Injuries

- Other special non-communicable diseases like oral disorders, eye disorders and mental health disorders

The disease burden in the country, is in part due to low awareness among the population of what these diseases are and their risk factors, weak health systems, expensive treatment options and ineffective chronic disease policies (de-Graft Aikins et al., 2012). The Ministry of Health (2012) identified cardiovascular diseases, cancers, sickle cell disease, diabetes and chronic respiratory diseases as the major NCDs in the country. According to them, the prevalence of these diseases is projected to increase under the influence of urbanization, an ageing population and unhealthy diets. The NCDs of interest in this study are further discussed in the ensuing sections.

### *2.3.1 Hypertension*

Hypertension, otherwise known as high blood pressure, occurs when the pressure in blood vessels is high with readings 140/90 millimetres of mercury or higher (World Health Organization, 2023b) with 140mmHg representing the systolic blood pressure reading and 90mmHg representing the diastolic blood pressure reading. As a major cause of premature death, hypertension is mostly asymptomatic, where people with the condition may show no symptoms thus dubbed ‘the silent killer’. An effective way of knowing one’s hypertension status is to routinely check blood pressure readings.

The risk factors associated with hypertension are mostly lifestyle related including unhealthy diet, tobacco use and not engaging in physical activity. Although hypertension can affect anyone, the World Health Organization (2023) identifies certain key demographics as being more likely to develop the disease. They include older adults, being obese or overweight, abusing alcohol, indulging in high-salt diets, being physically inactive and genetics. According to Mills et al. (2020), about 31% adults representing 1.39 billion people had hypertension globally in 2010.

In 2023, World Health Organization (2023) estimated about 46% adults not aware they may have the condition.

Hypertension is an important public health concern. In 2010, there was an increase in outpatient hypertension cases from 60,000 cases in 1990 to 700,000 cases in public and mission health facilities only (Ministry of Health, 2012). A study by Agyei-Mensah & de-Graft Aikins (2010) found hypertension and diabetes among the top ten causes of death in the country, attributed to urbanization, lifestyle changes and choices and ageing population. Twelve years later, Tannor et al., (2022) found hypertension to be the leading cause of preventable deaths in Ghana. The Ministry of Health (2012) identified that approximately 70% of persons with hypertension are not getting treatment with up to 13% only, controlling their blood pressure.

Hypertension has varied effects on different socio-demographics. Atibila et al., (2021) identified marked differences between males and females in their study where hypertension prevalence among females was approximately 30% and for males, approximately 34%. They identified significant differences of hypertension prevalence across place of residence and age structure with urban residents and older adults having a higher likelihood of having the disease. To proactively prevent hypertension, lifestyle changes including eating a healthy diet with fruits and vegetables, engaging in physical activity, not indulging in alcohol and tobacco are necessary.

### *2.3.2 Diabetes*

In simple terms, diabetes is a chronic ailment with elevated blood glucose. There are four types of diabetes including type 1 diabetes where the body does not produce insulin, type 2 diabetes, where the body does not produce enough insulin, gestational diabetes which affects females whilst pregnant and pre-diabetes, where blood glucose levels are higher than normal (Suresh Lal, 2016). Type 2 diabetes is the commonest type with about 95% of those with diabetes

having type 2 diabetes (World Health Organization, 2023d). Unlike hypertension, there are symptoms of diabetes including polyuria or frequent urination, polydipsia or regular thirst for water, polyphagia or frequent hunger, tiredness, tingling in hands and feet, cuts which do not heal, unusual weight gain or weight loss and sometimes male sexual weakness and has the likelihood of causing blindness, strokes, kidney failure and in some cases, amputation of the lower limbs (Suresh Lal, 2016; Shouip, 2014).

The prevalence of type 2 diabetes globally increased from 180 million in 1980 to 422 million in 2014 (World Health Organization, 2023d). In SSA, Kazibwe et al., (2024) estimate about 24 million people living with the condition and are projecting this number to increase by 134% 2045. Just like hypertension (which is mostly a co-morbid condition), this is associated with urbanization and lifestyle changes including consuming processed foods with higher caloric content and high sugar diets as well as accompanying lifestyle changes including a decrease in physical activity brought on by sedentary lifestyles. Specifically in Ghana, the burden of diabetes is likely to increase because of urbanization, unhealthy lifestyles and population ageing (Ministry of Health, 2022b).

Studies on the prevalence of diabetes in Ghana are scattered and scarce. de-Graft Aikins et al. (2013) give an account of diabetes prevalence in a community in Ho in the Volta Region recording 0.2% in the late 1950s, a prevalence of 0.5% was recorded in the early 1970s in Accra for males and 0.4% for females. Consequently, a prevalence of 2% was recorded in the 1990s in a survey done in selected urban areas and 6.4% reported for 2 urban and 20 rural communities in Accra. The Accra Women's Survey, conducted in 2023 recorded a prevalence of 8.3% (de-Graft Aikins et al., 2013). This points to the fact that despite having limited studies on the prevalence of diabetes, the few done show a steady increase.

### 2.3.3 Mental health disorders

Mental health is not a standalone concept. According to Bhugra et al. (2013), mental health incorporates how people feel and think about themselves, including how they cope in times of trouble. The concept of mental health has progressed over the years. The WHO conceptualizes mental health as “...a state of well-being in which the individual realizes his or her own abilities, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to his or her community.” The United Nations (2022) also explains mental health disorders as a state of mental well-being, providing people with the ability to cope with different life stresses whilst contributing to their communities. To control and manage mental health disorders, the WHO introduced policies including the Mental health Action Plan 2013 to 2020 and Mental Health Gap Action Programme (mhGAP), with the latter concentrating efforts in resource poor communities to help prevent and manage mental disorders globally.

According to the WHO (2013b), mental disorders encompass depression, bipolar affective disorder, schizophrenia, anxiety disorders, dementia, substance use disorders, intellectual disabilities, and developmental and behavioural disorders. These disorders are often developed from childhood. Depression or depressive disorder, anxiety disorder and suicidal ideation negatively affect how people think and feel about themselves. It was estimated to affect over 300 million people globally with prevalence higher in women and the youth than men. Which is why Bradshaw et al., (2014) identified a high prevalence of mental health disorders for young people particularly in high-income countries with similar results in low-income countries. Among 15–29-year-olds, suicide remains the fourth leading cause of death.

Until recently, Ghana did not have a clear path on tackling mental disorders. This gap necessitated the formation of the Mental Health Authority in 2013, with backing from the Mental

Health Law, Act 846. The concept remains neglected in the health care system of the country with few clinicians, limited research, scarce epidemiological data and speculative conclusions (Read & Doku, 2012). This notwithstanding, Nakua et al., (2023) estimated that about two million Ghanaians are suffering from mental health disorders with a multiplicity of barriers to mental health care in Ghana including limited integration to primary health care, inadequate information about the risk factors and available interventions, strong community beliefs and associated stigma and limited financial allocations to mental health care.

Obeng-Dwamena (2020) in her thesis on alcohol use and mental health in Ghana identified studies done at the hospital facility-level and community level with an evident increase in depression at the facility level. Notwithstanding, there's a paucity of research on depression, anxiety and suicidal ideation, which are co-morbid conditions at the community level, to understand how community members perceive the risks of these diseases and the interventions they associate with these diseases.

## **2.4 Modifiable risk factors**

The rising burden of NCDs, particularly the top four including cardiovascular diseases, cancers, respiratory diseases and diabetes and others, is a major source of concern for global health and national governments. The major risk factors associated with these NCDs have been identified as unhealthy diets, physical inactivity, alcohol use and tobacco use by the WHO (2023e) otherwise known as modifiable risk factors or lifestyle choices. This makes such NCDs preventable considering that lifestyle choices play a significant role in the onset of these diseases (Budreviciute et al., 2020). These modifiable risk factors are discussed in subsequent sections.

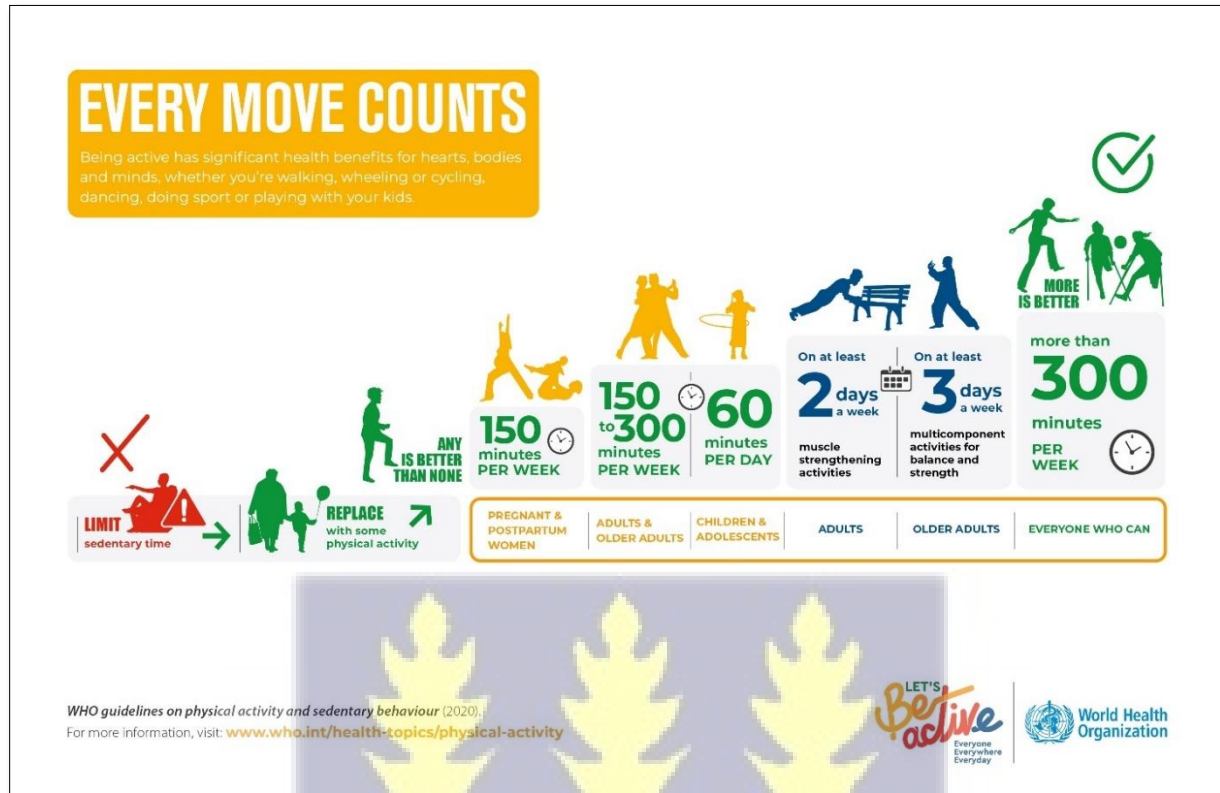
#### 2.4.1 Physical activity

Referred to as medicine for non-communicable diseases, Saqib et al. (2020) identifies physical activity is an important factor in the prevention and management of NCDs and for overall wellbeing. However, physical inactivity is often downplayed although it is in the top four leading causes of mortality worldwide (Nyawornota et al., 2022). Incorporating physical activity as a lifestyle is known to help in the prevention and management of diseases including mental health disorders, hypertension, diabetes, stroke and heart disease and others (World Health Organization, 2024b). However, the WHO estimates that about 31% adults and 80% adolescents fall short of the recommended physical activity level.

According to Azevedo, et al., (2007), whilst males tend to be more engaged in leisure time moderate and vigorous physical activity, females are less likely to also report leisure physical activity. This has the likelihood of translating into females not getting enough benefits from leisure physical activity. It also has the propensity to contribute to gender-disparities in risk factors including obesity and other cardiovascular risk factors. Such disparities in physical activity have been linked to environmental, motivation and self-efficacy factors which differ by gender (Garg, 2023). Consequently, females tend to be more engaged in household or unpaid domestic tasks whilst males tend to be engaged in leisure and paid work which incorporates vigorous physical activity. This may place females at a disadvantage where they may have less opportunities for physical activity which benefits their health. This makes it important to emphasize the importance of having gender-sensitive interventions.

The different physical activity requirements for different age groups and socio-demographics per the standards of the WHO are indicated in figure 1.

Figure 1: WHO guidelines on physical activity



Source: World Health Organization, 2020

#### 2.4.2 Diet

Nutrition and diet play an important role in the NCD discourse. Evidence from all around the world suggests a connection between poor diet and NCDs including hypertension and diabetes. The NCD Alliance & World Cancer Research Fund International (2014) identified a correlation between foods consumed and being overweight, having elevated blood pressure, blood cholesterol and being resistant to insulin. The authors also encouraged consuming fruits and vegetables as a way of preventing cardiovascular diseases. Dolui et al., (2023) also identified how consuming micronutrients including Vitamin C and E is likely to reduce the risk of heart or cardiovascular disease, which are normally found in fruits and vegetables. The WHO recommends consuming at least five fruits and/or vegetable servings per day. Results from the WHO SAGE Wave 1 study

conducted in Ghana by Britwum et al. (2015) suggested over 69% of the respondents consuming less the recommended daily fruits and vegetable servings.

This burden is often associated with the Nutritional Transition particularly in LMICs including Ghana where as communities become more urbanized, populations gradually shift from traditional plant-based foods and foods high in fiber to the consumption of processed foods high in fats, sugar and carbohydrates (Popkin, 2017). In addition to this, differences in dietary behaviour has the likelihood of influencing health outcomes. In Senegal Holdsworth, et al., (2006) found out that females are more likely to put first the dietary needs of the household before their own needs, thus consuming less-nutritious foods. This is problematic, making females more susceptible to malnutrition. On the contrary, Subar et al., (2015) assert that males are more likely to consume diets with more meat and alcohol which places them at a higher risk of obesity and other related cardiovascular diseases. Findings such as these bring to the fore the need to have dietary-specific interventions which highlight both individual and communal dietary behaviour to address the growing burden on NCDs in the country.

#### *2.4.3 Alcohol use*

Overconsumption of alcohol is one of the leading risk factors for morbidity and mortality, resulting in over 3 million deaths globally, higher than HIV/AIDS, tuberculosis and violence-induced deaths (World Health Organization, 2024a). Per the records of the WHO, alcohol use accounts for about 5% of the global burden on disease and injury including hypertension and strokes. Alcohol use, according to Centre for Health Protection & Department of Health (2020) is also associated with anxiety disorders, depression and a myriad of other mental disorders. The harmful use of alcohol has also been linked to several diseases including mental health disorders,

hypertension, different types of cancers and cardiovascular diseases among others (Rehm et al., 2017).

Whilst there have been efforts to reduce the consumption of alcohol globally and by national governments, the act is behavioural which social cognition philosophers such as Armitage & Conner, (2000) have indicated that it is difficult to change unless it is backed by certain cues to change. In addition to this, there are disparities in the consumption of alcohol for both males and females. Whilst males tend to consume alcohol recreationally and in large quantities, Obot & Room (2005) assert that females are more likely to consume alcohol occasionally. This notwithstanding, females who consume alcohol are at a greater disadvantage biologically because of a combination of metabolism and body composition. This, according to Erol & Karpyak (2015), makes females more likely to have a higher risk of health complications from consuming alcohol.

#### *2.4.4 Tobacco use*

Tobacco use, including smoke and smokeless products, are a major risk factor for NCDs including diabetes and hypertension. Their use cuts across different socio-demographic groups. The campaign for tobacco-free kids in 2013 identified tobacco use as the number one preventable risk factor of NCDs worldwide. Although data on tobacco use in SSA and Ghana are scanty, Britwum et al., (2015) identified in their study in Ghana that about a tenth of the study respondents admitted to using a tobacco product at the time of data collection. Again, males were three times more likely to be current users of tobacco products. This included chewing, sniffing or inhaling tobacco products. Findings from the Ghana Demographic and Health Survey in 2014 also reported about 4% of males consuming tobacco as against only 1% of females. Whilst this might be encouraging, females are less likely to report using tobacco as it is culturally frowned upon.

## 2.5 Adherence to recommended lifestyle choices associated with hypertension

Adhering to lifestyle choices recommended by the WHO including engaging in physical activity, regulating salt intake, alcohol and tobacco is one of the main ways of controlling and managing hypertension (Burnier & Egan, 2019). Over the years, these recommendations have been proven to reduce significantly high blood pressure readings as well as lower the risk of complications from cardiovascular diseases. Despite this, adherence among population sub-groups remains low. According to Abegaz et al., (2017), adherence among patients with hypertension globally is less than 50%.

Certain socio-economic and cultural factors including weak healthcare systems, limited health education and healthy foods being overpriced according to Atinga et al., (2020) contribute to low adherence on lifestyle recommendations in SSA. This is compounded by perceptions of the risk factors of hypertension and certain socio-cultural and health beliefs including discontinuing medication when symptoms subside. Aside this, Awuah et al., (2019) identified marked differences in how males and females engage with the risk factors of hypertension where males generally consume tobacco and alcohol as part of fitting into the wider masculinity social identity bracket compared to females who engage in household duties and may prioritize the dietary needs of their households.

The narrative in Ghana does not deviate from the global occurrence. Despite hypertension awareness being high, its control remains low. The cost of consuming healthy foods, together with the inadequacy of counselling services at healthcare centers across the country are contributory factors to the low adherence levels (Awuah et al., 2019). Differences in socio-economic status also offer differing responses to adherence where individuals from high-income groups are more likely to have access to better healthcare and nutritious food compared to low-income groups.

There is a gap in scholarship in Ghana on the interaction between gender, wealth and hypertension necessary to understand adherence to recommended lifestyle choices of the WHO. Identifying and addressing this gap is a critical step towards recommending strategies likely to improve the control and management of hypertension in Ghana.

## **2.6 Socio-demographic risk factors of non-communicable diseases**

### *2.6.1 Sex*

Biological differences between males and females influence health behaviour and promotion. There are marked gender differences on susceptibility to diseases where males may have higher morbidity and mortality from cardiovascular diseases according to Gillis & Sullivan (2016) and women, higher rates of autoimmune diseases (Kronzer et al., 2021). Apart from this, males and females engage differently in risky health behaviours and have different access to health care, all of which influence health promotion. Whilst diabetes prevalence among women was slightly higher than men based on the findings by Alrashed et al. (2024), prevalence of hypertension was higher in males than females (Carrillo-Larco et al., 2023). In the discourse on mental health disorders, women are more likely than men to have mood changing disorders like depression and anxiety which World Health Organization (2002) linked to hormonal changes, whereas males are more likely to engage in high-risk behaviours such as substance abuse and suicide.

### *2.6.2 Age*

NCDs used to be associated with older adults, however, this dynamic is changing. Persons of all age groups can develop these diseases. Some studies including Budreviciute et al., (2020b) have identified that NCDs can develop in the early years of life and progress to old age. This notwithstanding, age has been identified as a major risk factor of hypertension, diabetes and mental

health disorders (Sapkota et al., 2023; Britwum et al., 2015; Cheng et al., 2022) in quantitative studies. Kaba et al. (2017) in their qualitative study how young adults perceived the risk factors of NCDs to be low compared to the middle-aged and older adults. Similarly, certain behavioural risk factors are also presented as increasing or decreasing with age where Sapkota et al., (2023) identified a decrease in physical activity with age for both men and women but an increase in alcohol consumption with age for women than men.

### *2.6.3 Religion*

Religion, as a concept in health promotion, is not new. Although controversial, religion has been identified by previous and current studies to have a relationship with non-communicable diseases. Studies including Buck et al., (2009); Cozier et al., (2018); Kpobi & Swartz, (2019) have identified some significance and perceptions of religion on health behaviour among community members in both quantitative and qualitative studies. As the NCD burden continues to rise, the influence of religion is important in addressing belief systems to promote behavioural changes.

### *2.6.4 Ethnicity*

Cultural practices are ingrained in ethnic groups and form part of the nature vs nurture debate by Galton (1874) where the environment influences actions and perceptions. Studies in different cultural contexts such as Gagné & Veenstra, (2017), established differences in the risk factors of hypertension in ethnic minorities in Canada. In Ghana, Agyei et al. (2024) found an associated perception of prevalence of mental health disorders including depression and anxiety among ga-adangme males. They associated this occurrence with their feeling of powerlessness and fear. Findings such as these are important in furthering the discourse on the association between ethnicity and NCDs.

#### *2.6.5 Place of residence*

The rising burden of NCDs has been attributed to urbanization (Agyei-Mensah & de-Graft Aikins, 2010; de-Graft Aikins et al., 2014; World Health Organization, 2012). This places urban residents at a higher risk of developing NCDs due to differential access to the modifiable risk factors of NCDs. Urban residents in Ghana, are more exposed to processed foods and stress-induced factors which may place them at higher risk of developing mental disorders, hypertension, and diabetes (de-Graft Aikins et al., 2012; Read & Doku, 2012; Sanuade et al., 2018). Exploring the linkages between place of residence and NCDs is therefore vital for public health promotion.

#### *2.6.6 Wealth status*

Similarly, there were differences in the disease burden among different socio-demographic groups where wealthier communities have a higher risk of developing NCDs whilst poorer communities have a double burden of infectious diseases and NCDs (Agyei-Mensah & de-Graft Aikins, 2010). This brings to the fore the influence of wealth on the prevalence of NCDs and the need to conduct an intersectional analysis to identify the possibility of discrimination to health education, health risks and health promotion for different wealth statuses and identities.

#### *2.6.7 Marital status*

Emerging scholarship on NCDs present contrasting views on the association between marital status and NCDs. Whilst Son et al. (2022) found a relationship between marital status and NCDs as protecting against the triggers of hypertension, Wekesah et al., (2018) found a negative correlation between marital status and NCDs. Their findings suggested that females in a union were more likely to develop NCDs compared to females in no union. As studies are progressing, incorporating marital status as a possible predictor of NCDs in Ghana would help in assessing the vital role marriage plays in this conundrum.

#### *2.6.7 Educational status*

The level of education of persons, at both the hospital facility-level and community level, are important determinants of NCDs awareness and risks (Glanz et al., 2008; Gupta et al., 2021; Zacher, 2023). Vital to the conversation on the topic is the assimilation and understanding of health information, the ability to process such information and act on them as well as its influence on health behaviour.

#### *2.6.8 Employment status*

Apart from scholarships which suggest that NCDs have the likelihood of reducing the work force in the form of absenteeism and presenteeism according to Allen et al., (2018), there's growing evidence to support how employment status influences health behaviour through long hours of sitting, traffic-induced stress and other psychosocial stressors (Schouw et al., 2020). Exploring employment status is a critical part of understanding disparities in the prevalence and management of NCDs.

### **2.7 Perceptions of non-communicable diseases in Ghana**

There are limited qualitative studies exploring the perceptions of community members otherwise known as lay people on their perceptions on non-communicable diseases. A study by Nyaaba et al., (2018), the first of its kind in Ghana, explored the perceptions of lay persons on hypertension. Hypertension was seen as a spiritual disease ascribed by witchcraft with traditional medicine being the best treatment option. It was interesting to note that for the participants of this study, they did not perceive themselves to be at risk of developing the condition. Although this finding cannot be generalized, it sets the tone for other similar studies to bridge the existing knowledge gap on this subject.

Although findings from qualitative studies on perceptions of non-communicable diseases in Ghana may be sparse, some insights from the sub-region provide useful data. Findings from a study done across SSA by Tulu et al., (2021) suggest that respondents consider stress as a very important risk factor of NCDs including but not limited to financial stress, emotional stress as well as conflicts in a relationship. Apart from this, being obese was seen as an indicator of wealth and beauty, which are all culturally acceptable. On the other hand, being thin was associated with being sick. In the same study, respondents preferred consulting traditional and spiritual healers. Respondents used biomedical care as a last resort when the sickness of disease was severe.

In a similar study done among Ghanaian migrants in three European countries as well as Ghanaians living in rural and urban Ghana, de-Graft Aikins et al., (2019a) found out that in addition to respondents acknowledging biomedical reasons to NCDs, they also believed these diseases were caused by spiritual, psychosocial and structural causes including “thinking too much”, poverty and migration. The combination and coexistence of these perceptions suggest that although people may be aware of the risk factors of NCDs, it is not enough leaving gaps on what exactly people know, what they do not know and their varied responses by gender and wealth.

## **2.8 Gaps identified**

One resounding gap identified from the literature review is by de-Graft Aikins et al., (2012) who assert that there's limited population-based research on perceived risks and interventions of NCDs among community members who may not necessarily have an NCD. With emphasis on prevention, it is imperative to identify what the knowledge gaps are in terms of how communities perceive the risks and interventions associated with hypertension, diabetes and mental health disorders. This assertion was supported by Tindana et al., (2020) and Boakye et al., (2023) who also identified the paucity of behavioural adherence among community members.

The introduction of intersectionality approach by Crenshaw (1993) has made it important to identify the barriers different social identities and groups encounter in relation to health access and health promotion. Although this is a new concept, there are limited studies to investigate existential barriers contributing to health disparities. Vohra-Gupta et al., (2023) highlighted the importance of conducting an intersectionality study to identify health disparities which would help in the formulation of policies to target specific socio-demographic groups for better outcomes. The gaps identified are addressed in this study with the objectives and findings made from the analysis

## **2.9 Theoretical framework**

Three theories were identified to be relevant and practical to this study. They were the Biopsychosocial Model of Health and Disease, the Health Belief Model (HBM) and Intersectionality. The models are explained in subsequent sections.

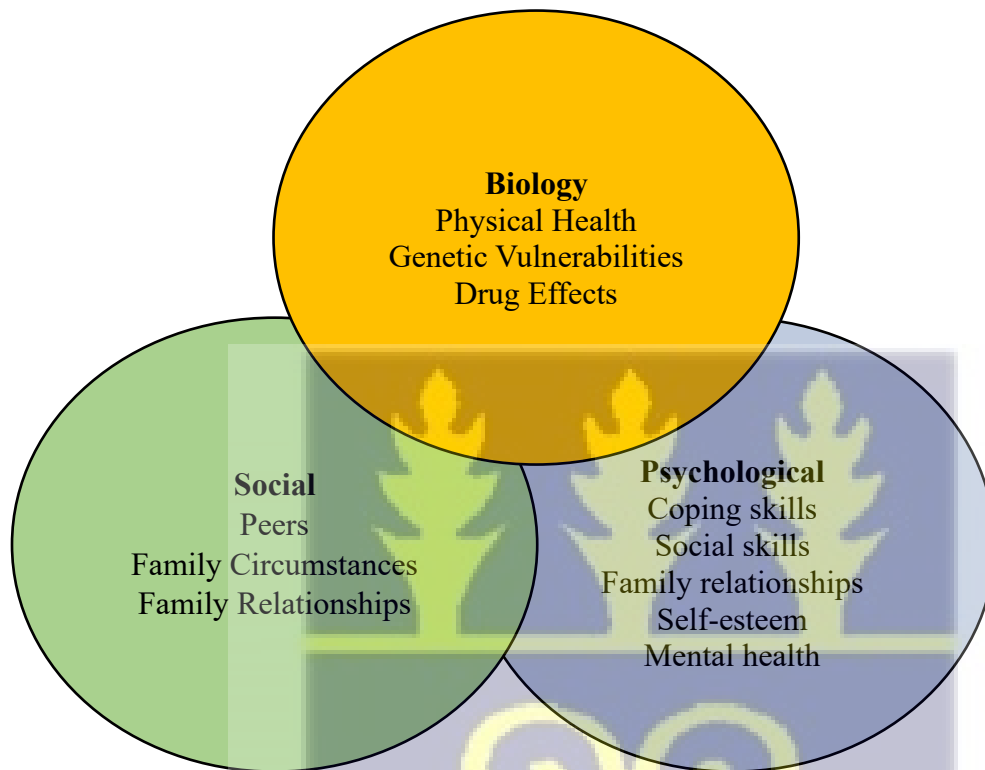
### *2.9.1 Biopsychosocial model of health and disease*

The biopsychosocial model of health and disease is a framework developed by George L. Engel in 1977 to challenge the existing biomedical model attributing disease to biological factors only. In this new model, Engel (1977) states that the interactions between the biological, psychological, and social factors are equally important in ascertaining what causes diseases, how diseases manifest and the outcomes of wellness and/or disease. Prior to this novel work by Engel, theories including the nature vs nurture where either nature, including factors associated with genes or hereditary or nurture, including the environment one grows up in contributes to their development (Cherry, 2022).

In the model, Engel (1977) attributes the biological to physical health, genetic vulnerabilities, effects of drugs among others. The psychological factors include the coping skills of a person, social skills, relationship with family, self-esteem and mental health disorders. The

influence of peers, circumstances of family and family relationships were important components under the social factors. Engel posits that all three factors are necessary for health behaviour and health promotion. The interplay of all three factors is depicted in the figure below.

Figure 2: The biological, social and psychological components of the biopsychosocial model



Source: Derived from the biopsychosocial model of Engel, 1977

This theory has been validated through several studies over the years to further the understanding of health promotion by tackling health status, perceptions of health and socio-cultural barriers to accessing health care through this lens. This study aligns with the tenets of the biopsychosocial model where the biological, social and psychological factors are all important in the socio-demographic and behavioural risk factors associated with hypertension, diabetes and mental health disorders.

### 2.9.2 Health Belief Model

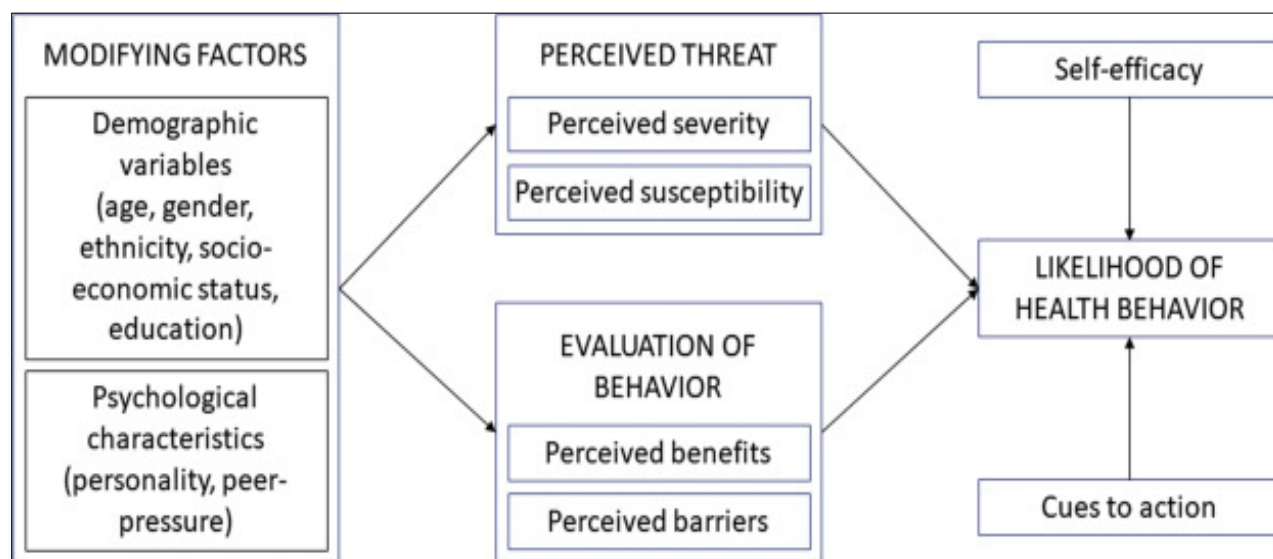
The Health Belief Model was developed in the United States Public Health Service in the 1950s (Laranjo, 2016). The HBM postulates that people are likely to effect a change in their health if they perceive a threat to be serious. The model taps on the beliefs and perceptions of people to assess their readiness to act.

The tenets of the HBM suggest that modifying factors often described as socio-demographic and psychological factors contribute to an individual's ability to perceive threats and evaluate their behaviour to act. This perception of threat is a stimulus. In the NCD discourse, if an individual believes that he/she is at risk of developing hypertension, the person is more likely to engage in preventive behaviour. Similarly, if an individual believes that his/her risk is low, he/she is likely to ignore health-related warnings and continue to engage in unhealthy behaviour.

The evaluation of behaviour in HBM is predicated on the perceived benefits and perceived barriers to health. When individuals who believe that engaging in physical activity will reduce their tendency of developing diabetes, they are more likely to put in place a consistent physical activity regimen. The perceptions of threat may present themselves as the belief of not having adequate time to engage in physical activity. Other barriers including cost or agency may also deter the individual from engaging in healthier behaviours.

The model also presents self-efficacy, which is the confidence an individual has in him or herself to act and cues to action, which are certain triggers inducing an individual to act. For example, a person witnessing the death of a loved one through suicide may be more likely to report seeking for mental health care when going through challenges or stressors. It is important to maintain clear communication about the threats, benefits and barriers to enhance perception. The HBM is depicted in the figure below.

Figure 3: Tenets of the health belief model



Source: Adapted from Rosenstock IM, Strecher VJ, Becker MH (1988)

### 2.9.3 Intersectionality

The intersectionality model is a sociological and analytical tool introduced by Kimberlé Crenshaw. She posits how social identities including race, gender, socio-economic status among others interact to form unique experiences. The theory initially addressed inherent multiple layers of discrimination, privilege and power embedded in society and how these influence the lives of people based on different social identities. Over the years, this theory has been adapted into discourse on population health and policy.

Inequalities in access to health have been evident not only in gender but across social class and identities. Since the inception of this theory, there has been an advance in scholarship on how race, gender and income are intricately connected as determinants of health. With the increase in the prevalence of non-communicable diseases, it has become evident the existential biases which exist in accessing knowledge and quality healthcare to prevent and manage these conditions. In the United States, Gagné & Veenstra (2017) found inequalities in access to healthcare for wealthy

women where they had better access. Similarly, black women were the least knowledgeable on health risks and were also more likely to have higher body mass index with age (Gagné & Veenstra, 2017).

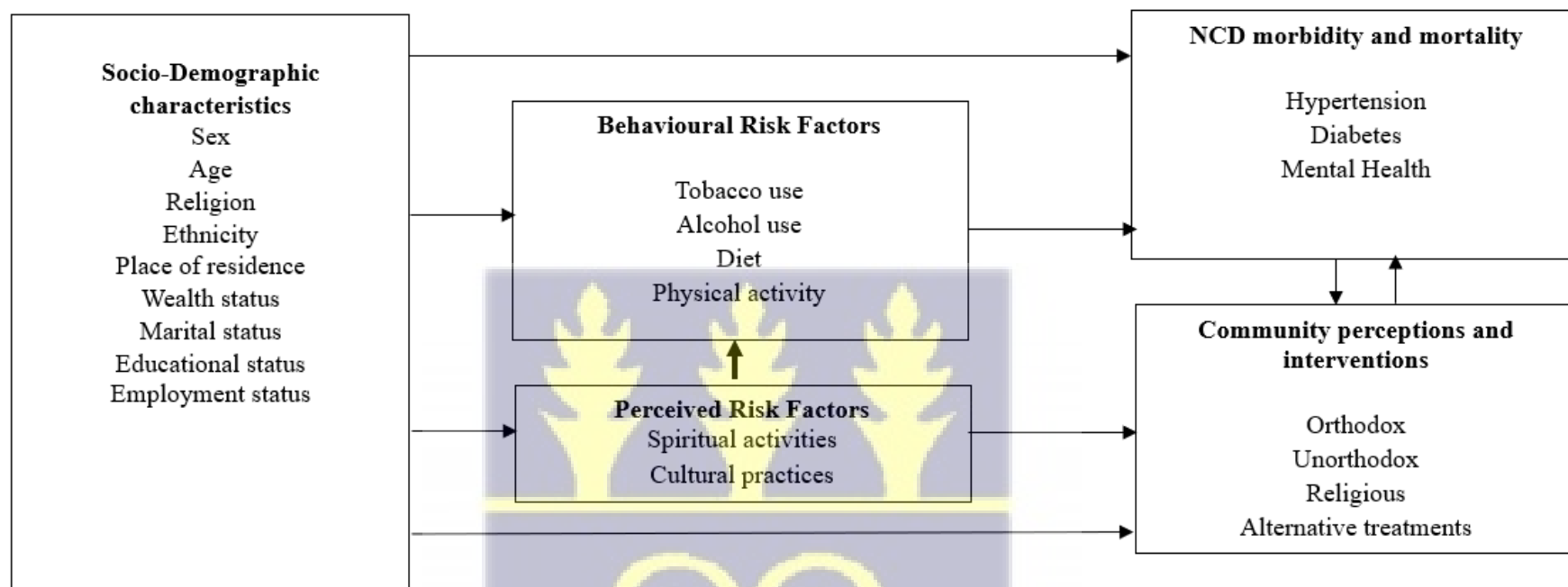
Such detailed analysis on health risks for different socio-demographic groups in SSA and Ghana are limited. Existing literature study gender or wealth as individual factors influencing NCDs. Applying the intersectionality model in this study to understand the interplay between gender, wealth and hypertension to ascertain hypertension status among different social identities contributes to its novelty.

## **2.10 Conceptual framework**

The conceptual framework is presented in figure 4. The study conceptualizes that modifiable and perceived risk factors are likely to be influenced by certain socio-demographic characteristics based on biological, psychological and physical factors depicted by the biopsychosocial model. Sex, as a biological factor, affects how males and females access health risks and may contribute to how they behave or perceive these risk factors. Similarly, the perceptions of individuals are based on their experiences, their environment, and their agency which also fall under modifying factors in HBM. The interplay of these factors may contribute to their risks of developing hypertension, diabetes, and mental disorders.

Equally important in the conceptual framework is how the perceived risk factors have the likelihood of influencing the interventions people ascribe to for health promotion. The framework conceptualizes that people who perceive diabetes as a spiritual disease for example are more likely to go in for faith-based healing as an intervention. Essentially, the interconnectedness of these factors plays a major role in the prevalence of hypertension, diabetes and mental disorders and its associated interventions.

Figure 4: Conceptual framework of socio-demographics and behavioural risk factors of non-communicable diseases (hypertension, diabetes, and mental health disorders)

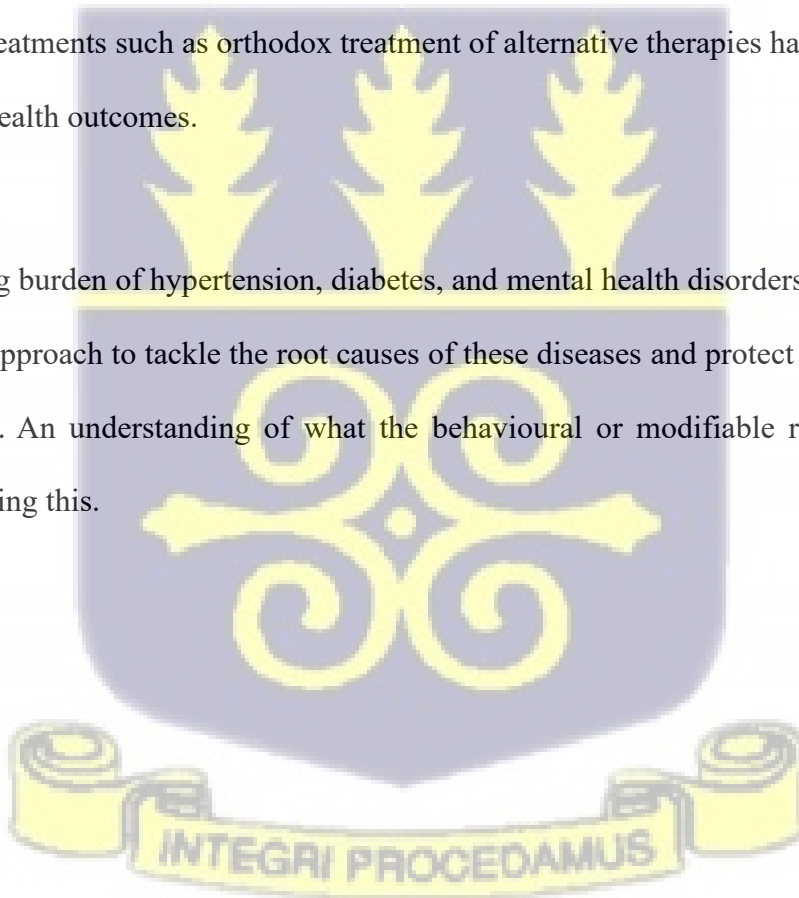


Source: Author's construct, 2024

The perceived risk and interventions of community members are captured as part of their psychology. This is addressed in terms of how they explain why they adopt certain health behaviours, their perceptions about risk or how they even cope with disease. In this regard, the psychological aspects of health in this study are captured in the perceived risk factors and interventions of community members. The biopsychosocial model used in this study identifies that the interplay of the biological, social and psychological factors contributes to health outcomes. This study conceptualizes that biological includes factors such as age and sex, social factors such as wealth, marital status and educational level as well as psychological factors including perceptions of risk prejudiced by spiritual activities and cultural practices as well as community perceptions of treatments such as orthodox treatment of alternative therapies has the likelihood of contributing to health outcomes.

## **2.11 Conclusion**

The rising burden of hypertension, diabetes, and mental health disorders in Ghana needs a comprehensive approach to tackle the root causes of these diseases and protect the citizenry from financial burden. An understanding of what the behavioural or modifiable risk factors are, is critical in achieving this.



## CHAPTER THREE: RESEARCH METHODS

### 3.1 Introduction

This chapter outlines the methods used for this study. This is important to be able to establish methodological rigour, justify the research design, ensure transparency and replicability where appropriate and provide a roadmap for interpretation. The chapter outlines the research design, philosophical standpoint of the researcher and underpinnings of the research. It also highlights the analytical methods used in the study showing the adoption of pragmatism by using a mixed-methods approach. The chapter goes on further to outline how the objectives of the study are achieved using quantitative and qualitative research methods. It showcases the study area, sampling and data collection processes for transparency and methodological accuracy.

### 3.2 Philosophical Standpoint of Researcher

Understanding the philosophical underpinnings of this research is necessary in highlighting the perceptions of risk factors and prevalence of diabetes, hypertension, and mental health disorders in a broader social context. Given that this study uses both quantitative and qualitative data, it is essential to address the philosophical underpinnings of both approaches.

In investigating the prevalence of hypertension, diabetes, and mental health disorders as well as finding the association between the risk factors and these NCDs, this study adopts the positivist approach. Largely, positivism is considered scientific through its use of quantitative data, empirical evidence and laid down observation methods. By using such quantitative data, Park et al. (2020) posit that it aids in finding the causal and explanatory variables of a phenomenon under study. In this case, the causal relationship between risk factors and the prevalence of the NCDs

under study. Using this approach, according to the authors, is desirable as it aids in finding explanatory associations between variables hence the ability to make accurate predictions of the phenomenon under inquiry. Moreover, using a large dataset such as the nationally representative WHO SAGE Wave 2 Data on Ghana improves the consistency and representativeness, making it possible to generalize based on the findings.

Closely linked to positivism is pragmatism where the focus is on the effect of the research as against the methods used. The use of this approach again focuses on the fact that how humans behave is intrinsic in their past experiences and beliefs (Kaushik & Walsh, 2019). The attention placed on the use of quantitative data to influence policies on public health, healthcare practices and interventions at the local levels also makes it ideal.

For pragmatist philosophy highlights using multiple research approaches to understand the phenomenon under study. This approach allows for the use of both quantitative and qualitative approaches. Adopting pragmatism in this study is guided by the study objectives of exploring the predictors of hypertension, diabetes and mental disorders, adherence to recommended lifestyle choices for hypertension and community perceptions of risks and interventions of hypertension, diabetes and mental disorders. Adopting only the quantitative or qualitative approach alone will not be enough to achieve the objectives. Pragmatism therefore provides a more comprehensive approach.

Using the qualitative approach, the philosophy of phenomenology stands out. Phenomenology, according to Gallagher (2012), encompasses studying human experiences and the different ways things appear to humans by way of experiences. In this case, the narratives of people through their lived experiences create subjective perspectives revealing valuable insights into their thoughts and general experiences on a subject matter. By delving deeper into the

perceptions of people on the risk factors for hypertension, diabetes, and mental health disorders as well as their perceptions of unorthodox treatment options, the phenomenological approach best fits.

The phenomenological approach does not underscore the role of social constructivism where Mckinley (2015) assert that this concept is beneficial in qualitative research in a bid to better understand how people interact with the world. In this case, the ideas and experiences of people overlap with societal beliefs, norms, and values, influencing their perceptions on issues. In seeking to know further the perceptions of community members on diabetes, hypertension and mental health disorders, this study addresses societal frameworks and their role on shaping perceptions about the risk factors and treatment options available to them.

The philosophical underpinnings outlined above are inconclusive but highlight the standpoint of the researcher in conducting this research. It serves as the framework to guide the development of the study to help generate pragmatic solutions to improve public health.

### **3.3 Study area**

This study is conducted in Ghana, which is in West Africa along the Gulf of Guinea. The country is found at latitude  $7.9465^{\circ}$  N, and longitude  $1.0232^{\circ}$  W. It is bordered to the North by Burkina Faso, to the East by Togo, to the West by Côte d'Ivoire and to the South by the Gulf of Guinea. Ghana's capital city is Accra and has sixteen (16) administrative regions. According to the Ghana Statistical Service (2021), the population of the country during the recent Population and Housing Census was 30.8 million with females comprising 50.7% and males 49.3%. The population of the Greater Accra, Ashanti, Eastern and Central regions comprised of more than half of the entire population of Ghana with 56.7% of the entire population being urban and 43.3% rural (GSS, 2021). Since 2010, the population of Ghana has increased by about 6.1 million from 24.7

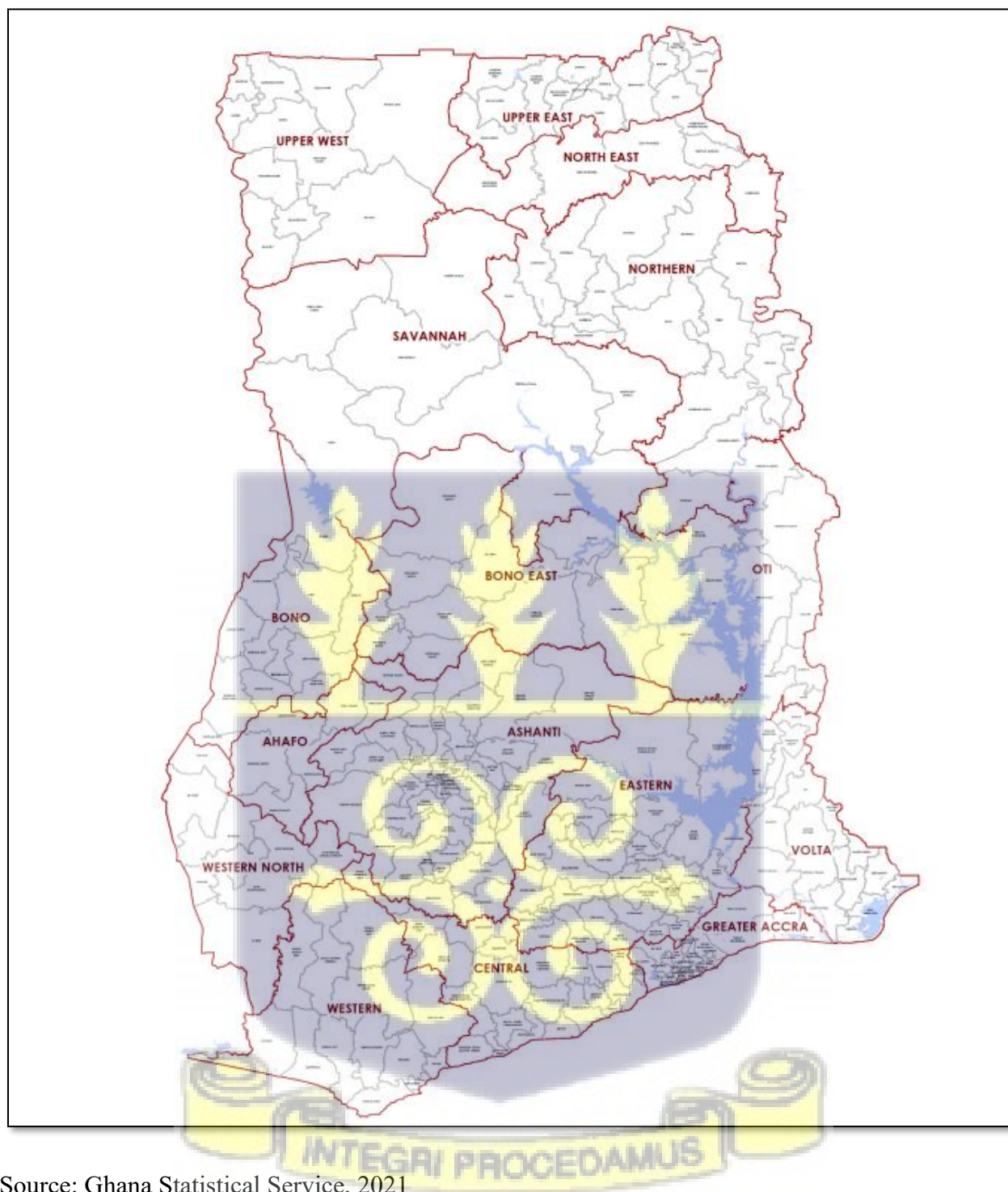
million which according to Ghana Statistical Service (2021) represents an intercensal growth rate of 2.1%. The Ghana Statistical Service estimated that by 2050, the country's population would exceed 50 million people.

According to the 2021 Population and Housing Census, Ghana has a youthful population, where approximately 57% of its population are aged 30 years and below (GSS, 2021). Christians are in the majority representing about 71%, followed by Islam representing about 20% and Traditional religion about 3%. The diverse ethnic composition of Ghana places Akans in the majority, representing about 47% of the total populace. This is followed by Mole-Dagbani with about 17%, Ewe representing about 14% and Ga-Adangme representing about 7%. The country is also relatively urban with the urban population representing about 57% of the total population (GSS, 2021).

Ghana generally has an informal economy, dominated by females engaging in petty trade and males engaging in manual or skilled labour. According to the GSS (2021), females are more likely to be married or widowed whereas males are more likely to be single. Additionally, education level remains low with just about 13% of adults with tertiary education. Wealth is not equitably distributed across the country. The census report highlights the richest being mostly found in Southern Ghana particularly the Greater Accra region and the poorest in Northern Ghana.



Figure 5: Administrative regions of Ghana



Source: Ghana Statistical Service, 2021

### 3.4 Mixed methods research design

The research design in each study provides a sense of direction keeping in mind the objectives. For this study, the quantitative and qualitative research design are both used. Whilst the quantitative methods provide accurate measures through statistical tools, qualitative methods provide more clarity on complex issues in a defined setting (Almeida et al., 2017). According to Vázquez (2009), quantitative methods are used in health research to ascertain the prevalence of a health issue, the degree to which health personnel adhere to interventions and how well a patient or user is satisfied with the intervention. In contrast, qualitative methods when used in health research help in understanding the perspectives or perceptions of people on a subject matter. Using both quantitative and qualitative methods provides comprehensive and all-encompassing results which is impossible to achieve using only one approach.

This study adopts the mixed methods approach to help in understanding the risks of NCDs in Ghana. This requires an analysis of quantitative associations to identify socio-demographic predictors of NCDs and their health outcomes. It also requires exploring how individuals and communities perceive these risks with their associated interventions. Whilst using the quantitative approach provides an objective way of measuring patterns of risk, the qualitative approach provides explanations to behaviour whilst contextualizing the influence of socio-cultural beliefs. Using both methods provides a comprehensive and integrated understanding to the risk and interventions of NCDs in Ghana. Using only one method makes it impossible to conduct such a comprehensive analysis.

#### 3.4.1 Data screening

The data was screened for missing data and possible outliers. This brought the sample size from 4735 to 4714 study respondents for the quantitative analysis. This enhanced the reliability of

the findings from the statistical analysis. Cross tabulations were done for the descriptive statistics to check for missing values. The missing completely at random (MCAR) test was also done. The results showed a p-value less than 0.05 thus some data missing was not random but related to specific patterns. To control for bias, the cases with missing data were excluded from the analysis.

### *3.4.1 Quantitative design*

Research design, for a long time, has been dominated by quantitative research design. Quantitative research is often seen as scientific and rigorous compared to qualitative research. Whilst the methods might be different, the findings they produce complement each other.

In understanding the importance of quantitative research, Lakshman et al. (2000) purport that using this approach makes it possible to determine the effects of an independent variable on a dependent variable numerically, thus making it possible to draw causal relationships. Such conclusions are often made when the variables are controlled and devoid of any outside influence. Given that this study intends to find the causal relationship between the identified socio-demographic variables and the prevalence and management of NCDs, using quantitative research design is appropriate.

In instances where large populations are to be studied, quantitative research design makes it relatively easier and faster to study using laid down systematic and scientific approaches. This, according to Eyisi (2016), makes it possible to generalize findings from such studies. The ability to generalize findings made from quantitative research design from one geographical area to a much wider area makes it desirable for use in research. Taking into consideration that this study uses a nationally representative data to understand the prevalence of hypertension, diabetes, and

mental health disorders in Ghana, using the quantitative research approach makes it possible to generalize based on the findings made.

The generalizability of quantitative research has a ripple effect on its replicability. Using standard scientific methods with clearly defined measurements and guidelines, this research approach can be replicated in different areas with the same parameters. This is likely to produce the same or similar findings and is considered objective (Lakshman et al., 2000). Per the review of Eyisi (2016) in his paper, quantitative researchers can detach themselves from their research leaving behind any biases or personal interpretations. Findings made from such designs are therefore considered objective and are purely reflective of the responses given by the target group under study. In as much as this is a benefit, it equally can be classified as a disadvantage. Being detached from research makes the investigator an observer. Moreover, numbers alone do not tell the full story. Quantitative methods alone do not provide in-depth understanding of the phenomenon under study or why respondents behave the way they do. This is why it is important to combine quantitative and qualitative study designs.

### *3.4.3 Measures*

The variables used in this study primarily were derived from SAGE Wave II consisting of hypertension, depression, mental health disorders (depression, suicidal ideation and anxiety), tobacco use, alcohol consumption, diet and physical activity. The other measures include perceived risk factors including spiritual causes and cultural practices and community perceptions of interventions including orthodox, unorthodox, religious and alternative treatments. For purposes of this study, most of the variables outlined above were re-coded and categorizations modified

with their base rooted in the SAGE data. The composition of the variables used for this study are outlined below.

### *3.4.3.1 Dependent variables*

The dependent or outcome variable is NCD prevalence and management categorized as non-communicable diseases with hypertension, diabetes and mental health disorders as the NCDs of interest and community perceptions and interventions. They are explained below.

#### *3.4.3.1.1 Hypertension*

As a dependent variable, hypertension in this study was measured generally as blood pressure readings with systolic pressure  $\geq 140$  millimeters of Mercury (mmHg) and diastolic pressure of  $\geq 90$  mmHg. For a more detailed definition of hypertension to answer objective two clearly in line with ascertaining the adherence to recommended lifestyle choices associated with the disease, hypertension status is grouped into four main categories and are listed below.

- Hypertension (uncontrolled): persons who reported being diagnosed with hypertension and had elevated blood pressure readings above 140/90mmHg
- Hypertension (controlled) persons who reported being diagnosed with hypertension and had blood pressure readings below 140/90mmHg
- Hypertension (unaware): persons who reported not having hypertension but had elevated blood pressure readings above 140/90mmHg
- No hypertension (true): persons who reported not having hypertension and had blood pressure readings below 140/90mmHg.

Hypertension, as a dependent variable was measured as a categorical variable to have a clear distinction between those who had the disease and those who did not.

#### *3.4.3.1.2 Diabetes*

Diabetes is one of the outcome variables categorized under NCDs. Persons who reported having been diagnosed with type 2 diabetes excluding gestational diabetes. The question asked in the WHO SAGE Wave 2 survey for Ghana was.

- Since the last time we spoke, have you been diagnosed with diabetes (high blood sugar)?  
(Not including diabetes associated with pregnancy)

#### *3.4.3.1.3 Mental health disorders*

As an outcome variable, persons diagnosed with either depression, anxiety or suicidal ideation or a combination of two or all three were categorized as having a mental health disorders disorder. The questions asked in the survey were.

- Since we last spoke, have you been told by a doctor that you have depression?
- During this period, (the past 12 months) did you feel anxious and worried most days?
- During this period, did you ever try to end your life?

#### *3.4.3.1.4 Orthodox treatment*

This broadly refers to medical interventions. It is explained by National Cancer Institute (2024) as a structured system where medical doctors and health care professionals including therapists, nurses and pharmacists treat ailments with drugs, surgery or radiation.

#### *3.4.3.1.5 Unorthodox treatment*

This refers to treatments which are also considered to be medical but do not have enough scientific backing including the use of herbs.

#### *3.4.3.1.6 Religious interventions*

This encompasses interventions which seek the face of a higher being for healing, widely known as faith healing.

#### *3.4.3.1.7 Alternative interventions*

This is defined in this study as treatments which support the psychosocial well-being of an individual. It includes interventions such as meditation, massage therapy, aroma teas among others

#### *3.4.3.2 Socio-demographic characteristics*

The socio-demographic characteristics of the study respondents which were measured were sex, age, religion, ethnicity, place of residence, wealth status, marital status, educational status and employment status. Table 1 provides a description of the variables.

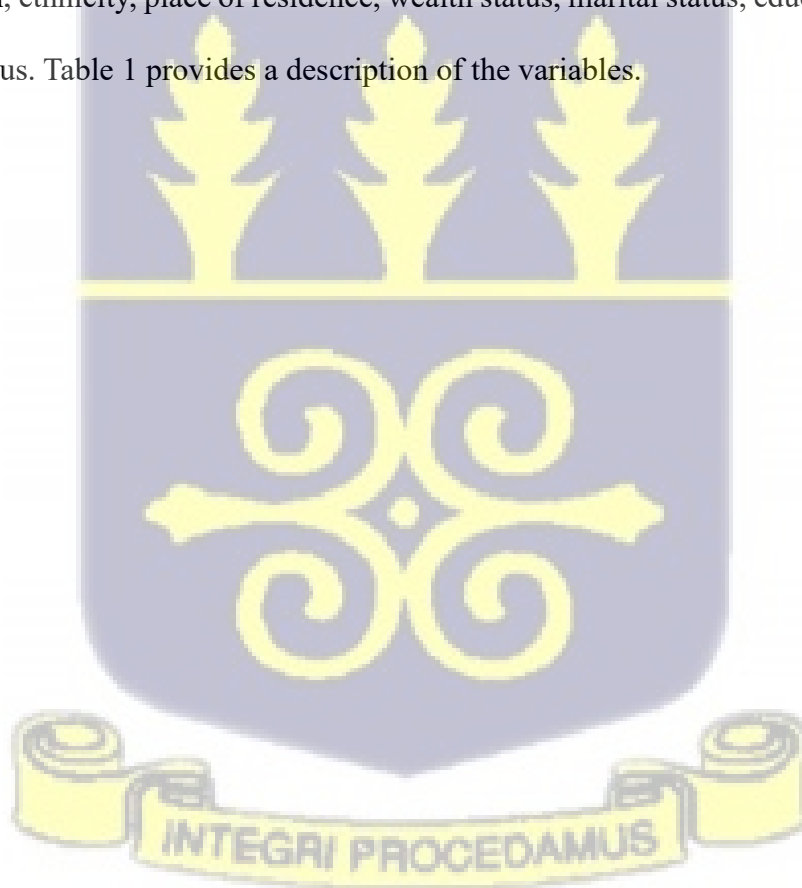


Table.1: Socio-demographic variables explained

| Name of variable   | Type of variable | Definition                                                                                 |
|--------------------|------------------|--------------------------------------------------------------------------------------------|
| Sex                | Categorical      | 0 = Female<br>1 = Male                                                                     |
| Age groups         | Categorical      | 0 = 50 years and above<br>1 = 18-34 years<br>2 = 35-49                                     |
| Religion           | Categorical      | 0 = Christian<br>1 = Islam<br>2 = Others<br>3 = None                                       |
| Ethnicity          | Categorical      | 0 = Akans<br>1 = Ewe<br>2 = Ga adangme<br>3 = Mande-busanga<br>4 = Other northern dialects |
| Place of residence | Categorical      | 0 = Rural<br>1 = Urban                                                                     |
| Wealth status      | Categorical      | 0 = Poor<br>1 = Middle<br>2 = Rich                                                         |
| Marital status     | Categorical      | 0 = Never married<br>1 = Married<br>2 = Formerly married                                   |
| Educational status | Categorical      | 0 = No education<br>1 = Primary<br>2 = Secondary<br>3 = Tertiary                           |
| Employment status  | Categorical      | 0 = Unemployed<br>1 = Employed                                                             |

Source: Author's construct, 2024

#### 3.4.3.3 Risk factors

The risk factors are categorized into behavioural risk factors and perceived risk factors. Whilst the behavioural risk factors were used in the quantitative analysis, the perceived risk factors were teased out of the focus group discussions. They are explained below.

#### *3.4.3.3.1 Alcohol Use*

In line with questions asked in the SAGE Wave 2 survey, persons having consumed alcohol in the last 30 days and responded ‘yes’ were considered to use alcohol and grouped under category 1. Respondents who answered ‘no’ to consuming alcohol were grouped under category 0 representing those adhering to the recommended alcohol use.

#### *3.4.3.3.2 Diet*

This was defined in line with consuming fruits and vegetables. Questions on fruits and vegetables consumed daily were asked. The diet variable was created in line with WHO’s (2021) recommendation of consuming at least 5 fruits and/or vegetable servings daily. Respondents who reported having 5 or more fruits and/or vegetable servings were grouped into the category 1 representing recommended diet. On the other hand, respondents who reported consuming less than 5 fruits and/or vegetable servings were categorized under category 0 representing not recommended.

#### *3.4.3.3.3 Physical Activity*

This variable was computed based on the premise of the SAGE Wave 2 survey. It was based on three (3) categorizations; work-based, leisure-based and transport-based (check and confirm). The questions used in computing this variable are outlined below.

- Work-based: does your work involve vigorous-intensity activity that causes large increases in breathing or heart rate, (like heavy lifting, digging or chopping wood) for at least 10 minutes continuously?

- Leisure-based: do you do any vigorous intensity sports, fitness or recreational (leisure) activities that cause large increases in breathing or heart rate (like running or football). For at least 10 minutes continuously? (Yes or No)
- Transport-based: do you walk or use a bicycle (pedal cycle) for at least 10 minutes continuously to get to and from places? (Yes or No)

Respondents who answered ‘yes’ to all three questions were engaging in physical activity and grouped under category 1 whilst those who responded ‘no’ were grouped under category 0.

#### *3.4.3.3.4 Tobacco use*

In line with the SAGE Wave 2 survey, tobacco use was measured based on the responses garnered from the respondents when asked if they were currently chewing, sniffing or inhaling any tobacco products. Those who responded ‘yes’ were grouped as currently smoking and those who responded no, were grouped under not smoking representing 1 and 0 respectively.

#### *3.4.3.3.5 Spiritual cause*

The spiritual causes were perceptions attributed to ailments which according to the respondents could not be explained with science. An example was having a dream about an ailment and waking up to notice symptoms of such ailments.

#### *3.4.3.3.6 Cultural risk factors*

These were socio-cultural practices including keeping a particular body image to be desirable among the opposite sex. For example, attributing pot belly to wealth status. These cultural risk factors were explored in the focus group discussions.

#### 3.4.4 Quantitative data analysis

The nationally representative quantitative data on Ghana from World Health Organization's Study on Global AGEing and Adult Health (SAGE) Wave 2 was used. This cross-sectional data was collected in China, Ghana, India, Mexico, South Africa, and the Russian Federation in 2014 and 2015 using the multistage cluster sampling strategies.

As done in previous waves, SAGE collected data from two target populations, persons aged 18-49 years and a larger sample of persons aged 50 years and above. This was primarily done for easier comparison whilst addressing relationships between health determinants, well-being, and health related outcomes. In total 4735 persons were interviewed. This was derived from 250 primary sample units and 20 strata (Britwum et al., 2015). Survey instruments comprised of 5 main parts including a household questionnaire, individual questionnaire, proxy questionnaire, verbal autopsy questionnaire and appendices with showcards. The unit of analysis in this study is the individual.

The quantitative data was used to answer the first two research questions. For the first objective, the analysis was stratified by sex to identify gender-specific variations in the socio-demographic predictors of hypertension, diabetes and mental health disorders. In identifying the adherence to recommended lifestyle practices for hypertension in the second objective, a column chi-square cross tabulation analysis was done. This method was employed to evaluate the differences in proportions across the identified categories in one variable, in this case checked hypertension status. The checked hypertension status was sub-categorized into four groups. To evaluate adherence to recommended lifestyle practices including diet, alcohol use, tobacco use and physical activity, t-tests analysis was employed to compare two independent groups, in this case

adherent and non-adherent within each of the four checked hypertension status sub-groups to identify any significant association of adherence to the recommended lifestyle choices. A multinomial regression was employed to model the relationship between the checked hypertension status (with a multi-category outcome) and socio-demographic characteristics and adherence to lifestyle choices. This approach was employed because the outcome variable had more than two categories. In testing for adherence to lifestyle choices, it was important to use this method to ascertain the likelihood of persons adhering to recommended lifestyle choices falling under each of the checked hypertension statuses.

*3.4.4.1 Objective 1: Gender-specific variations of socio-demographic determinants of hypertension, diabetes, and mental health disorders*

In achieving this objective, the background characteristics of the study respondents were stratified by sex showing the percentages of males and females for each of the socio-demographic characteristics of interest. The stratification was essential in running analysis separately for males and females. The aim of the multivariate analysis was to identify the gender-specific socio-demographic variables predicting hypertension, diabetes and mental health disorders. In testing for the relationship between the socio-demographic characteristics and the occurrence of hypertension, diabetes and mental disorders, logit regressions were employed for each disease because each outcome variable had only two possibilities, the presence or the absence of the disease. The results were analyzed based on the co-efficient (positive or negative), the p-values with 95% and 99% confidence levels and standard errors.

*3.4.4.2 Objective2: Adherence to recommended lifestyle choices associated with hypertension*

For objective 2, the reported hypertension status presented in objective 1 was built on. The averages of the systolic and diastolic blood pressure readings were taken for respondents who reported 'yes' to being diagnosed with hypertension and those who reported 'no'. Based on the recommended blood pressure readings of the WHO of 140/90mmHg, four hypertension statuses were derived using the column chi square test approach. This method, as explained above, was employed to evaluate the differences in proportions across the identified categories in one variable, in this case checked hypertension status. The sub-categories for checked hypertension status were hypertension (controlled), hypertension (uncontrolled), hypertension (unaware) and hypertension (true). These categories are explained in section 3.4.3.1.1.

Using the systolic blood pressure readings, a bivariate t-test analysis was done to ascertain the statistical differences between respondents adhering to recommended lifestyle choices (alcohol use, tobacco use, diet and physical activity) and respondents who were not adhering to these recommended lifestyle choices. The t-test approach was employed to test if there were any significant differences between persons who were adhering to and persons who were not adhering to the lifestyle choices. A p-value less than 0.05 (95% confidence level) indicated a significant relationship of adherence.

A multinomial regression was done due to having four categories of hypertension status to assess adherence to levels. Employing this approach made it possible to assess how socio-demographic characteristics could influence the likelihood of being in one of the four groups. It was relevant in understanding the relative risk of falling under each checked hypertension category

based on the predictors. This approach offered a nuanced understanding of the possible factors associated with the checked hypertension statuses.

An intersectionality approach was employed to understand the how persons with multiple social identities, in this case, sex and wealth status, interact with hypertension. This was relevant for this study because sex and wealth status are associated with health disparities where males and females engage in risky health behaviours differently and wealth could impact the ability of a person to adhere to the recommended lifestyle choices associated with hypertension. It was also relevant in identifying at-risk vulnerable populations who face multifaceted disadvantages based on their wealth status and gender. It served as a basis for making targeted policy recommendations to address the specific needs of the vulnerable groups to improve health outcomes.

#### *3.4.5 Qualitative study design*

For in-depth knowledge into the perceptions of the target audience about the risk factors associated with diabetes, hypertension, and mental health disorders, focus group discussions were carried out. These were done in the Adentan Municipal Areas which represents a rapidly urbanizing area within the Greater Accra region with diverse socio-economic backgrounds with a rising burden of NCDs. By way of community entry, a reconnaissance study was first done by driving through and making observations. A courtesy call was then made to the office of the Municipal Health Director to formally inform him of the research and the intent of the investigator to conduct focus group discussions in the Municipality. The Municipality requested a letter to inform them of the intended research clearly stating their level of involvement. Due to the topic under discussion, the purposive sampling technique was used. In this case, respondents chosen to participate in the FGDs needed to have general knowledge about NCDs. Over the years, FGDs have been gaining

popularity in health research because a lot of health-related conditions exist within a particular social context and are influenced by social environments (Wong, 2008). Using this approach puts into perspective the experiences of the public and their perceptions or understanding of diseases. Using FGDs in health research also helps in unveiling themes which are not well known or understood by the investigator (Bender & Ewbank, 1994). This includes local beliefs held by people. According to the same authors, FGDs can also be used to find out more information on the opinions of people on well-known topics.

In selecting candidates, the Municipal Health Directorate put out a communique informing community members of an upcoming discussion on diabetes, hypertension, and mental health disorders. Members were encouraged to attend to voice their opinions about these diseases. A contact number was indicated in the communique and interested members were asked to sign up to be part of the discussion. In exchange for their time and effort, refreshments were provided.

Using the FGD approach, participants were selected from the four zonal councils in the Adentan Municipal Assembly in Accra, Ghana. Participants from these zonal councils namely Nii Ashaley, Sutsuna, Gbentaana and Koose were selected using the purposive sampling technique. The Adentan Municipal Assembly was chosen due to its demographic diversity, its population, accessibility and the capacity of its local health governance. Records from the 2021 Population and Housing Census classify Adentan as an urban settlement with approximately 237,546 residents. Despite Adentan being fully urban, their demographic profile is diverse, capturing substantial young and working-age groups which allows for a comprehensive analysis stratified by age. The Municipal Health Directorate in Adentan Municipal Assembly is also well equipped to provide support for recruiting participants for the FGDs due to its continuous involvement and support for students and civil society organizations conducting research within the Municipality.

Six FGDs were conducted with the groups divided by age and sex for seamless discussions. The categorizations captured different age groups with different life experiences and perspectives which shaped the perceptions of NCDs to provide a nuanced understanding of how age influences health behaviours. The groups were divided into young adult females (18-34 years), middle-aged females (35-49 years), older females (50 years and above), young adult males (18-34 years), middle-aged males (35-49 years) and older males (50 years and above). These categorizations were made on the assumptions that the lived experiences and perceptions of risk factors of males and females are different whilst age groups are different. This is in line with the ideals of Field et al. (1990) where they assert that different age groups have different perceptions on risk factors, threats and barriers to health in alignment with the Health Belief Model. Each FGD had six (6) participants, who gave verbal informed consent after the purpose of the study had been read out to them. The demographic data of participants is indicated in table 12. The interviews were conducted in English and Twi.

#### *3.4.5.1 Qualitative data analysis*

Qualitative data collected was analyzed using the Atlas.ti 7 software. The thematic network analysis approach was adapted from Braun & Clarke (2006). The analysis began on the field by observing the body language of participants. After the data was collected, the first stage of analysis included listening to all the audio tapes of the FGDs and transcribing them. The transcripts were then read twice prior to the first round of coding. During this stage, both the deductive and inductive coding procedures were used for both exploratory purposes and to validate theories including the Biopsychosocial Model and Health Belief Model adopted for this study. Further analysis was done by grouping the different codes into basic themes, sub-themes, organizing themes and global themes keeping in mind the inter-relationships between quotes and themes.

The areas of focus during the FGDs included participants talking about their perceptions on the causes of hypertension, diabetes and mental health disorders as well as their perceptions on preferred treatment options. The discussion points are shown in Annex 1. Some of the discussion points are listed below.

- General knowledge on hypertension, diabetes and mental health disorders (awareness of the diseases and what they are)
- Risk factors associated with these diseases (metabolic risk factors)
- Perceived lifestyle and modifiable risk factors associated with these diseases
- Treatment options available and perceived best methods
- Community support for persons who have hypertension, diabetes, and mental health disorders

The findings made from the quantitative analysis showed significant statistical associations between socio-demographic characteristics and hypertension, diabetes and mental disorders. However, these findings do not explain why these patterns exist and the behavioural idiosyncrasies behind them. Using the quantitative analysis as a standalone approach does not explain why females reported having more NCDs or why wealth influenced disease awareness for males and females differently. The qualitative findings complemented these gaps. They identify how females engage more with health services thereby creating stronger social support systems juxtaposed to males reporting lower cases due to socio-cultural norms of being masculine. These insights together offer a comprehensive understanding of quantitative trends and psychosocial factors highlighting the importance of using a mixed methods approach.

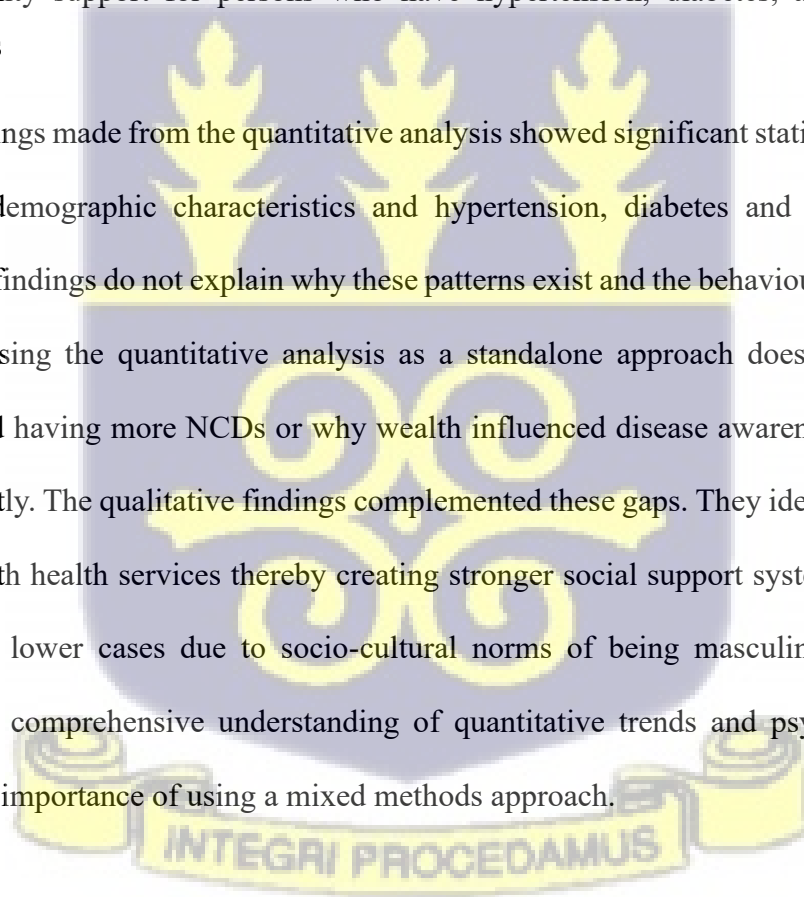
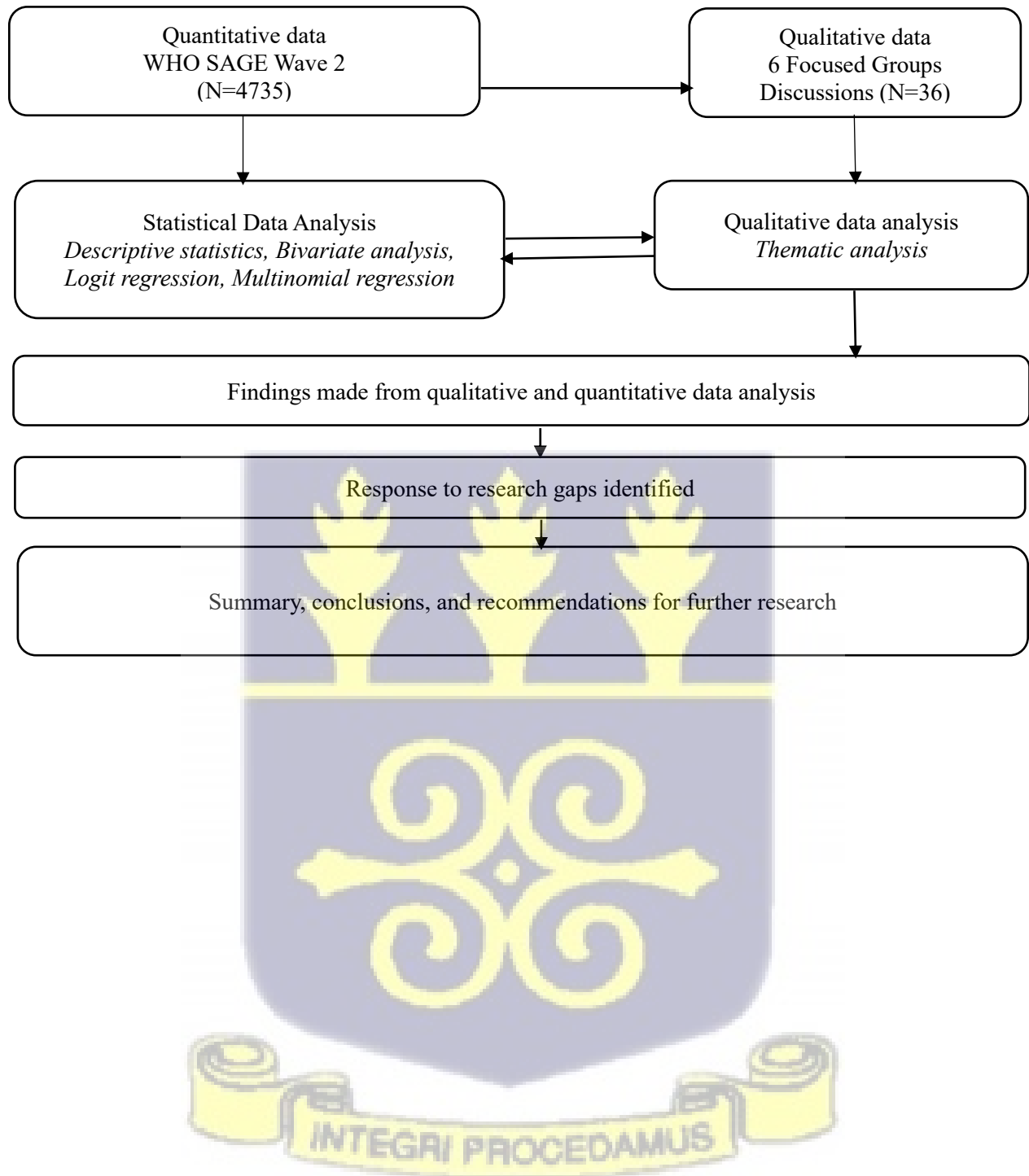


Figure 6: Simplified data analysis of study



### 3.5 Limitations of study

A notable limitation of this study was using the WHO SAGE Wave 2 Data from 2014, ten years back. Although data has been collected for Wave 3, it's not yet available for public use. In this dataset also, measures for hypertension, diabetes and mental health disorders were based on self-reports. The accuracy of self-reports has been brought to question where Yu (2010) argues that sometimes the recollections of people are tied to the outcome they desire. Short et al., (2009) on the other hand, identified in their study that self-reports did not deviate so much from the actual. Measures for tobacco use and alcohol use were based on a simple yes or no answer which doesn't allow for the identification of more nuanced differences.

Whilst objective one presented findings for hypertension, diabetes and mental health disorders, objective two focused on only hypertension. This was due to the inability to acquire glucose readings to do a multinomial analysis on diabetes. Such an analysis would have provided better insights into the prevalence of diabetes and the adherence levels of the different socio-demographic groups to the recommended lifestyle choices associated with the disease.

A hypertension diagnosis is often based on several blood pressure readings taking at several intervals on different days. Using the average of three blood pressure readings taken in one day as a proxy for hypertension is a limitation. Berg (2023) identified how blood pressure readings could go wrong due to patient factors including fear, eating, engaging in physical activity or using tobacco prior to the reading being taken. Other factors include inaccuracies in the procedure, inaccuracies in the equipment used and no rest times given in between readings.

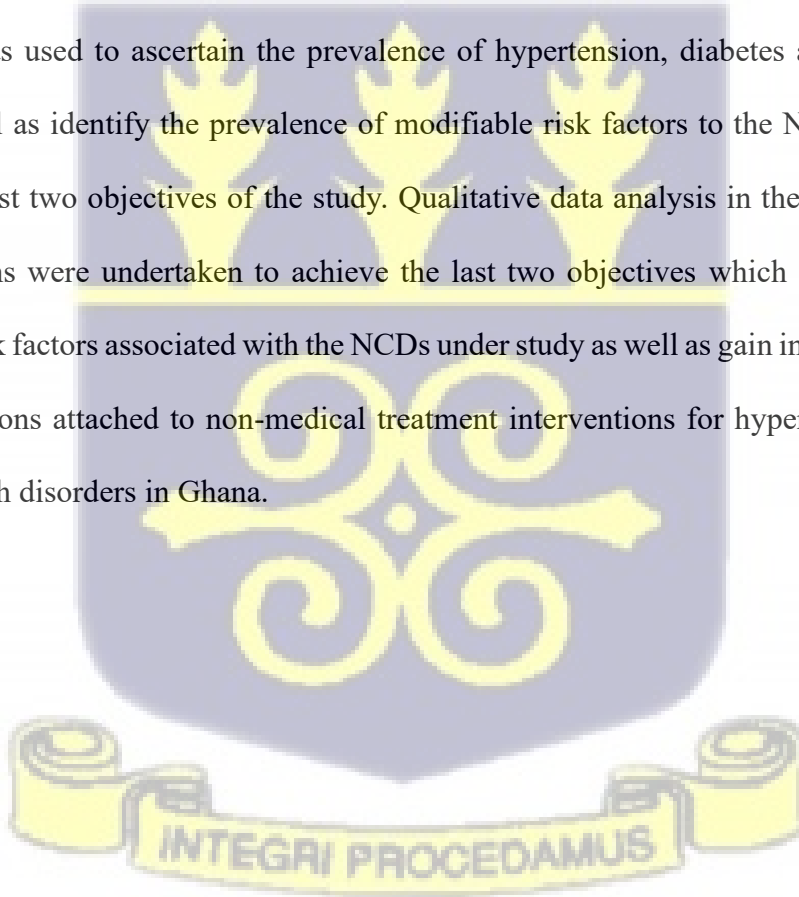
Although there may be the existence of co-morbidity among hypertension, diabetes and mental health disorders, this relationship was not explored.

### 3.6 Ethical Clearance

According to the guidelines of the University of Ghana, ethical clearance had to be sought to be able to carry out this research. The application was sent to the Ethical Committee for Humanities (ECH) of the University of Ghana. The certified protocol number assigned was ECH 209/22-23 after fulfilling all requirements to ensure confidentiality. The ethical clearance for this research was valid till July 12, 2024, as shown in Annex 2.

### 3.7 Conclusion

This chapter highlighted the research methods used in this study. Generally, quantitative data analysis was used to ascertain the prevalence of hypertension, diabetes and mental health disorders as well as identify the prevalence of modifiable risk factors to the NCDs under study. These are the first two objectives of the study. Qualitative data analysis in the forms of focused group discussions were undertaken to achieve the last two objectives which seek to assess the perception of risk factors associated with the NCDs under study as well as gain in-depth knowledge into the perceptions attached to non-medical treatment interventions for hypertension, diabetes, and mental health disorders in Ghana.



## **CHAPTER FOUR: GENDER-SPECIFIC VARIATIONS OF SOCIO-DEMOGRAPHIC DETERMINANTS OF HYPERTENSION, DIABETES, AND MENTAL HEALTH DISORDERS**

### **4.1 Introduction**

This chapter presents quantitative findings on the socio-demographic predictors of hypertension, diabetes and mental health disorders for males and females separately. This is necessary because males and females experience different exposure influenced by the roles they play in society, socio-economic opportunities and cultural expectations. The gender-specific analysis is also necessary to aid in highlighting inequalities to diagnosis and access to healthcare. The SAGE Wave 2 dataset is used in the analysis to help in addressing the first objective of the study. It begins by analyzing the socio-demographic characteristics of the study population as a baseline. The chapter delves into dissecting self-reported diagnosis of hypertension, diabetes and mental disorders as well as assessing gender differences in the socio-demographic predictors of these diseases. The data is analyzed through bivariate and multivariate analysis. The chapter concludes with a discussion of the main findings.

### **4.2 Socio-demographic characteristics of the study population**

Giving an in-depth description of the population under study helps in gaining more insight into the sample population across the different variables. Historically, descriptive statistics are known to help in providing a summary and describing relationships existing between the variables under study in a population (Kaur et al., 2018).

Table 2 gives insights into the descriptive statistics of the study population whilst highlighting the statistics for male and female separately. The total sample size for this study was 4,735 adults with 41% being males and the rest, females. One important characteristic of the WHO

SAGE Wave II data is the fact that the population aged 50 years and above were oversampled. This is depicted here where almost 76% of the sample population was aged 50 years and above with an almost equal distribution between males and females. Whilst those who were married were in the majority representing more than half of the sample population, a staggering 74% of males were married. It is worth noting that about 47% of those who were formerly married were females with the male counterparts representing about 15%. Generally, about a third of the sample population were unemployed with more females being unemployed compared to males. The rural-urban divide was slightly to the advantage of rural dwellers with 58.5% residing in rural areas. Considering Ghana is predominantly made up of Christians, it was no surprise to record over 70% of the sample population as Christians, followed by the Islam religion, others and none. There was an almost equal distribution of the population across the wealth tripartite for the general sample population and between males and females. Almost 50% of the females had no education compared to 34.8% of males who had up to secondary education. Akans represented almost half of the sample population with other Northern dialects being the least represented.

Table 2: Socio-Demographic Characteristics of Study Population Categorized by Gender

| <b>Socio-demographic characteristic</b> | <b>Total (%)</b><br><i>N</i> = 4735 | <b>Male (%)</b><br><i>N</i> = 1948 | <b>Female (%)</b><br><i>N</i> = 2787 |
|-----------------------------------------|-------------------------------------|------------------------------------|--------------------------------------|
| <b>Sex</b>                              |                                     |                                    |                                      |
| <i>Male</i>                             | 41.2                                | -                                  | -                                    |
| <i>Female</i>                           | 58.8                                | -                                  | -                                    |
| <b>Age Groups</b>                       |                                     |                                    |                                      |
| <i>18-34</i>                            | 11.5                                | 11.3                               | 11.6                                 |
| <i>35-49</i>                            | 13.0                                | 13.2                               | 12.9                                 |
| <i>50&amp; above</i>                    | 75.5                                | 75.5                               | 75.5                                 |
| <b>Marital Status</b>                   |                                     |                                    |                                      |
| <i>Never married</i>                    | 9.3                                 | 10.7                               | 8.3                                  |
| <i>Married</i>                          | 56.8                                | 74.0                               | 44.8                                 |
| <i>Formerly married</i>                 | 33.9                                | 15.3                               | 46.9                                 |
| <b>Employment Status</b>                |                                     |                                    |                                      |

| <b>Socio-demographic characteristic</b> | <b>Total (%)</b><br><i>N</i> = 4735 | <b>Male (%)</b><br><i>N</i> = 1948 | <b>Female (%)</b><br><i>N</i> = 2787 |
|-----------------------------------------|-------------------------------------|------------------------------------|--------------------------------------|
| <i>Employed</i>                         | 69.1                                | 70.8                               | 67.7                                 |
| <i>Unemployed</i>                       | 30.9                                | 29.2                               | 32.3                                 |
| <b>Place of Residence</b>               |                                     |                                    |                                      |
| <i>Rural</i>                            | 58.5                                | 64.5                               | 54.4                                 |
| <i>Urban</i>                            | 41.5                                | 35.5                               | 45.6                                 |
| <b>Religion</b>                         |                                     |                                    |                                      |
| <i>Christianity</i>                     | 73.2                                | 66.4                               | 77.8                                 |
| <i>Islam</i>                            | 18.7                                | 22.2                               | 16.4                                 |
| <i>Others</i>                           | 5.4                                 | 7.6                                | 3.6                                  |
| <i>None</i>                             | 2.7                                 | 3.8                                | 2.2                                  |
| <b>Wealth Status</b>                    |                                     |                                    |                                      |
| <i>Poor</i>                             | 32.8                                | 36.7                               | 30.1                                 |
| <i>Middle</i>                           | 31.6                                | 30.6                               | 32.3                                 |
| <i>Rich</i>                             | 35.6                                | 32.7                               | 37.6                                 |
| <b>Educational Status</b>               |                                     |                                    |                                      |
| <i>None</i>                             | 42.1                                | 33.1                               | 48.6                                 |
| <i>Primary</i>                          | 28.6                                | 26.8                               | 29.8                                 |
| <i>Secondary</i>                        | 26.1                                | 34.8                               | 19.8                                 |
| <i>Tertiary</i>                         | 3.2                                 | 5.3                                | 1.8                                  |
| <b>Ethnicity</b>                        |                                     |                                    |                                      |
| <i>Akan</i>                             | 48.6                                | 43.6                               | 52.2                                 |
| <i>Ewe</i>                              | 5.9                                 | 5.5                                | 6.2                                  |
| <i>Ga-adangme</i>                       | 12.4                                | 11.4                               | 13.1                                 |
| <i>Mande-busanga</i>                    | 24.7                                | 30.1                               | 20.9                                 |
| <i>Other northern dialects</i>          | 8.4                                 | 9.4                                | 7.6                                  |

Source: Derived from WHO SAGE Wave Data 2014

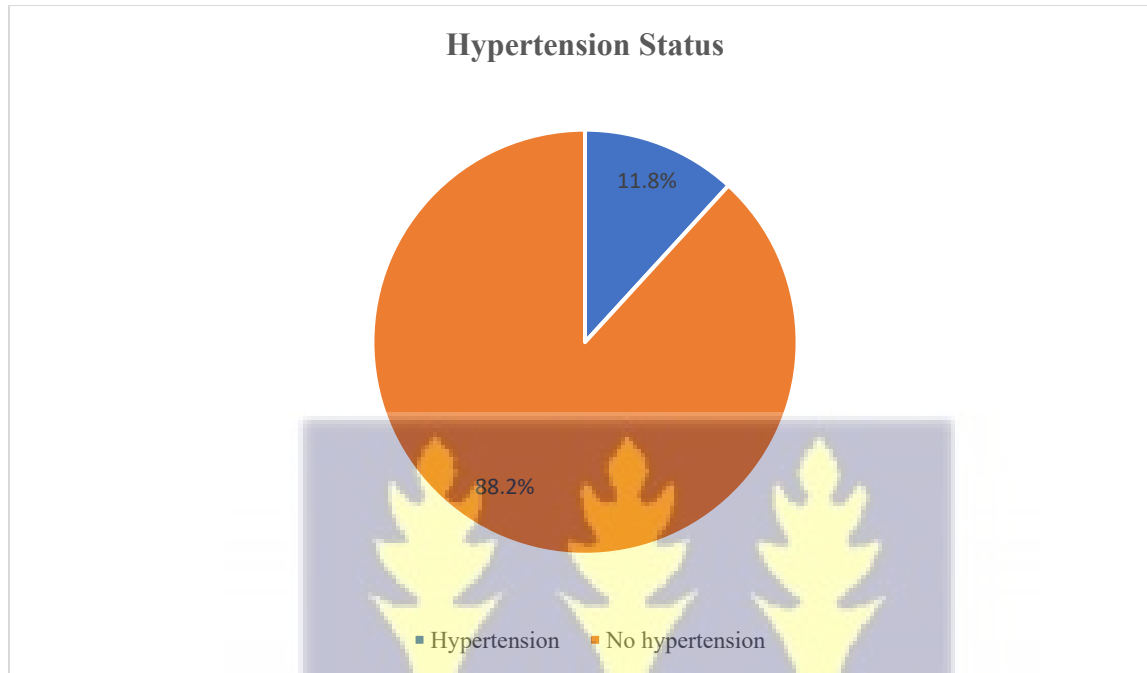
### 4.3 Hypertension Status

#### 4.3.1 Reported hypertension status

Gaining an insight into the hypertension status of the study population helps in better contextualizing the at-risk populations which is an important first step in identifying targeted public health interventions to better manage these populations. It also helps in revealing potential health disparities which are essential for public health interventions. The hypertension status

reported for the study population shown in figure7 indicated that about 12% of the study population reported as being diagnosed with hypertension.

Figure 7: Reported hypertension status of the study population

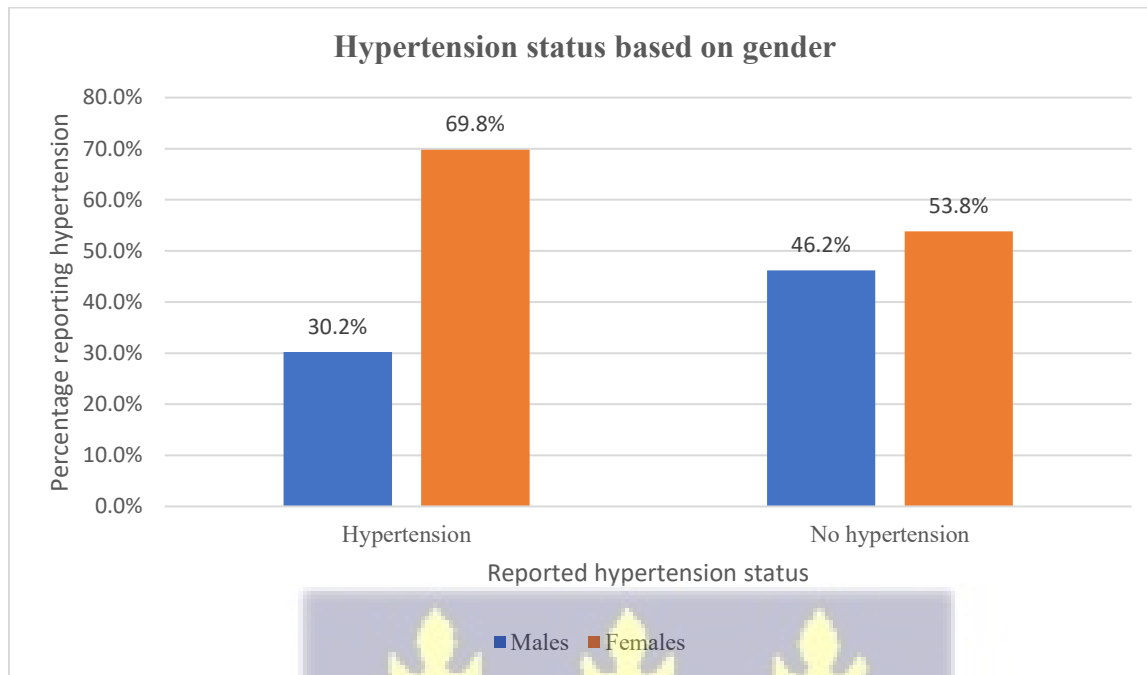


Source: Derived from WHO SAGE Wave Data 2014

#### 4.3.2 Reported hypertension status based on gender

Under the biopsychosocial model, Engel explains the importance of the interplay of biological, psychological and social components influencing health behaviour and health promotion. There are marked biological differences for males and females when it comes to developing and treating hypertension. For example, hormonal differences in males and females may influence the risk of hypertension. Other physical and psychological factors including health behaviours may also vary, which is why identifying the incidence of hypertension based on gender is critical.

Figure 8: Reported hypertension status based on gender



Source: Derived from WHO SAGE Wave Data 2014

From a first glance, females diagnosed with hypertension are higher than their male counterparts. Studies including that done by Gillis & Sullivan (2016), indicated men having a higher incidence of hypertension than females. Other studies including that done by Reckelhoff & Fortepiani (2004) indicate how although the incidence of hypertension among males is higher, this incidence is higher for females after menopause. The results from this analysis are in line with the findings of Reckelhoff & Fortepiani (2004), keeping in mind that the population aged 50 years and above were oversampled in the dataset being used for this analysis.

#### 4.3.3 Gender disparities in socio-demographic predictors of hypertension

Highlighting the predictors of hypertension based on gender disparities provides not only a better understanding of the disease but also aids in identifying specific risk factors for males and females. Table 3 shows the different socio-demographic characteristics predicting hypertension for

males and females. Per the data, females aged 18-34 years are less likely to have hypertension compared to females aged 50 years and above. Males aged 35-49 years are less likely to have hypertension compared to the reference category of 50 years and above. Several authors including Gillis & Sullivan (2016); Santosa et al., (2020); Wu et al. (2023) have confirmed that males are generally more likely to have hypertension compared to females. However, this study aligns with the findings of Reckelhoff & Fortepiani (2004) who suggest that females after menopause are more likely to have hypertension due to a myriad of hormonal changes, stress, among other factors. Given that the population aged 50 years and above were oversampled, it is reflected in the data where males aged are less likely to have hypertension compared to females.

Age, for the total sample, is a predictor of hypertension in this study in alignment with Cheng et al., (2022) and Vishram-Nielsen et al. (2021). Hypertension in young adults and middle-aged people over the past few years has been a major public health concern. This notwithstanding, those aged 18-34 years, and 35-49 years are generally less likely to have hypertension. Again, females aged 18-34 years are less likely to have hypertension compared to those aged 50 years and above. On the other hand, males aged 35-49 years are less likely to have hypertension compared to males aged 50 years and above.

Interestingly, marital status in this study is a predictor of hypertension for the total sample but is not significant when separated into males and females. This could be associated with a study done by Son et al., (2022) where they suggest those who are divorced or had a deceased partner are more likely to have hypertension. In other words, marriage presents protection against the triggers of hypertension for both males and females.

The relationship between employment status and hypertension is significant for the total sample where persons employed are less likely to have hypertension compared to unemployed

persons. This can be associated with this category of people having a more structured routine, social support or having a sense of purpose. There is no significant relationship between employed males and hypertension as well as employed females and hypertension.

Another interesting factor is the place of residence being significantly associated with hypertension. This is argued from the point where urban residents are more exposed to the triggers or risk factors of hypertension including high stress levels, dietary habits with greater access to processed and fast foods, lower access to fresh foods which are often more expensive when available. All these coupled with limited green spaces interspersed with social isolation compound the effect of hypertension. It is therefore not a surprise that urban residents in this study are more likely to have hypertension, which is equally significant for both males and females.

A study done by Mustapha et al. (2022) in Uganda suggests that rural residents with higher wealth index or socio-economic status are more likely to have hypertension. Juxtaposed to the results from this study, it identifies the correlation between wealth status and hypertension where persons who are considered rich in the total sample are more likely to have hypertension. This is again significant for females who are rich. Rich females are more likely to have hypertension compared to poor females. There is no significant relationship between wealth and hypertension status for males.

Whilst there is no significant relationship between females and educational status, the model shows that educated males are more likely to have hypertension compared to males with no education. Authors such as Zacher (2023) in his study shows the negative correlation between educational status and hypertension where less educated persons are more likely to have hypertension. This is in contrast with the findings of this study where persons with higher education are more likely to have hypertension for the total sample and for males. Higher education

is assumed to translate to white-collar jobs with significantly longer sitting periods and little time to engage in physical activity.

Ethnicity also plays a significant role in the discourse on hypertension where females who are Ga-adangme and other northern dialects are more likely to have hypertension compared to Akans. Although there hasn't been a lot of research to investigate this occurrence, a study by Sanuade et al. (2018) shows hypertension awareness as highest amongst the Ga-adangmes. It is worth noting that awareness is not the same as prevalence.

The coefficients in the regression analysis indicates differences in the predictors of hypertension for males and females. Sex, age, educational status, wealth status and place of residence are significant predictors of hypertension in this study. For males, the negative coefficient indicates males being less likely to report hypertension in comparison to females. The coefficients for age also indicate that persons aged 18-34 and 35-49 years are less likely to report hypertension compared with those aged 50 years and above, which is consistent with an increase in the risk of having hypertension as age increases. The coefficients for education status for males highlights how males with tertiary education are more likely to report hypertension due to a possible increase in awareness levels and sedentary lifestyles. On the other hand, educational status is not significant for females. Wealth has a strong positive coefficient which suggests that wealthier females are more likely to report hypertension compared with poorer females. The positive coefficients of urban residence for both males and females echoes lifestyle differences between urban and rural populations. Generally, the coefficients emphasize gender disparities in hypertension status, highlighting variances in diagnosis and awareness apart from differences in the biology reflecting the biopsychosocial model.

Table 3: Gender disparities in socio-demographic predictors of hypertension

| <b>Socio-demographic Characteristics</b>             | <b>Total Sample Coefficient (SE)</b><br><i>N=3190</i> | <b>Male Coef. (SE)</b><br><i>N= 1412</i> | <b>Female Coef. (SE)</b><br><i>N= 1778</i> |
|------------------------------------------------------|-------------------------------------------------------|------------------------------------------|--------------------------------------------|
| <b><i>Sex (Ref: Females)</i></b>                     |                                                       |                                          |                                            |
| <i>Males</i>                                         | -0.77*** (0.16)                                       | -                                        | -                                          |
| <b><i>Age Groups (Ref: 50+)</i></b>                  |                                                       |                                          |                                            |
| <i>18-34</i>                                         | -1.94*** (0.44)                                       | -                                        | -1.70*** (0.45)                            |
| <i>35-49</i>                                         | -0.58*** (0.21)                                       | -0.95** (0.45)                           | -0.41 (0.24)                               |
| <b><i>Marital Status (Ref: Never married)</i></b>    |                                                       |                                          |                                            |
| <i>Married</i>                                       | 0.84** (0.43)                                         | 0.03 (0.29)                              | 0.59 (0.44)                                |
| <i>Formerly married</i>                              | 0.89** (0.42)                                         | -                                        | 0.75 (0.43)                                |
| <b><i>Employment Status (Ref: Unemployed)</i></b>    |                                                       |                                          |                                            |
| <i>Employed</i>                                      | -0.45*** (0.13)                                       | -0.72 (0.23)                             | -0.31 (0.16)                               |
| <b><i>Place of Residence (Ref: Rural)</i></b>        |                                                       |                                          |                                            |
| <i>Urban</i>                                         | 0.74*** (0.14)                                        | 0.86*** (0.25)                           | 0.66*** (0.17)                             |
| <b><i>Religion (Ref: Christian)</i></b>              |                                                       |                                          |                                            |
| <i>Islam</i>                                         | 0.46 (0.37)                                           | 0.66 (0.58)                              | 0.42 (0.48)                                |
| <i>Others</i>                                        | -0.04 (0.23)                                          | 0.38 (0.36)                              | -0.23 (0.31)                               |
| <i>None</i>                                          | 0.32 (0.35)                                           | 0.21 (0.58)                              | 0.64 (0.46)                                |
| <b><i>Wealth Status (Ref: Poor)</i></b>              |                                                       |                                          |                                            |
| <i>Middle</i>                                        | 0.28 (0.19)                                           | 0.31 (0.35)                              | 0.23 (0.22)                                |
| <i>Rich</i>                                          | 0.65*** (0.19)                                        | 0.67 (0.35)                              | 0.63*** (0.23)                             |
| <b><i>Educational Status (Ref: No education)</i></b> |                                                       |                                          |                                            |
| <i>Primary</i>                                       | 0.33 (0.17)                                           | 0.88** (0.38)                            | 0.20 (0.19)                                |
| <i>Secondary</i>                                     | 0.62*** (0.18)                                        | 1.31*** (0.48.)                          | 0.040 (0.21)                               |
| <i>Tertiary</i>                                      | 0.77** (0.31)                                         | 1.33*** (0.48)                           | 0.59 (0.47)                                |
| <b><i>Ethnicity (Ref: Akan)</i></b>                  |                                                       |                                          |                                            |
| <i>Ewe</i>                                           | 0.19 (0.23)                                           | 0.17 (0.42)                              | 0.21 (0.27)                                |
| <i>Ga-adangme</i>                                    | 0.46*** (0.18)                                        | 0.46 (0.34)                              | 0.45** (0.21)                              |

| Socio-demographic Characteristics | Total Sample Coefficient (SE)<br>N=3190 | Male Coef. (SE)<br>N= 1412 | Female Coef. (SE)<br>N= 1778 |
|-----------------------------------|-----------------------------------------|----------------------------|------------------------------|
| <i>Mande-busanga</i>              | -0.11 (0.217)                           | 0.15 (0.34)                | -0.29 (0.29)                 |
| <i>Other northern dialects</i>    | 0.51 (0.26)                             | 0.41 (0.48)                | 0.63** (0.31)                |

Source: Derived from WHO SAGE Wave Data 2014

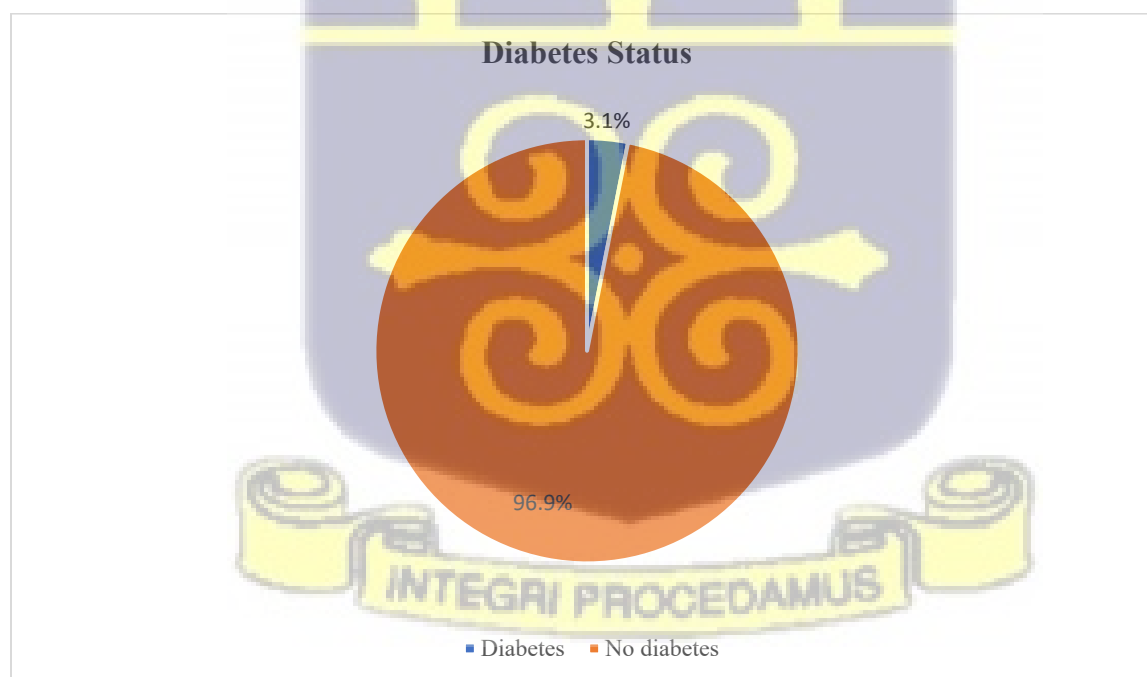
Values represent co-efficients (standard errors) \*\*\* $p < 0.01$ , \*\* $p < 0.05$

#### 4.4 Diabetes Status

##### 4.4.1 Reported diabetes status

Understanding the prevalence of diabetes within the study population helps in assessing how widespread the disease is and in identifying at-risk populations which are all important for targeted interventions. From figure 9, over 95% of the study population reported not being diagnosed with diabetes with the rest reporting as having been diagnosed with the disease.

Figure 9: Reported diabetes status of the study respondents

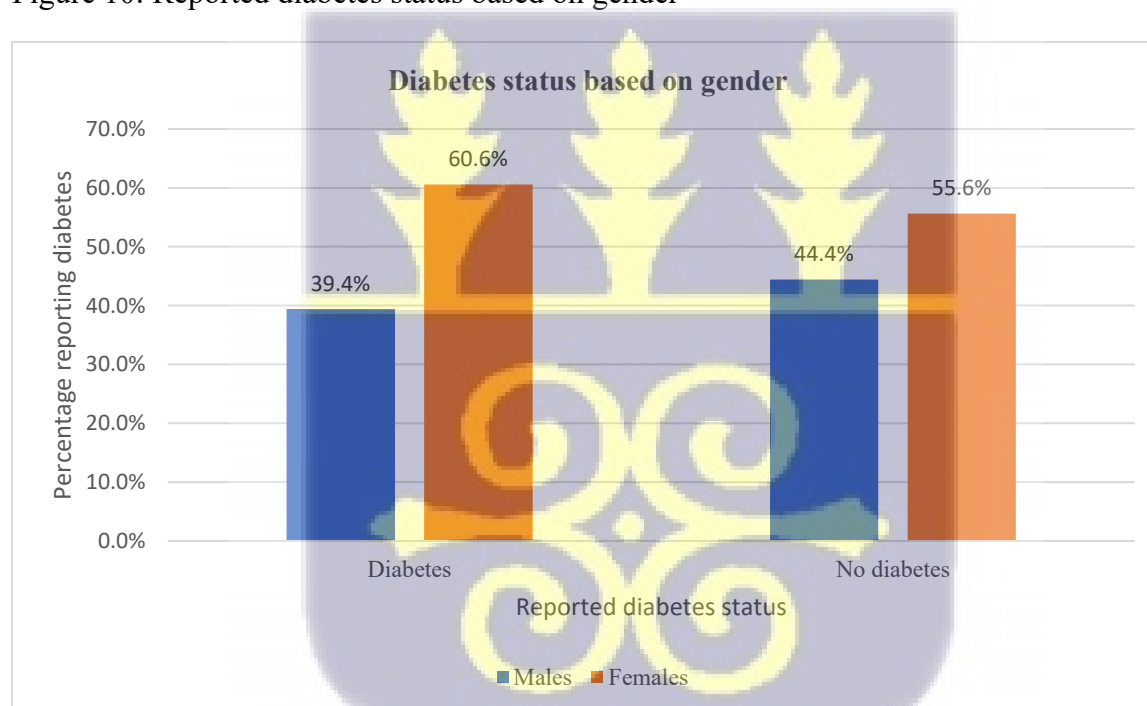


Source: Derived from WHO SAGE Wave Data 2014

#### 4.4.2 Reported diabetes status based on gender

A comparative analysis of gender differences in diabetes is important in informing specific policy interventions for males and females. Figure 10 shows a higher proportion of females, constituting about 60% having diabetes compared to males. This could be attributed to a complex interplay of hormonal changes taking place in various life stages of the female including pregnancy, menstrual cycles, pre-menopause and menopausal stages. Kautzky-Willer et al. (2023) in their study identified how females who developed gestational diabetes were more likely to develop type 2 diabetes later in life.

Figure 10: Reported diabetes status based on gender



Source: Derived from WHO SAGE Wave Data 2014

#### 4.4.3 Gender Disparities in Socio-Demographic Predictors of Diabetes

Table 4 shows gender disparities of socio-demographic predictors of diabetes. Doing this analysis is essential in identifying specific socio-demographic determinants of diabetes for males

and females separately, which is an important step in being able to curate targeted interventions to help curb the incidence of diabetes in public health programmes.

Results from the logit regression indicate age as a significant predictor of diabetes for the total sample where persons aged 35-49 years are less likely to have diabetes. Females within this same age category are also less likely to have diabetes compared to females aged 50 years and above. A study done by Kautzky-Willer et al. (2023) indicated how females within the pre-menopausal stage are less likely to have diabetes because of them having high estrogen levels which improves insulin sensitivity. This ties into the biological component of the biopsychosocial model.

Persons living in urban areas in the total sample are also more likely to have diabetes. There is no significant relationship between place of residence and diabetes for males. On the other hand, females living in urban areas are more likely to have diabetes compared to females living in rural areas. Apart from being exposed to some triggers of diabetes including processed foods and others in the urban areas, females generally have a unique combination of physical, biological and psychological factors including reduced opportunities for physical activity (for work and for leisure), reproductive health and hormonal factors which increases their risks of developing gestational diabetes during pregnancy thus increasing their risk of later developing type 2 diabetes. The other factors include obesity and body image pressure to maintain a certain body weight which is deemed by society as beautiful. These myriads of factors tie into the biopsychosocial model where all three facets are contributing to females in urban areas having a higher risk of developing diabetes.

Having higher education, in this analysis, places persons in the total sample at a higher risk of developing diabetes. Per the results of this analysis, males with higher education are more likely

to develop diabetes compared to males with no education. Having higher education is often associated with white-collar jobs which may mean working sedentary jobs and sitting for long hours with limited physical activity for work. Such persons are also likely to have the capacity and affluence to indulge in frequently eating processed foods late at night and consuming alcohol which places them at a higher risk of developing diabetes. Their busy schedules may also prevent them from routinely visiting the hospital for checkups and may contribute to a late diagnosis of diabetes.

In table 4, the coefficients highlight gender differences in the socio-demographic predictors of self-reported diabetes. Males are less likely to report having diabetes compared to females which may highlight differences in awareness. Again, respondents aged 50 years and above are more likely to report having diabetes compared to those aged 18-34 and 35-49 years. This points to the likelihood of diabetes increasing with age. Although males with higher education are more likely to report having diabetes, education status is not significant for females. The coefficient of wealth also suggests that rich females are more likely to report diabetes compared to poor females. Both males and females resident in the urban areas are also more likely to report diabetes compared to rural residents. Generally, older adults, females, urban dwellers and wealthier females are more likely to report having diabetes.

Table 4: Gender disparities in socio-demographic predictors of diabetes

| Socio-demographic Characteristics | Total Sample Coefficient (SE)<br>N=3190 | Male Coef. (SE)<br>N= 1412 | Female Coef. (SE)<br>N= 1778 |
|-----------------------------------|-----------------------------------------|----------------------------|------------------------------|
| <i>Sex (Ref: Females)</i>         |                                         |                            |                              |
| <i>Males</i>                      | -0.72 (0.30)                            | -                          | -                            |
| <i>Age Groups (Ref: 50+)</i>      |                                         |                            |                              |
| <i>18-34</i>                      | -                                       | -                          | -                            |

| <b>Socio-demographic Characteristics</b>             | <b>Total Sample Coefficient (SE)</b><br><i>N=3190</i> | <b>Male Coef. (SE)</b><br><i>N= 1412</i> | <b>Female Coef. (SE)</b><br><i>N= 1778</i> |
|------------------------------------------------------|-------------------------------------------------------|------------------------------------------|--------------------------------------------|
| <i>35-49</i>                                         | -2.02*** (0.73)                                       | -1.51 (1.04)                             | -2.39** (1.03)                             |
| <b><i>Marital Status (Ref: Never married)</i></b>    |                                                       |                                          |                                            |
| <i>Married</i>                                       | 0.89 (1.05)                                           | -0.51 (1.04)                             | 0.77 (1.08)                                |
| <i>Formerly married</i>                              | 0.84 (1.03)                                           | -                                        | 0.62 (1.05)                                |
| <b><i>Employment Status (Ref: Unemployed)</i></b>    |                                                       |                                          |                                            |
| <i>Employed</i>                                      | -0.37 (0.25)                                          | -0.68 (0.38)                             | -0.14 (0.32)                               |
| <b><i>Place of Residence (Ref: Rural)</i></b>        |                                                       |                                          |                                            |
| <i>Urban</i>                                         | 0.82*** (0.28)                                        | 0.77 (0.42)                              | 0.84** (0.37)                              |
| <b><i>Religion (Ref: Christian)</i></b>              |                                                       |                                          |                                            |
| <i>Islam</i>                                         | -0.04 (0.75)                                          | 0.96 (0.80)                              | -                                          |
| <i>Others</i>                                        | -0.65 (0.52)                                          | -0.11 (0.68)                             | -0.99 (0.84)                               |
| <i>None</i>                                          | -0.24 (0.77)                                          | -0.11 (1.09)                             | 0.08 (1.07)                                |
| <b><i>Wealth Status (Ref: Poor)</i></b>              |                                                       |                                          |                                            |
| <i>Middle</i>                                        | 0.27 (0.37)                                           | 0.43 (0.60)                              | .012 (0.48)                                |
| <i>Rich</i>                                          | 0.41 (0.39)                                           | 0.64 (0.61)                              | 0.26 (0.49)                                |
| <b><i>Educational Status (Ref: No education)</i></b> |                                                       |                                          |                                            |
| <i>Primary</i>                                       | 0.14 (0.36)                                           | 0.77 (0.71)                              | -0.09 (0.42)                               |
| <i>Secondary</i>                                     | 0.72** (0.34)                                         | 1.39** (0.66)                            | 0.43 (0.42)                                |
| <i>Tertiary</i>                                      | 1.12** (0.49)                                         | 1.66** (0.80)                            | 1.09 (0.72)                                |
| <b><i>Ethnicity (Ref: Akan)</i></b>                  |                                                       |                                          |                                            |
| <i>Ewe</i>                                           | 0.00 (0.43)                                           | -0.45 (0.78)                             | 0.29 (0.52)                                |
| <i>Ga-adangme</i>                                    | 0.33 (0.32)                                           | 0.47 (0.50)                              | 0.26 (0.42)                                |
| <i>Mande-busanga</i>                                 | -0.11 (0.21)                                          | 0.13 (0.56)                              | -0.29 (0.69)                               |
| <i>Other northern dialects</i>                       | 0.06 (0.58)                                           | -0.48 (1.13)                             | 0.38 (0.67)                                |

Source: Derived from WHO SAGE Wave Data 2014

Values represent co-efficients (standard errors) \*\*\* $p < 0.01$ , \*\* $p < 0.05$

## 4.5 Mental Health Disorders

### 4.5.1 Reported mental health status

According to the World Health Organization (2004), mental disorders contribute to the global burden on disease. Knowing the mental health status of the study population is therefore vital in identifying the prevailing burden of mental health disorders which helps in addressing the specific challenges associated with specific mental health conditions for different socio-demographic groups. It also helps in highlighting mental well-being as a public health concern to aid in policy intervention.

The mental health disorders relevant to this study are depression, anxiety and suicidal ideation. Study respondents who reported having either one, a combination of or all these conditions are categorized as having a mental health disorder. From figure 11, about 95% of the study respondents reported not having any of these mental health disorders. Almost 5% reported having a mental health disorder.

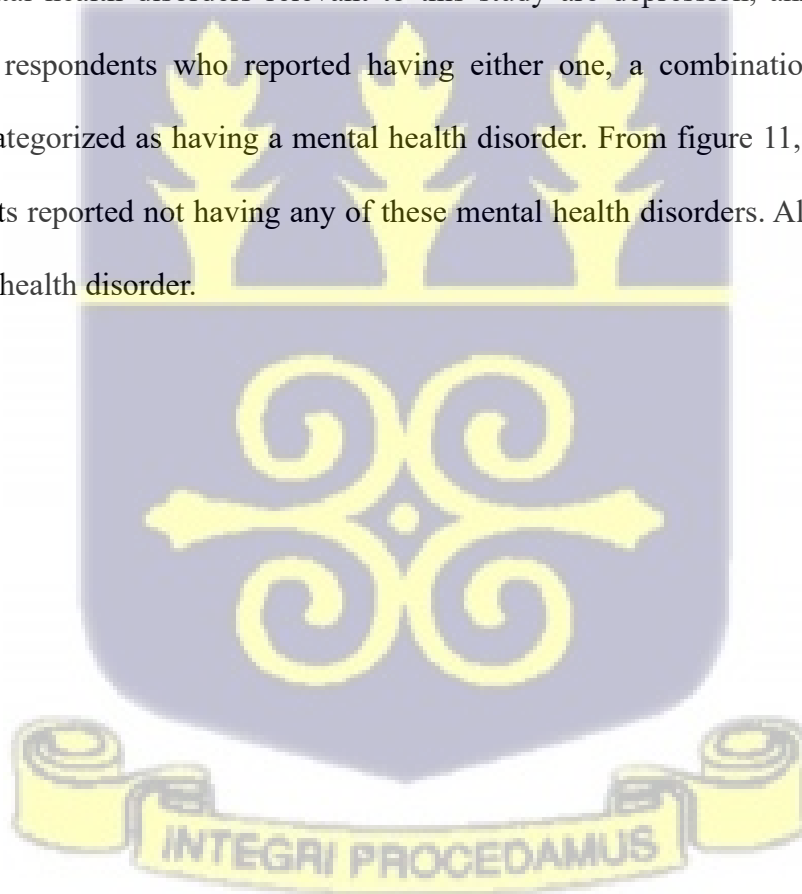
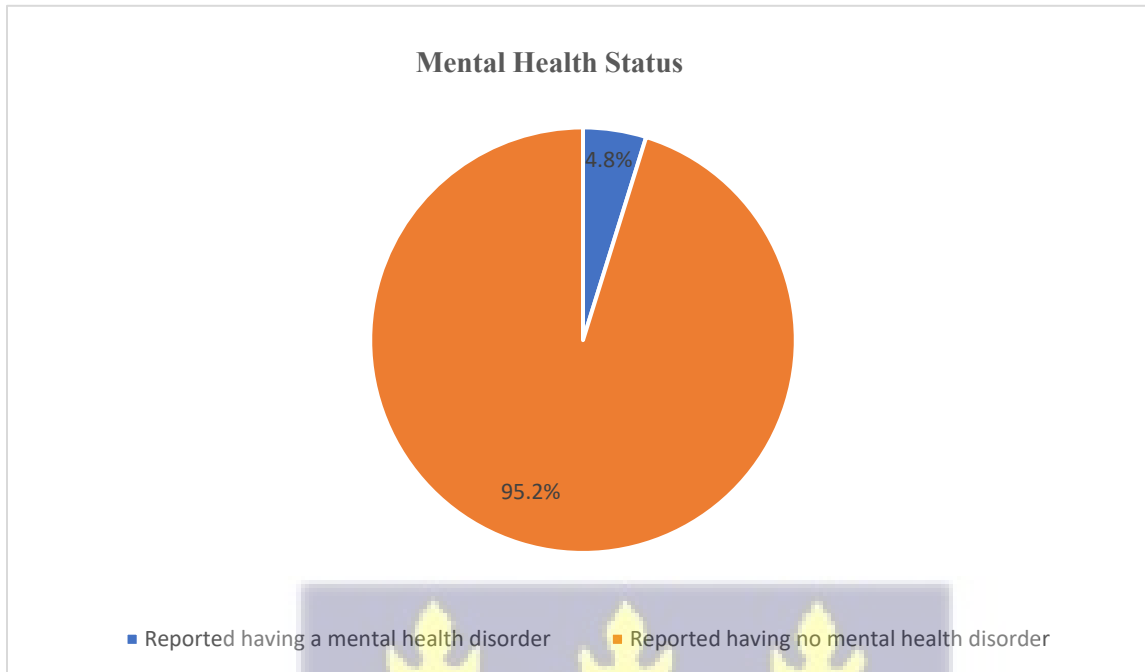


Figure 11: Reported mental health status of the study respondents



Source: Derived from WHO SAGE Wave Data 2014

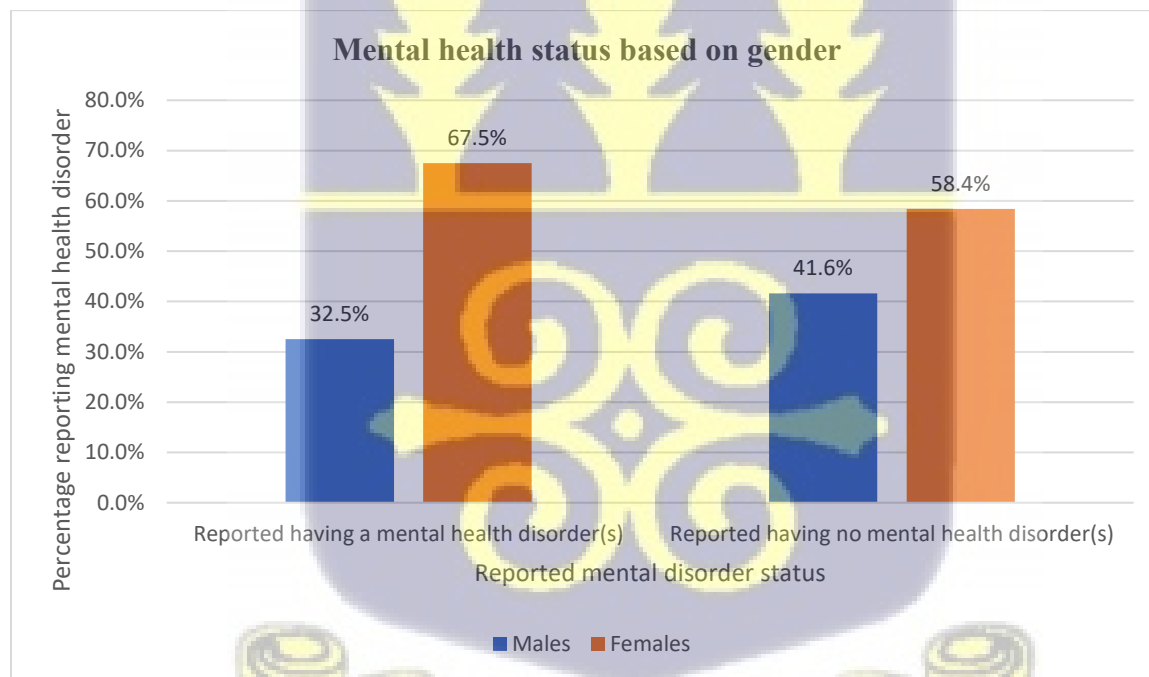
#### 4.5.2 Reported mental health status based on gender

The prevalence of mental health disorders differs among males and females due to a myriad of biological, psychological and social factors. To develop tailor-made interventions for males and females separately, it is important to understand the unique mental disorders faced by each gender. Again, this gendered analysis helps in identifying at-risk populations for a deeper understanding of this complex yet sensitive phenomenon. According to Afifi (2007), not examining gender differences in mental health disorders will not only derail the understanding of the epidemiological differences between males and females but can also have negative consequences for diagnosis and treatment.

Results from this bivariate analysis indicated in figure 12 shows a higher percentage of females reporting having mental disorders in comparison to males. Apart from certain biological

characteristics including hormonal changes which might make females more prone to reporting mental health conditions, other psychosocial stressors including the emotional stress of being the primary caregiver whilst balancing multiple roles, gender-based violence as well as the health-seeking behaviours of females might lead to a higher report of mental health disorders. A gendered analysis done by the World Health Organization (2004) suggest that whilst childhood mental disorders may be prevalent in males, females are more likely to develop mental disorders later in life including depression. The authors go on to explain how females are also more likely to suffer from mental disorders due to their role as primary caregivers where the burden of care rests on their shoulders.

Figure 12: Reported mental health status based on gender



Source: Derived from WHO SAGE Wave Data 2014

#### 4.5.3 Gender disparities in socio-demographic predictors of mental disorders

The multivariate analysis done in this section highlights the significant socio-demographic variables likely to predict reporting of mental health disorders for the total sample as well as for

males and females separately. The results show age, employment status, religion and ethnicity as significant predictors of reported mental disorders in the total sample. For males, religion and ethnicity were significant predictors of reported mental disorders where males practicing Islam and ga-adangme males were more likely to report suffering from mental disorders compared to Christian males and Akan males. For females, employment status and religion were significant variables predicting the report of mental disorders. Employed females were less likely to report suffering from mental disorders. On the other hand, females practicing Islam were more likely to report suffering from mental disorders compared to Christian females.

In table 5, the coefficients show differences in the predictors of self-reported mental disorders including anxiety, depression and suicidal ideation for males and females. Males are less likely to report having a mental health disorder compared to females. This may suggest females being more likely to acknowledge going through emotional distress. Males may under report having a mental health disorder due to limited mental health awareness or social stigma. Younger adults are also more likely to report having a mental disorder compared to older adults, which reflects an inverse relationship between mental disorders and age. Males with higher education are less likely to report having a mental disorder. For females, the coefficient suggests no statistically significant relationship between education and reporting a mental disorder. For both males and females, wealthier respondents and urban residents are also more likely to report having a mental disorder. To summarize, the coefficients suggest that females, younger adults, urban residents and wealthier respondents are more likely to perceive higher susceptibility and to report a mental disorder consistent with the Health Belief Model. On the other hand, males and older adults may internalize distress and are less likely to report a mental disorder due to some cultural norms.

Table 5: Gender disparities in socio-demographic predictors of mental disorders

| <b>Socio-demographic Characteristics</b>             | <b>Total Sample Coefficient (SE)</b><br><i>N=4735</i> | <b>Male Coef. (SE)</b><br><i>N= 1948</i> | <b>Female Coef. (SE)</b><br><i>N= 2787</i> |
|------------------------------------------------------|-------------------------------------------------------|------------------------------------------|--------------------------------------------|
| <b><i>Sex (Ref: Females)</i></b>                     |                                                       |                                          |                                            |
| <i>Males</i>                                         | -0.175 (0.17)                                         | -                                        | -                                          |
| <b><i>Age Groups (Ref: 50+)</i></b>                  |                                                       |                                          |                                            |
| <i>18-34</i>                                         | - 1.17** (0.51)                                       | - 1.63 (0.96)                            | - 1.02 (0.63)                              |
| <i>35-49</i>                                         | -0.32 (0.28)                                          | -1.51 (0.63)                             | 0.03 (0.32)                                |
| <b><i>Marital Status (Ref: Never married)</i></b>    |                                                       |                                          |                                            |
| <i>Married</i>                                       | 0.23 (0.47)                                           | -0.34 (0.80)                             | 0.42 (0.64)                                |
| <i>Formerly married</i>                              | 0.79 (0.46)                                           | - 0.26 (0.84)                            | 1.21 (0.63)                                |
| <b><i>Employment Status (Ref: Unemployed)</i></b>    |                                                       |                                          |                                            |
| <i>Employed</i>                                      | -1.03*** (0.15)                                       | -1.38 (0.27)                             | -0.86*** (0.18)                            |
| <b><i>Place of Residence (Ref: Rural)</i></b>        |                                                       |                                          |                                            |
| <i>Urban</i>                                         | -0.17 (0.17)                                          | - 0.39 (0.31)                            | - 0.14 (0.19)                              |
| <b><i>Religion (Ref: Christian)</i></b>              |                                                       |                                          |                                            |
| <i>Islam</i>                                         | 1.24*** (0.28)                                        | 1.42*** (0.42)                           | 1.29*** (0.38)                             |
| <i>Others</i>                                        | 0.13 (0.28)                                           | 0.71 (0.42)                              | -0.23 (0.38)                               |
| <i>None</i>                                          | -0.09 (0.37)                                          | 0.24 (0.51)                              | -0.30 (0.56)                               |
| <b><i>Wealth Status (Ref: Poor)</i></b>              |                                                       |                                          |                                            |
| <i>Middle</i>                                        | -0.17 (0.19)                                          | 0.14 (0.32)                              | -0.29 (0.23)                               |
| <i>Rich</i>                                          | -0.05 (0.21)                                          | 0.02 (0.38)                              | -0.05 (0.25)                               |
| <b><i>Educational Status (Ref: No education)</i></b> |                                                       |                                          |                                            |
| <i>Primary</i>                                       | 0.05 (0.19)                                           | 0.29 (0.37)                              | -0.08 (0.23)                               |
| <i>Secondary</i>                                     | 0.16 (0.21)                                           | 0.17 (0.38)                              | 0.18 (0.26)                                |
| <i>Tertiary</i>                                      | -0.35 (0.55)                                          | -0.20 (0.81)                             | -0.20 (0.77)                               |
| <b><i>Ethnicity (Ref: Akan)</i></b>                  |                                                       |                                          |                                            |
| <i>Ewe</i>                                           | - 0.72 (0.40)                                         | -0.99 (1.04)                             | -0.69 (0.44)                               |

| Socio-demographic Characteristics | Total Sample Coefficient (SE)<br>N=4735 | Male Coef. (SE)<br>N= 1948 | Female Coef. (SE)<br>N= 2787 |
|-----------------------------------|-----------------------------------------|----------------------------|------------------------------|
| <i>Ga-adangme</i>                 | 0.67*** (0.18)                          | 1.41*** (0.32)             | 0.29 (0.24)                  |
| <i>Mande-busanga</i>              | -0.37 (0.25)                            | -0.17 (0.41)               | -0.46 (0.32)                 |
| <i>Other northern dialects</i>    | -1.08** (0.46)                          | -1.89 (1.09)               | -0.74 (0.51)                 |

Source: Derived from WHO SAGE Wave Data 2014

Values represent co-efficients (standard errors) \*\*\* $p < 0.01$ , \*\* $p < 0.05$

#### 4.6 Discussion and summary of findings

Investigating among the adult population of Ghana gender-specific variations of socio-demographic determinants of hypertension, diabetes, and mental health disorders novel results. For hypertension, about 12% of the study respondents reported being diagnosed with the disease. Out of this, the bivariate analysis suggests about 70% females having hypertension with the rest being males. The high prevalence of hypertension in females is associated with biological, psychological and social factors where older females are more likely to develop hypertension compared to older males. The multivariate analysis which was done for the study respondents altogether and done for males and females highlight that the socio-demographic predictors of hypertension for the total sample include sex, age, marital status, employment status, place of residence, wealth status (rich), educational status (secondary and tertiary) and ethnicity (ga-adangme).

The socio-demographic predictors of hypertension for males only are age, place of residence and educational status where males with higher education are more likely to develop hypertension. This is in line with studies such as Zacher (2023). This occurrence is associated with several factors including having white-collar jobs with little physical activity, having the ability to indulge in the triggers of hypertension including consuming alcohol and processed foods as well

as not going in for regular hospital checkups which might lead to late diagnosis considering hypertension is asymptomatic, presenting late to the hospital. As significant predictors of diabetes, males in urban areas are more likely to develop hypertension while males aged 35-49 are less likely to develop hypertension.

Unlike males, the socio-demographic predictors of hypertension for females are age, place of residence, wealth status (rich) and ethnicity (ga-adangme and other northern dialects). According to the data, females aged 18-34 are less likely to develop hypertension. Similarly, females residing in urban areas are more likely to develop hypertension. Also, rich females are more likely to develop hypertension. This is associated with the ability and affluence to indulge in some of the modifiable risk factors of hypertension including the low consumption of fruits and vegetables, the use of alcohol and tobacco products as well as inadequate physical activity. Whilst there aren't enough studies to suggest why females who are ga-adangme and from other northern dialects are more likely to develop hypertension, a study done by Agyei et al. (2024) suggests that the feeling of being powerless and frustrated as well as coming from a relatively poorer socio-economic background places such groups at the disadvantage of being more likely to develop hypertension.

Univariate analysis on diabetes showed only about 3% of the study respondents reporting being diagnosed with diabetes. A bivariate analysis comparing gender with diabetes prevalence indicated that a higher proportion of females, constituting about 60% of those with diabetes were females with the rest being males. This occurrence is associated with a unique interplay for biological, psychological and social factors including females developing gestational diabetes during pregnancy which puts them at a higher risk of developing type 2 diabetes later in life as purported by Kautzky-Willer et al., (2023), experiencing chronic stress from playing several roles

as the primary caregiver and taking on other family responsibilities as well as trying to fit into society's ideal body image and weight to be deemed beautiful.

The multivariate analysis on diabetes reiterated age as a significant predictor of diabetes, where those aged 35-49 years are less likely to develop diabetes. Age is also a significant predictor of diabetes for females where those aged 35-49 years are less likely to develop diabetes in comparison with females aged 50 years and above. This ties into findings made by Alrashed et al., (2024) where older females are more likely to develop diabetes.

Persons living in urban areas are also more likely to develop diabetes for the total sample. For males, place of residence is not a significant predictor of diabetes. Females living in urban areas, on the other hand, are more likely to develop diabetes compared to females living in rural areas. This is linked to a combination of biopsychosocial factors including but not limited to hormonal changes, increased stress levels, dietary patterns, sedentary lifestyles, accessibility to and use of alcohol and tobacco products which is more acceptable in urban areas than rural areas among others.

Educational status is significantly associated with diabetes where persons with higher education are more likely to develop diabetes for the total sample. The assumption is that such persons are more likely to be engaged in desk jobs where they sit for long hours compared to those with no education who are often engaged in jobs that are physically involving. Apart from this, chronic stress can perpetuate resistance to insulin and low metabolism which tends to increase the risk of developing diabetes. In this same analysis, males with higher education are more likely to develop diabetes compared to males with no education. There is no significant relationship between educational status and females.

Mental health as an essential part of health promotion enriches the discourse on the subject matter. As an integral part of wellbeing, it is interesting to identify that about 5% of the study respondents reported having a mental health disorder which in this analysis means reporting depression, anxiety and/or suicidal ideation. Out of this, the bivariate analysis shows a higher proportion of females reporting a mental health disorder compared to their male counterparts, comprising approximately 70%.

The multivariate analysis done for mental health disorders suggests that age is a significant predictor for reporting mental health disorders where persons aged 18-34 years are less likely to report a mental health disorder. Persons within this age category are assumed to have stronger social support and might not have the same levels of stress compared to older adults. Again, they are more likely to discuss their mental health disorders openly compared to older adults. Age is, however, not a significant predictor of reporting a mental health disorder for males and females.

Among other things, the financial security of being employed contributes to employed persons being less likely to report having a mental disorder in the total sample. This is also true for employed females who are less likely to report having a mental health disorder. Apart from that, other social factors including having social networks from work, the ability to develop their skills and generally having the ability and power to make decisions and take control over their lives places them at less risk of reporting developing a mental health disorder.

In this study, religion is a significant predictor of mental health disorders, with Muslims more likely to report having a mental disorder. This is consistent for both males and females. Although the literature on Islam and mental disorders is limited, there are different possible explanations evident in the existing literature. Using the biopsychological model, religion shapes

how individuals perceive illness, their ability to cope with stress, their interaction with healthcare and possible perceptions of mental distress or disorder as a spiritual issue which contributes to their health seeking behaviour and perceptions of interventions (Koenig, 2012; Pergament, 2013). A study by Abbo et al., (2015) suggest that mental distress can be spiritualized and remedies through prayers or faith-based healing instead of through a clinical diagnosis. Other socio-cultural dynamics including stress from being the minority in a predominantly Christian society like Ghana can play a major role in reporting mental distress (Awad et al., 2019). These unique dynamics and how they interact with the wider social structure make it ideal to conduct further research to understand these issues within the country.

The final socio-demographic characteristic with a significant relationship with reporting a mental disorder is ethnicity where Ga-adangmes in the total sample are more likely to report having a mental disorder compared to Akans. The analysis also revealed that Ga-adangme males are more likely to report having a mental disorder compared to Akan males. This is associated with findings from Agyei et al., (2024) who suggest that certain socio-economic conditions including poverty, the feeling of being powerless and frustration account for this occurrence. Again, persons from other Northern dialects are less likely to report having a mental health disorder. There is no statistically significant relationship between ethnicity for females and reporting a mental health disorder. Table 6 provides a summary of the socio-demographic predictors of hypertension, diabetes and reporting mental health disorders as well as predictors for males and females separately.

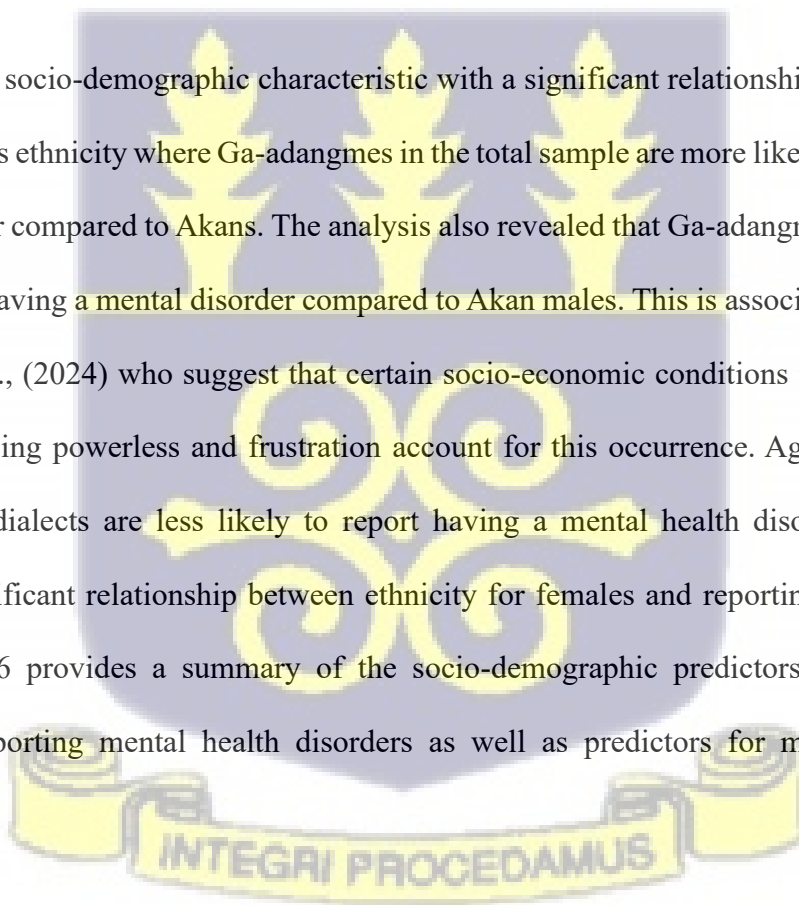


Table 6: Socio-demographic predictors of hypertension, diabetes, and reporting mental health disorders

| <b>Non-Communicable Disease</b> | <b>Predictors for both males and females in the total sample</b>                                                            | <b>Predictors for only males</b>                | <b>Predictors for only females</b>                      |
|---------------------------------|-----------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|---------------------------------------------------------|
| Hypertension                    | Sex<br>Age<br>Marital Status<br>Employment Status<br>Place of Residence<br>Wealth Status<br>Educational Status<br>Ethnicity | Age<br>Place of residence<br>Educational Status | Age<br>Place of residence<br>Wealth Status<br>Ethnicity |
| Diabetes                        | Age<br>Place of residence<br>Educational Status                                                                             | Educational Status<br>Employment status         | Age<br>Place of residence                               |
| Mental health disorders         | Age<br>Employment Status<br>Religion<br>Ethnicity                                                                           | Religion<br>Ethnicity                           | Employment status<br>Religion                           |

Source: Author's Construct, 2024



## **CHAPTER FIVE: ADHERENCE TO RECOMMENDED LIFESTYLE CHOICES ASSOCIATED WITH HYPERTENSION**

### **5.1 Introduction**

The second objective of this study is addressed in this chapter where adherence to recommended lifestyle choices associated with hypertension is investigated among the adult population of Ghana. This is necessary because effectively managing hypertension is heavily reliant on lifestyle factors. The focus is on hypertension due to availability of blood pressure readings in the dataset. Hypertension status is explored based on what is reported by the respondents and blood pressure readings taken. Univariate, bivariate and multivariate level analysis is done to identify how relevant adhering to recommended modifiable risk factors or lifestyle choices including diet, physical activity, alcohol use and tobacco use is in relation to hypertension. The chapter ends with a discussion on findings made.

### **5.2 Reported and checked hypertension status among the study population**

To gain an in-depth analysis into the varying levels of hypertension status, a further analysis was done to determine if indeed the reported hypertension status of the study respondents hold true. This serves as a precursor to the rest of the analysis in this chapter.

During the data collection process in the WHO SAGE Wave II, the blood pressure of the study participants was taken three times in the morning within a specified interval. All three readings were recorded accordingly. Per the tenets of the WHO, a person with blood pressure readings above 140/90 millimetres of mercury (mmHg) is classified as being hypertensive. Whilst the 140 represents the systolic readings, the 90 represents the diastolic readings. In line with this, the averages of the blood pressure readings for both the diastolic and the systolic were taken. The results from these averages were grouped into four main categories in reference to the reported

hypertension status. Table 7 outlines the hypertension status of the study respondents based on the blood pressure readings taken.

Table 7: Checked hypertension status of study respondents

| Checked hypertension status | Explanation                                                                             |
|-----------------------------|-----------------------------------------------------------------------------------------|
| Hypertension (uncontrolled) | Persons reported having hypertension. Averages of readings are above 140/90mmHg         |
| Hypertension (controlled)   | Persons reported having hypertension. Averages of readings are below 140/90mmHg         |
| Hypertension (unaware)      | Persons reported not having hypertension. Averages of the readings are above 140/90mmHg |
| No hypertension (true)      | Persons reported not having hypertension. Averages of the readings are below 140/90mmHg |

Source: Author's construct, 2024

A further analysis of the prevalence of hypertension among the study respondents was done. This was done based on the reported hypertension status as against the checked hypertension status. The results, indicated in table 8, show that approximately 12% of the respondents reported having developed hypertension. However, about 4% still had readings above 140/90mmHg which presupposes that they are not managing the condition.

According to the Ghana Demographic and Health Survey (GDHS) conducted by the Ghana Statistical Service et al., (2015), hypertension prevalence in Ghana was 13% in 2014. Out of this, about 47% knew of their status and approximately 40% were treating the condition. Findings from this study indicate that approximately 12% had developed hypertension which is consistent with the GDHS. Out of those who reported as having been diagnosed with the disease, about 8% of them had high readings whilst about 4% had readings lower than 140/mmHg and were assumed to be managing the condition.

Out of those who reported not having the disease, the results show that about 77% of them had readings lower than 140/90mmHg, which suggests that truly they had not developed the condition. On the other hand, about 12% of those who reported not having the disease had readings above the recommended mark. In this case, they were categorized as being unaware of their hypertension status. Although this is alarming, it is not surprising considering hypertension is asymptomatic.

Table 8: Reported and checked hypertension status of study respondents

| Hypertension status (checked)        | Hypertension Status (Reported) |       | Total |
|--------------------------------------|--------------------------------|-------|-------|
|                                      | No                             | Yes   |       |
| Hypertension ( <i>uncontrolled</i> ) | 0.0%                           | 28.1% | 3.4%  |
| Hypertension ( <i>controlled</i> )   | 0.0%                           | 71.8% | 8.4%  |
| Hypertension ( <i>unaware</i> )      | 12.8%                          | 0.0%  | 11.4% |
| No hypertension ( <i>true</i> )      | 87.1%                          | 0.0%  | 76.8% |
| Total                                | 100%                           | 100%  | 100%  |

Source: Derived from WHO SAGE Wave Data 2014

### 5.3 Adherence to lifestyle choices and hypertension status

The World Health Organization, (2023e) reiterates how modifiable or behavioural risk factors including diet, alcohol use, tobacco use and physical activity otherwise termed lifestyle choices, can influence NCDs in general. They highlight the importance of adopting good or recommended lifestyle choices to reduce the occurrence and effect of such NCDs including hypertension. This analysis identified how persons under the different hypertension status categories identified above were adhering to these recommended lifestyle choices.

The systolic readings of the study respondents were used in this analysis. The systolic number, expressed as the top number in a blood pressure measurement, simply refers to the

pressure in the arteries when the heart pumps blood or beats. The systolic readings, according to Basile (2002) is a better predictor of cardiovascular disease compared to the diastolic although both are important predictors. The systolic also allows in stratifying risk of cardiovascular disease. This is reiterated by Alrashed et al. (2024) who suggest that the ability to control systolic blood pressure helps in lowering the risks, progression and complications from cardiovascular diseases.

A t-test bivariate analysis was done using the mean systolic readings and recommended lifestyle choices mentioned above. This approach was taken to ascertain if there's indeed a significant relationship between adhering to the recommended lifestyle practices and hypertension, with systolic blood pressure measurement as the proxy. The result for this analysis is shown in table 9. The results show a significant relationship between persons in the hypertension (unaware) group and diet which suggests that consuming five or more fruits and/vegetables servings per day has the likelihood of decreasing blood pressure readings of such persons all things being equal. Although the systolic readings were 160.5mmHg, higher than the ideal 140mmHg per the recommendations of WHO, it was lower than the readings of persons who were not adhering to the recommended diet suggested by WHO.

For persons in the no hypertension (true) group, physical activity was statistically significant. This shows that persons engaged in physical activity were more likely to have lower systolic blood pressure readings of 121.4mmHg compared to persons who were not engaged in any physical activity with an average reading of 123.4mmHg. There was no significant relationship between physical activity, alcohol and tobacco use and the reduction of systolic blood pressure readings in this study.

Table 9: Relationship between recommended lifestyle risk factors and checked hypertension status

|                          | Hypertension (uncontrolled) | Hypertension (controlled) | Hypertension (unaware) | No hypertension (true) |
|--------------------------|-----------------------------|---------------------------|------------------------|------------------------|
| <b>Diet</b>              |                             |                           |                        |                        |
| Not recommended          | 169.1                       | 134.8                     | 165.4                  | 121.9                  |
| Recommended              | 163.2                       | 134.0                     | 160.5                  | 122.1                  |
| T-tests                  | 0.1267                      | 0.7254                    | 0.0088***              | 0.7612                 |
| <b>Physical Activity</b> |                             |                           |                        |                        |
| Not recommended          | 167.7                       | 136.5                     | 164.9                  | 123.4                  |
| Recommended              | 165.7                       | 133.4                     | 162.5                  | 121.4                  |
| T-tests                  | 0.06279                     | 0.1731                    | 0.2388                 | 0.0311**               |
| <b>Alcohol Use</b>       |                             |                           |                        |                        |
| Not recommended          | 167.1                       | 134.9                     | 163.7                  | 122.3                  |
| Recommended              | 164.9                       | 133.3                     | 162.1                  | 121.3                  |
| T-tests                  | 0.6084                      | 0.5023                    | 0.4114                 | 0.1731                 |
| <b>Tobacco Use</b>       |                             |                           |                        |                        |
| Not recommended          | 166.9                       | 132.2                     | 158.1                  | 121.9                  |
| Recommended              | 153.3                       | 134.5                     | 163.5                  | 121.9                  |
| T-tests                  | 0.1764                      | 0.7509                    | 0.1445                 | 0.9878                 |

Source: Derived from WHO SAGE Wave Data, 2014

T-test values represent \*\*\* $p < 0.01$ , \*\* $p < 0.05$

#### 5.4 Socio-demographic and modifiable risk predictors of hypertension based on checked hypertension status

A multinomial regression was fitted to ascertain the socio-demographic predictors of hypertension status based on the four checked hypertension status groupings identified above. This is presented in Table 10. The reference category was the hypertension (true) group or those who reported not having hypertension and had their systolic reading below 140mmHg.

*5.4.1 Socio-demographic predictors of hypertension (uncontrolled) compared to hypertension true*

The results from the multinomial regression in Table 10 show no significant relationship between marital status, place of residence, wealth status, ethnicity, alcohol use, tobacco use, diet and physical activity and persons categorized under the hypertension (uncontrolled) group compared to persons in the hypertension (true) group. Other variables, including sex, age, employment status, religion and educational status had a significant relationship with persons in the hypertension (uncontrolled) group. Males are less likely to be in the hypertension (uncontrolled) group in comparison to hypertension (true) group holding all other variables constant. Similarly, being in the age group 18-34 years significantly reduces an individual's chances of being in the comparison group than in the reference group.

Whilst employed persons are less likely to be in the hypertension (uncontrolled) group, persons under Islamic religion are more likely to be in the hypertension (uncontrolled) group in comparison to those in the hypertension (true) group. The educational status of a person is also significant in this analysis where persons with higher (secondary and tertiary) education are more likely to be in the comparison group than in the reference group. In this instance, the higher one's level of education, the more likely the person is to be in the hypertension (uncontrolled) group with elevated blood pressure readings.

*5.4.2 Socio-demographic predictors of hypertension controlled compared to hypertension true*

The socio-demographic characteristics with no significant relationship with hypertension (controlled) in this analysis include marital status, religion and the modifiable risk factors including alcohol use, tobacco use, diet and physical activity as presented in Table 10.

The other variables including sex, age, employment status, place of residence, wealth status, educational status and ethnicity are significant with the hypertension (controlled) group. Males are less likely to be in the hypertension (controlled) group than in the hypertension (true) group. Again, age is a significant predictor of hypertension status where persons aged 18-34 years and 35-49 years are less likely to be in the hypertension (controlled) group compared to those in the hypertension (true) group.

The results also show that whilst persons employed are less likely to be in the hypertension (controlled) group, persons living in the urban area are more likely to find themselves in the same group. Wealth status also plays a significant role in this analysis where persons considered to be rich are more likely to be in the hypertension (controlled) group. This is also equally true for persons with secondary education and ga-adangmes who are more likely to be in the hypertension (controlled) groups than in the reference group.

#### *5.4.3 Socio-demographic predictors of hypertension unaware compared to hypertension true*

The socio-demographic characteristics which are significant in this analysis are age and employment status together with the modifiable risk factors alcohol use and tobacco use. The other variables are not significantly associated with the hypertension (unaware) group as shown in Table 10.

To put this in perspective, persons aged 35-49 years and those employed are less likely to be in the hypertension (unaware) group in comparison to the hypertension (true) group. In effect, these groups of people are less likely to have high blood pressure readings compared to persons in the hypertension (true) group.

## 5.4.4 Association between modifiable risk factors and checked hypertension status

Whilst modifiable risk factors are important for this analysis, alcohol and tobacco use are only significantly associated with the hypertension (unaware) group where persons who use alcohol and tobacco products are more likely to be unaware of their hypertension status thus finding themselves in the hypertension (unaware) groups holding all other variables constant.

Table 10: Multinomial regression model showing the socio-demographic predictors of hypertension based on checked hypertension status

| Socio-demographic Characteristics              | Hypertension Uncontrolled (SE) | Hypertension Controlled (SE) | Hypertension Unaware (SE) |
|------------------------------------------------|--------------------------------|------------------------------|---------------------------|
| <b>Sex (Ref: Females)</b>                      |                                |                              |                           |
| Males                                          | -1.012*** (0.302)              | -0.755*** (0.199)            | -0.180 (0.161)            |
| <b>Age Groups (Ref: 50+)</b>                   |                                |                              |                           |
| 18-34                                          | - 2.449** (1.033)              | - 1.999*** (0.489)           | - 2.632 (0.605)           |
| 35-49                                          | -0.277 (0.334)                 | -8.802*** (0.251)            | -0.623*** (0.215)         |
| <b>Marital Status (Ref: Nformerly married)</b> |                                |                              |                           |
| Married                                        | 1.553 (1.040)                  | 0.611 (0.466)                | -0.147 (0.339)            |
| Formerly married                               | 1.522 (1.039)                  | 0.762 (0.465)                | 0.121 (0.339)             |
| <b>Employment Status (Ref: Unemployed)</b>     |                                |                              |                           |
| Employed                                       | -0.497** (0.246)               | -0.421*** (0.157)            | -0.241* (0.137)           |
| <b>Place of Residence (Ref: Rural)</b>         |                                |                              |                           |
| Urban                                          | 0.356 (0.251)                  | 0.846*** (0.166)             | 0.041(0.139)              |
| <b>Religion (Ref: Christian)</b>               |                                |                              |                           |
| Islam                                          | 1.118** (0.524)                | 0.146 (0.497)                | 0.189 (0.330)             |
| Others                                         | -0.008 (0.430)                 | -0.048 (0.272)               | 0.256 (0.207)             |
| None                                           | 0.694 (0.581)                  | 0.081(0.460)                 | 0.253 (0.272)             |
| <b>Wealth Status (Ref: Poor)</b>               |                                |                              |                           |
| Middle                                         | 0.507 (0.339)                  | 0.231 (0.221)                | 0.100 (0.150)             |
| Rich                                           | 0.684 (0.358)                  | 0.609*** (0.225)             | -0.157 (0.180)            |

| Socio-demographic Characteristics             | Hypertension Uncontrolled (SE) | Hypertension Controlled (SE) | Hypertension Unaware (SE) |
|-----------------------------------------------|--------------------------------|------------------------------|---------------------------|
| <b>Educational Status</b> (Ref: No education) |                                |                              |                           |
| Primary                                       | 0.437 (0.315)                  | 0.250 (0.200)                | -0.098 (0.163)            |
| Secondary                                     | 0.819** (0.321)                | 0.491** (0.206)              | -0.165 (0.183)            |
| Tertiary                                      | 1.246** (0.527)                | 0.659 (0.359)                | .0122 (0.363)             |
| <b>Ethnicity</b> (Ref: Akan)                  |                                |                              |                           |
| Ewe                                           | -0.037 (0.435)                 | 0.284 (0.267)                | 0.319 (0.205)             |
| Ga-adangme                                    | 0.335 (0.313)                  | 0.521** (0.207)              | 0.173 (0.190)             |
| Mande-busanga                                 | -0.247 (0.407)                 | -0.095 (0.257)               | -0.146 (0.195)            |
| Other northern dialects                       | 0.736 (0.441)                  | 0.455 (0.307)                | 0.194 (0.251)             |
| <b>Modifiable risk factors</b>                |                                |                              |                           |
| Alcohol use                                   | 0.239 (0.256)                  | -0.207 (0.179)               | 0.315** (0.141)           |
| Tobacco use                                   | 0.468 (0.637)                  | 0.148 (0.495)                | 0.586** (0.265)           |
| Diet                                          | 0.166 (0.224)                  | .0111 (0.146)                | 0.129 (0.124)             |
| Physical Activity                             | -0.349 (0.250)                 | -0.156 (0.164)               | -0.010 (0.146)            |

Source: Derived from WHO SAGE Wave Data, 2014

Values represent co-efficients (standard errors) \*\*\* $p < 0.01$ , \*\* $p < 0.05$

### 5.5 Exploring the intersection between wealth status, adherence to the recommended lifestyle choices and hypertension status

There is an interest in how wealth status influenced hypertension status. Studies including that done by Luo et al., (2024) indicate how adults within the highest household income group were less likely to develop hypertension in comparison to those in the lowest household income group. Further analysis of wealth status and its relationship with hypertension status using an intersectional approach, provides more insight into how wealth status, broken down into wealth

tripartite (poor, middle, rich), is an important social determinant of health, and in this case hypertension status.

A multinomial regression was done using the intersectionality approach. Findings from this model are presented in table 11. The results reveal that wealth status is a significant factor of adherence to recommended lifestyle practices.

The results suggest that rich females within the hypertension (controlled) group are more likely to report having been diagnosed with hypertension. This suggests that although they may be more likely to have the disease, they are also more likely to be managing their condition through lifestyle modifications and treatment. It aligns with the biopsychosocial model where health literacy, access to quality healthcare and psychosocial support are critical in improving awareness and control of hypertension.

In contrast, poor females are less likely to report hypertension. Whilst this does not imply lower prevalence of hypertension, it emphasizes the findings made by de-Graft Aikins et al., (2019b) where poor females may have lower access to healthcare, lower health literacy and a myriad of financial burden making them more likely to be exposed to environmental and nutritional stressors further compounding their cumulative disadvantage which is a critical aspect of the intersectionality model (Crenshaw, 1991).

Although there is no statistically significant relationship between wealth, sex and hypertension status in this analysis, Courtney (2000) and Griffith et al., (2012) assert that rich males may have better access to healthcare due to their ability to afford such services. However, they are less likely to adopt lifestyle routines to improve their health due to gendered constructions of masculinity which discourages males from accepting illness or seeking early medical attention.

Poor males are less likely to be in the hypertension (uncontrolled) and hypertension (controlled) groups than hypertension (unaware) group. This may make them more prone to limited screening for hypertension, low health literacy and possibly, more exposure to behavioural risk factors including tobacco and alcohol use. This reinforces that assertion that being poor and male places one at a disadvantage where they are less likely to underreport or go undiagnosed, making poor males vulnerable to the disease.

This analysis highlights the importance of hypertension awareness and control. Although wealth may improve detecting and controlling hypertension, there are gendered differences deeply rooted in socio-economic structures. Females engaging frequently with health services may afford them early diagnosis making them more likely to control the disease compared to males. Juxtaposing this to wealth, poor females and poor males may encounter financial barriers which makes them less likely to report having the condition and subsequently, being able to control the disease. The novel finding from this analysis places poor males at a greater disadvantage due to a myriad of complex cultural, economic and psychosocial factors. This reinforces the importance of conducting intersectional analysis of public health and population-based interventions for better management strategies.

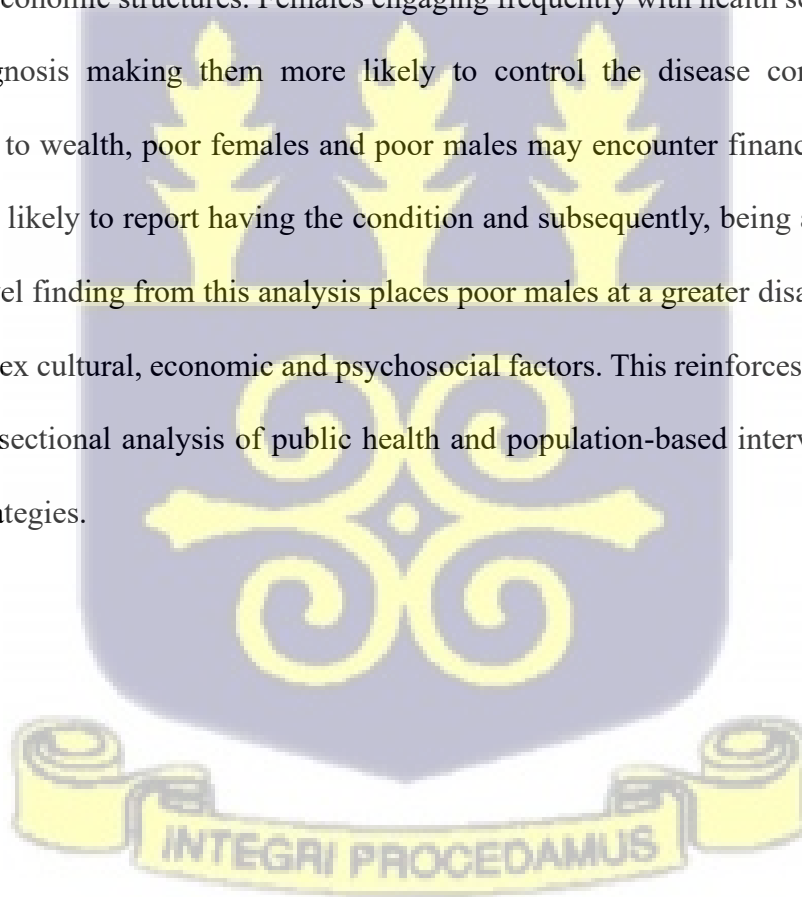


Table 11: An intersectional relationship between wealth status, sex, hypertension status and recommended lifestyle choices

| Sex & Wealth Status            | Hypertension uncontrolled (SE) | Hypertension controlled (SE) | Hypertension Unaware (SE) |
|--------------------------------|--------------------------------|------------------------------|---------------------------|
| Female#Middle                  | 0.237 (0.386)                  | 0.272 (0.262)                | 0.356 (.0197)             |
| Female#Rich                    | 0.306 (0.395)                  | 0.543** (0.259)              | -0.241 (0.231)            |
| Male#Poor                      | -2.034*** (0.685)              | -0.817** (0.374)             | -0.035 (0.227)            |
| Male#Middle                    | -0.760 (0.501)                 | -0.648 (0.359)               | -0.297 (0.255)            |
| Male#Rich                      | -0.394 (0.482)                 | -0.083 (0.324)               | -0.074 (0.268)            |
| <b>Modifiable risk factors</b> |                                |                              |                           |
| Diet                           | 0.176 (0.224)                  | 0.111 (0.146)                | 0.122 (0.124)             |
| Physical activity              | -0.354 (0.250)                 | -0.156 (0.164)               | -0.014 (0.146)            |
| Alcohol use                    | 0.242 (0.256)                  | -0.204 (0.178)               | 0.322** (0.141)           |
| Tobacco use                    | 0.545 (0.640)                  | 0.167 (0.496)                | 0.603** (0.265)           |
| <i>All co-variates present</i> |                                |                              |                           |

Source: Derived from WHO SAGE Wave Data, 2014

Values represent co-efficients (standard errors) \*\*\* $p < 0.01$ , \*\* $p < 0.05$

## 5.6 Discussion and summary of findings

Identifying the hypertension status of study respondents in this study sets the tone for understanding the risk factors and serves as a guide for recommending targeted interventions. It also serves as a marker to assess adherence which is key in managing diseases such as hypertension. The four hypertension statuses identified in this study including hypertension (uncontrolled), hypertension (controlled), hypertension (unaware) and no hypertension (true) were critical in knowing the true hypertension status among study respondents. In doing so, it was identified that about 12% had developed hypertension, which is in line with the hypertension prevalence of Ghana being 13% in 2014 as reported by the Ghana Statistical Accra (2015) in the Ghana Demographic and Health Survey. It is equally important to note that about 12% of the study respondents are not aware they had developed hypertension. This makes it critical to engage in random and routine health checks for high blood pressure considering hypertension is known to be the ‘silent killer’.

Adherence to modifiable risk factors is critical in the prevention and management of hypertension. Adhering to the recommendations provided by the World Health Organization (2023a) has long term health benefits. After t-tests were done on the averages of systolic blood pressure readings to determine adherence to the modifiable risk factors, it was interesting to identify that for persons in the hypertension (uncontrolled) group, adhering to the recommended diet practice of consuming five or more fruits and/or vegetable servings per day is likely to decrease systolic blood pressure readings. Persons in the hypertension (unaware) group are also likely to have a decrease in their systolic blood pressure readings for consuming five or more fruits and/or vegetables servings per day. This finding tallies with work done by Utsugi et al., (2008) and Madsen et al., (2023) where consuming fruits and vegetables contributed to lower blood pressure readings. Ström et al., (2022) specifically associated lower systolic blood pressure readings to consuming fruits and vegetables in their study.

In further analysis, the socio-demographic characteristics which are significant for persons in the hypertension (uncontrolled), hypertension (controlled) and hypertension (unaware) groups with hypertension (true) as the reference group is age and employment status. Specifically, persons aged 18-34 years are less likely to find themselves in these groups compared to the reference group. Similarly, persons who are employed are less likely to find themselves in these groups compared to the reference group. In effect, age and employment status confers protection from being in the hypertension (uncontrolled), hypertension (controlled) and hypertension (unaware) groups.

There have been studies linking wealth and hypertension status including Luo et al., (2024) where persons within the highest household income group are less likely to develop hypertension. Results from the multinomial regression done suggest that persons categorized as rich are more likely to be in the hypertension (controlled) group than the hypertension (true) group. Although

this result is encouraging, it does not delve deeper into the different groupings under wealth juxtaposed with gender to help understand the complexities and levels of inequality which exist as barriers to health promotion. This is where intersectionality by Crenshaw (1993) plays a key role. This analysis, broken down by the category of wealth status juxtaposed by sex indicated that whilst poor males categorized under hypertension (uncontrolled) and hypertension (controlled) groups are less likely to comply with the recommended lifestyle choices, rich females in the hypertension (controlled) groups are more likely to adhere with the recommended lifestyle choices. This is associated with these rich females having the ability to afford to practice these recommended lifestyle choices compared to the poor males who encounter the barrier of cost which ties into perceived barriers and threats under the health belief model.



## **CHAPTER SIX: COMMUNITY PERCEPTIONS OF RISK FACTORS AND INTERVENTIONS ASSOCIATED WITH HYPERTENSION, DIABETES, AND MENTAL HEALTH DISORDERS**

### **6.1 Introduction**

This chapter explores the perceptions of community members of the perceived risks of hypertension, diabetes, and mental health disorders using a qualitative approach. Using this approach is critical as it reveals socio-cultural factors which influence how people behave and their experiences. To be able to effectively manage these conditions, understanding why people act and behave the way they do is important to design strategies. This is done using Focus Group Discussions (FGDs) conducted in the Adentan Municipal Area in the Greater Accra region, Ghana. The chapter begins with a description of the socio-demographic characteristics of the study participants. Analysis of the findings are then presented using thematic network analysis. Findings from this chapter show the role community perceptions play in shaping health behaviours and interventions.

### **6.2 Demographic characteristics of participants of the focus group discussions**

A total of six focus group discussions were conducted in the Adentan Municipality, categorized into males and females aged 18-34 years who were considered as young adults, 35-49 years who were classified as middle-aged and 50 years and above, who were older adults.

The characteristics of the respondents are presented in Table 12. In total, 36 people participated in the FGDs across the four zonal councils of Adentan namely Koose, Gbentenaa, Nii Ashale and Sutsurunaa. For a fair distribution, 18 males and 18 females were interviewed. Each age category had six participants for both males and females.

Table 12: Demographic characteristics of focus group participants

| Demographic characteristics | Koose | Gbentenaa | Nii Ashale | Sutsurunaa | Total (n=36) |
|-----------------------------|-------|-----------|------------|------------|--------------|
| <b>Age</b>                  |       |           |            |            |              |
| 18-34                       | 3     | 2         | 4          | 3          | 12           |
| 35-49                       | 2     | 3         | 3          | 4          | 12           |
| 50 and above                | 4     | 3         | 2          | 3          | 12           |
| <b>Sex</b>                  |       |           |            |            |              |
| Male                        | 4     | 4         | 5          | 5          | 18           |
| Female                      | 5     | 4         | 4          | 5          | 18           |

Source: Field data, 2024

### 6.3 Community perceptions of non-communicable diseases

As a psychological framework for understanding individuals' perceptions of health risks, the Health Belief Model is crucial in this analysis. As Kaba et al., (2017) put it, the HBM is a very effective model in assessing health behaviour-change for individuals. Furthermore, the tenets of this model help in understanding how individuals and the collective community assess their risks and vulnerabilities to hypertension, diabetes and mental health disorders in this study.

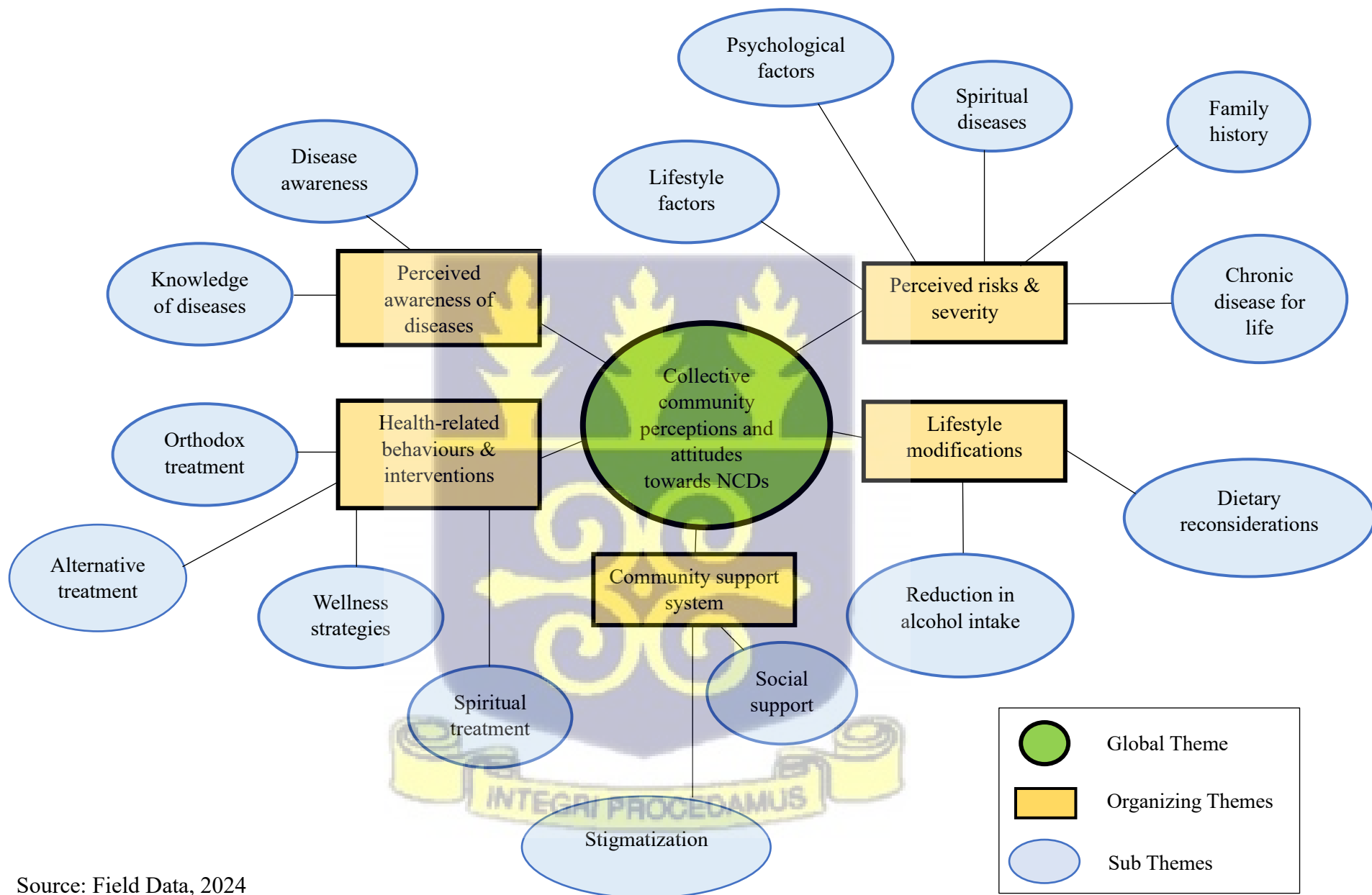
In this analysis, three levels of themes were generated. These were the basic themes, organizing themes and global theme respectively. In all, five organizing themes were identified which fed into the development of the global theme. To ascertain the perceptions of risks for these NCDs, the perceptions of awareness of these diseases had to be explored. Doing this generated 2 main organizing themes. Participants discussed their perceptions of what these diseases are, and the risk factors associated with these diseases. The health-related behaviours associated with managing the diseases and lifestyle modifications were also explored. To end the discussions, community support systems were explored which generated 2 organizing themes. The different themes are discussed in the ensuing sections.

### *6.3.1 Collective community perceptions and attitudes towards non-communicable diseases*

During the FGDs, participants talked about that how aware they were of the diseases, the perceived risks and severity, health-related behaviours and interventions, lifestyle modifications as well as community support systems available for community members with these diseases. These are presented in figure 13.



Figure 13: Thematic map of community perceptions and attitudes towards non-communicable diseases



Source: Field Data, 2024

### 6.3.2 Perceived awareness of diseases

As a subset of figure 6.1, figure 6.2 presents the organizing theme for ‘Perceived awareness of diseases’ highlighting the sub-themes and basic themes. During the discussions, the participants spoke about what they knew about hypertension, diabetes, and mental health disorders. These were characterized into two basic themes namely knowledge of the disease and disease awareness.

#### 6.3.2.1 Knowledge of diseases

According to the participants, knowledge of diseases was centered on the kind of information they had on these diseases and whether they thought these diseases were infectious or non-infectious. In discussing the knowledge of the diseases, one male young adult talked about mental health disorders in terms of the social and psychological well-being and the fact that you cannot determine who has a mental health condition by merely looking at the person.

*“Mental health is about social and psychological health and everything. Because some of us here, we can have mental health issues, but you would not know” [Male, 23 years, FGD 1]*

Others also admitted that although they had heard about some of the diseases, they did not know much about them. One young female adult had this to say

*“I’ve heard about hypertension, but I do not know what causes it” [Female, 22 years, FGD 4]*

#### 6.3.2.2 Disease awareness

The awareness of these diseases in terms of their triggers and misconceptions were discussed.

Similarly, in discussing disease awareness, participants talked about what they perceived as the triggers of NCDs were. In some instances, pregnancy was highlighted as a risk factor for

developing hypertension. In relation to diabetes, some were of the view that not eating or sleeping right, as well as indulging in alcohol puts one at risk of developing diabetes. On the issue of mental health disorders, some were of the view that having financial problems could trigger mental health conditions in an individual.

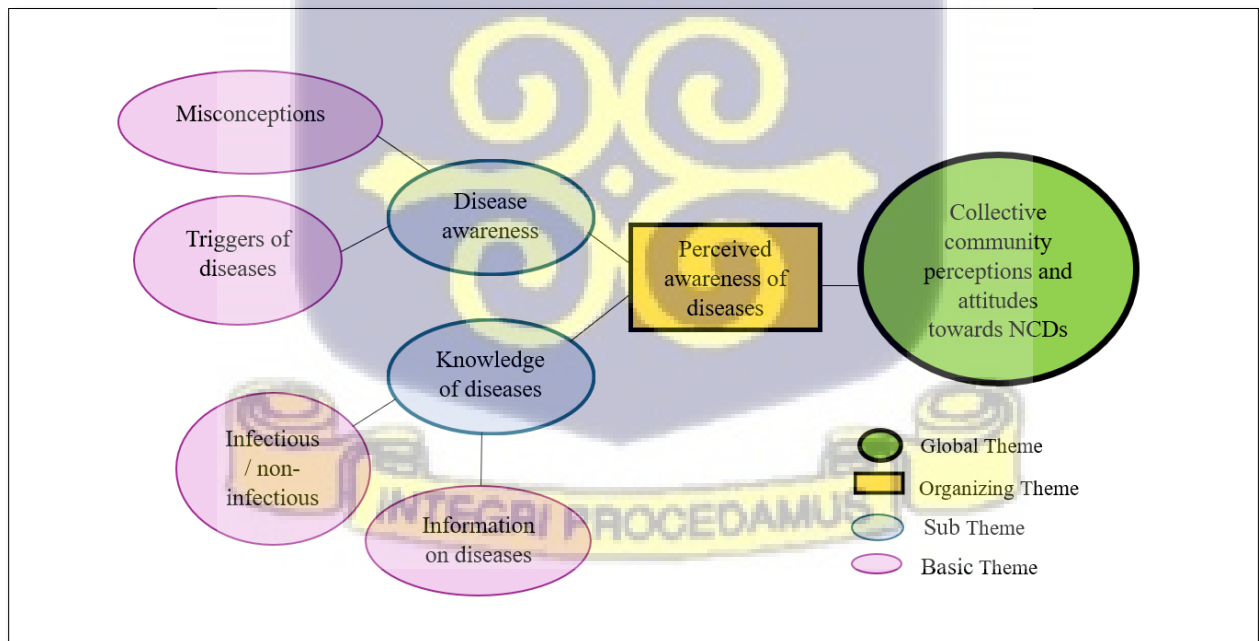
*“When I got pregnant and went to the hospital, I was told I had hypertension, but I was not thinking, or smoking or drinking” [Female, 25 years, FGD 4]*

*“Usually, if you do not eat well and do not sleep for long. Some people drink alcohol before eating. They’ll take 2 tots before eating” [Male, 42 years, FGD 2]*

*“Financial problems can cause mental problems. Even bp (blood pressure” [Male, 53 years, FGD 3]*

In general terms, the community members were aware of what hypertension, diabetes and mental health disorders were. They also had knowledge about the possible causes of these diseases and what their triggers are.

Figure 14: Thematic map highlighting perceived awareness of diseases



Source: Field data, 2024

### 6.3.3 Perceived risks and severity

In discussing the perceived risks and severity of the diseases, the participants talked about a myriad of factors including lifestyle factors, psychological factors, spiritual diseases, family history and chronic diseases being lifelong diseases. These factors are expanded in the sections below.

#### 6.3.3.1 Lifestyle factors

According to the participants, lifestyle factors including food choices served as risk factors and increased the severity of the diseases. In explaining further, a middle-aged woman talked about consuming foods high in salt and canned or processed foods. According to her these foods were not healthy. Again, another spoke about foods with too much sugar in them. Such foods, in her view, can contribute to developing diabetes.

*“You do not have to take in a lot of salt and those foods which are usually in cans. You have to reduce their intake otherwise you’ll become sick” [Female, 35 years, FGD 5]*

*“Eating too much sugar and carbohydrates gives you diabetes” [Female 24 years, FGD 4]*

Apart from food choices, participants discussed the likelihood of being obese as a risk factor for the diseases. In their opinion, an overweight person, especially one who does not engage in any physical activity, is at risk of developing diabetes but also has the likelihood of developing other diseases as well.

*“When someone is obese, the likelihood of getting it (diabetes) is high” [Male, 62 years, FGD 3]*

*“Someone who is big and doesn’t exercise can get the disease. She’s always sitting at one place” [Male, 18 years, FGD 1]*

Whilst on the topic of engaging in physical activity, there were some perceptions that exercising has the likelihood of reducing one's weight, it also has the potential of making one's blood work well.

*“When you exercise, it makes your blood work well. If your blood is not working well from not exercising, you can get hypertension. If you sit at one place without doing anything, you can get hypertension” [Male, 23 years, FGD1]*

Interestingly, male young adults and female older middle-aged adults had dissenting views about the intake of tobacco products and alcohol as risk factors for developing the diseases. Whilst the former felt that consuming these products in moderation were not risk factors for developing the diseases, the latter perceived that consuming alcohol and tobacco products were not beneficial to the body in any way and could harm the body. Apart from that, they expressed how consuming these products could affect the severity of these diseases, if you have already developed them.

*“If you take in alcohol and cigarettes, things which do not benefit your immune system, you have to stop. Some of these people have been told to stop but because they are hardheaded, they continue taking in alcohol and cigarettes and will be suffering. All these things make the body weak” [Female, 37 years, FGD5]*

*“I do not think smoking can cause hypertension or diabetes. Maybe weed can cause mental health issues” [Male, 25 years, FGD1]*

#### 6.3.3.2 Psychosocial factors

Participants identified certain psychological and social factors they perceived as influencing the risks and severity of NCDs in line with biopsychosocial model. They discussed the use of narcotics and having experienced abuse or trauma as a precursor to developing or worsening mental health conditions. The young adults, males and females, were particularly passionate about these factors.

*“It can be hard drugs. There was an actor who acted ‘Age 18’. Because of hard drugs, he has slimmed down. He has even been taken to the rehabilitation centre...hard drugs is very important in mental health” [Male, 23 years, FGD 1]*

*“Maybe she’s going through some trauma that she doesn’t want to open up...because of heartbreak, someone has drunk parazone (detergent) before” [Female 22 years, FGD 4]*

It was interesting to know how some perceived that upbringing and the relationship with parents had some influence on the severity of mental health conditions.

*I: If you’re saying she’s depressed, what do you think caused this?*

*R1: It can be family issues [Female, 22 years, FGD4]*

*I: What kind of family issues?*

*R1: Maybe the family is going through financial hardships and because Adwoa is a girl, they want her to contribute. If she does not have money, it can cause depression [Female, 22 years, FGD4]*

*R2: I will say that sometimes our parents cause it. You’ll tell them you’re not feeling well but they would not believe you. They’ll say you’re lazy. That’ll make you more depressed and sadder [Female, 18 years, FGD 4]*

On the other hand, older adults discussed these risks and severity in terms of behavioural and biological or health conditions in terms of co-morbid conditions. They also discussed how certain adopted social conditions are perceived to affect the severity of these diseases. Their areas of concern and focus were on diabetes and hypertension compared to the young adults whose discussions and perceptions were centered on mental health disorders for perceived risks and severity.

*“If you’re someone who easily gets angry, you can get hypertension” [Male 63 years, FGD3]*

*“I think it could be that she had bp (blood pressure) because if you have hypertension, you can have diabetes too” [Male, 56 years, FGD 3]*

*“Maybe she has isolated herself from others. She doesn’t want to talk to anyone. She feels like no one understands her” [Female 55 years, FGD 6]*

When pressed to know their thoughts about how people developed mental health conditions and the potential risks using a case scenario, they had this to say:

*I: So what do you think is wrong with Adwoa? (after reading scenario to them – attached in Annex 1)*

***R1: Adwoa is depressed [Male, 26 years, FGD1]***

*I: What does depression mean?*

***R1: Since she was lively and all of a sudden, she became slow, she's going through something. Something is bothering her. [Male, 26 years, FGD1]***

***R2: It can be from her family, financial, friends and society [Male 23 years, FGD1]***

***R1: Are we assuming Adwoa is single? [Male, 26 years, FGD1]***

***R2: She's not single. If she cries a lot, then someone has broken her heart [Male 23 years, FGD1]***

#### 6.3.3.3 Spiritual diseases

Spirituality, whilst complex, was brought up in all the focus group discussions. The argument was simple. According to the participants, life is made up of both the physical and spiritual worlds. You cannot discuss one and leave the other. According to the participants, you can do everything right and still develop or suffer from these diseases.

*“They (spirits) can give you sickness. We have the spiritual side and the physical side. So when it's the spiritual, you take it to a pastor. When it is physical, you take it to the hospital”*  
***[Female, 65 years, FGD 6]***

*It's not everything that is physical. Sometimes, someone can just say something to you in your dreams. You wake up and realize you're not well. You need someone with spiritual eyes to tell you what the problem is”* ***[Female 63 years, FGD 6]***

From their point of view, taking such diseases inflicted by the spirits to the hospital will not yield good results. It is important to seek the help of a good pastor.

#### 6.3.3.4 Family history

Family history plays a crucial role when discussing the risks and severity of diseases. The participants identified this and discussed how although NCDs are not infectious, they can be passed down through genetics.

*“It’s hereditary. Sometimes at a young age it (diabetes) doesn’t show but as the person grows, it shows” [Male, 18 years, FGD 1]*

*“Diabetes is not infectious but if someone in your family has it, maybe your father or grandfather, you can also have it” [Female, 25 years, FGD 4]*

#### 6.3.3.5 Chronic diseases for life

The participants also discussed how the severity of such diseases worsens over time mostly because they are chronic in nature. According to them, having such diseases over a long period of time increases their severity. Ultimately, these diseases can only be managed and not cured.

*“It (diabetes) cannot be cured” [Female, 42 years, FGD 5]*

*“Even if he treats it, he will still have hypertension” [Male, 68 years, FGD 3]*

*“Medications can only minimize it (mental health conditions)” [Female, 59 years, FGD 6]*

They also discussed how important it was to manage or control the triggers of NCDs to reduce its severity.

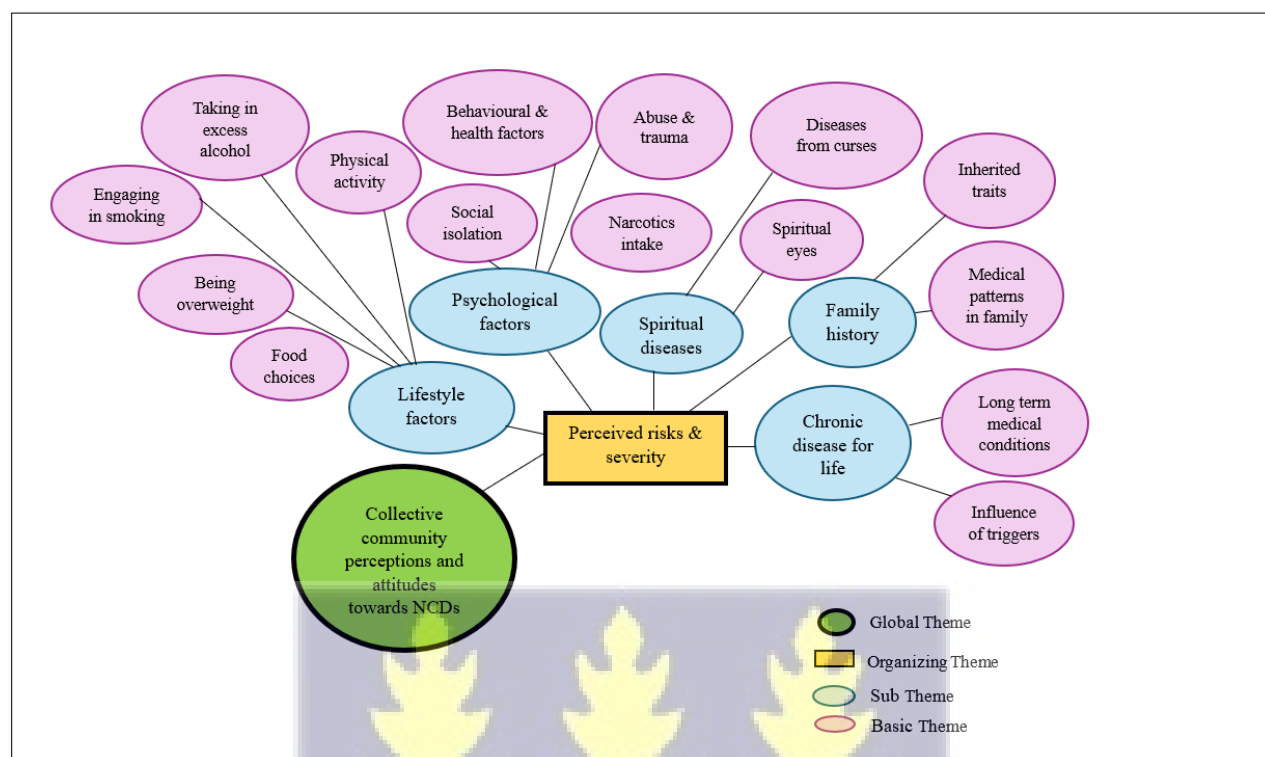
*“It depends on how they handle her and what triggered it (mental health disorders). She can get better if she stays away from what triggered the disease” [Female, 25 years, FGD 4]*

*“If you have hypertension and you’re still drinking alcohol, you’re calling for your death” [Male, 65 years, FGD 3]*

Figure 12 shows the thematic map highlighting perceived risks and severity of NCDs



Figure 15: Thematic map showing perceived risks and severity of NCDs



Source: Field data, 2024

#### 6.3.4 Health related behaviours and interventions

Participants discussed this under 4 broad sub-themes including orthodox treatment, alternative treatment, spiritual treatment and wellness strategies. The sub sections below discuss these in detail.

##### 6.3.4.1 Orthodox treatment

During the various discussions, participants opined visiting the hospital as the first point of contact for persons with NCDs. According to them, medical professionals were trained to handle such situations. If medical professionals could not handle the case, then alternative treatment options could be sought.

*“The Drs can tell him what exactly is causing the hypertension. If it’s the food he’s eating, then they can advise him on the type of food to eat. For some people, maybe they like eating*

*heavy food in the evening. So, he can limit eating heavy food at night. He can eat the heavy food in the afternoon and eat light at night” [Female 39 years, FGD 5]*

*“Sometimes the Doctors take you through counselling. Someone will look happy and smiley to the outside world, but she can be going through some challenges she cannot talk about so maybe one day she’ll reach her breaking point. After thinking about it for so long, the brain can get weak. So, the counselling will help. She can tell the Doctor that she thinks too much or tell the Doctor what her challenges are” [Female 62 years, FGD 6]*

*“Sometimes they say ‘Nyame beye’. But whilst God is doing His part, you have to go to the hospital. Just stick to the treatment” [Male, 68 years, FGD 3]*

Apart from visiting the hospital, another important component of the treatment they discussed was taking the prescribed medications. According to them, not taking the medications as prescribed would do more harm than good.

*“It (medication) is prolonging your life span, so you have to take them as the doctors have prescribed” [Male, 40 years, FGD 2]*

Apart from this, they also discussed the importance of not self-medicating.

*“Maybe the medicine has not been prescribed by the Doctor, but you feel like you have a headache, so you say, let me go to the drug store and get a pain killer. It’s not good” [Male 36 years, FGD 2]*

In addition to the point raised above, they also discussed the importance of not combining different treatment alternatives. In this case, herbal medicine should not be combined with orthodox medicine.

*“If it’s herbal treatment, she should take only herbal medicine. She should not mix herbal and the drugs from the hospital. Do not mix the two” [Male, 68 years, FGD 3]*

#### 6.3.4.2 Alternative treatment

Alternative treatment options according to the participants included herbal treatment and selfcare options. Whilst some liked the idea of going in for herbal treatment, others believed any other treatment apart from orthodox treatment did not work.

*“There are some people who go round checking for bp. I had an auntie who had hypertension. She didn’t go to the hospital. She was taking herbal medicine and would let those people checking bp, check hers. When the disease became worse and we took her to the hospital, we were told all her internal organs were failing and were transferred to Korle Bu. Anytime you tell her to go the hospital, she would say she doesn’t have money. She died eventually. After her death, we found about GHS 1500 (15 million cedis) under her bed. So as for me, I do not like those people who go round checking bp. They annoy me” [Female, 47 years, FGD 5]*

*“Sometimes when you go to the herbal clinic, they even prescribe orthodox medicine for you in addition” [Female, 23 years, FGD 4]*

Selfcare options, according to the participants, included staying away from stressful situations and lowering expectations in life.

*“Stay calm and do not force things. When the time is right, God himself will give you everything you want” [Male, 53 years, FGD3]*

*“Lower your expectations in life. Do not aim too high” [Female 47 years, FGD 5]*

#### 6.3.4.3 Spiritual treatment

Seeking spiritual guidance and praying diseases away were the two main talking points for this analysis. According to some of the participants, they had experienced family and friends visiting the prayer camps for healing. Per their recollection, such people got healed without any complications. However, the other party who was taken to the hospital, died.

*“But I know people who were told they had diabetes; they went to the prayer camp and got healed. I experienced that with my own eyes. They were twins in my class. The other one died, the panyin died but the kakra was taken to the prayer camp and was healed” [Male, 25 years, FGD 1]*

It was also interesting when participants discussed seeking spiritual guidance when orthodox treatment failed. This was a backup plan some of them had.

*“After going to the hospital and taking all the drugs prescribed but still the disease is getting worse or not going away, then you have to go for the spiritual. But if you’re diagnosed with the disease and go to the spiritual healer right away, I will not advise that. You have to look at the physical aspect too” [Female, 63 years, FGD 5]*

*“You can go to the pastor to pray for you. When they pray for you, the sickness goes away but you have to look for a good one otherwise the bad ones will take your money and run”*  
**[Male, 44 years, FGD 2]**

#### 6.3.4.4 Wellness strategies

Participants discussed wellness strategies as ways of reducing stress. According to them, stress is a major factor which could worsen NCDs with its attendant problem. By adopting wellness practices, the health of persons suffering from these conditions is likely to reduce.

*I: What wellness strategies changes can he (from scenario) adopt?*

*R1: He should be reserved [Male, 18 years, FGD 1]*

*I: What do you mean by reserved?*

*R1: When you take in things or say something, it's part of stress [Male, 18 years, FGD 1]*

*I: So he shouldn't talk to people about his disease?*

*R2: Not talking about the disease per se but he shouldn't talk about things that cause stress [Male, 23 years, FGD 1]*

*R1: Yes, something that will cause stress to himself. He should be reserved [Male, 18 years, FGD 1]*

*R2: He shouldn't go looking for trouble [Male, 23 years, FGD 1]*

This analysis is represented in figure 16,

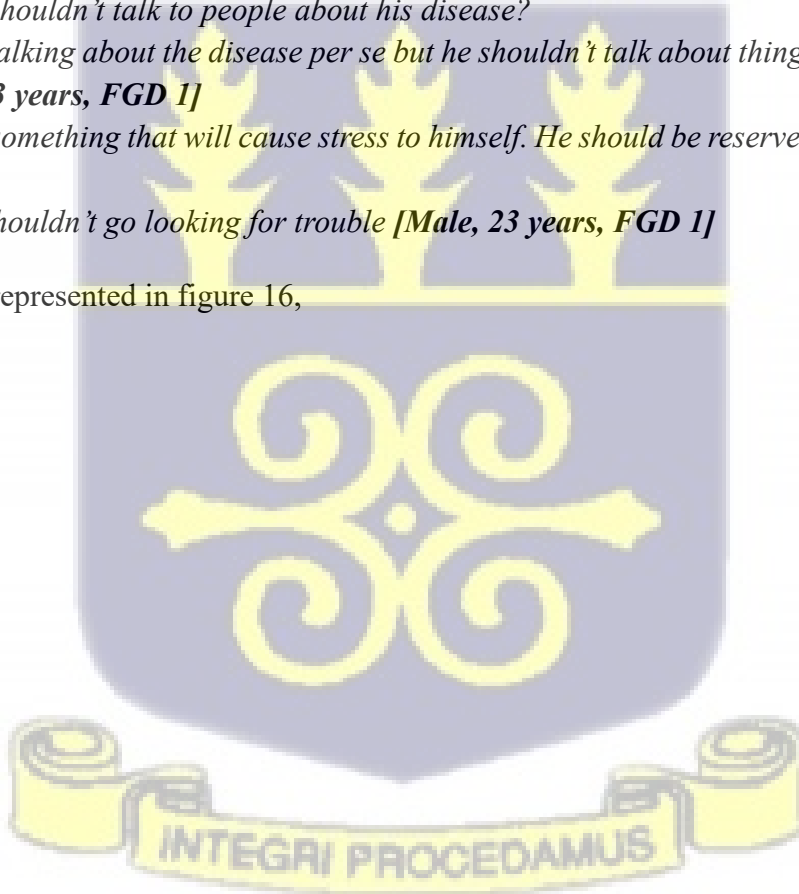
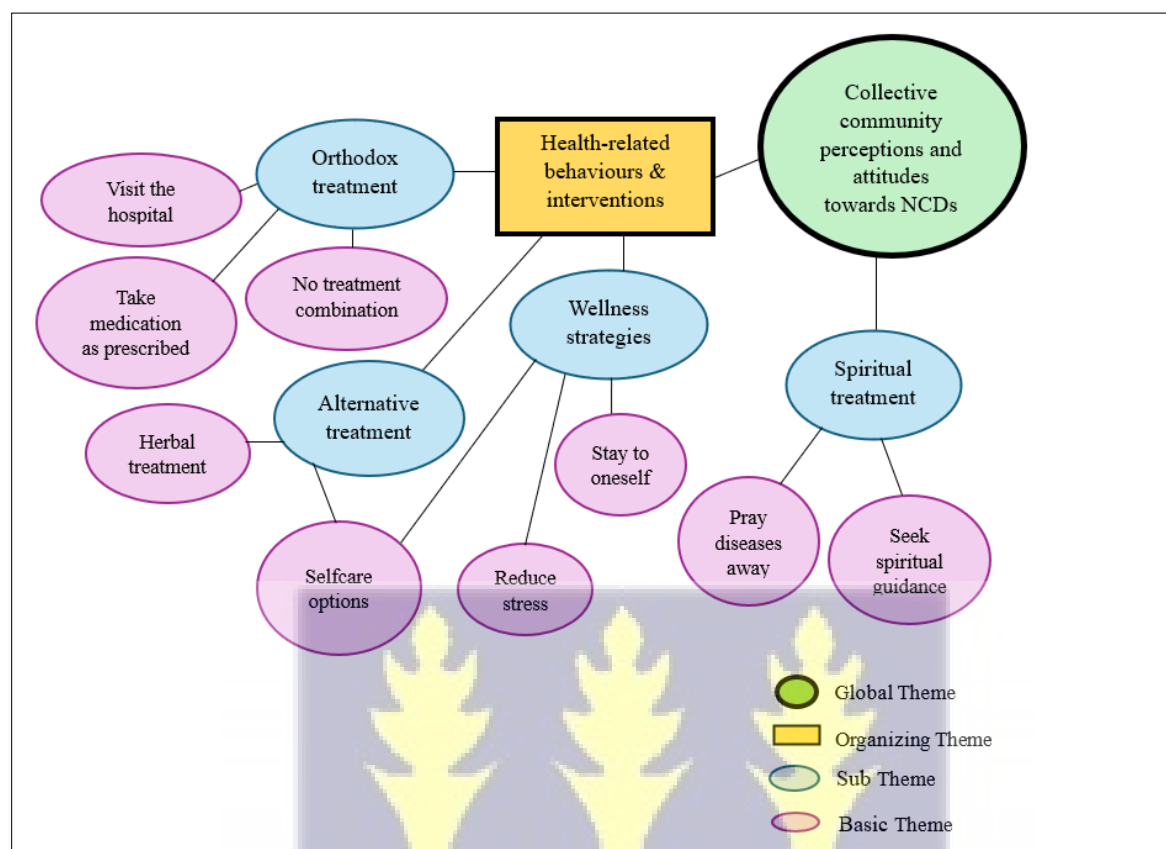


Figure 16: Thematic map showing health-related behaviours and interventions



Source: Field data, 2024

### 6.3.5 Lifestyle modifications

The discussions on lifestyle modifications were centered on three thematic areas including dietary reconsiderations, reduction of alcohol intake and engaging in physical activity. The specifics are discussed below.

#### 6.3.5.1 Dietary reconsiderations

Participants acknowledged the relevance of diet not only when it comes to developing NCDs but in the management of the diseases as well. According to them, consuming certain foods could put individuals at risk of developing NCDs.

*“Ama (from scenario) has to reduce the intake of sugar. For example, if she keeps eating sugary foods like always buying Fanta and pie, these drinks, if she likes them then she has to reduce it” [Female, 39 years, FGD 5]*

*“A person without hypertension and a person who has hypertension cannot take the same food” [Male, 68 years, FGD 3]*

*“Usually, hypertension and diabetes affect only rich people. The people who have these diseases are rich. They have the money to buy these junk foods. Every day they eat burger and pizza. But the poor person will eat plantain and kontomire” [Male, 18 years, FGD 1]*

In the same light, they discussed how eating certain foods could help in the managements of the diseases. To them, it is essential that persons suffering from NCDs take what they eat seriously.

*“I would say they should eat green leafy vegetables. You can eat some vegetables at night and maybe add a little bit of tea with a slice of bread” [Female, 42 years, FGD 5]*

#### 6.3.5.2 Reduction in alcohol intake

The discussions on alcohol were diverse unlike diet where most of the participants agreed that it was important to consume certain foods in to help manage NCDs. With alcohol, some participants were of the view that persons with NCDs did not have to completely cut off alcohol but could reduce their intake.

*“Stop taking the very hard liquor. Maybe taking a bottle of beer once a while is okay” [Male, 39 years, FGD 2]*

*“Some people will go to the hospital and take their medicine as prescribed, but they’ll still take in alcohol. When you tell them to stop, they’ll say ‘I will not die because I’m taking my medicine’, Eventually, they’ll die. So, you have to know what to take and what not to take” [Female, 63 years, FGD 6]*

It was enlightening to know the differences in perceptions based on the age groups where younger males believe cutting back on hard liquor is fine whilst older males believed stopping the use of alcohol altogether was the best way to go.

### 6.3.5.3 Engaging in physical activity

The importance of exercising was not downplayed during the discussions. Participants believed that engaging in physical activity or exercising was important to stay healthy. According to them, staying at one place without being active might make one more susceptible to NCDs. Engaging in physical activity, per their beliefs, rids the body of toxins.

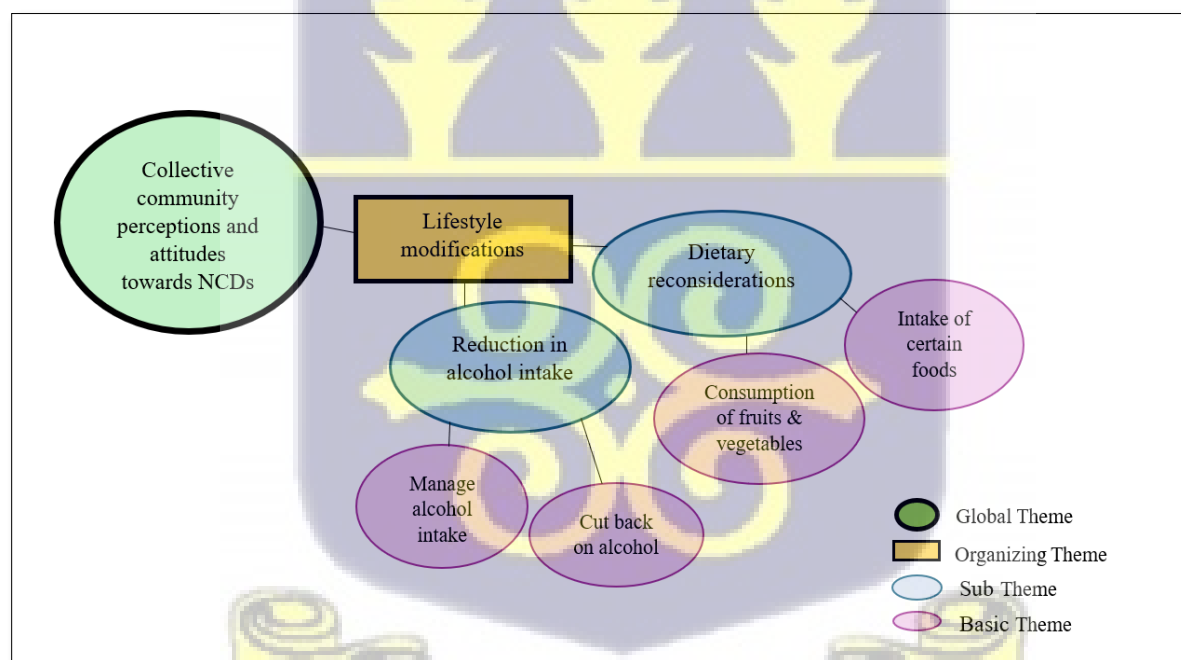
*“A footballer can take a lot of sugar, but it would affect him because of the training and the sweat”*  
[Male, 18 years, FGD 1]

*“Sometimes, it’s not that the blood is plenty. Sometimes, the blood is filled with dirt. Exercise will help clear the dirt in the blood”* [Female, 23 years, FGD 4]

*“She has to exercise a lot so that she can sweat out the toxins”* [Female, 39 years, FGD 5]

The discussions are presented in a thematic map in figure 17

Figure 17: Thematic map showing lifestyle modifications



Source: Field data, 2014

### 6.3.6 Community support

The support of community members played a significant role in the management of NCDs especially because these diseases are chronic and long-term. The perception of community members and their support somehow provided some social and emotional comfort. The discussions on this were two-fold where participants talked about community members not stigmatizing persons with NCDs and serving as sources of comfort to them.

#### 6.3.6.1 Stigmatization

Participants discussed how there's some stigmatization associated with NCDs particularly mental health conditions. From their point of view, a lot of people do not understand the causes of these diseases and tend to shun people away. They considered such people to be illiterates.

*“Some are ignorant about the causes, so they'll shun you. They'll also stigmatize her (from scenario) because in the community there are people who are illiterates. They do not know about the sickness. They're ignorant” [Female, 23 years, FGD 4]*

*“Maybe I was a respectable person in society but because now everyone knows I have a mental health issue; they will not take me serious again. And they will not respect me. The kind of respect they had for me will reduce” [Male 63 years, FGD 3]*

*“Sometimes, it's not that we stigmatize the person but maybe the person's behaviour is unpredictable. So, you keep your distance. Even if they come close to you, you do not engage them for a long time. You just answer one or two of their questions and leave them alone” [Male, 18 years, FGD 1]*

#### 6.3.6.2 Social support

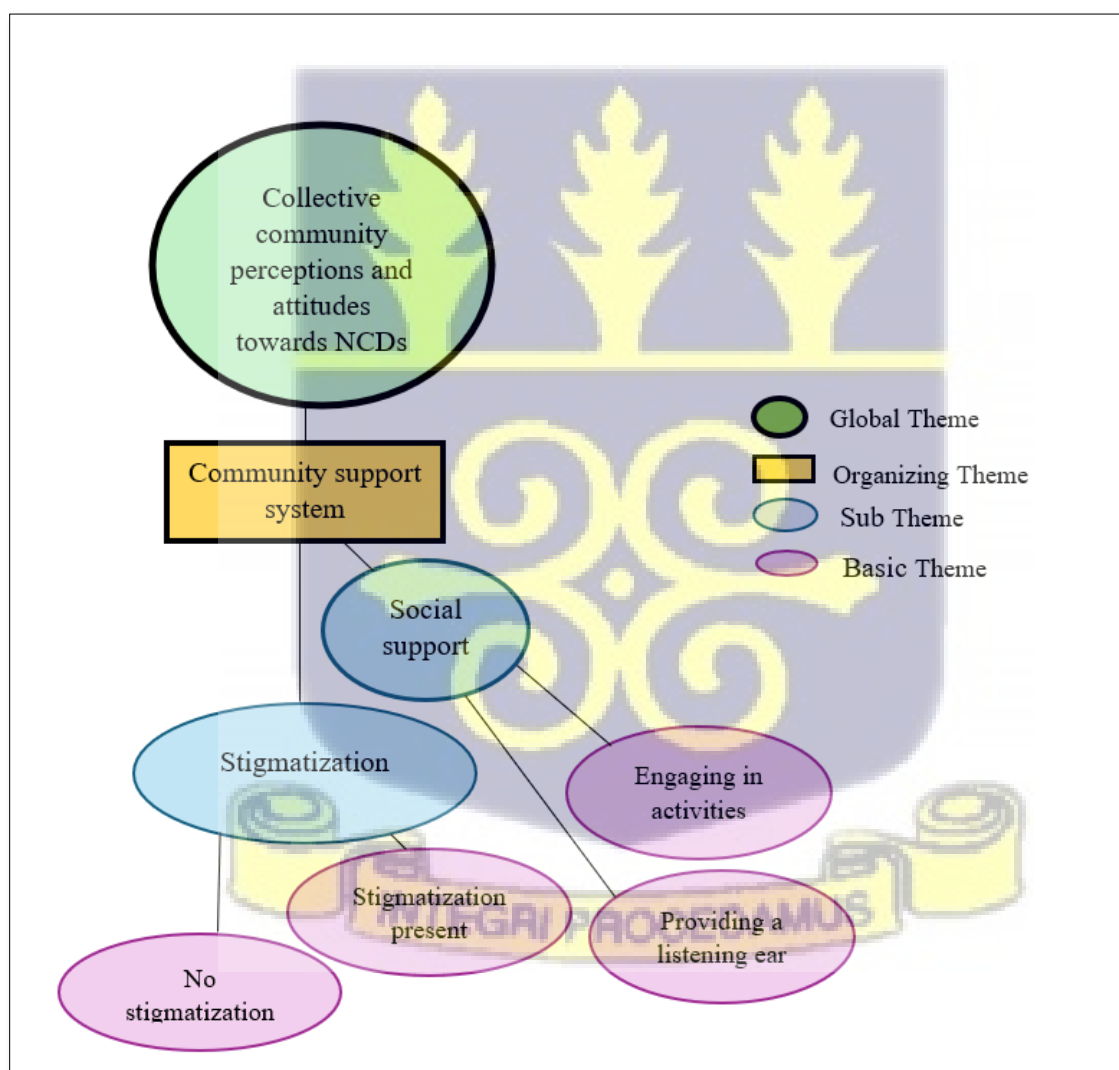
The discussions highlighted how important social support was in managing NCDs. Some of the participants were of the view that people with NCDs should be deliberately included in activities, especially for people with mental health conditions. That social support, they believe, is crucial in the management of the conditions.

*“Give her space. Enough space for her to be herself but close enough to notice when she needs you” [Female 23 years, FGD 4]*

*“As a community, we’ll advise the girl. If she stays alone, we’ll advise that her family members come for her. For the boy, we’ll advise him to get close to his friends. Boys are hardheaded more than girls. You can appeal to the emotions of girls, but boys will not listen to you. I know a boy who took weed in school and had mental health issues. He was hospitalized for a while but one day he run away from the hospital and broke his leg. After treatment, he went back to smoking weed. If it was a girl, I do not think she’ll go back to it after all the pain she has been through.” [Female, 49 years, FGD 5]*

The discussions are shown in a thematic map in figure 18.

Figure 18: Thematic map of community support system



Source: Field data, 2024

## 6.4 Discussion and summary

The findings on community perceptions of risk factors and interventions associated with hypertension, diabetes and mental health disorders are presented and discussed. The findings are discussed with the precepts of the Health Belief Model and some components of the biopsychosocial model to further understand the beliefs of community members and behaviour associated with health promotion. The discussion is grouped into 2 main parts: community perceptions of risk factors of NCDs and community perceptions of interventions of NCDs. These themes are discussed for hypertension, diabetes and mental health disorders.

### *6.4.1 Community perceptions of risk factors of NCDs*

Participants of the focused group discussions expressed their views on what they perceived to be the risk factors of hypertension, diabetes and mental health disorders. They classified the risk factors into biological, psychological and social factors in line with the biopsychosocial model. These are discussed in the sections below.

#### *6.4.1.1 Hypertension*

Under the biopsychosocial model, risk factors associated with hypertension include under biological, factors including genetic factors, gender, obesity among others. Under the psychological, factors such as personality traits, chronic stress and coping mechanism are prominent whilst factors including social isolation, culturally accepted practices among others fall under the social component of the theory. According to (Cuevas et al., 2017) psychosocial factors including socio-economic status, physical inactivity, alcohol intake among others are important risk factors of hypertension. The findings made during data collection suggested that community members have some kind of knowledge of the risks of hypertension. Some of the respondents

associated risk factors of hypertension to modifiable risk factors including alcohol intake, tobacco use, physical inactivity and unhealthy diets.

Others were of the view that hypertension could be conferred on an individual spiritually, whether the person indulges in any of the risk factors mentioned above or not. Although the concept of spirituality is a complex one, belief systems are often difficult to prove or challenge. Similarly, perceptions are not necessarily facts but mere beliefs. However, studies including Buck et al., (2009); Cozier et al., (2018) found a relationship between religiosity (with prayer as the proxy) and hypertension where they suggest that persons who engage in prayer frequently have high blood pressure. Whilst these studies used a quantitative approach and could be scientifically proven, the findings from respondents in this analysis are only beliefs.

#### *6.4.1.2 Diabetes*

Tying into the biological component of the biopsychosocial model, participants believed that although diabetes is a non-infectious disease, it could be genetically passed on. According to them, so far as someone in your family has developed diabetes, all members of the family whether nuclear or extended, are liable to developing the condition.

Apart from that, they were also of the view that consuming foods high in sugar could lead to developing the condition. This point is a controversial one where certain studies such as Lean & Te Morenga (2016) do not associate eating too much sugar to diabetes. On the contrary, type 2 diabetes which is under focus in this study is caused by resistance to insulin or pancreatic failure. (Liu et al., 2023) in their study found an association between sugar intake and diabetes where persons of normal weight, who consumed too much sugar, had increased odds of developing diabetes.

Participants also believed that consuming too much processed food could contribute to the development of diabetes. Closely linked to this, they believed that people with higher socio-economic status were more likely to develop diabetes. They associate this with the ability to afford and indulge in fast foods or what is commonly known as junk food including chips, burger and soda or carbonated drinks. A study by (Gupta et al., 2021) identified a statistically significant relationship between wealth status and diabetes where persons from high income households were more likely to develop diabetes. (Marfowaa et al., 2024), however, identified in their study that the correlation between wealth status and diabetes is not consistent across countries. As research advances, there's likely to be more clarity on whether consuming too much sugar contributes to the development of diabetes.

#### *6.4.1.3 Mental health disorders*

Discussions on mental health disorders revealed substance abuse as the main factor participants believed to be a risk factor for developing mental health disorders in general. When they were pressed about the risk factors of depression, anxiety and suicidal ideation, they had different ideas. Some believed that depression was caused by financial stress and having experienced abuse either as a child or an adult. This aligns with Zafary et al. (2024) who assert that having excessive financial stress can contribute to depression, as part of the many stressors of being an adult. Although participants attributed some modifiable risk factors to the development of hypertension and diabetes, the risk factors they associated with mental health disorders were mainly socio-cultural.

In terms of anxiety and suicidal ideation, participants believed that these arose by worrying too much about what the future holds. Surprisingly, none of the participants introduced the concept of religiosity here as they did for hypertension and diabetes. On the contrary, they believed issues

including family or marital/relationship issues, isolation from family and friends and childhood trauma were important triggers. This finding aligns with (Goldsmith, 2001) who found out that communities with a relatively youthful population, strong control networks and extended family ties had lower suicide rates.

Despite these findings, there was low awareness of different conditions under mental health disorders. Some of the participants attributed psychosis as the only existing mental health disorder. They also had low awareness of the biological and psychological risk factors associated with mental health disorders. Moreover, discussions on mental health disorders made a lot of the participants uneasy compared to discussions on diabetes and hypertension.

#### *6.4.2 Community perceptions of interventions of NCDs*

Understanding community perceptions of interventions of NCDs was useful to help in the preparation of targeted interventions for specific socio-demographic groups. The findings here are discussed in line with the Health Belief Model where perceived benefits and perceived barriers are explored. The findings for each of the NCDs under study are discussed below.

##### *6.4.2.1 Hypertension*

Generally, community members believed hypertension needed to be treated at the hospital. They believed that medical professionals had the know-how to treat hypertension. Despite this, there was no mention of preventing hypertension by taking a more proactive approach of randomly and routinely checking blood pressure levels. However, there have been some changes in the Ghanaian healthcare system where blood pressure readings are often taken at triage before going into the consulting room in both private and public hospitals. Incorporating this practice into primary healthcare is likely to yield better results.

Some of the participants perceived herbal treatment as an alternative to orthodox treatment. It was not surprising to find this out considering studies such as Azizah et al. (2021) have indicated their potency for treating hypertension. According to the authors, using herbal medicine and orthodox medicine simultaneously were more effective and safer. However, participants believed that combining both treatment options was a bad idea and vehemently spoke against it. Although they acknowledged that certain herbal treatment centers prescribed both herbal medicine and orthodox or anti-hypertensives, they insisted on either taking herbal medicine or the anti-hypertensives but never combining the two.

Other wellness interventions including reducing stress and staying to oneself or staying out of trouble were also believed to help manage hypertension. Participants highlighted the importance of self-efficacy here where they opined that sometimes, people with hypertension needed to deliberately take themselves out of stressful situations. Doing so would help in reducing potential spikes in blood pressure readings thereby making proactive choices for their wellbeing.

#### *6.4.2.2 Diabetes*

Discussions on interventions for diabetes were quite engaging. Some participants were convinced that orthodox treatment was the only viable option. Another faction also believed that herbal treatment was the best option, partly because they knew someone who was managing the condition with herbal treatment. According to some of them, if they found themselves in the same situation, they would opt for herbal treatment thus tying into ‘cues to action’ under the Health Belief Model.

Yet another faction believed that going to a prayer camp was the best way of managing the condition. This was partly because they believed that if diabetes was conferred on someone spiritually, the only way to reverse the disease was to tackle it with prayer. This argument was

buttressed with an experience where one twin with diabetes died despite going to the hospital for treatment yet the other twin who was taken to a prayer camp survived.

On making lifestyle changes, the only change they perceived as being important was to stop the consumption of sugary foods. They associate developing diabetes to the over-consumption of sugar. Per their beliefs, persons with diabetes did not have to necessarily consume fruits, because fruits have sugar in them. Neither do they believe it is important to reduce alcohol intake or tobacco use since these things are not associated with diabetes.

#### *6.4.2.3 Mental health disorders*

Discussions on community interventions for mental health disorders were difficult to have unlike discussions on diabetes and hypertension where participants were eager to share their opinions. Nevertheless, because participants attributed the risks of developing mental health disorders conditions generally to different stressors including financial stress and marital stress, the interventions were mostly linked to going in for counselling sessions/ They also discussed family and friends serving as a source of support for such affected persons. There was no mention of taking in medication for mental health conditions.

There were also some who believed that mental health conditions induced by taking in hard drugs ought to be institutionalized and kept away from society due to their unpredictable behaviour. They believed doing so would be in the interest of everyone. For persons with mental health disorders, it could remove them from their triggers and for community members, it could protect them from possible attacks.

### **6.5 Conclusion**

The qualitative findings in this chapter provided additional depth and context on the perceptions of community members on the risks and interventions associated with hypertension,

diabetes and mental health disorders. They shared their lived experiences to provide a more nuanced understanding of NCDs. The insights garnered would be essential in developing future interventions not only to prevent but to also manage NCDs for different socio-demographic groups.



## CHAPTER SEVEN: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

### 7.1 Introduction

Together with mental health disorders, non-communicable diseases account for approximately 75% of mortality worldwide according to the World Health Organization (2023c). The non-communicable diseases under study include hypertension, diabetes and mental health disorders have gained some traction over the past couple of years. That notwithstanding, there has been limited population-based research in Ghana exploring gender-specific socio-demographic predictors of these diseases. Similarly, adherence to recommended lifestyle choices associated with these diseases as well as community perceptions of their risk factors and interventions have not been adequately explored within the Ghanaian populace. Understanding this quantitative analysis at the population level together with the perceptions of community members has the potential of providing insights to allow policy prescriptions and interventions to target specific socio-demographic populations to effectively prevent and manage these conditions.

Considering this, the objectives of this study focused on investigating among the adult population of Ghana, gender-specific variations of socio-demographic determinants of hypertension, diabetes, and mental health disorders. The study also sought to explore adherence to recommended lifestyle choices associated with hypertension. The qualitative component of this study explored community perceptions of risk factors and interventions associated with hypertension, diabetes, and mental health disorders. The health belief, biopsychosocial, and intersectionality models were used as the theoretical guides of this study. The findings made from this study will contribute to the body of knowledge of NCDs in Ghana. Specifically, it has outlined the specific socio-demographic characteristics predicting the prevalence of hypertension, diabetes and mental health disorders. In addition, the study explored hypertension status based on reported

hypertension status juxtaposed with checked hypertension status from blood pressure readings taken. From this, four main hypertension statuses were derived to have a clearer picture of those who were aware they had the condition but were either managing or not managing it, those who were not aware they had the condition and those who truly did not have the condition. These are summarized in the sections below. Consequently, the adherence to recommended lifestyle choices associated with hypertension was explored. This same analysis was not done for diabetes due to the absence of glucose readings in the dataset used. The final objective of this study, using a qualitative approach, explored community perceptions of the risks and interventions associated with NCDs. This was done using six focus group discussions in the Adentan Municipal Assembly categorized into three age groups 18-34 years, 35-49 years and 50 years and above for both males and females.

## **7.2 Summary of findings**

### *7.2.1 Gender-specific variations of socio-demographic determinants of hypertension, diabetes, and mental health disorders*

The socio-demographic predictors of hypertension in this study for the total sample include age, sex, marital status, employment status, place of residence, wealth status, educational status and ethnicity. For diabetes, they include age, place of residence and educational status. For mental health disorders, they include age, employment status, religion and ethnicity.

The study also outlined the socio-demographic characteristics predicting the NCDs under study for males and females. For males, these were educational status for hypertension, age and place of residence for diabetes and ethnicity for mental health disorders. For females, wealth status

and ethnicity were significant predictors of hypertension, age and place of residence for diabetes and employment status for mental health disorders.

#### *7.2.2 Adherence to recommended lifestyle choices associated with hypertension*

In exploring this second objective, four hypertension statuses were derived namely hypertension (controlled), hypertension (uncontrolled), hypertension (unaware) and hypertension (true). This categorization, as the name depicts, indicates whether the respondent has hypertension based on checked blood pressure levels, whether they are controlling the condition or not with readings above 140/90mmHg considered to be high per the standard of the WHO. There were also respondents who reported not having hypertension, but the blood pressure readings were above 140/90mmHG suggesting they did have the condition and finally respondents who truly did not have the condition because the readings were below 140/90mmHg. The hypertension prevalence in this study was approximately 12%, consistent with findings from the Statistical Service Accra (2015) from the Ghana Demographic and Health Survey done in 2014. It was alarming that about 13% of the study respondents were not aware they had hypertension based on their blood pressure readings.

The averages of the systolic blood pressure readings were calculated for each of the categorizations. The systolic readings were used because they are known to better predict and cause cardiovascular diseases according to Basile (2002) and Peng et al, (2020) although both the diastolic and systolic blood pressure readings are important in predicting cardiovascular diseases. Based on the averages, t-tests were done to ascertain the relationship between recommended lifestyle choices and hypertension status. The results showed a statistically significant relationship between diet and persons in the hypertension (uncontrolled) group where adhering to the recommended diet practice of consuming five or more fruits and/or vegetables servings per day is

likely to decrease systolic blood pressure readings. There was no significant relationship between hypertension and physical activity, alcohol use and tobacco use in this study.

Results from the multinomial regression analysis, to help identify the specific socio-demographic characteristics predicting adherence to the recommended lifestyle choices based on the four categorizations, showed age and employment status being significant for all the hypertension groups with hypertension (true) as the reference. Similarly, the regression highlighted wealth was a significant predictor of adherence for persons in the hypertension (controlled) group, where such persons are more likely to adhere to these recommended lifestyle choices. In a further analysis to identify likely barriers sex and wealth status plays in the hypertension conundrum, an intersectional analysis was done. The results indicated wealth status as a significant factor of adherence to recommended lifestyle practices for poor males in the hypertension (uncontrolled) and hypertension (controlled) groups where they were less likely to comply. Rich females in the hypertension (controlled) group were more likely to comply to the recommended lifestyle choices per the data. These findings affirm the intersectionality model by Crenshaw (1993) to understand how certain barriers, in this case wealth status and sex, can create inequalities in adherence to the recommended lifestyle choices to manage hypertension.

### *7.2.3 Community perceptions of risk factors and interventions associated with hypertension, diabetes, and mental health disorders*

The perceptions of community members on the risks and interventions of hypertension, diabetes and mental health disorders were categorized into five main themes, listed as organizing themes in the thematic map analysis. Whilst participants shared their perceptions on how aware they were of these diseases, it was evident that although they had heard about them, there was

some knowledge gap on their associated risk factors in relation to modifiable risk factors or lifestyle choices. Under perceived risks and interventions as an organizing theme, participants highlighted in alignment with the biopsychosocial model how psychological factors, lifestyle choices, family history, lifelong ‘chronic’ diseases and spiritual factors are risk factors for developing and managing NCDs. They also discussed how they believed certain lifestyle modifications including a reduction in alcohol intake and dietary choices could help manage the diseases. They asserted that persons with diabetes ought not to over-indulge in foods with high sugary content whilst persons with hypertension had to cut back on salt intake and alcohol. Persons with mental health disorders conditions, according to them, did not have to make adjustment to any of the lifestyle choices including physical activity, diet, alcohol use and tobacco use. This was partly because they believed these were not relevant to mental health disorders. Rather, using narcotics and adulthood stressors were much more important risks of developing mental health disorders conditions.

In line with the perceived associated risks, the interventions included orthodox treatment, herbal treatment, wellness strategies and prayers. The respondents were in favour of visiting the hospital to care for all three diseases. They discussed the relevance of taking medications as prescribed and not combining orthodox treatment with herbal treatment. A faction of the respondents was also in favour of herbal treatment because of certain cues to act depicted in the health belief model in the form of friends and acquaintances receiving healing after they took herbal treatments. Yet another faction was in support of prayers particularly for diabetes, especially where they believed they were conferred spiritually on persons in line with findings made by de-Graft Aikins et al. (2014). The wellness strategies including limiting stressful activities or keeping to oneself were mostly related to interventions for persons with hypertension and mental health

disorders conditions. These findings are helpful in enriching discourse on how communities perceive risks and interventions associated with NCDs.

### **7.3 Implications and conclusions of study**

The findings from this study are likely to have implications for policy recommendations, further research and practice. In line with the first objective, the prevalence and management of hypertension, diabetes and mental health disorders are associated with certain socio-demographic characteristics and modifiable risk factors as presented in the results in consonance with other studies including Minicuci et al. (2014) and Issah et al. (2024). This is explained according to the tenets of the biopsychosocial model where certain genetic predispositions, socio-cultural and lifestyle factors can increase the risks of developing hypertension, diabetes and mental health disorders in this study.

Findings from the second objective suggested a critical gap in hypertension awareness and risk factors where about 13% of the study respondents were not aware they had hypertension based on their systolic blood pressure readings. In line with the health belief model, persons who do not perceive to be at risk in terms of severity or susceptibility to hypertension, are less likely to adopt to lifestyle choices and likelihood of adopting health behaviours to enhance their health.

The final objective highlights the complex inter-relationship between perception and NCD prevention and management. Whilst there is some knowledge and awareness of risk factors and interventions associated with hypertension, diabetes and mental health disorders, there is a critical gap in how modifiable risk factors are associated with these diseases. This community-based approach used meant that participants of the focus group discussions did not necessarily have an NCD and are as such oblivious of the risk factors of NCDs. However, interventions were largely centered on orthodox treatment, alternative treatment, wellness strategies and spiritual

interventions. This bridges the gap on how to approach the management of NCDs at the community level and primary healthcare level considering socio-cultural nuances.

This study, using the WHO SAGE Wave II data backed by a qualitative study at the community level, provides a clearer picture of socio-demographic and modifiable risk factors associated with hypertension, diabetes and mental health disorders. It identifies the complexities of how community members who may not necessarily have an NCD perceive the risks and their associated interventions for NCDs. For males, educational status was associated with hypertension and diabetes and mental health disorders was associated with ethnicity. For females, wealth status and ethnicity were associated with hypertension, age and place of residence for diabetes and employment status for mental health disorders. These are all critical findings necessary when designing interventions to prevent and manage NCDs. The findings also show a high prevalence rate of hypertension with approximately 12% being aware they had hypertension and about 13% unaware of their hypertension status. Based on these, it was not surprising that the adherence to diet, which was the only risk factor with a significant relationship with hypertension status was low. It was even more concerning where poor males were less likely to adhere to the dietary recommendation compared to rich females who were more likely to adhere to these recommendations. In teasing out the perceived risks and interventions, it became more evident the knowledge gap existing at the community level on the risks and interventions associated with hypertension, diabetes, and mental health disorders. Altogether, the findings provide critical information needed to draw strategic community level policies to better prevent and manage NCDs considering evident multifaceted socio-cultural differences.

## 7.4 Recommendations

### 7.4.1 Policy recommendations

The recent policy on non-communicable diseases in Ghana dubbed ‘National policy non-communicable diseases’ was completed in 2022. The policy document was put together by experts with varied knowledge on the control and prevention of NCDs, the policy units under the Ministry of Health (MoH) and the National Development Planning Commission (NDPC). As spelt out, one of the main challenges faced was funding during the implementation of the previous policy. This notwithstanding MoH has prioritized plans to acquire funding for the implementation of the current policy document (Ministry of Health, 2022b).

The findings from the first objective of this study identifying specific socio-demographic predictors of hypertension, diabetes, and mental health disorders for both males and females are crucial in designing interventions to prevent and manage these conditions. They provide direction on the need to have targeted public health and behavioural interventions addressing the specific risk factors which are relevant to each demographic group. The socio-cultural approach used in policy interventions is likely to yield better results this way, when the needs of different socio-demographic groups are addressed through policy interventions. It is recommended that the National Health Insurance Authority expands coverage of the scheme itself as well as the benefit package to cover each demographic group with a strong focus on regular screening and counselling patients on the risk factors, management and control of hypertension, diabetes and mental health disorders.

In addressing the findings from the second objective, there is a critical gap in hypertension awareness and risk factors. This calls for enhanced public health efforts at the national and community levels to increase awareness of the associated risk factors, especially the modifiable

risk factors. Currently, the NCD policy document addresses health promotion at the primary level through health education, creating and strengthening community action for health promotion and reprogramming health services to adjust to health promotion among others. It also highlights how each modifiable risk factor including alcohol use, tobacco use, diet, physical activity and the others are addressed in public health initiatives to ensure compliance. Not only are these likely to promote healthier lifestyles but also to have better outcomes on the management of NCDs. Whilst all these are great interventions, it is important to incorporate these interventions through public health awareness programmes at the primary healthcare levels together with routine and random blood pressure checks. The Ministry of Health and Ghana Health Service should collaborate in leading the charge of integrating gender and wealth-sensitive strategies into primary health care policies. As asserted by Kelly & Barker (2016) behavioural change is difficult and needs long-term continuous and well-planned interventions to sustain it for best results. Such public health awareness programmes are great platforms to educate the populace about the risk factors and their associated interventions using language the people understand whilst being culturally sensitive to their beliefs and perceptions. This is why the qualitative findings from this study are crucial in policy implementation.

#### *7.4.2 Recommendations for further research*

Findings from this study provide valuable knowledge on the socio-demographic and modifiable risk factors associated with hypertension, diabetes and mental health disorders using the WHO SAGE Wave 2 dataset. Whilst these findings are valuable, the SAGE Wave 3 dataset is a more updated version. At the time of starting this study, the SAGE Wave 3 dataset was not available for use. Further research spearheaded by the Regional Institute for Population Studies – University of Ghana, could explore the current predictors when the data set is made available. In

addition, although hypertension, diabetes, and mental health disorders can have co-morbid tendencies, that was not explored in the study. This was mostly due to logistical challenges. However, it is important in understanding the nuances of NCDs and their inter-relatedness. This could be addressed with further research to understand co-morbidity among hypertension, diabetes and mental health disorders backed by qualitative data to further understand the perceived risks and interventions associated with co-morbid conditions. On a national level, the Ghana Statistical Service in collaboration with Ghana Health Service, Regional Institute for Population Studies, School of Public Health - University of Ghana and other research bodies should conduct interdisciplinary studies which explores perceptions of risk factors of NCDs, employing the intersectionality approach to delve deeper into existential patterns including religion, mental disorders and gender among others which might otherwise not be evident.

#### *7.4.3 Recommendations for practice*

This study made inferences at various points to the health belief model, biopsychosocial model and the intersectionality model to explain the predictors of hypertension, diabetes and mental health disorders based on different socio-demographic characteristics, adherence to recommended lifestyle practices and finally the risks and interventions to prevent and manage these NCDs. As the government through the Ministry of Health is already implementing the NCD policy, it is critical for health workers at all levels to understand the biological, psychological and social determinants of health promotion for the different demographics they work with. It is also important to understand their perceptions and treat them sensitively to get community members to accept the interventions being preached to them. Whilst these may seem simple, dealing with culture and behaviour change is complex, one which needs a lot of patience and sustained endurance. This is why the Ministry of Gender, Children and Social Protection ought to collaborate

with the Ministry of Health and Ghana Health Service to design interventions which address the needs of both males and females, and children especially because the lifestyle choices associated with the risk factors of these diseases can be modified.

To promote a proactive approach to the prevention and management of NCDs, this study recommends engaging community members in regular check-ups for blood pressure, glucose levels and general wellbeing. This could be incorporated into the primary healthcare systems and CHPS compounds in both rural and urban areas. The local governments including District and Municipal Health Directorates can champion this cause through public education, health talks, health walks and regular community health screening. Using this community-based approach provides a much simpler yet effective way of minimizing the prevalence of these diseases as well as reducing the effect of late presentation, which might be too late or too expensive to treat.



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## ANNEX

### Annex 1: Standard Operating Procedures for Data Collection using Focus Group Discussions

*Method:* Focus Group Discussions (FGDs) was conducted in Adentan Municipal Area for males and females. Six (6) FGDs were conducted in total. The FGDs were sub-categorized into these groups

| Group Number | Age grouping                 |
|--------------|------------------------------|
| Group 1      | 18-34 years (males)          |
| Group 2      | 35-49 years (males)          |
| Group 3      | 50 years and above (males)   |
| Group 4      | 18-34 years (females)        |
| Group 5      | 35-49 years (females)        |
| Group 6      | 50 years and above (females) |

The Data Collection Teams (DCT) were made up of two researchers, the main interviewer and a supporting interviewer was taking audio recording proceedings as well as making other subtle observations including body language. Each FGD was made up of at least 6 participants.

Before the FGD commenced, verbal consent was obtained from participants after which their names and ages were recorded on the participant sheet.

### Interview Guide

#### *Procedure for conducting the Focus Group Discussion*

1. At the beginning of the discussion, we welcomed participants and introduced ourselves to the group
2. Each person was allowed to introduce themselves briefly
3. An overview of the topic was given

Overview: Today we'll be talking about non-communicable diseases. During this discussion, they'll be referred to as NCDs. The NCDs for this study are hypertension, diabetes (type 2) and mental health. We're conducting this research to know how community members understand these diseases.

4. Participants were informed about the format of the discussion.

There will be 3 scenarios. Each scenario will look at one disease ie hypertension, diabetes and mental health disorders. Each scenario will be read out loud at least twice. A series of questions for discussion will be asked under each scenario. There's no right or wrong answer. Please feel at home and answer them to the best of your knowledge and experience.

#### *Ground rules*

- Please raise your hand if you want to answer or ask a question

- Please do not talk over someone else (when the person is talking)
  - Let us all agree to show respect and consideration for each other during this discussion. You may not always agree with what someone says, but please share your different opinion in a respectful manner which does not ridicule anyone.
  - Please do not make sarcastic comments during or after someone has made his/her comment
5. Ask if participants have any questions. If there are no questions, ask participants if the discussion can start with the first scenario

### **Scenario 1 - Discussion on hypertension**

*Kofi has not been feeling well of late. He has been experiencing headaches, chest pains and dizziness symptoms for the past few months. He visited the hospital and after a series of tests, he was told by the doctors that he had hypertension. (Repeat the scenario)*

#### **Question 1**

| What do you think caused Kofi's hypertension? |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|-----------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Probe further                                 | Based on the answers they provide; ask why they think those factors caused Kofi's hypertension. Is there any other cause? Why do you think it started at this point (of having the symptoms)?<br>Follow up – are there any dietary considerations when it comes to hypertension? some people say that smoking and drinking alcohol may lead to hypertension. What do you think and why? Others also say being overweight can contribute to hypertension. What do you think and why? |

#### **Question 2**

| How do you think Kofi should manage his condition?                                                                                                                                                                                     |                                                                                                                                           |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|
| If they say he needs to receive treatment, then follow-up with where should he go? And follow on from there with where else? They may talk about lifestyle changes, so your follow-ups should also include asking what else he can do? |                                                                                                                                           |
| Probe further                                                                                                                                                                                                                          | Do you think this is a life-long condition or do you think it will go away?<br>How does the community see/treat people with hypertension? |

6. Thank them for their contributions to scenario 1 and inform them that the discussion is moving to scenario 2

### **Scenario 2 - Discussion on Diabetes**

*Ama has been urinating frequently lately, more than usual. She drinks a lot more water than before and gets hungry within short intervals. When she tasted her urine, she found it was sugary. She talked to her friend who advised her to go to the hospital. After a couple of tests, she was diagnosed with diabetes. (Repeat the scenario)*

*Question 1*

| What do you think caused Ama to get diabetes? |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|-----------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Probe further                                 | Based on the answers they provide; ask why they think those factors caused Ama's diabetes? Is there any other cause? Why do you think it started at this point (of having the symptoms)?<br>Follow up – are there any dietary considerations when it comes to diabetes? some people say that not engaging in physical activity and poor eating habits may lead to diabetes. What do you think and why? Others also say family history can contribute to diabetes. What do you think and why? |

*Question 2*

| How do you think Ama should manage her condition?                                                                                                                                                                                         |                                                                                                                                    |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|
| If they say she needs to receive treatment, then follow-up with where should she go? And follow on from there with where else? They may talk about lifestyle changes, so your follow-ups should also include asking what else she can do? |                                                                                                                                    |
| Probe further                                                                                                                                                                                                                             | Do you think this is a life-long condition or do you think it will go away? How does the community see/treat people with diabetes? |

7. Thank them for their contributions to scenario 2 and inform them that the discussion is moving to scenario 3

**Scenario 3 - Discussion on Mental Health Disorders**

**Depression & Suicidal Tendencies**

*Adwoa used to be a bubbly and lively girl. Of late, she's been feeling very overwhelmed with life, often feels tired and doesn't want to go out. She cries a lot and doesn't want to meet other people. She also struggles to complete tasks and no longer enjoys the things she once used to. She confided in her friend who advised her to speak to a Doctor/Therapist.*

*Question 1*

| What do you think is wrong with Adwoa? |                                                                                                                                                                        |
|----------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Probe further                          | Based on the answers they provide; ask why they think that way. What do you think caused the condition? What does it do to her? Is it a serious problem? Why? Why not? |

*Now, Adwoa feels she's a burden to her family and her friends. She confides in her friend that sometimes she wants to take her own life.*

| What do you think is wrong with Adwoa? |                                                                |
|----------------------------------------|----------------------------------------------------------------|
| Probe further                          | Based on the answers they provide; ask why they think that way |

*Question 2*

|                                               |                                             |
|-----------------------------------------------|---------------------------------------------|
| What is the best way for Adwoa to get better? |                                             |
| Probe further                                 | Based on the answers they provide; ask why. |

*Question 3*

|                                                                                                                                                         |                                            |
|---------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|
| How will the community perceive Adwoa when they find out about what she's going through?<br>How does the community see/treat people with such problems? |                                            |
| Probe further                                                                                                                                           | Based on the answers they provide; ask why |

**Anxiety**

*Adwoa used to be a very confident girl. Lately, she easily gets angry, complains of constant headaches, gets tired easily, she's worried about the future and finds it difficult concentrating on her studies. She confided in her friend who advised her to speak to a Doctor/Therapist.*

*Question 1*

|                                        |                                                                |
|----------------------------------------|----------------------------------------------------------------|
| What do you think is wrong with Adwoa? |                                                                |
| Probe further                          | Based on the answers they provide; ask why they think that way |

*Question 2*

|                                               |                                                                          |
|-----------------------------------------------|--------------------------------------------------------------------------|
| What is the best way for Adwoa to get better? |                                                                          |
| Probe further                                 | Based on the answers they provide; ask why. Same or different for a male |

*Question 3*

|                                                                                          |                                                                           |
|------------------------------------------------------------------------------------------|---------------------------------------------------------------------------|
| How will the community perceive Adwoa when they find out about what she's going through? |                                                                           |
| Probe further                                                                            | Based on the answers they provide; ask why. Same or different from a male |

*Ask the respondents if they have any questions. Reiterate that the responses they have given are purposely for academic purposes and that their identities will not be linked to their responses in any way. In the same way, they must also not share the responses given by other respondents with others.*

8. Thank them for their patience and contributions to all three scenarios. Assure them that everything that has been discussed will be confidential. Let them know of any departure rules (if any)

**Annex 2: Ethical Clearance (ECH 209/22-23)**



**UNIVERSITY OF GHANA**  
**ETHICS COMMITTEE FOR THE HUMANITIES (ECH)**

*P. O. Box LG 74, Legon, Accra, Ghana*

*My Ref. No: ECH 209/ 22-23*

July 13, 2023

Akosua Afriyie Osei-Appaw  
Regional Institute for Population Studies  
University of Ghana  
Legon

**ETHICAL CLEARANCE**  
**(ECH 209/ 22-23)**

The Ethics Committee for the Humanities (ECH) conducted a full board review and approved your protocol titled:

**BEHAVIOURAL RISK FACTORS OF NON-COMMUNICABLE DISEASES IN GHANA**

**PRINCIPAL INVESTIGATOR: AKOSUA AFRIYIE OSEI-APPAW**

Please note that the final review report must be submitted to the Committee at the completion of the study. Your research records may be audited at any time during or after the implementation. Any modification of this research project must be submitted to ECH for review and approval prior to implementation.

Please report all serious adverse events related to this study to ECH within seven (7) days verbally and in writing within fourteen (14) days.

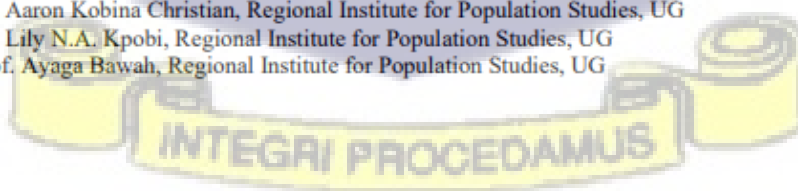
This certificate is valid until July 12, 2024. You are required to submit annual reports for continuing review.

Please accept my congratulations.

Yours Sincerely,

**Professor C. Charles Mate-Kole**  
**ECH Chair**

Cc: Dr. Aaron Kobina Christian, Regional Institute for Population Studies, UG  
Dr. Lily N.A. Kpobi, Regional Institute for Population Studies, UG  
Prof. Ayaga Bawah, Regional Institute for Population Studies, UG



**Annex 3: Multinomial regression showing intersectionality between wealth status, sex, hypertension status and recommended lifestyle practices**

| <b>Socio-demographic characteristics</b>       | <b>Hypertension uncontrolled (SE)</b> | <b>Hypertension controlled (SE)</b> | <b>Hypertension Unaware (SE)</b> |
|------------------------------------------------|---------------------------------------|-------------------------------------|----------------------------------|
| <i>Wealth status</i>                           |                                       |                                     |                                  |
| Female#Middle                                  | 0.237 (0.386)                         | 0.272 (0.262)                       | 0.356 (.0197)                    |
| Female#Rich                                    | 0.306 (0.395)                         | 0.543** (0.259)                     | -0.241 (0.231)                   |
| Male#Poor                                      | -2.034*** (0.685)                     | -0.817** (0.374)                    | -0.035 (0.227)                   |
| Male#Middle                                    | -0.760 (0.501)                        | -0.648 (0.359)                      | -0.297 (0.255)                   |
| Male#Rich                                      | -0.394 (0.482)                        | -0.083 (0.324)                      | -0.074 (0.268)                   |
| <i>Age groups (Ref: 5+)</i>                    |                                       |                                     |                                  |
| 18-34                                          | -2.443** (1.033)                      | -1.988*** (0.489)                   | -2.610*** (0.605)                |
| 35-49                                          | -0.263 (0.334)                        | -0.796*** (0.251)                   | -0.620*** (0.216)                |
| <i>Marital status (Ref: Nformerly married)</i> |                                       |                                     |                                  |
| Married                                        | 1.536 (1.040)                         | 0.605 (0.466)                       | -0.144 (0.340)                   |
| Formerly married                               | 1.499 (1.039)                         | 0.757 (0.465)                       | 0.134 (0.340)                    |
| <i>Employment status (Ref: unemployed)</i>     |                                       |                                     |                                  |
| Employed                                       | -0.492** (0.246)                      | -0.420*** (0.157)                   | -0.243 (0.137)                   |
| <i>Place of residence (Ref: Rural)</i>         |                                       |                                     |                                  |
| Urban                                          | 0.364 (0.250)                         | 0.844*** (0.166)                    | 0.0368 (0.139)                   |
| <i>Religion (Ref: Christian)</i>               |                                       |                                     |                                  |
| Islam                                          | 1.160** (0.526)                       | 0.157 (0.498)                       | 0.187 (0.331)                    |
| Others                                         | -0.00402 (0.429)                      | -0.0430 (0.272)                     | 0.269 (0.207)                    |
| None                                           | 0.795 (0.578)                         | 0.0881 (0.462)                      | 0.219 (0.274)                    |
| <i>Educational status (Ref: no education)</i>  |                                       |                                     |                                  |
| Primary                                        | 0.465 (0.317)                         | 0.258 (0.200)                       | -0.0768 (0.163)                  |
| Secondary                                      | 0.841*** (0.326)                      | 0.499** (0.207)                     | -0.141 (0.184)                   |
| Tertiary                                       | 1.218** (0.530)                       | 0.646* (0.360)                      | 0.106 (0.366)                    |
| <i>Ethnicity (Ref: Akan)</i>                   |                                       |                                     |                                  |
| Ewe                                            | -0.0517 (0.435)                       | 0.278 (0.267)                       | 0.309 (0.250)                    |
| Ga-adangme                                     | 0.337 (0.313)                         | 0.521** (0.207)                     | 0.171 (0.190)                    |
| Mande-busanga                                  | -0.225 (0.404)                        | -0.0917 (0.257)                     | -0.136 (0.195)                   |
| Other northern dialects                        | 0.755 (0.439)                         | 0.451 (0.307)                       | 0.183 (0.251)                    |
| <i>Modifiable risk factors</i>                 |                                       |                                     |                                  |
| Alcohol use                                    | 0.243 (0.256)                         | -0.204 (0.179)                      | 0.322** (0.141)                  |
| Tobacco use                                    | 0.545 (0.640)                         | 0.168 (0.497)                       | 0.604** (0.265)                  |
| Diet                                           | 0.177 (0.224)                         | 0.111 (0.146)                       | 0.122 (0.124)                    |
| Physical activity                              | -0.354 (0.250)                        | -0.157 (0.164)                      | -0.0144 (0.146)                  |

Source: Derived from WHO SAGE Wave Data, 2014

Values represent co-efficient (standard errors) \*\*\* $p < 0.01$ , \*\* $p < 0.05$

**Annex 4: Themes on focus group discussions in the Adentan Municipality**

| Global Theme                                                                     | Organizing themes                  | Sub-themes                | Codes                             | Quotes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|----------------------------------------------------------------------------------|------------------------------------|---------------------------|-----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Collective community perceptions and attitudes towards non-communicable diseases | 1. Perceived awareness of diseases | 1.1 Knowledge of diseases | 1.1.1 Information on diseases     | <ul style="list-style-type: none"> <li>• Mental health is about social, psychological, mental health. Everything. Because some of us here, we can have mental health issues, but you would not know.</li> <li>• I've heard of hypertension, but I do not know what causes it</li> </ul>                                                                                                                                                                                                                                                                                                                                                                              |
|                                                                                  |                                    |                           | 1.1.2 Infectious / non-infectious | <ul style="list-style-type: none"> <li>• These diseases are not infectious. For example if I'm coughing and you're sitting next to me, you can also start coughing. But if I have diabetes and you're close to me, you cannot get it.</li> <li>• Oh no, I do not think I can get hypertension from someone else</li> <li>• But some houses, there are a lot of mad people there. Maybe it's in the blood.</li> </ul>                                                                                                                                                                                                                                                 |
|                                                                                  |                                    | 1.2 Disease awareness     | 1.2.1 Triggers of diseases        | <ul style="list-style-type: none"> <li>• When I got pregnant and went to the hospital, I was told I had hypertension, but I was not thinking or smoking or drinking.</li> <li>• Usually, if you do not eat well and do not sleep for long. Some people drink alcohol before eating. They'll take 2 tots before eating.</li> <li>• Maybe her boyfriend whom she has planned marriage with has gone for another girlfriend. It can cause her mental stress.</li> <li>• Financial problems can cause mental problems. Even bp.</li> <li>• You do not have to stress yourself too much</li> <li>• Sometimes when you think too much, you can get hypertension</li> </ul> |
|                                                                                  |                                    |                           | 1.2.2 Misconceptions              | <ul style="list-style-type: none"> <li>• Smoking cannot cause hypertension. I do not think so.</li> <li>• I do not think young people can get hypertension or mental health problems. Young people are mostly active and fit.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                             |

| Global Theme | Organizing themes             | Sub-themes               | Codes                          | Quotes                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|--------------|-------------------------------|--------------------------|--------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|              | 2. Perceived risks & severity | 2.1 Lifestyle factors    | 2.1.1 Food choices             | <ul style="list-style-type: none"> <li>When you do not eat a balanced diet</li> <li>You do not have to take in a lot of salt and those foods which are usually in cans. You have to reduce their intake otherwise you'll become sick.</li> <li>Eating too much sugar and carbohydrates gives you diabetes</li> </ul>                                                                                                                                 |
|              |                               |                          | 2.1.2 Being overweight         | <ul style="list-style-type: none"> <li>But when someone is obese, the likelihood of getting it (diabetes) is higher</li> <li>Someone who is big and doesn't exercise can get the disease. She's always sitting at one place.</li> </ul>                                                                                                                                                                                                              |
|              |                               |                          | 2.1.3 Physical activity        | <ul style="list-style-type: none"> <li>It (exercising) reduces their weight</li> <li>When you exercise, it makes your blood work well. If your blood is not working well from not exercising, you can get hypertension. If you sit at one place without doing anything, you can get hypertension</li> <li>When you sit at one place for a long time without exercising</li> </ul>                                                                    |
|              |                               |                          | 2.1.4 Engaging in smoking      | <ul style="list-style-type: none"> <li>I do not think smoking can cause hypertension. Maybe weed can cause mental health issues</li> <li>If you take in alcohol and cigarettes, things which do not benefit your immune system, you have to stop. Some of these people have been told to stop but because they are hardheaded, they continue taking in alcohol and cigarettes and will be suffering. All these things make the body weak.</li> </ul> |
|              |                               |                          | 2.1.5 Taking in excess alcohol | <ul style="list-style-type: none"> <li>If you drink alcohol, you can get hypertension</li> <li>It depends. If you drink alcohol in excess and continuously, you can get hypertension. If you drink alcohol once a while, you cannot get hypertension</li> </ul>                                                                                                                                                                                      |
|              |                               | 2.2 Psychosocial factors | 2.2.1 Narcotics intake         | <ul style="list-style-type: none"> <li>It can be hard drugs</li> <li>There was an actor, he acted "Age 18". Because of drugs, he has slimmed down. He has even gone to the rehab centre</li> </ul>                                                                                                                                                                                                                                                   |

| Global Theme | Organizing themes | Sub-themes             | Codes                              | Quotes                                                                                                                                                                                                                                                                                                                                                                                                                             |
|--------------|-------------------|------------------------|------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|              |                   |                        |                                    | <ul style="list-style-type: none"> <li>• Hard drugs is very important in mental health</li> <li>• Some people have never used hard drugs before so the moment they try it, it can affect them.</li> </ul>                                                                                                                                                                                                                          |
|              |                   |                        | 2.2.2 Abuse & trauma               | <ul style="list-style-type: none"> <li>• Maybe it's child abuse</li> <li>• Maybe it's emotional damage from childhood. Sometimes our parents do not listen to us when we want to tell them things</li> <li>• Maybe she's going through some trauma that she doesn't want to open up.</li> <li>• Because of heartbreak someone has drunk 'parazone' before.</li> <li>• Maybe she has done something that is haunting her</li> </ul> |
|              |                   |                        | 2.2.3 Behavioural & health factors | <ul style="list-style-type: none"> <li>• If you're someone who easily gets angry, you can get hypertension.</li> <li>• I think it could be that Ama had bp (blood pressure) because if you have hypertension, you can have diabetes too.</li> </ul>                                                                                                                                                                                |
|              |                   |                        | 2.2.4 Social isolation             | <ul style="list-style-type: none"> <li>• Maybe she has isolated herself from others</li> <li>• She doesn't want to talk to anyone. She feels like no one understands her.</li> </ul>                                                                                                                                                                                                                                               |
|              |                   | 2.3 Spiritual diseases | 2.3.1 Diseases from curses         | <ul style="list-style-type: none"> <li>• They (spirits) can give sickness</li> <li>• We have the spiritual side and the physical side. So, when it's the spiritual, you take it to the pastor. When it is physical, you take it to the hospital.</li> </ul>                                                                                                                                                                        |
|              |                   |                        | 2.3.2 Spiritual eyes               | <ul style="list-style-type: none"> <li>• Some of the pastors see things within the spirit realm. When he sees it, he might not be able to tell you.</li> <li>• It's not everything that is physical. Sometimes, someone can just say something to you in your dreams and you wake up and realize you're not well. You need someone with spiritual eyes to tell you what the problem is.</li> </ul>                                 |
|              |                   | 2.4 Family history     | 2.4.1 Inherited traits             | <ul style="list-style-type: none"> <li>• It's hereditary, diabetes</li> </ul>                                                                                                                                                                                                                                                                                                                                                      |

| Global Theme | Organizing themes                            | Sub-themes                   | Codes                              | Quotes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|--------------|----------------------------------------------|------------------------------|------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|              |                                              |                              |                                    | <ul style="list-style-type: none"> <li>Sometimes at a young age it doesn't show but as the person grows, it shows</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|              |                                              |                              | 2.4.2 Medical patterns in family   | <ul style="list-style-type: none"> <li>Sometimes it might not be your direct family. It might be your aunty</li> <li>Diabetes is not infectious but if someone in your family has it, maybe your father or grandfather, you can also have it.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|              |                                              | 2.5 Chronic disease for life | 2.5.1 Long term medical conditions | <ul style="list-style-type: none"> <li>It (diabetes) cannot be cured</li> <li>Even if he treats it, he will still have hypertension</li> <li>It (medications) will only minimise it</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|              |                                              |                              | 2.5.2 Influence of triggers        | <ul style="list-style-type: none"> <li>It depends on how they handle her and what triggered it (mental health). She can get better if she stays away from what triggered the disease.</li> <li>If you have hypertension and you're still drinking alcohol, you're calling for your death.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|              | 3. Health related behaviours & interventions | 3.1 Orthodox treatment       | 3.1.1 Visit the hospital           | <ul style="list-style-type: none"> <li>The Drs can tell him what exactly is causing the hypertension. If it's the food he's eating, then they can advise him on the type of food to eat. For some people, maybe they like eating heavy food in the evening. So he can limit eating heavy food at night. He can eat the heavy food in the afternoon and eat light at night.</li> <li>Sometimes they say 'Nyame beye'. But whilst God is doing His part, you have to go to the hospital. Just stick to the treatment</li> <li>When she visits the hospital, the Doctors can direct her on what to eat which can reduce how severe the sickness is.</li> <li>He can visit the psychologist and talk to him.</li> <li>Sometimes the Doctors take you through counselling. Someone will look happy and smiley to the outside world but she can be going through some challenges she cannot talk about so maybe one day she'll reach her breaking point. After thinking about it for so long, the</li> </ul> |

| Global Theme | Organizing themes | Sub-themes                | Codes                               | Quotes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|--------------|-------------------|---------------------------|-------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|              |                   |                           |                                     | brain can get weak. So, the counselling will help. She can tell the Doctor that she thinks too much or tell the Doctor what her challenges are.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|              |                   |                           | 3.1.2 Take medication as prescribed | <ul style="list-style-type: none"> <li>• It (medications) is prolonging your life span so you have to take them as prescribed</li> <li>• Maybe the medicine hasn't been prescribed by the Doctor but you feel like you have a headache so you say let me go to the drug store and get a pain killer.</li> <li>• They (Doctors) gave him all types of medicines but he died</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|              |                   |                           | 3.1.3 No treatment combinations     | <ul style="list-style-type: none"> <li>• If it's herbal treatment, she should take only herbal medicine. She should not mix herbal and the drugs from the hospital. Do not mix the two</li> <li>• Sometimes they say 'Nyame beye'. But whilst God is doing His part, you have to go to the hospital. Just stick to the treatment</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|              |                   | 3.2 Alternative treatment | 3.2.1 Herbal treatment              | <ul style="list-style-type: none"> <li>• But sometimes when you go to the herbal clinic, they prescribe orthodox medicine for you to add.</li> <li>• Like endpoint like this, if you go there, they will prepare the medicine for you there and give it to you. So, you'll wait for them to prepare the medicine for you</li> <li>• There are some people who go round checking for bp. I had an auntie who had hypertension. She didn't go to the hospital. She was taking herbal medicine and would let those people checking bp, check hers. When the disease became worse and we took her to the hospital, we were told all her internal organs were failing and were transferred to Korle Bu. Anytime you tell her to go the hospital, she would say she doesn't have money. She died eventually. After her death, we found about GHS 1500 (15 million cedis) under her bed. So as for me, I do not like those people who go round checking bp. They annoy me.</li> </ul> |

| Global Theme | Organizing themes | Sub-themes              | Codes                         | Quotes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|--------------|-------------------|-------------------------|-------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|              |                   |                         | 3.2.2 Selfcare options        | <ul style="list-style-type: none"> <li>Ama has to drink a lot of water so that all the toxins will come out.</li> <li>Stay calm and do not force things. When the time is right, God himself will give you everything you want.</li> <li>Lower your expectations in life. Do not aim too high.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|              |                   | 3.3 Spiritual treatment | 3.3.1 Pray diseases away      | <ul style="list-style-type: none"> <li>We have the spiritual side and the physical side. So when it's the spiritual, you take it to the pastor. When it is physical, you take it to the hospital.</li> <li>But I know people who were told they had diabetes, they went to the prayer camp and got healed. I experienced that with my own eyes. They were twins in my class. The other one died, the <i>panyin</i> died but the <i>kakra</i> was taken to the prayer camp and was healed.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|              |                   |                         | 3.3.2 Seek spiritual guidance | <ul style="list-style-type: none"> <li>After going to the hospital and taking all the drugs prescribed but still the disease is getting worse or not going away, then you have to go for the spiritual. But if you're diagnosed with the disease and go to the spiritual healer right away, I will not advise that. You have to look at the physical aspect too.</li> <li>There are some pastors who are specialized in some of these diseases. When you go to them and they pray for you, you can get healed. When they go and do another test, they're told they do not have the disease anymore. Some people too will go to these pastors and take the herbal treatment, and the disease will become worse. But the pastors, they help a lot.</li> <li>You can go to the pastor to pray for you. When they pray for you, the sickness goes away but you have to look for a good one otherwise the bad ones will take your money and run</li> </ul> |
|              |                   | 3.4 Wellness strategies | 3.4.1 Reduce stress           | <ul style="list-style-type: none"> <li>Do not stress yourself</li> <li>He shouldn't stress himself over things that may bring pressure</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

| Global Theme | Organizing themes          | Sub-themes                      | Codes                                    | Quotes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|--------------|----------------------------|---------------------------------|------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|              | 4. Lifestyle modifications |                                 | 3.4.2 Stay to oneself                    | <ul style="list-style-type: none"> <li>• He should be reserved</li> <li>• He should not go looking for trouble</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|              |                            | 4.1 Dietary reconsiderations    | 4.1.1 Intake of certain foods            | <ul style="list-style-type: none"> <li>• A person without hypertension and a person who has hypertension cannot take the same diet.</li> <li>• If I have hypertension, I cannot take alcohol. I cannot take too much salt but someone without hypertension, you have to take it but not too much</li> <li>• Ama has to reduce the intake of sugar. For example, if she keeps eating sugary foods like always buying fanta and pie, these drinks, if she likes them then she has to reduce it.</li> </ul>                                                                                                                                                                                                                      |
|              |                            |                                 | 4.1.2 Consumption of fruits & vegetables | <ul style="list-style-type: none"> <li>• (Person cannot consume) any kind of fruits but the prescribed fruits</li> <li>• (Eating) green leafy vegetables</li> <li>• You can eat some vegetables at night and maybe add a little bit of tea with a slice of bread</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|              |                            | 4.2 Reduction in alcohol intake | 4.2.1 Cut back on alcohol                | <ul style="list-style-type: none"> <li>• So if the person was taking alcohol for him to get hypertension, the person will have to reduce the alcohol consumption</li> <li>• You're triggering the disease. You're already a drunkard and you got hypertension. You should stay away from too much alcohol and still you're going ahead to drink alcohol, it means that you're calling for your death</li> <li>• If you take in alcohol and take cigarettes, things which do not benefit your immune system, you have to stop. Some of these people have been told to stop but because they are hardheaded, they continue taking in alcohol and smoking and will be suffering. All these things make the body weak.</li> </ul> |
|              |                            |                                 | 4.2.2 Manage alcohol intake              | <ul style="list-style-type: none"> <li>• Some people will go the hospital and take their medicine as prescribed, but they'll still take in alcohol. When you tell them to stop, they'll stay 'I will not die'</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |

| Global Theme | Organizing themes           | Sub-themes                        | Codes                        | Quotes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|--------------|-----------------------------|-----------------------------------|------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|              |                             |                                   |                              | <p>because I'm taking my medicine. Eventually, they'll die. So you have to know what to take and what not to take.</p> <ul style="list-style-type: none"> <li>• Stop taking the very hard liquor. Maybe taking a bottle (beer) once a while is okay.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|              |                             | 4.3 Engaging in physical activity | 4.3.1 Regular exercising     | <ul style="list-style-type: none"> <li>• Sometimes it's not that the blood is plenty or something. Sometimes, the blood is filled with dirt. Exercise will help clear the dirt in the blood</li> <li>• She should exercise regularly</li> <li>• You do not have to sit at one place. You have to exercise. Maybe in the morning, even if you go for a walk, it's fine. Whatever your energy allows you to do.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|              |                             |                                   | 4.3.2 Vigorous exercises     | <ul style="list-style-type: none"> <li>• She has to exercise a lot so she can sweat out the toxins</li> <li>• A footballer can take a lot of sugar but it would affect him because of the training and the sweat.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|              | 5. Community support system | 5.1 Stigmatization                | 5.1.1 Stigmatization present | <ul style="list-style-type: none"> <li>• If you were to be drunkard and got hypertension from drinking, then people will stigmatize you.</li> <li>• But the fact that they know (you have the disease), some are ignorant about the causes so they'll shun you</li> <li>• They'll also stigmatize her because in the community there are people who are illiterates. They do not know about the sickness. They're ignorant</li> <li>• Sometimes it's not that we stigmatize the person but maybe the person's behaviour is unpredictable. So you keep your distance. Even if they come close to you, you do not engage them for a long time. You just answer one or two of their questions and leave them alone.</li> <li>• I knew someone who had mental problems. When she comes close to you, she'll talk nicely and calmly to you but within seconds, she can just get wild and take something to hit you.</li> <li>• Maybe I was a respectable person in the society but because now everyone knows I have a mental health issue, they will not take me serious again. And they will</li> </ul> |

| Global Theme | Organizing themes | Sub-themes         | Codes                           | Quotes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|--------------|-------------------|--------------------|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|              |                   |                    |                                 | not respect me. The kind of respect they had for me will reduce.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|              |                   |                    | 5.1.2 No stigmatization         | <ul style="list-style-type: none"> <li>• If the person is involved in hard labour and gets hypertension, I do not think people will stigmatize him.</li> <li>• We just keep our distance because they are unpredictable</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|              |                   | 5.2 Social support | 5.2.1 Engaging in activities    | <ul style="list-style-type: none"> <li>• Her friends should involve her in going for parties, going out to eat.</li> <li>• Give her space. Enough space for her to be herself but close enough to notice when she needs you</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|              |                   |                    | 5.2.2 Providing a listening ear | <ul style="list-style-type: none"> <li>• Her friends should talk to her</li> <li>• It (having people around) helps take your mind off what you're going through. So, they just come round and talk to you so that you forget what you're going through</li> <li>• As a community, we'll advise the girl. If she stays alone, we'll advise that her family members come for her. For the boy, we'll advise him to get close to his friends. Boys are hardheaded more than girls. You can appeal to the emotions of girls, but boys will not listen to you. I know a boy who took weed in school and had mental health issues. He was hospitalized for a while but one day he run away from the hospital and broke his leg. After treatment, he went back to smoking weed. If it was a girl, I do not think she'll go back to it after all the pain she has been through.</li> </ul> |

