UNIVERSITY OF CAPE COAST

THE EFFECTS OF EDUCATIONAL INTERVENTION ON PATIENTS' KNOWLEDGE ON HYPERTENSION, BELIEFS, AND ADHERENCE TO THERAPY IN THE KWAEBIBIREM MUNICIPALITY

OKYERE YAW MARFO

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BY

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Thesis Submitted to the Department of Adult Health of the School of Nursing and Midwifery, College of Health and Allied Sciences, University of Cape Coast, in Partial Fulfilment of the Requirements for the Award of Master of Nursing

AUGUST, 2024

DECLARATION

Candidate's declaration

I hereby declare that this thesis is the result of my own original research and that no part of it has been presented for another degree in this university or elsewhere.

Candidate's Signature. …….. Date: …….

Name: Okyere Yaw Marfo

Supervisors' Declaration

We hereby declare that the preparation and presentation of the thesis were supervised in accordance with the guidelines on supervision of thesis laid down by the University of Cape Coast.

Supervisor's Signature: …….. Date: ……..

Name: Dr. Christian Makafui Boso

Supervisor's Signature: …….. Date: ……

Name: Dr. Theodora Dedo Azu

ABSTRACT

Hypertension has become a significant public health concern in developing countries due to its increasing prevalence and harmful effects on clients with hypertension. The study assessed the effects of educational intervention on patients' knowledge on hypertension, beliefs, and adherence to therapy. The study used the quasi-experimental design. Stratified sampling technique was used to select 217 respondents who attended hypertension clinic at Kade Government Hospital in the Kwaebibirem Municipality from January to April 2023. The data collection instruments used were Magadza et al.'s tool on hypertension, Horne et al.'s tool on beliefs about medication, Zyoud et al.'s tool on medication adherence and education intervention tool based on WHO's Diagnosis and Management for Patients with hypertension. Data were processed using the Statistical Package for the Social Sciences Version 25. Demographic data were analysed using descriptive statistics. Paired T-tests and McNemar-Bowker for dependent samples were performed to compare the participants' levels of knowledge about hypertension and its therapy, beliefs about medicines, and levels of adherence to antihypertensive therapy before and after the educational intervention. There was significant increase in the patients' levels of knowledge about hypertension ($P<.001$), beliefs about medicines were significantly modified in a positive manner ($P<.001$), and a significant ($p<0.001$) difference in adherence scores before and after the educational intervention. The results of this study indicate a deliberate educational intervention has a positive effect on knowledge, belief and adherence. Health education should be organized regularly to improve knowledge and adherence among patient living with hypertension.

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DEDICATION

To my dear wife, parents and siblings

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LIST OF ACRONYMS

AHA	American Heart Association
BP	Blood Pressure
BMQ	Beliefs about Medicines Questionnaire
CA	Cronbach's Alpha
CDC	Center for Disease Control
CI	Confidence Intervals
CMC	Chronic Medical Condition
CVD	Cardiovascular Disease
ENT	Ear Nose and Throat
GHS	Ghana Health Service
HPT	Hypertension
IHME	Institute for Health Metrics and Evaluation
IMB	Information Motivation Behavioural
LMICs	Low- and Middle-Income Countries
MOH	Ministry of Health
MMAS-8	Morisky Medication Adherence Scale 8-item
OPD	Outpatient Department
SPSS	Statistical Package for the Social Sciences
USA	United State of America
WHO	World Health Organization
GSS	Ghana Statistical Service

CHAPTER ONE

INTRODUCTION

This study assessed the effect of educational intervention on patients' knowledge, beliefs, and adherence to hypertension therapy in Kwaebibirem Municipal. This introductory chapter gave an overview of the problem under study. Also, the chapter covered the background to the study, statement of the problem, purpose of the study, research questions of the study, delimitations, limitations, definition of terms, and organization of the study.

Background to the Study

Hypertension is one of the major silent killers globally (Centres for Disease Control and Prevention [CDC], 2016; Dzau, & Balatbat, 2019) and the primary cause of cardiovascular problems, which affect a significant number of people worldwide). The annual report by the American Heart Association and the National Institutes of Health stated that an increase in cardiovascular risk among 30447 participants (Tsao et al., 2023). The complications of hypertension that leads to death include heart diseases, stroke, kidney damage, aneurysms, peripheral artery diseases and hypertensive crises. Health care professionals may prevent, treat, and control the disease if they are aware of people's hypertension diagnoses (Eshah & Al-Daken, 2016). Around one billion people worldwide suffer from hypertension; it is responsible for about 9.4 million fatalities each year (Dzau, & Balatbat, 2019). Hypertension affects 31.1% of adults worldwide and was indicated as systolic blood pressure (BP) of at least 140mmHg and/or diastolic BP of at least 90mmHg (Mills et al. 2016). According to the World

Health Organization [WHO] (2021), the number of adults with hypertension has doubled from 650 million in 1990 to 1.28 billion in 2019, with the majority of incidence occurring in low- and middle-income nations. It is projected that 23 million adults will die from cardiovascular diseases by 2030, with low- and middle-income countries accounting for 85% of these deaths (Anowie & Darkwa, 2015).

Although low- and middle-income countries (LMICs) have seen a major shift in recent decades towards elevated blood pressure, only one in three people are aware of their hypertension statuses, and only 8% have their blood pressure under control (Schutte et al. 2021). The prevalence of hypertension is increasing in low- and middle-income countries (LMIC) but decreasing in high-income countries with about 80% of the attributable burden of hypertension globally occurring in LMIC (Tannor et al., 2019). The burden of hypertension is highest in people aged 45 to 69 years (Bosu et al., 2019).

In Africa, hypertension is the leading preventable cause of deaths among the adult population (Tannor et al., 2015). According to the Institute for Health Metrics and Evaluation ([IHME], 2017) hypertension caused almost 900,000 fatalities in 2016 (or 10% of all deaths on the African continent and has climbed by 82% since 1990. If appropriate preventative measures are not implemented, it is predicted that the prevalence of hypertension would rise by 17% over the next 10 years, with the highest increase occurring in the African region (Agyei-Baffour *et al.* 2018). Additionally, more than half of the first acute strokes in Africa are caused by hypertension (O'Donnell et al., 2016). It is estimated that hypertension

causes 52.5% of all strokes in Sub-Saharan Africa (O'Donnell et al., 2016). The Pan-African Society of Cardiology (PASCAR) acknowledged addressing hypertension as the main priority in reducing cardiovascular diseases in Africa (Dzudie et al., 2018).

The WHO estimated that the prevalence of hypertension among Africans may be highest in the Africa region compared to other regions in the world, where 46% of adults aged 25 and above are estimated to have hypertension (WHO, 2022). The estimated pooled prevalence of hypertension is about 30.8% in Africa (Adeloye, 2014) and 30.0% - 31.1% in SSA (Sarki et al., 2015). About 80 million adult residents of sub-Saharan Africa suffer from hypertension. The adult population has a high rate of undetected hypertension, even though hypertension is preventable with several modifiable risk factors (Mills et al., 2020).

The incidence of hypertension has increased in traditionally low-risk categories like rural areas, households with low incomes, and young people. It is a common cause of medical admissions in African hospitals (Bosu et al., 2019). High blood pressure will probably continue to rise because of the increasing urbanization, the stress that comes with it, westernized diets, and a lack of physical activity (Zhou et al., 2017). In Africa, hypertension affects older people more frequently than younger people. (Bosu et al., 2019). A recent systematic analysis found that the overall pooled prevalence among older persons (> 50 years old) in SSA was alarmingly high at 57.0% (95% CI 52-61%) (Bosu et al., 2019).

Healthcare resources are strained in developing countries due to the dual burden of non-communicable diseases like diabetes and hypertension as well as

communicable diseases like malaria, HIV/AIDS, and tuberculosis (Nyirenda, 2016). A disproportionate amount of health resources is spent on fighting and preventing infectious diseases, leaving little money for non-communicable disease prevention initiatives (Kushitor & Boatemaa, 2018). In Ghana, accessible records show that hypertension prevalence has been rising along with the several factors including a surge of rural-to-urban migration and related changes in food and lifestyle preferences (Atibila et al., 2021). The increase in the prevalence of hypertension has been attributed to other variables, including the positive perception of obesity, increased sedentary lifestyle, excessive consumption of high-calorie foods, genetic susceptibility, high intake of salt, and an increase in life expectancy (Bosu et al., 2019; Mohsen Ibrahim, 2018). Subsequently, Ghana's pooled prevalence of hypertension was 27.0% (Adeloye et al., 2015).

According to the Ghana Demographic and Health Survey (GDHS) in 2014, hypertension has a prevalence of 13% amongst adults with 40.5% on treatment and only 23.8% of hypertension under control (Ghana Statistical Service, 2014; Sanuade, Boatemaa, & Kushitor, 2018). The United Nations estimates that Ghana's adult population in 2020 is about 19.54 million representing 62.9% of the total population. Applying the 27.0% prevalence to this figure translates into 5.27 million people who have hypertension (Bosu & Bosu, 2021). Furthermore, in Ghana, due to delayed presentation or identification by the current healthcare system and insufficient blood pressure control, about half of all people with documented hypertension exhibit clinical symptoms of organ damage (Atibila *et al.*, 2021). End organs that are complicated by

uncontrolled hypertension in Ghana includes the heart, brain, and kidneys (Tannor et al., 2019).

Health education plays a key role in the management of patients living hypertensive (Mohsen Ibrahim, 2018). The common tools of health education in community health centres include health posters, health booklets, individualized lecture, and public lecture. Educational interventions have proven to improve hypertension knowledge, medication adherence and beliefs (Tam et al., 2020). Educational interventions have the potential to positively affect patients' attitudes, which in turn has the potential to change patients' behaviours, such as improving adherence to a recommended therapy and possibly having an impact on disease-related factors such as blood pressure levels. Long-term effects could include changes in the disease's course and the frequency of illnesses such as heart attacks and strokes that are linked to hypertension (Ribeiro et al., 2015). Understanding people's levels of hypertension knowledge may help health care workers more successfully prevent, treat, and control the disease (Eshah & Al-Daken, 2016).

Ghana, as a developing country, has challenges with conducting health education on the management of hypertension as health education is still in at the experimental stages (Lu et al., 2015).

Statement of the Problem

According to the (MOH, 2022) the prevalence of hypertension and its associated risk factors among older adults in Ghana is 53.72%. Hypertension has continuously ranked in the top five outpatient diseases for more than 15 years in Ghana, accounting for 3% - 5% of all new outpatient diseases across all ages

(Adedia et al., 2020). Patients living with hypertension (HPT) are admitted for one to 91 days, with 22.7% staying for four or more days (Nuamah et al., 2017). The burden of hypertension among outpatients has been rising from 35,855 new cases in 2006 to 138,040 in 2010, with new cases in the Eastern Region climbing to 3.8-fold in five years (Bosu & Bosu, 2021; Opare et al., 2013). A study on the prevalence of hypertension in adults in Ghana discovered a prevalence of 61.7% in both urban and rural settings (Atinyi et al., 2017). In 2014, hypertension was ranked sixth for top ten causes of outpatient department (OPD) attendance, third for cause of admissions, and fifth cause of deaths (Nuamah et al., 2017).

Even though excellent clinical outcomes are associated with medication adherence, failure to effectively educate the patients leads to an incomplete understanding of the disease or drug regimens (Ampofo et al., 2020). Ineffective education may result in continuous adoption of cultural and religious beliefs, influencing people's attitudes to medication leading to lack of adherence. Health behaviours in the self-management of chronic diseases can also be affected by both health literacy and self-efficacy (Huang et al., 2018).

Therefore, by emphasizing the advantages of medication adherence, increasing health literacy about medications through education might reduce harmful beliefs (Soones et al., 2017). Face to face education is a common approach that promotes engagement, improves trust and enhances patient participation during education. This is because, the face-to-face approach enhances the assessment of patient's needs and reduces barriers to medication adherence (Zomahoun et al., 2017). The study by Soltani, et al. (2023) reported

that individualized face-to-face education add significant benefits to hypertension management. Ampofo et al. (2020) revealed that verbal educational interventions can improve health literacy and consequent adherence to medication among individuals with hypertension.

Frequent educational interventions can enhance patient engagement, participation as well as promote medication literacy and adherence. Healthcare professionals should adopt innovative ways of ensuring regular follow-ups and making educational interventional sessions more interactive and useful to patients (Ampofo et al., 2020). This was evident in the study by Hussein, Abd El Salam, and Farid Amr, (2016) who found in their study that educational intervention was successful in improving knowledge adhere to medication.

Looking at the rising rate of patients living with hypertension in Ghana, the need for educational interventions on hypertension is crucial than ever. This researcher has not found any published study on effect of educational intervention on patients' knowledge, beliefs, and adherence to hypertension therapy in Ghana. Thus, this study will focus on the effect of educational interventions on medication adherence, knowledge and beliefs among patients with hypertension in Ghana.

Purpose of the Study

The purpose of this study was to assess the effects of educational intervention on patients' knowledge, beliefs, and adherence to hypertension therapy in the Kwaebibirem Municipality.

Research Objectives

The objectives of the study were to:

1. Assess the effects of educational intervention on patients' level of knowledge about hypertension and its therapy.
2. Examine the effects of educational intervention on patients' belief about hypertension medications.
3. Assess the effects of educational intervention on respondents' level of adherence to hypertension medications.

Significance of the Study

The results of the study could assist health professionals to identify the problems patients face and develop educational strategies to help patients take their medications to limit complications and increase their lifespan. Identified factors can also guide medical professionals in their attempts to increase the likelihood of patient adherence to drug treatment regimens. The findings of the study would inform the Ministry of Health and the Ghana Health Service as the conservancy body responsible for the health of people to initiate policies and take actions that would contribute to the improvement of knowledge, beliefs and promotion of adherence to medications among hypertension diagnosed patients. The policies may include improving the patient hypertension education, provider–patient relationship and making the treatments accessible at the time of use.

Moreover, the results of the study would help the Ministry of Health, Ghana Health Service, and Christian Health Association Ghana to adopt the educational intervention tool to provide hypertension education service to

improve patients' knowledge about hypertension, enhance health belief about hypertension medications, and patients' level of adherence to hypertension medications. The policy makers can use both health workers and the media to undertake this education intervention.

Delimitation

The scope of this study was to assess the effects of educational intervention on patients' knowledge, beliefs, and adherence to hypertension therapy at the Kade Government Hospital in the Kwaebibirem Municipal Assembly. The respondents of this study comprised persons who are diagnosed with hypertension and attend hypertension clinic at the Kade Government Hospital during the study period. Hypertension diagnosed patients who were absent during the period of the study were excluded from the study.

Limitation

Typically, the study involved only one hospital (single –site) within the municipality which may contribute to bias of the data collected and would be too small to represent the whole country. Also, only hypertension patients who attended hypertension clinic at Kade Government Hospital were involved in the study while there could be huge number of patients visiting other private hospitals within the Kwaebibirem Municipality.

Definition of Terms

The following are terms used in the study. How they are used are explicated.

Adherence to Hypertension therapy: the process by which patients take their therapy as prescribed (Sheppard et al. 2021). It was used in measuring adherence

to antihypertensive medication attending primary care. In this study, adherence is the way by which patients follow their therapy as prescribed. Zyoud et al.'s to on medication adherence.

Belief: Mental acceptance of a claim as true, often based on one's own reasoning about hypertension and its therapy (Connors & Halligan, 2015). Belief, in this study, meant an acceptance that something is true about hypertension without proof. Horne et al.'s tool on beliefs about medication was used in this study.

Educational Intervention: Education intervention is educating, instructing, or teaching activities; activities that convey knowledge or expertise about hypertension (Ongkulna, Pothiban, Panuthai, & Chintanawat, 2022). Educational intervention in this study meant educating an individual to gain facts and skills about hypertension adapted from the WHO Diagnosis and Management for Patients with Hypertension (WHO, 2017).

Effect: The Oxford dictionary defines effect as a change which is a result or consequence of an action or other cause (Stevenson, 2010). In this study effect is defined as the potential changes that may occur in the knowledge, belief, and adherence to hypertension therapy of patients living with hypertension and attended hypertension clinic at Kade Government Hospital.

Knowledge: According to the Oxford dictionary knowledge is facts, information, and skills acquired through experience or education (Stevenson, 2010). An information someone has about hypertension is Knowledge in this study represented in Magadza et al.'s tool on hypertension knowledge.

Patient: The Cambridge dictionary defines patient as a person who is receiving medical care. An individual diagnosed of hypertension or a known hypertensive individual (Flack & Adekola, 2020). In this study, a patient is an individual living with hypertension attended hypertension clinic at Kade Government Hospital.

Organization of the Study

The study consisted of five chapters. The first chapter dealt with the introduction of this thesis. It incorporated areas such as the background to the study, statement of the problem, statement of purpose, specific objectives, research questions, significance of the study, delimitation to the study, limitation to the study, operational definitions of terms, and organization of study. The second chapter also reviewed relevant literature relating to the study. The third chapter explicated the research methods used for this study. It covered study type and design, study population and setting, sampling technique and size, data collection instrument, data collection procedures, data analysis and ethical consideration. The fourth chapter covered the results and discussion of this study, while the fifth chapter concluded the research on summary, conclusion, and recommendations.

Chapter Summary

The chapter sought to provide a prologue to this study. The importance of educational intervention on patients with hypertension regarding their knowledge, beliefs and adherence to therapy was made. This was achieved *inter alia* by explicating the background to the study, the research problem as well as the purpose of the study. More specifically, the need to determine the effects of

educational intervention on patient's level of knowledge, belief, and adherence to hypertension medication was highlighted. In the ensuing chapter, the state of the current literature was reviewed.

CHAPTER TWO

LITERATURE REVIEW

This chapter dealt with a complete description of the theoretical foundations of the research and review of pertinent literature. It also dealt with the theoretical framework that was used to study the effects of educational interventions on patients' knowledge, beliefs, and adherence to hypertension therapy in the Kwaebibirem Municipality. This section is in three parts: theoretical review, conceptual review and the empirical review. The literature review summarizes the body of knowledge already known about the topic and highlights the need for additional research (Polit & Beck, 2010). Concepts and theories behind the subject, empirical data supporting knowledge of hypertension, beliefs about medications, and adherence were reviewed. The empirical review considered the global prevalence of hypertension, prevalence of hypertension in Ghana, prevalence of hypertension among religious groups and occupation, the frequency at which hypertension occurs in males and females. Also, the studies further delved into level of knowledge and its effects on patients with hypertension**,** prevalence of hypertension among various age groups and educational intervention and level of adherence to hypertension therapy.

Search Strategy

To find out more about the numerous works that were relevant to this research, information was retrieved through the following search engines: Google Scholar, PubMed, and Cumulative Index to Nursing Allied Health (CINAHL). To obtain a comprehensive corpus of recent research, a variety of search terms,

including key words like “hypertension knowledge”, “medication non-adherence”, “medication adherence”, “beliefs about medications, “educational intervention’’, “medication adherence and hypertension”, “beliefs about medications and hypertension”. All the search terms in a colon were searched using PubMed search engine. A total of 5 articles popped out of which two of them were relevant to the study after the abstract were read. Also, a search was made using the Google scholar search engine with the search terms “Hypertension AND beliefs AND knowledge AND adherence”. The outcome was 90,800 articles. The search was filtered with a customized range from 2009 to 2023. The results were 20,400 articles. The search output was filtered down using books and documents, Clinical trials, randomized Controlled trial and systematic review, free full text. It was then scaled down to 3,200 articles. Finally, after removing duplicates and reading the titles and abstracts, 28 relevant articles were selected for the study. The results of the search were limited to studies conducted within the past decade and English Language to achieve specificity. Afterwards, the reference list was examined from various kinds of literature to identify relevant studies. Exclusion criteria consisted of studies with participants under 18 years of age, studies deficient of scientific consistency, and studies in other languages rather than English.

Theoretical Review

Hypertension, also known as high blood pressure, refers to a medical condition where the force of blood against the walls of your blood vessels is consistently elevated, measuring at 140/90 mmHg or higher. While it is a

prevalent condition, it can have severe consequences if left untreated. Importantly, individuals with high blood pressure may not experience noticeable symptoms (World Health Organization [WHO], 2021). High blood pressure (BP), or hypertension, is defined by American College of Cardiology/American Heart Association's (ACC/AHA) 2017 guidelines as elevated BP, with a systolic pressure (SBP) between 120- and 129-mm Hg and diastolic pressure (DBP) less than 80 mmHg, and/or stage 1 hypertension, with an SBP of 130 to 139 mm Hg or a DBP of 80 to 89 mm Hg (Whelton et al., 2018).

Table 1: Categories of Blood Pressure in Adults

BP Category	SBP	DBP
Normal	<120 mm Hg	<80 mm Hg
Elevated	120 - 129 mm Hg	<80 mm Hg
Hypertension		
Stage 1	130–139 mm Hg	80–89 mm Hg
Stage 2	≥140 mm Hg	≥90 mm Hg

Source: (Whelton et al., 2018).

Selecting a theoretical framework to investigate the research questions is a very key aspect of the literature review (Creswell & Creswell, 2017). The purpose is partly to select a conceptual/theoretical to guide the study. Consequently, the various health education theories/models are explicated.

In addition to promoting the motivation, abilities, and self-efficacy (self-efficacy) required to take action to improve health, WHO (2012) defines health education as "the communication of information concerning the underlying social, economic, and environmental conditions impacting on health, as well as individual risk factors and risk behaviours, and use of the health care system." Therefore, enhancing people's capacities to obtain and use health information to

make wise health decisions and maintain basic health can be seen as a result of good health education WHO (2012). Helping individuals maintain and enhance their health, lower their risk of disease, and manage chronic illness is the goal of the majority of health education, public health, and chronic disease management programmes (Glanz, 1997).

According to research, no one theory predominates in health education. Instead, while some theories concentrate on the individual, others look at how families, organisations, communities, and cultures have changed. Multiple theories may be needed to address a health problem, as no single theory can be used in every situation. A "thorough assessment of the situation: the units of analysis or change, the topic, and the type of behaviour to be addressed" should come before choosing a theory (Rimer & Glanz 2005). The eight theories listed below look at and make an effort to alter personal traits at the intrapersonal capacity level: awareness and knowledge, beliefs, views and attitudes, self-efficacy, intentions, and skills and personal power.

Health Belief Model

One of the first models for behaviour modification to describe how people make decisions about their health and act on those decisions is the health belief model (Rosenstock, 1974). In the 1950s, social psychologists sought to understand why some people baulked at getting free chest X-rays to check for tuberculosis. What they found was that people's desire to take preventive action was influenced by their perceptions of the seriousness of an illness and their vulnerability to it.

Activated Health Education Model

The model of "activated health education" consists of three stages. (Dennison & Golaszewski, 2002). The model's phases are as follows: The actively involves people in the evaluation of their health. The information presented during the awareness phase raises awareness of the goal behaviour and offers a justification for integrating the experiential activity that was already done. The responsibility phase involves participants in the process of behaviour change, helps them identify and clarify their own unique health values, and creates a personalised behaviour change strategy (Becker, 1974; Dennison & Golaszewski, 2002).

Communication Theory

Communication theory investigates "who says what, to whom, through what channels, and to what effects" WHO (2012). The process of developing messages that aim to reach a bigger audience can range from the straightforward distribution of a booklet to the sophisticated production and airing of a series of television shows that are backed up by an interactive website and phone-in resource. Health educators use the communications medium mainly to educate the public on behaviours that are harmful to their health and those that are beneficial, to change attitudes, perceptions, and beliefs, to inspire action, and to describe preventive services that are offered (US Department of Health and Human Services, 1989).

Information-Motivation-Behavioural Skills (IMB) Model

Fisher and Fisher (1992) established the Information Motivation Behavioural Skills (IMB) Model. Fisher as they worked to identify the mechanism underlying the shift in HIV-risk behaviour. They discovered that an individual's access to three elements information, motivation, and behavioural skills determines how likely they are to modify their behaviour. They combined these results into a generalizable model, which has been used as a framework for therapies and as a resource for comprehending various behaviour changes both inside and beyond the realm of medicine (Fisher & Fisher, 1992).

It was evident that most the theories reviewed can be used in both groups and individuals but the EPPM has the potency to cause behavioural change in communities. Also, the EPPM and the communication theory showed that the medium through which the information is given has an effect on how change in behaviour will take place. In choosing the model that would be most appropriate for this study, the researcher reviewed eight theories and focused on the IMB Model since it has been applied to influence various types of behaviour change such as the study by Chang et al. (2014). Additionally it has been used to inform a variety of interventions, especially in public health. This is evident in the first season of the MTV show, "Shuga" which incorporates the IMB model in its function as an intervention for HIV-risk behaviour change (MTV Shuga, 2016). The Information Motivation Behavioural Model has been explicated in this chapter.

Background of Information-Motivation-Behavioural Skills Model

A comprehensive social psychology paradigm for examining and promoting health-related behaviour is the Information-Motivation-Behavioural Skills Model (IMB). IMB's conceptions are based on practical concepts from social and health psychology. On the other hand, the IMB conceptual frameworks were developed to address shortcomings discovered in other pertinent theories, such as the description of relationships between constructs, predictive validity of key constructs, conceptual parsimony, and the inclusion of constructs essential for comprehending and altering health behaviours. The IMB, which was designed to be easily transformed into intervention programs, has been used to target, among other things, safety gear use habits, obesity-related behaviours, HIV preventive behaviours, and adherence to difficult prescription regimens (Fisher, Fisher & Harman, 2003).

To understand HIV-related behaviours, Fisher and Fisher (2000) developed the information-motivation-behavioural skills (IMB) model, which recognizes three categories as separate individual drivers of behaviour and behavioural change: information, motivation, and behavioural skills (Norton, Fisher & Fisher, 2009). The information-motivation-behavioural skills (IMB) model delineates three key components that support the initiation and maintenance of health behaviours: precise information that can be easily translated into health behaviour performance; personal and social motivation to act on such information; and activity skills to successfully carry out the health behaviour. The study was unrelated to other comparable theoretical frameworks

that were later found to be helpful. According to the theory of planned behaviour (Ajzen, 1991), "people behave in accordance with their intentions and perceptions of control over the action," but intentions are influenced by attitudes toward the conduct, subjective norms, and perceptions of behavioural control.

Information, motivation, and behavioural skills are three factors that determine health-related behaviour and are typically addressed separately in health promotion activities. The IMB model, however, assumes that there is a causal relationship between the three elements and includes mechanisms for applying the model to health promotion programs (Fisher, Fisher & Harman, 2003). The IMB asserts that for individuals to engage in complex activities, they must be knowledgeable, motivated, and endowed with the necessary actual and perceived abilities (Fisher, Fisher & Harman, 2003).

According to IBM, information and motivation are also believed to affect behaviour through behavioural skills. To put it another way, the inception and maintenance of behavioural change is facilitated by the addition of health promotion behavioural skills to the health promotion knowledge and incentive components. People who are knowledgeable about HIV, have social and personal motivation to prevent HIV, and have the necessary behavioural skills, for example, are expected to start and maintain HIV prevention activities (Fisher, Fisher, and Harman, 2003).

The Information-Motivation-Behavioural (IMB) model is straightforward and frugal despite using an ecological approach. With the intention of being easily adaptable to intervention programs, the IMB was developed. In addition to

assisting in the understanding of health behaviour determinants, the Information-Motivation-Behavioural (IMB) model also offers procedures for identifying constructs and causal pathways that are highly influential for populations and health-related behaviours; this identification is crucial before developing targeted health promotion programs (Fisher, Fisher & Harman, 2003). The Information-Motivation-Behavioural (IMB) model can, therefore, address problems that have occurred when previous models have been employed to improve drug knowledge, medication adherence, and hypertension knowledge.

Numerous empirical studies support the use of the Information-Motivation-Behavioural (IMB) paradigm in the design of various aspects of health promotion (Chang, et al. 2014; Fisher, Fisher, Harman, 2003; Kelly, Melnyk, Belyea, 2012; Osborn et al. 2010). In addition, a health education intervention on hypertension among older people in south-east Nigeria was influenced by the Information-Motivation-Behavioural (IMB) paradigm in terms of its design, content, delivery, implementation, and evaluation (Ozoemena et al. 2019). As a result, the IMB is founded on a thorough examination and synthesis of behavioural theory constructs that incorporate essential elements for altering a range of health-related behaviours.

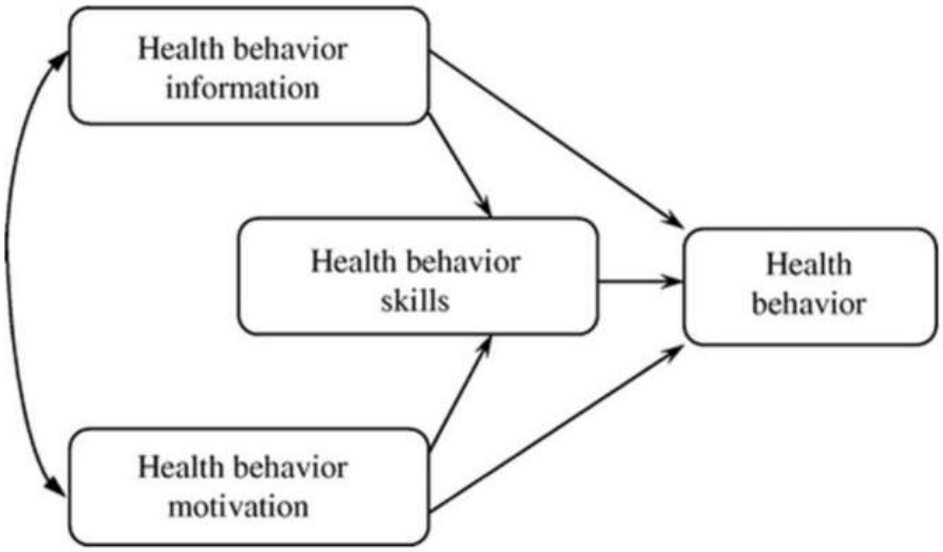

Figure 1: Theoretical Model adopted from IMB skills model of health behaviours (Fisher et al., 2003)

The Information Motivation Behavioural (IMB) theory postulates that motivation and information may interact, and that this relationship, when mediated by critical behavioural abilities, may lead to good habits. If the behaviour is not complex, knowledge alone may also be sufficient to change it. Furthermore, the IMB claims that certain target demographics may value knowledge more than others. Therefore, before creating a program for health promotion, the IMB proposes carrying out an elicitation study method (Fisher, Fisher & Harman, 2003). The IMB model addressed variables that could be changed to reduce the risk of developing hypertension, including behaviour-related information and knowledge, beliefs and adherence to a particular health activity, perceptions of social support, self-efficacy, and capacities to negotiate preventive measures (Ozoemena, et al. 2019).

Constructs of IMB Skills Model

According to the IMB model, developing healthy habits involves behavioural skills, motivation, and health-related knowledge. People are more likely to adopt healthy behaviours and experience better health outcomes if they are well-informed, motivated to act, and possess the necessary fundamental skills. On the other hand, people who lack the essential abilities, are unmotivated to act, or have poor information are more likely to engage in risky activities and experience unfavourable health effects (Fisher, Fisher & Harman, 2003).

Information (Knowledge). Knowledge from facts, heuristics, and implicit theories can all have an impact on how well health behaviour is performed. According to the IMB model, knowledge that is directly related to the behaviour's execution and fairly completed within a person's social environment is necessary to carry out health behaviours (Fisher, Fisher & Harman, 2003).

Motivation (Belief). Motivation affects the execution of an action and influences people's desire to follow health promotion information. According to the IMB model, personal and societal incentives are two crucial factors that determine how health-related actions are carried out. Personal motivation is a person's attitude and belief toward actions that are relevant to their health. Additionally, habits in other aspects of health, such as taking medications as prescribed and performing breast self-examinations, may be influenced by social support and personal beliefs (Champion, 1990; Fisher et al. 2000; Lierman et al. 1991; Misovich et al. 2003).

Behavioural skills (Adherence). People can engage in acts that promote health when they have the necessary behavioural skills in addition to knowledge and motivation. The IMB's perceived self-efficacy and objective ability constructs are related to completing the necessary actions. Keeping with the HIV example, the likelihood of wearing condoms rises when a person learns how to haggle with a partner about their use. Numerous studies have demonstrated the importance of self-efficacy in carrying out a range of health-related tasks. For instance, giving up smoking, performing breast and testicular self-examinations, and taking medications as prescribed (Fisher, Fisher, and Harman, 2003; Glanz, Rimer & Viswanath, 2008).

Utility of the IMB for chronic medical conditions

According to the American Heart Association, hypertension is considered a chronic illness (AHA, 2017). A chronic medical condition (CMC) must be monitored, managed, and routinely evaluated to be kept under check (Amico, 2011). In 2012, over half of all Americans had at least one chronic medical condition. A person with two or more chronic conditions makes up one in four people. Seven of the top 10 causes of death in 2010 were related to chronic medical disorders (Centres for Disease Control and Prevention, 2016). Approximately 63% of people with chronic illnesses do not adhere to their recommended treatments (Amico, 2011). Therefore, it is important to encourage people with chronic medical conditions to practice preventative measures. All people with chronic illnesses need to change their behaviours, including those related to diet, exercise, attitudes, medication adherence, and use of healthcare.

Strength

Chang et al. (2014) claims that the IMB is a "powerful" model to use in changing behaviours that would help patients manage chronic medical illnesses. The authors suggest using motivational interviewing and social support groups in addition to "disease-specific and behaviour-specific" teaching materials in the form of handouts, flip charts, films, and interactive discussion to increase motivation. The authors conclude by advising the use of behaviour games, memory blocking, skill development modules, and role acting (hands-on skills) to increase both objective and perceived self-efficacy (Chang, et al, 2014).

Conceptual Framework

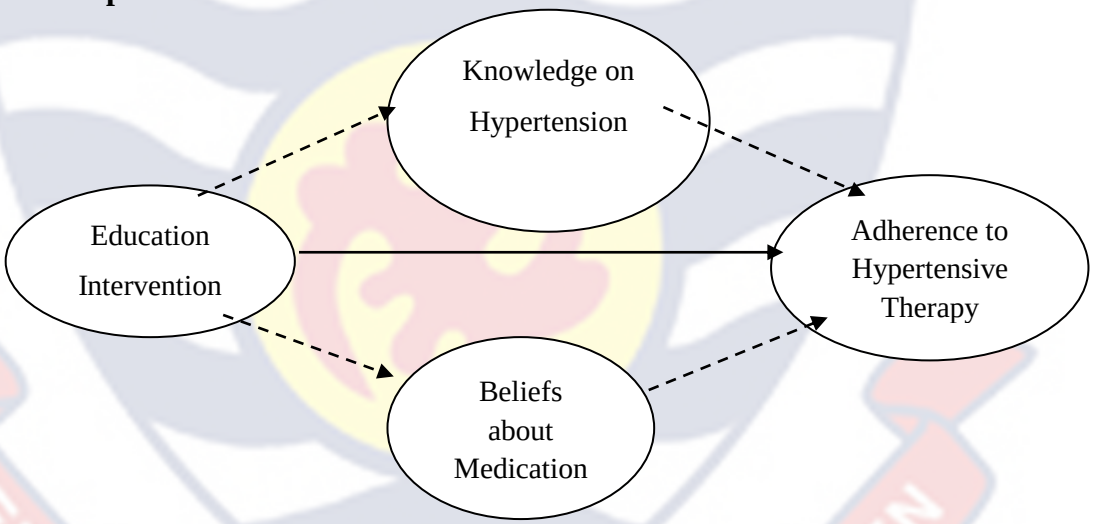

Figure 2: Conceptual Framework: Relationship between educational intervention, knowledge on hypertension, beliefs about medication and adherence to hypertensive therapy.

As shown in figure 2, the study proposes relationships among educational intervention, knowledge on hypertension, beliefs about medication and adherence to therapy. That is, educational intervention would have a direct effect on

patients' level of adherence to hypertensive therapy. Again, knowledge on hypertension has a direct influence on patients' level of adherence to hypertensive therapy.

Similarly, patients' beliefs about medication have a direct influence on their level of adherence to hypertensive therapy. The relationship between educational intervention and patients' level of adherence to hypertensive therapy would be mediated by both their knowledge on hypertension and beliefs about medication.

A study conducted in Nigeria titled effects of a health education intervention on hypertension-related knowledge, prevention, and self-care practices in Nigerian retirees: a quasi-experimental study (Ozoemena et al. 2019) used IMB skills model. Also, effects of a combined intervention on the control of hypertension, in patients from primary care centres in Lisbon by Diana Almeida Souto (2015) used the IMB skills model. Both studies used the IMB Skills Model which is suggested to affect the patient's perception and adherence to treatment.

The study also adopted the IMB Skills Model to assess the effect of educational interventions on patients' knowledge, beliefs, and adherence to hypertension therapy in Kade Government Hospital. This is because similar intervention studies in HIV, hypertension and diabetes have used the same model which worked hence its adaptation. In other disease perspectives, the IMB model has successfully justified and supported medication adherence and thus may have usefulness in justifying and promoting adherence to hypertension medications. The IMB skills model of adherence has been authenticated with cross-sectional data gathered from distinct samples of HIV-infected persons (Kalichman et al.,

2005; Starace et al., 2006) and then used to design interventions that have successfully improved both medication adherence and clinical results (Mannheimer et al., 2006; Fisher et al., 2011).

Limitation

One such limitation is that the information construct of this model is a weak and inconsistent predictor of behaviour. It can be said that information while necessary is not sufficient for behaviour change. The second limitation is that information and motivation are often not mutually exclusive. Such interdependence poses problems in testability of this model. Finally, the model lacks environmental and cultural factors which are important in predicting and explaining behaviours and enhancing the predictability of any model (Sharma, 2012).

Empirical Review

Prevalence of hypertension

Global

The WHO has reported that over 1.28 billion adults aged 30-70 years worldwide have hypertension of which most are living in low- and middle-income countries (WHO, 2021). It was interesting to discover that barely 46% of adults with hypertension are unaware that they have the condition (Gupta et al., 2018). A study conducted by Prabhakaran et al. (2018) on the changing patterns of cardiovascular diseases and their risk factors in the states of India reported that in 2016 the prevalence of hypertension among adults in India was 21.1% (men, 20.9%; women, 21.2%). Another cross-sectional survey carried out in Augsburg

region by Muli et al., (2020) to determine the prevalence, awareness, treatment, and control of hypertension among 1079 older people in Germany found that prevalence of hypertension was 73.8%. A study conducted by Ostchega et al. (2021) to determine the differences in hypertension prevalence and hypertension control by urbanization among adults in the United States, 2013–2018 found the prevalence of age-adjusted hypertension to be 45.4% among adults and was higher among men (51.0%) than women (39.7%).

Africa

According to the World Health Organization, the African continent has the highest prevalence of hypertension, with 46% of persons aged 25 and older having the condition (Ferdinand, 2020). The projected number of Africans with hypertension has continuously risen from 54.66 million in 1990 to 92.03 million in 2000 (an increase of 70%), and then to 130.2 million in 2010 (a rise of 41.1% from the year 2000). It is anticipated to increase by 66% from the year 2010 to 216.8 million by the year 2030 (Okello et al., 2020).

Sub-Saharan Africa

The number of cases of hypertension in sub-Saharan Africa (SSA) was estimated to be 130.2 million in 2010, with only one-third of those individuals being aware of their hypertension; the figure is expected to increase to 216.8 million by 2030 (Adeloye & Basquill, 2014). The prevalence of hypertension is significant in Burkina Faso, where it is estimated to be 18.5% (Soubeiga et al., 2017). Some national representative studies on prevalence of hypertension

were reported in Kenya (15.6%), Botswana (46%) (Tapela et al., 2020), Guinea (24.8%) (Camara et al., 2016), and Nigeria (60%) (Odili et al., 2020).

Ghana

Dai at al. (2022) conducted a study among 3,997 respondents on the prevalence of hypertension and its associated risk factors among older adults in Ghana. Their study found 53.72% hypertension prevalence rate. Bonsu and Dary (2020) also conducted a systematic literature review on prevalence, awareness and control of hypertension in Ghana and discovered that more than one in four adults in Ghana has hypertension. This high prevalence has persisted for decades and is similar in rural and urban populations. It accounted for 15.3% of the total deaths in Ghana.

A similar study was performed by Tannor et al. (2019) on the prevalence of Hypertension in Ghana: Analysis of an awareness and screening campaign in 2019. Their findings indicated that out of 3080 participants with a mean age of 39.8 years, the prevalence of hypertension was 27.3%. The study also showed that two thirds of the clients who were hypertensive had low level of knowledge regarding their conditions and only 49.5% of the participants with history of hypertension on therapy were controlled.

Prevalence of hypertension among males and females

In a study conducted in the United States by Fryar et al. (2017) to determine hypertension prevalence and control among adults in the United States, 2015-2016 reported that men having higher prevalence of hypertension than women among adults aged 18-39 years but lower prevalence of hypertension than

women among adults 60 years and over. A study conducted by Ostchega et *a*l. (2020) on the topic hypertension prevalence among adults aged 18 and over: United States, 2017-2018 found that hypertension was higher among men (51.0%) than women (39.7%). A similar longitudinal study by Everett and Zajacova (2015) on gender differences in hypertension and hypertension awareness among young adults found that women were far less likely to be hypertensive compared to men (12% vs. 27%).

Gender and hypertension were again studied by Bantas and Gayatri (2019) to find out the prevalence of hypertension in both men and women. They concluded on a statistically significant association between gender and hypertension. Thus, women were less likely to have hypertensive than men (OR 0.86 P value < 0.0033). This finding is congruent with the study of Kim & Kang (2017) on gender differences in hypertension prevalence and control analysis of the 2010-2014 Korea National Health and Nutrition Examination Survey. The research sampled 27,887 individuals with hypertension and reported that the prevalence was higher in men (34.6%) than women (30.8%) with 30 years. The study revealed that female respondents aged 60 years and above were more likely to be hypertensive than their males' counterparts.

Prevalence of hypertension among various age groups

Acheampong et al. (2019) conducted a study on predictors of hypertension among adult female population in Kpone-Katamanso District, Ghana among 419 hypertensive patients to determine whether hypertension was influenced by age. The researchers reported that the prevalence of hypertension was 33.8% which

increased with age (95% CI 27.4-40.2). They found out that at the time of the study, women aged 45-64 years and 65+ years were two to five times more susceptible as those with age of 25-44 years to be hypertensive. The researchers concluded that increasing age was associated with hypertension. Similarly, Bantas and Gayatri (2019) reported that hypertension increased with age.

Another study by Ostchega et *a*l. (2020) on the topic hypertension prevalence among adults aged 18 and over: United States, 2017-2018 reported that hypertension increased with age (22.4%) (Aged 18-39), 54.5% (40-59), and 74.5% (60 and over). The finding correlates with the work of Dai et al. (2022) on the topic the prevalence of hypertension and its associated risk factors among older adults in Ghana. Their study found that hypertension prevalence was 53.72% among older adults and hypertension increases with increasing age ($B = -0.18$, $OR = 0.84$, $p < 0.017$).

Hypertension among religious groups

Meng et al. (2019) performed a systematic review on the correlation between religion and hypertension by extracting 79 qualified articles for the evaluation. The outcome of the investigation showed several inconsistencies and few trials on correlations between religion and hypertension. Although the findings of the studies showed unspecified species of religion, Christianity was discovered as the most common among the categories of religion. In a way of demystifying the doubt about effect of religion on hypertension. Meng et al. (2018) studied the effect of religion on hypertension in adult Buddhists and residents in China. The study recruited 1384 adults Tibetan Buddhist and reported

that the risk of the Buddhist is significantly decreased by 38% than the Tibetan residents. The study depicts that religion has effects on the prevalence of hypertension and therefore religion could be used to protect the aged from hypertension. A study conducted by Nyarko et al. (2017) with a sample size of 4,387 found that prevalence of hypertension history was highest 6.3% among Christians and lowest 2.3% among traditionalists.

Hypertension and employment status

Parekh et al. (2022) conducted a study in the United States about the association between employment status and occupational groups with prevalent hypertension in working-age adults found that out of the 28,973 adults involved in the study prevalence was 24.7%. The study further stated that employment was associated with reduced odds of hypertension in the US. Thus, occupations included in the research were associated with reduced odds of hypertension as compared with the unemployed.

Unemployment may play a role in the increased incidence of hypertension. However, In Europe, Rumbal-Smith et al. (2014) conducted a retrospective cohort study on work and hypertension: gaps in employment not associated with increased risk in 13 European countries showed consistently no correlation between unemployment and increased hypertension. On the other hand, Rumbal-Smith and colleagues reported that there could be a bias that contributed to the results of their work. Mezuk et al. (2011) conducted a study on Job strain, workplace discrimination, and hypertension among older workers in

the United States found inverse association between hypertension and employment status.

Also, a study conducted by Bhattarai et al., (2021) on socioeconomic status and its relation to hypertension in rural Nepal among 290 participants found that compared to low-income and unemployed groups, the prevalence ratio of hypertension was 1.33 and 2.26 times more for those belonging to the high-income and employed groups, respectively. Similarly, Estrella et al. (2018) also worked on the association of employment status with hypertension factors and behaviours among Hispanic/Latino adults. Estrella and colleagues reported that among males, those who were employed had higher prevalence of hypertension. They further added that Hispanic/Latino females who were homemakers or unemployed had lower rates of ideal hypertension.

Educational level and Hypertension

Kan et al. (2022) conducted research on association of education levels with the risk of hypertension and hypertension control: a nationwide cohort study in Chinese adults using sample size of 101,959 participants. They reported that incidence of hypertension among participants education level at elementary school and below was high 0.76% (95% CI, 0.72 -0.80) in those with a middle school education level and low 0.67(95% CI, 0.63-0.70) in those with a high school degree or above. In contrast, a study conducted by Bhattarai et al. (2021) on socioeconomic status and its relation to hypertension in rural Nepal among 290 participants reported that prevalence of hypertension was two times higher for those with higher education.

Marital status and Hypertension

In Korea, Son et al. (2022) conducted a study on the effects of marital status and income level on hypertension. Their study employed 211,576 participants with hypertension in male and female over 40 years of age. The work revealed that the prevalence of hypertension increased linearly as income level decreased and divorce was most associated with hypertension in male. On the other hand, in females, low income and the married group were the most associated with hypertension. The outcome of the study showed that it is vital to approach males and females' marital status separately according to income level in health policies to address inequalities in the prevalence of hypertension.

To examine the associations of marital status with hypertension, cardiovascular disease and all-cause mortality, Ramezankhani et al. (2019) conducted quantitative research in Iran. The study sampled 9,737 males with a mean age of 47.6 years. The study found out that the relationship between marital status and hypertension varied by gender. Thus, males that were never married were important risk factor for hypertension. However, among women, being widowed was associated with a lower risk of hypertension. In Ghana, a study was conducted by Tuoyire et al. (2019) to find out the relationship between marital status and the prevalence of hypertension showed significantly higher number of hypertensions for married, cohabiting and previously married women but no significant association was found between any of the marital status cohorts and hypertension for men. The results demonstrate that marital status is an independent risk factor for hypertension in Ghana for women, rather than men.

Effect of Educational interventions on hypertension Knowledge

Williams et al. (1998), in their cross-sectional study in 402 hypertensive patients at the USA, found 189 patients (47.02%) did not have adequate knowledge about hypertension. Additionally, in a cross-sectional study in North Carolina (700 hypertensive patients) study on high blood pressure knowledge among primary care patients with known hypertension in North Carolina, 78% of participants had a good knowledge of hypertension (Viera et al. 2008). The high percentage of the participants' level of knowledge could be attributed to the high literacy rate in North Carolina.

In a cross-sectional study conducted at Mumbai, India involving 340 hypertensive patients by Mahajan, Kazi, Sharma and Velhal (2012) titled hypertensive patients' knowledge, attitude and practices reported patients had poor knowledge, attitude and practices but these improved significantly after health interventions were put in place. Prior to the intervention, only 16.58% of the study population had good knowledge, 30.89% good attitude and 26.76% good practice towards hypertension respectively which after intervention improved to 75%, 78.23%, and 66.18%, respectively. The low score for knowledge, attitude and practice was mainly due to illiteracy and low socioeconomic class of the patients.

The cross-sectional study held in Pakistan with 650 participants revealed that hypertensive patients had inadequate knowledge about hypertension and the frequency of patients with BP under control was higher among the patients with high level of knowledge about hypertension (Almas, Godil, Lalani, Samani, &

Khan, 2012). Also, in Turkish population, it was also found that the participants had low level of knowledge about hypertension (Oskay, Önsüz, & Topuzoglu, 2010). Similarly, the study held in USA also showed that hypertensive patients had the low level of knowledge about the health issues (Levinthal, Morrow, Tu, Wu, & Murray, 2008).

In Ghana, prevalence and knowledge of hypertension among people living in rural communities were studied by Agyei-Baffour et al. (2018). The study involved 534 participants in their study in six different communities. The study found that there was an increased prevalence of hypertension from 23% to 49% knowledge gap and misconceptions surrounding hypertension in the rural communities in Ghana. This outcome recommended interventional programmes that would improve the knowledge and prevention of hypertension.

Further, a study to determine the level of knowledge and its effects on patients with Hypertension by Akoko et al. (2017) involving 221 hypertensive patients, found that 31 participants (14.0%) had knowledge of hypertension which could be considered adequate. Also, 118 participants (53.4%) had average knowledge and 72 (32.6%) had poor knowledge of hypertension. In Ido-Ekiti, Nigeria, less than half of participants (47.1%) in a study, had good knowledge of hypertension (Busari, et al. 2010). This level of knowledge about hypertension may be because of the high illiteracy rate in the sub-Saharan African country.

Furthermore, Magadza et al. (2009), on their study on the effect of an educational intervention on patients' knowledge about hypertension, beliefs, about medicines, and adherence concluded on a significant ($p < 0.001$) increase in

the participant's levels of knowledge about hypertension and its therapy. This finding concurs with the study of Ibrahim et al. (2022) who studied the effect of educational intervention on knowledge about hypertension and factors predicting adherence to drug therapy and reported positive effect on knowledge of the respondents (from 64% to 66.3%).

Educational intervention and Level of Adherence to hypertension therapy

In a cross-sectional study conducted in a rural area of the Ardabil city, Iran by Kamran, Ahari, Biria, Malpour and Heydari (2014) found that overall adherence to medication was 24% (161/671) in the study population as compared to the cross-sectional study by Al-Dabbagh and Aswad (2010) in Duhok city, Iraq, a total of 54.6% compliance rate (707) of the study sample. Also, 37.0% of participants were sometimes neglectful regarding the schedule of medicine.

Another type of study conducted by Thomas et al. (2011) in Bangalore, India, found that of the 608 patients participated; non-adherence was found in 49.67% of patients. It was determined that around 50% of the Indian patients investigated did not follow their antihypertensive regimen, which may have contributed to poor blood pressure control. Iyalomhe and Iyalomhe (2010), in their study conducted in Auchi-Nigeria, found that out of the 108 participants only 36 (33.3%) of the respondents were adherent with treatment and fewer practiced life-style modification. A quasi-experimental study involving 600 patients conducted by Ibrahim et al. (2022) titled effect of educational intervention on knowledge about hypertension and factors predicting adherence to

drug therapy. Following the educational intervention, the proportion of respondents with good adherence rose from 41.3% to 48.3% (p = 0.369).

Monotherapy and once daily medication had a positive role in adherence compared to poly therapy and more than once a day (Kamran et al. 2014). Also, a study conducted in Brazil among 231 hypertensives, 36.2% of patients on mono therapy were found to be adherent, 36.6% of patients taking two drugs had their blood pressure under control, and only 5.9% of patients using three or more antihypertensive drugs had the same outcome (Oliveira-Filho, Barreto-Filho, Neves & Lyra Junior, 2012).

Ghembaza et al. (2014) in their cross-sectional study conducted in Algeria with 453 hypertensive patients posited that only 35.5% of patients were found to be adherent to their treatment. In another study conducted in Brazil, authors have reported similar poor adherence rate Demoner et al. (2012). On the contrary, a study conducted in a developing country have reported high adherence rates in Ethiopia (64.6%) (Ambaw et al., 2012). In a cross-sectional study conducted in New Territories Region of Hong Kong, 65.1% of 1114 patients had good adherence to antihypertensive agents. Younger age and poor self-perceived health status were negatively associated with drug adherence (Lee *et al.* 2013).

A cross-sectional study was conducted among 1159 hypertensive people in a rural population across three township hospitals in Northern China (Ma, 2016). The goal of the study was to examine medication compliance among Chinese patients with hypertension living in a rural community, as well as to investigate the factors that influence medication compliance. Using a multivariate

logistic regression, the study discovered that 21.3 % of patients were medication adherent and 78.7% were non-adherents. The majority of patients (71.4%) took medication more than three times per day, while 18.2% only took one antihypertensive tablet per day. Age, household income, duration of diagnosis, quantity of antihypertensive tablets taken in each dose, and number of times taken daily were all factors that influenced adherence, according to the multivariate logistic regression. The researchers concluded that medication adherence was poor in Chinese hypertensive people living in rural areas, and that more attention should be paid to these patients via medication adherence-focused healthcare programs.

To better understand the efficacy of medication adherence (MA) strategies among Chinese patients with hypertension, Xu et al. (2018) conducted a comprehensive review and meta-analysis of randomized control trials. The scientists discovered that increasing the impact size improved drug adherence and lowered blood pressure. In addition, the more time an intervention lasts, the more successful it is. According to the authors, adherence strategies enhance medication adherence and lower uncontrolled blood pressure in Chinese hypertensive patients. Investigators should also adopt a skill set to address the issue of poor drug adherence, according to the authors.

Lee, Jang, and Park (2017) conducted a retrospective cohort research to explore the impact of antihypertensive medication adherence on cerebrovascular accident incidence. From 2009 to 2013, data on 38,520 individuals with hypertension was examined from National Health Insurance claims and check-

ups. During this period, 957 of these hypertensive people suffered strokes, with non-adherence being a primary contributor to a greater stroke rate. The researchers found that individuals with hypertension who did not take their antihypertensive drugs as prescribed had a higher risk of stroke. They go on to add that healthcare practitioners should concentrate on interventional measures to ensure that these patients follow their drug regimens, resulting in fewer bad consequences.

Effects of educational interventions on patients' belief about hypertension

Naeemi et al. (2022) conducted a study on the effects of educational intervention on self-care behaviour in 99 hypertensive elderly people in Iran. They revealed that the study group did not differ significantly in terms of belief and self-care at the beginning of the study but three months after, all the variables of awareness, self-care and perceived sensitivity constructs, showed significant rise in the experimental group compared to the control group. Thus, the researchers concluded that educational intervention based on health belief model can be effective to reduce the barriers of self-care behaviours. This finding aligns with another study–conducted by Magadza et al. (2009) which claimed that educational intervention led to an increase in the participant's levels of knowledge about hypertension and a positive influence on their beliefs about medicines.

In India, a study conducted by Mini et al. (2022) on the effectiveness of a school-based educational intervention to improve hypertension control among 402 school teachers found that nurse-facilitated educational intervention subsequently caused a change in the belief of the patient and promoted the management of

hypertension. In addition, Khorsandi et al. (2017) investigated the effect of education based on the health belief model on the adoption of hypertension-controlling behaviours in the elderly in Iran. The outcome of the study showed that education based on the health belief model increases the performance and enhances the health beliefs regarding hypertension in the elderly population with hypertension.

Additionally, Al-Noumani et al. (2018) study on their studies on health beliefs and medication adherence in Omanis with hypertension showed that patient's beliefs are highly significant to improve medication adherence. Thus, patient's beliefs should be critically analyzed and strategies to improve medication adherence should incorporate beliefs as a key component to improve antihypertensive medication adherence.

Relationship between educational Intervention and the management of hypertension

In a study by Kurnia et al. (2022) on the impact of educational programs on the management of uncontrolled hypertension patients in rural Indonesia, it was found that the provision of educational programs increases patients' knowledge ($p<0.000$) of the management of hypertension. Similarly, a quasi-experimental study conducted by Ozoemena *et al.* (2019) on effects of a health education intervention on hypertension-related knowledge, prevention and self-care practices in Nigerian retirees found that hypertension knowledge score significantly increased in the intervention group between baseline and 1-month post-intervention compared to those in the control group ($P < 0.0001$)

In a survey conducted in South Africa by Magadza et al. (2009), they noted that the participants' (n=45) levels of knowledge of hypertension and its treatment grew noticeably, showing that they learnt more about their condition than they had known before. A cluster-randomized controlled trial study by Mini et al. (2022) on the effectiveness of a school-based educational intervention to improve hypertension control among school teachers showed two months after a 3-month educational intervention, a greater proportion of intervention participants (49.0%) achieved hypertension control than the usual care participants (38.2%).

Jarelnape *et al.* (2016) in their Quasi-experimental study conducted among 150 patients titled the Effect of Health Educational Program on Patients' Knowledge about Hypertension and Its' Management in Sudan's -White Nile State, showed that there was a significant ($P < 0.001$) improvement of the patients' knowledge concerning the correct knowledge of the definition of hypertension, signs and symptoms and complications of hypertension.

In a South African study (n=45), participants' attitudes regarding their antihypertensive medications and toward all medicines in general changed both before and after the educational intervention, according to beliefs they held (Magadza *et al.* 2009). Their study limitation was a small sample size which makes it difficult to make inference. Another study conducted in southern Zimbabwe by Chimberengwa *et al.* (2019) on knowledge, attitudes and practices related to hypertension among residents of a disadvantaged rural community among 5867 inhabitants reported that the more education respondents had received, the more likely they were knowledgeable about hypertension. A study

by Magadza *et al.* (2009) found that the educational intervention led to a small increase in participant adherence. There were 45 participants (100%) who provided self-reports, 36 (80%) who collected refills on time, and 37 (82.22%) who provided pill counts for use in computing adherence levels. Their study limitation was a small sample size which makes it difficult to make inference.

Chapter Summary

High prevalence of hypertension in the sub-Saharan Africa, Africa and worldwide was revealed during the review of literature. There was no literature in publication on the effect of educational intervention on patients' knowledge, beliefs, and adherence among people living with hypertension in Ghana and sub-Saharan Africa but one in South Africa by Magadza et al. (2009). Very few relevant publications provided very critical evidence about educational intervention on patients' knowledge, beliefs, and adherence. Evidence from available LMICs suggests an improvement in the educational intervention delivery is needed to improve knowledge and adherence toward hypertension management.

From the literature review, it was observed that, there are several studies on the prevalence, knowledge, attitude, beliefs, practices and adherence among people living with hypertension, but limited studies have been found on the effect of educational intervention on patients' knowledge, beliefs, and adherence among people living with hypertension. Furthermore, educational level, age, marital status, and perceived beliefs have a great effect on hypertension management adherence.

CHAPTER THREE

RESEARCH METHODS

The purpose of this study was to assess the effects of an educational intervention on patients' knowledge, beliefs, and adherence to hypertension therapy in the Kwaebibirem Municipality. This section presents the research methods and designs that was employed to carry out this study, which included data collection procedures and analysis. Description of data collection procedures were included to enable readers of this study appreciate the strength and weakness of the study. This included research design, study area, population, sampling procedure, data collection instruments, education intervention, data collection procedure, data processing and analysis and ethical consideration.

Research Design

The study was quantitative in nature using the quasi-experimental design (one group pre-test post-test design). The quasi-experimental design, sometimes called the pre-post intervention design often is used to evaluate the benefits of specific interventions. The weakness of the design includes lack of randomization, limited control over extraneous variables and sometimes selection bias. The increasing capacity of health care institutions to collect routine clinical data has led to the growing use of quasi-experimental study designs in the field of medical informatics as well as in other medical disciplines (Harris, et al., 2006). The research participants received step-by-step education on hypertension at Kwaebibirem Municipal Health Directorate Conference Room after the pre-test

questionnaire was administered. A post-test questionnaire was administered to determine any significant differences between the pre-test and post-test.

Study Area

The research took place in Kade Government Hospital in the Kwaebibirem Municipality, which is located between latitudes 60 22'N and 50 75'S, and longitudes 10 0'W and 00 35'E. The Municipality covers a total area of 1,230 km2. It is in Ghana's Eastern Region, in the south-western portion, with Kade as its municipal capital. The population of the municipality is expected to be at 113,721 (Ghana Statistical Service [GSS], 2010). Males make up 49.0 percent of the population, while females make up 51.0 percent. Smallholder farmers cultivate tree-crops such as oil palm, cocoa, and citrus, as well as food crops such as plantain, cassava, cocoyam, and maize, which employ 70.8 percent of the economically active labour force. Farming is the dominant occupation of the inhabitants of the Kwaebibirem Municipality source (Ghana Statistical Service [GSS], 2010).

The Kade Government Hospital in the Eastern Region of Ghana was upgraded from a health centre to a hospital status fifteen years ago. Currently, the hospital has a bed capacity of 60 and it is the only hospital within the municipality. Units in the hospital include: The Outpatient Department (OPD), General Administration, General Wards, Maternity Ward, Records, and Estate section, Pharmacy, Laboratory, ENT Unit, Eye Unit, Dental Unit, Psychiatric Unit and Child Welfare Unit. The hospital had a total OPD attendance of 48,696 in the year 2021. According to the Health Information Department of the hospital about

500 patients living with hypertension are seen on OPD basis. The high number (500) of patients living with hypertension who attended their hypertension clinic at the Kade Government Hospital and as referral hospital for Health Centres in the Kwaebibirem Municipality necessitated the chosen setting for the study.

Population

The total number of participants that meet a set of study requirements is referred to as a population (Zamboni & Litschig, 2018). The Kade Government Hospital in the Kwaebibirem Municipality had a total OPD attendance of 48,696 in the year 2021. Outpatient Department (OPD) Hypertension visit at the hospital was about 500 of which 170 were males and 330 were females.

Inclusion Criteria

The study included:

1. Patients who are hypertensive
2. Patients who attend hypertension clinic at Kade Government Hospital.
3. Patients who attended hypertension clinic during period of the study.

Exclusion Criteria

The study will exclude:

1. Hypertension patients who have severe medical condition (cardiac failure, tuberculosis etc)
2. Hypertension patients who are on admission or who are unwell.

Sampling Procedures

A sample is a representative or sub-group of a larger population that is examined to acquire statistical information about the population. It consists of a

small number or a subset of a larger group (Borden & Abbott, 2002). The population from which the sample size was taken from consisted of 500 patients living with hypertension. The sample size for the study consisted of 217 patients who attended hypertension clinic at Kade Government Hospital in the Kwaebibirem Municipality. The study employed stratified sampling technique to select 217 patients (74 males and 143 female) who attend hypertension clinic at Kade Government Hospital. Also, proportionate sampling principle was adhered to. The patients living with hypertension were first separated into males' and females' groups. To avoid bias and giving equal probability for each participant, simple random technique was used to select 74 males and 143 females for the study. This was performed by allowing participants to select pieces of papers with numbers from 1 -3. All those who selected papers with numbers 1 were involved in the study whiles those who choose 2 and 3 were not involved in the study.

In determining the sample size in research Krejcie and Morgan was used. Krejcie and Morgan is a commonly employed method for sampling. Krejcie and Morgan (1970) used the following formula to determine sampling size:

$$S = \frac{X^2\, NP\,(1-P)}{d^2\,(N-1) + X^2\,P\,(1-P)}$$

Where:

S = required sample size

X^2 = the table value of chi-square for one degree of freedom at the desired confidence level N = the population size

P = the population proportion (assumed to be .50 since this would provide the maximum sample size)

d = the degree of accuracy expressed as a proportion (.05)

Based on Krejcie and Morgan's (1970) table for determining sample size, for a given population of 500, a sample size of 217 would be needed to represent a cross-section of the population.

$$S = \frac{3.84 * (500) * 0.5\,(1 - 0.5)}{0.5 * (500 - 1) + 3.84 * (0.5(1 - 0.5)}$$

$$S = \frac{480}{1.25 + 0.96}$$

$$S = \frac{480}{2.21}$$

$$S = 217.19$$

$$S = 217$$

Data Collection Instruments

Data collection instruments are essential part of the research process, as they provide the analytical foundation for the search for solutions to a particular research topic (Taherdoost, 2021). The data collection instrument common to research study is the questionnaire because 'it is easy to use and advantageous to obtain large data in a relatively shorter period (Parahoo, 2014). A structured questionnaire was used to collect data from respondents in this study. The data collection instruments used were Magadza et al.'s tool on knowledge on hypertension and its therapy, Horne et al.'s tool on beliefs about medication (BMQ), Zyoud et al.'s tool on medication adherence (MMAS-8) and education intervention tool based on WHO's Diagnosis and Management for Patients with hypertension. The first part of the questionnaire contains socio-demographic

characteristics of respondents which will require information such as, age, sex and marital status, level of education, occupation, and religion.

Section A concentrated on knowledge questions about hypertension measuring 18 items adapted from Magadza et al. (2009) (See Appendix B). The questionnaire was adapted to improve clarity and ensure the questions align with the research objectives. There are 10 questions on the general overview of hypertension and 8 also on the general knowledge on hypertensive medications. The questions were designed to convey key concepts of hypertension in a simple format to be easily understood by patients with even low literacy levels. The questionnaire was in Yes or No format but was modified to into a Likert 5-point scale (1=strongly disagree, 2= disagree, 3= not sure, 4= agree, 5 =strongly agreed).

In section B, the belief was measured using Beliefs about Medicines Questionnaire (BMQ) adopted from Horne et al. (1999) which had 18 items which measures both specific and general beliefs about medicines. Respondents indicated the extent to which they agree or disagree to statements on the questionnaire according to a Likert 5-point scale (1=strongly disagree, 2= disagree, 3= not sure, 4= agree, 5 =strongly agreed (See Appendix B).

Section C focused on validated 8-item Morisky Medication Adherence Scale adopted from (Zyoud et al., 2013) (MMAS-8, including 8 questions covering various aspects of adherence behaviour, with the possible answers “yes” and “no,” and higher total scores indicating a better adherence), MMAS-8 and BMQ was chosen because they are most frequently used. For the MMAS-8,

Persons are classified as low adherence if they have <6 points, medium adherence if they have 6-7 points, and high if they have 8 points (Zyoud et al., 2013) (See Appendix B). The strength include efficiency, standardization, anonymity, Ease of analysis whiles the weaknesses include limited depth, response bias, limited understanding, low response rate among others.

Educational Intervention Tool

Education was used as an interventional tool for this study adapted from the World Health Organization Diagnosis and Management for Patients with Hypertension (A Noncommunicable disease education manual for primary health care professionals and patients) (WHO, 2017) (See Appendix C). The manual comprises of the general overview of hypertension, definition, diagnosis, management (pharmacologic and non-pharmacologic), and preventive measures. The manual was adapted because it contains the basic facts about hypertension needed to educate the study population. Also, summary information sheet was made available for respondents as a reference material.

Validity of the Instruments

To ensure content validity of the questionnaire, it was given to my supervisors of the School of Nursing and Midwifery of the University of Cape Coast for expert assessment and scrutiny. The items were examined to see whether they were related to the objective of the study. This was to ensure content related evidence of the items in the questionnaire. Suggestion that was made by faculty and weakness identified were addressed to improve the content validity of

the questionnaire. There were reverse translation of the data collection instruments from the English language to Twi.

Pre-testing of the Instrument

Pre-testing of the questionnaire was conducted at the University of Cape Coast Hospital. The pre-testing was aimed at improving the validity and reliability of the research instrument. Twenty (20) respondents were recruited from the university hospital and provided with questionnaire pre and post intervention. Respondents were allowed to comment on the clarity or otherwise of the items in the questionnaire during the pre-test phase. The pre-test was aimed at testing the ability of the questionnaire to elicit information to answer the research questions, and the number of minutes on the average each session would last to help plan the time well.

Some of the respondent who participated in the pre-testing were not able to read and understand the English language which led to the translation of the research instruments into Twi (See Appendix C). The questionnaire was translated into Twi for the study participants since Twi is the most frequently used language in the Kwaebibirem Municipality. The translation was done by a certified translator who has a Master of Philosophy in Twi. The respondents who participated in the pre-testing were not included in the main study. Using Cronbach's Alpha, a reliability coefficient of 0.840 was obtained for the knowledge scale and 0.689 was obtained for the belief scale after the pre-test.

Ethical Consideration

Ethical clearance was sought from the Institutional Review Board (IRB) of the University of Cape Coast with reference ID UCCIRB/CHAS/2022/149 (See Appendix F). Permission was sought from the Kwaebibirem Municipal Health Directorate (See Appendix H) through an introductory letter from the University of Cape Coast (See Appendix G). This was done to get authorization to recruit participants, a copy of the research proposal was forwarded to the authorities of the study locations. However, the names of the patients who were included in the study was not revealed to the hospital's administrators.

The study's details were communicated to each participant, and their consent to voluntarily participate in the study was sought. Patients were given time to ask questions about the study and their concerns. Clarification and answers were provided accordingly. If a patient does not feel comfortable with the nature of the study, he or she was given the option to withdraw from the study without penalty. They were also told that, they could withdraw from study at any stage without any retributive actions against them. Evidence of consent was provided by the signature on a consent form. In accordance with ethical guidelines, names and addresses of participants were not used in any document relating to the study to ensure anonymity and confidentiality. Special ID number was assigned to the response to maintain confidentiality. A list of codes was used to match up with name to ensure privacy. To ensure the safety of participants' information, data collected from them was securely stored under lock and key

while computer-based files were encrypted with password**.** Data will be accessible to the researcher and the supervisor.

Data Collection Procedures

This study was conducted at Kade Government Hospital in the Kwaebibirem Municipality, Eastern Region of Ghana. The purpose and nature of the study was explained to the participants to their understanding before inviting them to participate. Patients living with hypertension who attended their regular monthly hypertension clinic were invited to participate in the study.

Informed consent was obtained from all patients before the study commenced. The researcher met the respondents once every week for four weeks. However, owing to the nature of the Kwaebibirem Municipal Health Directorate Conference Room, respondents were put into 4 groups of 54 and 55 respectively, thus 54 in three groups and 55 in one group to make 217 respondents. Patients were made to participate in a month (4-weeks) educational intervention that included three components: presentations, a summary information pamphlet, and weekly meetings with the researcher. The post intervention measurements were performed a month after the entire educational intervention was completed. The education interventional section took place at the Kwaebibirem Municipal Health Directorate Conference Room.

All patients were seated during the sessions, and various topics discussed. There were four presentations covering the following topics: (1) general overview of hypertension, (2) antihypertensive medications, (3) adherence, and (4) hypertensive patients' suggested food and lifestyle. Patients were handed a

summary information sheet after all four presentations have been given, which summarized all the important points discussed during the presentations. All patients had access to this paper, which was available in English and Twi. Patients also had the opportunity to ask questions on hypertension and its treatment following each presentation. The session was held on a weekly basis, and the researcher assessed the participants' adherence to their antihypertensive therapy during these meetings. The researcher also revisited the most recent topic with those participants who were unable to attend the last session. During the education sessions, the researcher emphasized the importance of adhering to global hypertension practice guidelines recommendations for managing hypertension related to diet, personal activity, medication adherence, and at-home blood pressure monitoring.

Before and after the educational intervention, patients' levels of knowledge on hypertension, belief, and adherence were assessed using the same self-administered questionnaires. Patients were given self-administered questionnaires (pre-intervention questionnaires) before the educational intervention session. This was done to establish the patients' baseline levels of knowledge on the subject.

Patients completed the same self-administered questionnaires for all topics (post-intervention questionnaires) 4 weeks after receiving the summary information booklets (See Appendix E) to see if the availability of written information leads to a further increase in patients' levels of hypertension knowledge. The dates when the patients collected their follow-up medications

were available from their health passports (a book where all details about the patient's visits to hypertension clinic are recorded). It took the participants at most 15 to 30 minutes to complete the questionnaire. Field assistants helped the researcher in the administration of the questionnaire to both in English and Twi.

Data Processing and Analysis

The responses to questionnaires returned were cleaned and coded with the help of Statistical Package for the Social Sciences (SPSS) software version 25.0. The data cleaning procedure was used to check whether respondents followed the instructions given to them correctly and check if all items on the questionnaire were responded to. Demographic data of the respondents were analysed using descriptive statistics (means, frequencies, and percentages).

The post intervention measurements were performed a month after the entire educational intervention was complete. At 95% level of significance, t-test and McNemar-Bowker for dependent samples were performed to compare the participants' levels of knowledge about hypertension, their beliefs about medicines, and adherence levels pre and post the educational intervention. In pre-test post-test design, a dependent t-test is used since the dependent variable is measured on an interval scale. At 95% confidence intervals (CI) estimates of the effect size of the tests were determined for levels of knowledge about hypertension, beliefs about medicines, and adherence levels. The internal reliability of the beliefs about medicines questionnaire (BMQ) was tested using the Cronbach's alpha (CA).

Data management

Questionnaires used for data collection were treated with care both before and after collection of data to ensure the questionnaires' integrity and the confidentiality of participants are maintained. All the questionnaires retrieved were put together and examined before the data entry and analysis process was initiated. Data analysed were kept on a personal hard drive under lock and key. Research records will be retained for five (5) years. Paper records will be destroyed in a manner that leaves no possibility for reconstruction (burning) while the soft data will be formatted accordingly. This will be done to safeguard the information of the participants.

Chapter Summary

The study was conducted in the Kade Government Hospital in the Kwaebibirem Municipality among patients living with hypertension. Ethical clearance was sought from the Institutional Review Board (IRB) of the University of Cape Coast. Permission was sought from the Kwaebibirem Municipal Health Directorate through an introductory letter from the University of Cape Coast to gain their cooperation. A sample size of 217 was chosen for the study.

Simple random sampling technique was used to select the samples for the study. A structured questionnaire was used to collect data from respondents in this study pre and post intervention. The first part contains sociodemographic characteristics of respondents. The second part is made up of and standardized questionnaire in three sections: Section A (knowledge about hypertension and its therapy was adapted from Magadza et al. (2009), Section B (Beliefs about

Medicines Questionnaire (BMQ) (Horne et al., 1999), and Section C (8-item Morisky Medication Adherence Scale) (Zyoud et al., 2013).

The responses to questionnaires returned were cleaned and coded with the help of Statistical Package for the Social Sciences (SPSS) software version 25.0. Demographic data of the respondents was analysed using descriptive statistics (means and percentages). Data on Research Questions 1 to 3 was analysed using Dependent t-Tests and McNemar-Bowker at 95% level of significance to compare the patients' levels of knowledge about hypertension, their beliefs about medicines, and adherence levels before and after the educational intervention. This test assumed that the paired observation should be independents and nominal or ordinal. The next chapter presents the results and discussion of the study.

CHAPTER FOUR

RESULTS AND DISCUSSION

To assess the effect of educational intervention on patients' understanding of hypertension, beliefs, and adherence to therapy, this chapter presents the study's findings and highlights its interpretation. There are two major sections to the chapter. The first section presented the results. The second section discussed the key results of the study with respect to the research objectives.

Results

The study included patients living with hypertension and attended hypertension clinic at the Kade Government Hospital. The sample size used in the study was 217 patients living with hypertension. The table 1 presents the socio-demographic data of the participants involved in the study. Majority 143 (65.90%) were females and about a third 67(30.8%) of the participants were 70 years and above. Nearly half, 101(46.5%) were married, and were mostly Christians. Most of the participants, 84(38.7%), have a Junior High School education. Most of the participants were self-employed 107(49.3%) and nearly a quarter of the participants were unemployed 54(24.9%).

Table 2: Demographic characteristics of Respondents (n=217)

Demographic Characteristics	Frequency(f)	Percentage (%)
Gender		
Male	74	34.10
Female	143	65.90
Age range (years)		
18-29	1	0.5
30-39	14	6.5
40-49	30	13.8
50-59	41	18.9
60-69	64	29.5
70 and above	67	30.8
Marital status		
Never Married	8	3.7
Divorced	24	11.1
Married	101	46.5
Widow	58	26.7
Separated	14	4.5
Religious group		
Christian	160	73.7
Muslim	42	19.4
African Traditional	13	6.0
Non-Believer	2	.9

Table 2 continued: Demographic characteristics of Respondents (n=217)

Demographic Characteristics	Frequency(f)	Percentage (%)
Highest level of education		
Non-formal	29	13.4
Basic school	38	17.5
Junior High School	84	38.7
Senior High School	19	8.8
Diploma	21	9.7
Bachelor's degree	16	7.4
Post-graduate degree	10	4.6
Occupation		
Government Employed	30	13.8
Self/Privately Employed	107	49.3
Unemployed	54	24.9
Pensioner	26	12.0
Bachelor's degree	16	7.4
Post-graduate degree	10	4.6

Research Objective One: effect of educational intervention on patients' level of knowledge about hypertension

The research objective one was to determine the effect of educational intervention on patients' level of knowledge about hypertension and its therapy. Frequencies and paired T-test were used to analyse data. The tables 2 and 3 below presents the results of the analysis.

Table 3: Relationship between pre and post: Knowledge of hypertensive patients using education as an intervention.

		After intervention (POST)							
	Questions	Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree	Total	McNemar-Bowker value	p-value
	Definition of blood pressure								
Before intervention (PRE)									
	Strongly disagree	1	2	0	3	0	**6**	**64.52**	**<0.001**
	Disagree	0	2	2	4	2	**10**		
	Not sure	0	8	12	35	7	**62**		
	Agree	0	0	2	69	31	**102**		
	Strongly agree	0	1	0	7	29	**37**		
	Total	**1**	**13**	**16**	**118**	**69**	**217**		
	If you feel 'well' then your BP is within normal ranges.								
	Strongly disagree	8	1	0	2	0	**11**	**65.61**	**<0.001**
	Disagree	6	61	1	2	0	**70**		
	Not sure	5	25	5	6	0	**41**		
	Agree	4	27	2	40	4	**77**		
	Strongly agree	2	7	1	2	6	**18**		
	Total	**25**	**121**	**9**	**52**	**10**	**217**		

Table 3 Cont'd

		After intervention (POST)							
	Questions	**Strongly Disagree**	**Disagree**	**Not Sure**	**Agree**	**Strongly Agree**	**Total**	**McNemar-Bowker value**	**p-value**
	Stress Smoking are courses of High BP								
	Strongly disagree	0	0	0	5	2	**7**	**79.5**	**<0.001**
	Disagree	1	2	1	12	6	**22**		
	Not sure	0	1	0	32	22	**55**		
	Agree	0	0	1	60	26	**87**		
Before intervention (PRE)	Strongly agree	0	0	0	16	30	**46**		
	Total	**1**	**3**	**2**	**125**	**86**	**217**		
	High BP is part of aging, so no treatment is needed								
	Strongly disagree	18	10	1	1	0	**30**	**48.63**	**<0.001**
	Disagree	24	64	4	5	1	**98**		
	Not sure	7	28	10	0	0	**45**		
	Agree	4	16	5	8	2	**35**		
	Strongly agree	4	4	0	0	1	**9**		
	Total	**57**	**122**	**20**	**14**	**4**	**217**		

Table 3 Cont'd

		After intervention (POST)							
	Questions	**Strongly Disagree**	**Disagree**	**Not Sure**	**Agree**	**Strongly Agree**	**Total**	**McNemar-Bowker value**	**p-value**
Before intervention (PRE)	**There is no cure for High BP**								
	Strongly disagree	4	2	3	9	3	**21**	**123.46**	**<0.001**
	Disagree	2	10	3	32	15	**62**		
	Not sure	1	5	10	57	16	**89**		
	Agree	0	3	1	16	11	**31**		
	Strongly agree	0	0	0	7	7	**14**		
	Total	**7**	**20**	**17**	**121**	**52**	**217**		
	Change in lifestyle is not needed if one is on high BP medications								
	Strongly disagree	19	5	3	1	1	**29**	**51.15**	**<0.001**
	Disagree	27	86	3	2	0	**118**		
	Not sure	5	23	2	1	0	**31**		
	Agree	6	13	7	8	1	**35**		
	Strongly agree	1	3	0	0	0	**4**		
	Total	**58**	**130**	**15**	**12**	**2**	**217**		

Table 3: Cont'd

		After intervention (POST)							
	Questions	**Strongly Disagree**	**Disagree**	**Not Sure**	**Agree**	**Strongly Agree**	**Total**	**McNemar-Bowker value**	**p-value**
Before intervention (PRE)	**High BP can cause stroke, heart & kidney failure if untreated**								
	Strongly disagree	0	0	0	3	4	**7**	**32.13**	**<0.001**
	Disagree	0	1	1	7	2	**11**		
	Not sure	0	0	0	12	13	**25**		
	Agree	1	0	2	60	37	**100**		
	Strongly agree	1	3	0	29	41	**74**		
	Total	**2**	**4**	**3**	**111**	**97**	**217**		
	Normal BP is less or equal to 120/80mmHg								
	Strongly disagree	0	0	2	2	0	**4**	**62.89**	**<0.001**
	Disagree	0	1	5	8	3	**17**		
	Not sure	0	4	16	43	13	**76**		
	Agree	0	2	4	55	28	**89**		
	Strongly agree	1	0	1	10	19	**31**		
	Total	**1**	**7**	**28**	**118**	**63**	**217**		

Table 3: Cont'd

	Questions	After intervention (POST) Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree	Total	McNemar-Bowker value	p-value
	Family history of HPT is a predisposing factor for HPT								
	Strongly disagree	1	0	0	5	4	**10**	**93.15**	**<0.001**
	Disagree	0	2	0	16	10	**28**		
Before intervention (PRE)	Not sure	0	2	3	24	13	**42**		
	Agree	0	1	0	63	44	**108**		
	Strongly agree	0	0	2	7	20	**29**		
	Total	**1**	**5**	**5**	**115**	**91**	**217**		
	Regular BP check is key in HPT management								
	Strongly disagree	0	0	1	2	1	**4**	**38.34**	**<0.001**
	Disagree	0	2	0	9	8	**19**		
	Not sure	0	0	0	11	8	**19**		
	Agree	0	1	0	54	50	**105**		
	Strongly agree	1	0	0	37	32	**70**		
	Total	**1**	**3**	**1**	**113**	**99**	**217**		

Table 3: Cont'd

		After intervention (POST)							
	Questions	**Strongly Disagree**	**Disagree**	**Not Sure**	**Agree**	**Strongly Agree**	**Total**	**McNemar-Bowker value**	**p-value**
Before intervention (PRE)	**Tablet can cure high BP**								
	Strongly disagree	9	3	1	1	0	**14**	**99.59**	**<0.001**
	Disagree	8	39	4	1	0	**52**		
	Not sure	7	56	12	3	2	**80**		
	Agree	7	34	4	7	1	**53**		
	Strongly agree	3	8	2	3	2	**18**		
	Total	**34**	**140**	**23**	**15**	**5**	**217**		
	HPT tablets can keep BP under control								
	Strongly disagree	1	0	1	6	1	**9**	**87.72**	**<0.001**
	Disagree	2	25	3	46	12	**88**		
	Not sure	0	4	9	27	7	**47**		
	Agree	0	0	1	39	11	**51**		
	Strongly agree	0	5	1	10	6	**22**		
	Total	**3**	**34**	**15**	**128**	**37**	**217**		

Table 3: Cont'd

		After intervention (POST)							
	Questions	**Strongly Disagree**	**Disagree**	**Not Sure**	**Agree**	**Strongly Agree**	**Total**	**McNemar-Bowker value**	**p-value**
Before intervention (PRE)	**If one takes his regular BP drugs, then his BP will be under control**								
	Strongly disagree	3	0	1	2	4	**10**	**51.04**	**<0.001**
	Disagree	0	4	2	8	5	**19**		
	Not sure	0	1	6	18	18	**43**		
	Agree	0	8	0	75	31	**114**		
	Strongly agree	0	2	0	14	15	**31**		
	Total	**3**	**15**	**9**	**117**	**73**	**217**		
	If one changes lifestyle, he will not need BP medications								
	Strongly disagree	6	9	0	0	0	**15**	**61.40**	**<0.001**
	Disagree	16	73	6	2	2	**99**		
	Not sure	9	14	12	2	3	**40**		
	Agree	11	30	9	5	3	**58**		
	Strongly agree	0	5	0	0	0	**5**		
	Total	**42**	**131**	**27**	**9**	**8**	**217**		

Table 3: Cont'd

		After intervention (POST)							
	Questions	**Strongly Disagree**	**Disagree**	**Not Sure**	**Agree**	**Strongly Agree**	**Total**	**McNemar-Bowker value**	**p-value**
Before intervention (PRE)	**Medications for diseases like flu & cough can raise BP**								
	Strongly disagree	12	2	8	2	1	**25**	**22.63**	**<0.14**
	Disagree	6	31	17	1	0	**55**		
	Not sure	7	38	36	8	1	**90**		
	Agree	8	8	12	11	1	**40**		
	Strongly agree	1	1	3	2	0	**7**		
	Total	**34**	**80**	**76**	**24**	**3**	**217**		
	One must not take any drug for high BP unless prescribed								
	Strongly disagree	1	0	1	9	2	**13**	**46.72**	**<0.001**
	Disagree	0	5	0	27	5	**37**		
	Not sure	0	1	3	19	4	**27**		
	Agree	1	2	3	97	12	**115**		
	Strongly agree	0	2	1	11	11	**25**		
	Total	**2**	**10**	**8**	**163**	**34**	**217**		

Table 3: Cont'd

		After intervention (POST)							
	Questions	**Strongly Disagree**	**Disagree**	**Not Sure**	**Agree**	**Strongly Agree**	**Total**	**McNemar-Bowker value**	**p-value**
Before intervention (PRE)	**One must not take any herbal medicine unless prescribed**								
	Strongly disagree	0	2	1	5	1	**9**	**95.62**	**<0.001**
	Disagree	1	3	4	27	22	**57**		
	Not sure	0	0	1	10	9	**20**		
	Agree	0	4	1	54	48	**107**		
	Strongly agree	1	1	2	4	16	**24**		
	Total	**2**	**10**	**9**	**100**	**96**	**217**		
	Regular check-up is key in HPT management								
	Strongly disagree	0	0	1	8	1	**10**	**51.47**	**<0.001**
	Disagree	0	1	1	8	8	**18**		
	Not sure	0	0	1	5	5	**11**		
	Agree	3	2	0	52	68	**125**		
	Strongly agree	2	0	1	19	31	**53**		
	Total	**5**	**3**	**4**	**92**	**113**	**217**		

Prior to the educational intervention, 6 individuals disagreed, 37 agreed that blood pressure is a measurement of the force of blood against the walls of blood vessels. After the intervention only 1 disagreed, and 69 agreed blood pressure is a measurement of the force of blood against the walls of blood vessels. The participants were asked whether lack of symptoms meant that their blood pressure was within normal ranges, 11 disagreed, and 18 agreed before the educational intervention. However, after the educational intervention, 10 agreed and 146 disagreed that lack of symptoms meant that their blood pressure was within normal ranges. Participants were once again asked if stress, smoking, and obesity were the main causes of high blood pressure, prior to the educational intervention, 7 disagreed, and 46 agreed; however, following the educational intervention, 3 disagreed, 125 agreed that stress, smoking, and obesity were the main causes of high blood pressure.

The following responses to the claim that high blood pressure is a normal component of aging and 'does not require treatment were obtained prior to the educational intervention: 98 disagreed and 9 agreed. Nevertheless, following the educational intervention, 122 disagreed, and 57 agreed with the question high blood pressure is a normal component of aging and 'does not require treatment. Also, when asked if there was a cure for high blood pressure, the research participants responded as follows: 62 disagreed and 14 agreed. Following the educational intervention 121 agreed that there was no cure for high blood pressure.

In addition, prior to the educational intervention, 29 disagreed, 118 disagreed that high blood pressure can be controlled by medicine and that you 'do not need to make any lifestyle changes. After the educational intervention,

58 agreed and 130 disagreed that one does not need to change lifestyle if they are on treatment. Research participants were asked once more if high blood pressure can result in a heart attack, stroke, or renal failure if left untreated, 7 disagreed and 74 agreed. When they were subjected to educational intervention, just 2 disagreed and 111 agreed that high blood pressure can result in a heart attack, stroke, or renal failure if left untreated.

Additionally, when participants were asked if the ideal blood pressure is less than or equal to 120/80 mmHg before the educational intervention, 4 disagreed and 31 agreed. Nevertheless, only one disagreed and 118 agreed after the educational intervention.

Participants were once again questioned whether family history of hypertension was a predisposing factor for hypertension, 10 disagreed and 29 agreed. Only one person strongly disagreed and 91 agreed after the educational intervention that family history of hypertension was a predisposing factor for hypertension. Again, before starting the education intervention, 105 people agreed that frequently measuring blood pressure is important for managing hypertension, only one person disagreed and 99 agreed after the intervention that frequently measuring blood pressure is important for managing hypertension.

Moreover, prior to the educational intervention, 18 agreed and 14 disagreed that taking tablets may cure blood pressure. Nevertheless, following the educational session, 140 disagreed and 5 agreed that medications can cure high blood pressure. Also, before the educational intervention, the participants' responses to the question on whether taking medications alone is sufficient to control blood pressure were as follows: 10 disagreed and 31

agreed. After the educational intervention, 117 agreed, while 15 disagreed that taking medications alone is sufficient to control blood pressure

At the start of the educational intervention, 15 disagreed and 5 people agreed that one will not need any medication for blood pressure if he changes lifestyle. However, just 42 people disagreed, and 8 agreed after the educational intervention. The participants were asked whether medicine and tables for other diseases like flu and coughs can raise their blood pressure and 25 disagreed, 7 agreed before the educational intervention. After the educational intervention 34 disagreed, and only 3 agreed.

Before the educational intervention, 13 strongly disagreed that one must not take other medicines, besides tablets for high blood pressure, without first asking the doctor, pharmacist or nurse, 37 disagreed and 115 agreed to the question. Also, at the start of the educational intervention 9 disagreed that one must not take any herbs or traditional medicines without first asking the doctor, pharmacist, or nurse, 57 disagreed and 24 agreed. However, after the educational intervention only 2 disagreed and 96 strongly agreed. The participants were asked whether visiting physicians regularly is key in hypertension management and 10 disagreed and 53 agreed before the educational intervention. However, after the educational interventional 5 disagreed and 113 agreed that visiting physicians regularly is key in hypertension management.

Table 4: Pre and post: Overall knowledge score of hypertensive patients.

Knowledge score	Mean (±SD)	95%CI	p-value
Pre-Knowledge score	59.55±5.69	58.79-60.31	<0.001
Post knowledge score	66.68±3.74	66.78-67.18	

Statistic: Paired T-test, SD-Standard Deviation, CI – Confidence Interval

From the table, before the intervention, the participants had a mean knowledge score of 59.55±5.69. This means that the participants, on average, scored around 59.55 on the knowledge assessment. After the intervention, the participants had a higher mean knowledge score of 66.68±3.74. This indicates that, on average, the participants' knowledge scores improved to 66.68. The p-value of <0.001 suggests that the difference in knowledge scores before and after the intervention is statistically significant. This likely suggests that the observed increase in knowledge scores is unlikely to have occurred by chance. These findings indicate that the intervention or treatment had a positive effect on the participants' knowledge, resulting in a significant improvement.

Table 5: Relationship between pre and post: Beliefs about hypertension therapy using education as an intervention.

		After intervention (POST)							
	Questions	**strongly disagree**	**Disagree**	**not sure**	**agree**	**strongly agree**	**total**	**McNemar-Bowker value**	**p-value**
	My present health depends on my medicines								
Before intervention (PRE)	Strongly disagree	3	1	0	5	2	**11**	**51.33**	**<0.001**
	Disagree	0	8	0	21	8	**37**		
	Not sure	0	1	0	12	9	**22**		
	Agree	0	12	0	74	32	**118**		
	Strongly agree	0	1	1	7	20	**29**		
	Total	**3**	**23**	**1**	**119**	**71**	**217**		
	Having to medicines worries me								
	Strongly disagree	4	6	0	0	0	**10**	**42.54**	**<0.001**
	Disagree	7	65	0	8	0	**80**		
	Not sure	3	23	14	11	1	**52**		
	Agree	3	18	6	28	4	**59**		
	Strongly agree	3	5	1	3	4	**16**		
	Total	**20**	**117**	**21**	**50**	**9**	**217**		

Table 5 Cont'd

		After intervention (POST)							
	Questions	**strongly disagree**	**Disagree**	**not sure**	**Agree**	**strongly agree**	**total**	**McNemar-Bowker value**	**p-value**
Before intervention (PRE)	**My life would be impossible without my medicines**								
	Strongly disagree	1	0	2	4	5	**12**	**100.6**	**<0.001**
	Disagree	2	16	2	30	21	**71**		
	Not sure	0	1	9	26	21	**57**		
	Agree	1	2	3	50	13	**69**		
	Strongly agree	0	0	0	4	4	**8**		
	Total	**4**	**19**	**16**	**114**	**64**	**217**		
	Without my medicines I would be very ill								
	Strongly disagree	0	0	0	5	5	**10**	**88.69**	**<0.001**
	Disagree	1	5	0	36	13	**55**		
	Not sure	1	2	1	19	8	**31**		
	Agree	0	6	1	69	31	**107**		
	Strongly agree	0	1	0	5	8	**14**		
	Total	**2**	**14**	**2**	**134**	**65**	**217**		

Table 5 Cont'd

		After intervention (POST)							
	Questions	**strongly disagree**	**Disagree**	**not sure**	**agree**	**strongly agree**	**total**	**McNemar-Bowker value**	**p-value**
Before intervention (PRE)	**I sometimes worry about long term effect of my drugs**								
	Strongly disagree	4	0	0	0	0	**4**	**71.27**	**<0.001**
	Disagree	5	18	2	2	3	**30**		
	Not sure	5	18	5	7	1	**36**		
	Agree	7	32	8	43	7	**97**		
	Strongly agree	1	12	1	23	13	**50**		
	Total	**22**	**80**	**16**	**75**	**24**	**217**		
	My medicines are a mystery to me								
	Strongly disagree	3	3	1	1	0	**8**	**50.87**	**<0.001**
	Disagree	5	23	3	12	0	**43**		
	Not sure	9	41	19	24	3	**96**		
	Agree	4	14	12	28	2	**60**		
	Strongly agree	2	2	1	3	2	**10**		
	Total	**23**	**83**	**36**	**68**	**7**	**217**		

Table 5 Cont'd

		After intervention (POST)							
	Questions	**strongly disagree**	**Disagree**	**not sure**	**agree**	**strongly agree**	**total**	**McNemar-Bowker value**	**p-value**
	My health in the future will depends on my medicines								
Before intervention (PRE)	Strongly disagree	0	0	0	4	4	**8**	**95.15**	**<0.001**
	Disagree	1	9	0	22	23	**55**		
	Not sure	1	2	3	14	16	**36**		
	Agree	4	6	1	51	44	**106**		
	Strongly agree	0	1	1	4	6	**12**		
	Total	**6**	**18**	**5**	**95**	**93**	**217**		
	My medicines disrupt my life								
	Strongly disagree	7	8	1	1	0	**17**	**62.89**	**<0.001**
	Disagree	21	64	8	7	2	**102**		
	Not sure	5	40	8	2	1	**56**		
	Agree	1	16	9	8	1	**35**		
	Strongly agree	0	4	1	1	1	**7**		
	Total	**34**	**132**	**27**	**19**	**5**	**217**		

Table 5 Cont'd

	Questions	After intervention (POST) strongly disagree	Disagree	not sure	agree	strongly agree	total	McNemar-Bowker value	p-value
	I worry about becoming dependent on my medicines								
Before intervention (PRE)	Strongly disagree	5	4	0	0	1	**10**	**86.47**	**<0.001**
	Disagree	10	16	1	4	0	**31**		
	Not sure	14	16	0	4	1	**35**		
	Agree	23	30	2	42	10	**107**		
	Strongly agree	8	6	0	14	6	**34**		
	Total	**60**	**72**	**3**	**64**	**18**	**217**		
	My medicines protect me from becoming worse								
	Strongly disagree	0	0	0	3	1	**4**	**47.11**	**<0.001**
	Disagree	2	1	0	8	7	**18**		
	Not sure	0	1	0	12	9	**22**		
	Agree	0	3	1	64	55	**123**		
	Strongly agree	0	0	0	23	27	**50**		
	Total	**2**	**5**	**1**	**110**	**99**	**217**		

Table 5 Cont'd

		After intervention (POST)							
	Questions	**strongly disagree**	**Disagree**	**not sure**	**agree**	**strongly agree**	**total**	**McNemar-Bowker value**	**p-value**
	Doctors use too many medicines								
Before intervention (PRE)	Strongly disagree	6	5	1	3	1	**16**	**39.23**	**<0.001**
	Disagree	2	43	2	4	4	**55**		
	Not sure	2	15	11	17	2	**47**		
	Agree	3	14	2	45	10	**74**		
	Strongly agree	1	10	1	1	12	**25**		
	Total	**14**	**87**	**17**	**70**	**29**	**217**		
	People who take their medicines should sometimes stop for a while and again								
	Strongly disagree	12	10	0	1	0	23	**68.02**	**<0.001**
	Disagree	19	79	2	0	0	100		
	Not sure	5	16	9	1	0	31		
	Agree	3	43	2	6	1	55		
	Strongly agree	0	5	0	1	2	8		
	Total	39	153	13	9	3	217		

Table 5 Cont'd

		After intervention (POST)							
	Questions	**strongly disagree**	**Disagree**	**not sure**	**agree**	**strongly agree**	**total**	**McNemar-Bowker value**	**p-value**
Before intervention (PRE)	**Most medicines are addictive**								
	Strongly disagree	5	1	1	4	1	**12**	**39.32**	**<0.001**
	Disagree	6	18	1	8	5	**38**		
	Not sure	6	13	21	27	2	**69**		
	Agree	5	3	5	57	7	**77**		
	Strongly agree	0	0	1	15	5	**21**		
	Total	**22**	**35**	**29**	**111**	**20**	**217**		
	Natural remedies are safer than medicines								
	Strongly disagree	2	2	1	5	4	**14**	**30.01**	**<0.001**
	Disagree	7	11	7	39	4	**68**		
	Not sure	6	14	4	20	2	**46**		
	Agree	10	13	7	33	6	**69**		
	Strongly agree	6	4	2	6	2	**20**		
	Total	**31**	**44**	**21**	**103**	**18**	**217**		

Table 5 Cont'd

		After intervention (POST)							
	Questions	**strongly disagree**	**Disagree**	**not sure**	**agree**	**strongly agree**	**total**	**McNemar-Bowker value**	**p-value**
	Medicines do more harm than good								
Before intervention (PRE)	Strongly disagree	31	20	1	2	1	**55**	**43.17**	**<0.001**
	Disagree	24	54	6	1	0	**85**		
	Not sure	13	22	6	1	0	**42**		
	Agree	3	21	1	3	0	**28**		
	Strongly agree	1	3	2	0	1	**7**		
	Total	**72**	**120**	**16**	**7**	**2**	**217**		
	All medicines are poisons								
	Strongly disagree	55	26	1	1	0	**83**	**55.76**	**<0.001**
	Disagree	28	24	2	0	2	**56**		
	Not sure	22	21	3	1	1	**48**		
	Agree	13	6	2	1	0	**22**		
	Strongly agree	4	3	1	0	0	**8**		
	Total	**122**	**80**	**9**	**3**	**3**	**217**		

Table 5 Cont'd

		After intervention (POST)							
	Questions	**strongly disagree**	**Disagree**	**not sure**	**Agree**	**strongly agree**	**total**	**McNemar-Bowker value**	**p-value**
Before intervention (PRE)	**Doctors place to much trust on medicines**								
	Strongly disagree	6	2	0	1	0	**9**	**40.39**	**<0.001**
	Disagree	0	20	2	8	3	**33**		
	Not sure	1	17	6	25	7	**56**		
	Agree	1	23	6	58	8	**96**		
	Strongly agree	2	4	1	8	8	**23**		
	Total	**10**	**66**	**15**	**100**	**26**	**217**		
	If doctors had more time with patient, they would prescribe fewer medicines								
	Strongly disagree	1	0	0	4	2	**7**	**89.23**	**<0.001**
	Disagree	2	8	4	19	14	**47**		
	Not sure	1	1	4	23	14	**43**		
	Agree	0	2	3	47	43	**95**		
	Strongly agree	0	0	1	8	16	**25**		
	Total	**4**	**11**	**12**	**101**	**89**	**217**		

Before the education intervention began, 118 individuals agreed that their current health depended on the antihypertensives, compared to the 37 who disagreed. After the intervention, only 23 disagreed and 119 agreed to claim that their current health was dependent on their antihypertensive medication. Prior to the educational intervention, the following responses to the question of whether taking medications worries them were gathered: 80 disagreed and 16 agreed. However, after the educational intervention, 50 agreed and 117 objected to the question taking medications worries them.

The study participants also stated the following when asked if their life would be impossible without the antihypertensive: 71 disagreed and 8 agreed. After the educational intervention, 114 agreed and 19 disagreed that their life would be impossible without the antihypertensive. A different question was posed prior to the educational intervention, 10 disagreed while 107 agreed that they would become very unwell if they stopped taking their high blood pressure medicine. After the educational intervention, 134 people agreed while only 14 who disagreed.

When the research participants were asked again if they were concerned about the long-term effects of hypertension medicines, 97 agreed and 4 disagreed. Only 80 disagreed and 24 strongly agreed after being subjected to educational intervention. Additionally, when participants were asked if their medications are a mystery to them prior to the educational intervention, 8 disagreed and 60 agreed. Nevertheless, following the educational intervention, only 83 disagreed and 7 agreed. Furthermore, 106 agreed and 8 disagreed when asked if their future health will depend on their

hypertension drugs. After the educational intervention, only 6 disagreed and 95 agreed to the statement.

Prior to the education intervention, 7 agreed that using blood pressure medications disrupts their lives, while 102 participants disagreed. After the intervention, 132 disagreed and 5 agreed. This may indicate that after receiving the educational intervention, participants understand the need of taking their prescription on a regular basis. In addition, prior to the educational intervention, 107 agreed and 10 disagreed that they were concerned about becoming overly dependent on antihypertensive medications. However, after the educational session. As for their concern about becoming overly dependent on antihypertensives, 18 agreed and 72 disagreed to the question.

The participants' answers to the question of whether their medications helped prevent them from getting ill before the educational intervention were as follows: 123 agreed and 18 disagreed. However, following the educational intervention, 110 people agreed and 5 people disagreed. Once more, at the start of the educational intervention, 16 disagreed while 74 agreed that doctors use too many medications. After the educational session, only 14 participants still disagreed and 87 disagreed to the question. Again, before the educational intervention, 100 disagreed and 8 agreed with the statement that people should occasionally discontinue their medication. After the educational intervention, 153 disagreed and only 3 agreed.

At the start of the educational intervention, 12 disagreed that most medications are addictive, 77 agreed. However, after the educational intervention only 22 disagreed while 111 agreed that most medications are addictive. In addition, at the beginning of the educational intervention, 68

people disagreed and 20 people agreed that natural therapies are safer than medications. After the educational intervention, however, 103 agreed and 44 disagreed to the statement. Also, prior to the educational intervention, the participants' responses to the question of whether medications cause more harm than good were as follows: 85 disagreed and 7 agreed. 120 disagreed while 7 agreed to the question following the educational intervention. The frequency with which participants disagreed with the statement varied.

Prior to the educational intervention, 83 individuals disagreed and 8 agreed that all medicines are poison. Following the intervention, 3 agreed and 122 disagreed. Also, before the educational intervention, the following responses were made to the argument that doctors put too much faith in medicine: 96 agreed and 33 disagreed. Nevertheless, following the educational intervention, 100 agreed while 10 disagreed. Additionally, the participants' responses to the question of whether doctors would prescribe fewer medications if they spent more time with their patients before the educational intervention, were as follows: 7 disagreed while 95 agreed. However, following the educational intervention, 101 agreed and 11 disagreed to the statement.

Table 6: Pre and post: Overall belief score of hypertensive patients.

Believe score	Mean (SD)	95%CI	p-value
Pre believe score	59.04±5.59	58.29-59.79	<0.001
Post believe score	66.27±4.42	65.68-66.86	

Statistic: Paired T-test, SD-Standard Deviation, CI – Confidence Interval

From table 5, before the intervention, the participants had a mean knowledge score of 59.04±5.59. This means that the participants, on average,

scored around 59.04 on the belief assessment. After the intervention, the participants had a higher mean belief score of 66.27±4.42. This indicates that, on average, the participants' belief scores improved to 66.27. The p-value of <0.001 suggests that the difference in belief scores before and after the intervention is statistically significant. This likely suggest that the observed change in belief scores is unlikely to have occurred by chance. These findings indicate that the intervention had a positive effect on the participants' belief, resulting in a significant improvement.

Table 7: Pre and post: Overall adherence score of hypertensive patients.

Adherence score	Mean (±SD)	95%CI	p-value
Pre-Adherence score	3.66(±1.93)	3.40-3.91	<0.001
Post Adherence score	7.02(±0.87)	6.66-7.14	

Statistic: Paired T-test, SD-Standard Deviation, CI – Confidence Interval

Before intervention (education), the mean adherence score (M=3.66, SD=1.93) to hypertension therapy was lower as compared to the mean adherence score (M= 7.02, SD= 0.87) after the intervention. A p<0.001 indicates that there was a significant difference in adherence scores before and after the educational intervention.

Discussion

Age of patients with hypertension

This current study findings show that most of the participants 67(30.8%) were within the age range of 70 and above. This result is consistent with the findings of Acheampong et al. (2019), Dai et al. (2022) and Muli et al. (2020) who reported that adults 60 years of age and older are more prone to

hypertension. The study's findings are consistent with Dakum et al. (2019), who stated that advancing age is linked to hypertension.

Gender of patients with hypertension

This present study also revealed that 143 (65.90%) respondents were females and 74 (34.10%) were males. The results of this recent study support the claim that women are more likely than men to have hypertension (Gillis & Sullivan, 2016). This finding is consistent with the study by Bantas and Gayatri, (2019) and Fryar et al. (2017) who found that women were more prone to hypertension than males once they reach the age of 60. This suggests that in younger people, it might be higher in males than females. During menopause, women's blood pressure rises to levels greater than men's Reckelhoff (2001). In contradiction to the present study, Ostchega et al. (2020) and Everett and Zajacova (2015) found that hypertension was higher among men (51.0%) than women (39.7%) and (27% and 12%) respectively.

However, according to Naeemi et al. (2022), gender was a common predictor of antihypertensive treatment adherence with females reporting better adherence than males. The reason could be that females perceive and report their health problems more obstinately than men and they would like to pay more attention to diet, weight reduction, physical exercise, blood pressure monitors than their male counterpart. Also, men tend to be busier and under more stress at work than women, which may make it difficult for them to spend more time changing their lifestyles. Males are expected to work and take care of the female members of the family in a typical Ghanaian community. The location of patients with hypertension has been linked to medication adherence, according to a study by Naemi et al. (2022). This was

because patients in rural areas had lower adherence rates than those in metropolitan areas. This is so because, compared to urban inhabitants, rural dwellers typically have fewer levels of education, lower incomes, and more obstacles to obtaining healthcare. This is characteristic of people living in the Kade neighbourhood in the study's study area of Kwaebibirem.

Occurrence of hypertension among religious groups and marital status

It was observed from this current study that a large number of participants 160(73.7%) were Christians while a small number of the participants 2(0.9%) were non-believers. It can be concluded that Christians in the Kwaebibirem district formed the majority of hypertensive patients in this study. The findings of this current study are consistent with the study conducted by Nyarko et al. (2017) with a sample size of 4,387 who found that prevalence of hypertension history was highest 6.3% among Christians and lowest 2.3% among traditionalists. Also, Meng et al. (2019) revealed significant discrepancies in how religious affiliations influence the occurrence of hypertension. Nonetheless, Buddhists are less likely to have hypertension than Tibetan locals, according to Meng *et al.* (2019). The new study's findings seem to be at odds with Meng et al. (2019). Yet, the study's findings might be the result of the researcher's decision to exclusively survey believers. As Muslims make up 25% of the population and Christians make up roughly 70%, it is likely that most of the participants were either Christians or Muslims.

The findings of the study shows that majority of the participants 101(46.5%) were married, divorced 24(11.1%), and widowed 58(26.7%). The finding, however, is consistent with a study by Anamaale et al. (2019), who

found that there were more married people with hypertension than single and divorced people. In the typical Ghanaian society, marriage is valued more highly than divorce and cohabitation. Thus, the larger percentage of hypertension patients cannot be attributed to their marital status. This supports the findings of Manfredini et al. (2017), who found that married people are less prone to hypertension than single people. According to Mia Son et al. (2022), divorce was the factor most strongly linked to hypertension in men, while married status was the one most strongly linked to hypertension in women. The current study is refuted by Meng et al. (2019) that discovered that those who had never been married posed a serious risk for hypertension. Yet, this study demonstrated that most hypertension patients were married.

Level of education and occupation among patients living with hypertension

The findings of this current study shows that majority of the participants, 84(38.7%), had a Junior High School education, 38(17.5%) of the participants had Basic school education. In addition, only 10(4.6%) of the participants in Ghana's Kwaebibirem district had a post-graduate degree. The findings of this current study are consistent with a study conducted by Sun et al. (2022) on association of education levels with the risk of hypertension and hypertension control: a nationwide cohort study in Chinese adults using sample size of 101,959 participants. They reported a high incidence of hypertension among participants education level at elementary school and below was 0.76% (95% CI, 0.72 -0.80) in those with a middle school education level and 0.67(95% CI, 0.63-0.70) in those with a high school degree or above.

Agyei-Baffour et al. (2018) resolved one of the questions that the scientific community was unclear about: Does educational level have an impact on the degree of hypertension? His research demonstrated that residents of rural areas 'are not even aware of their hypertension status. According to the results of this recent study, a higher percentage of hypertensive people had completed Junior High School. Those with low levels of education and income who live in rural areas often 'do not have the habits of routinely testing their blood pressure and are unaware of their hypertension status. Yet, according to Agyei-Baffour *et al.* (2018), Tannor et al. (2019), and Son et al. (2022), the difference between people living in rural and urban regions is closing. This study's conclusion has the implication that the majority of highly educated people are aware of the importance of routine hospital visits for diagnosis and blood pressure checks. This might enable early diagnosis of bodily abnormalities and the application of remedial therapy. Also, those who have received an education are often disciplined when it comes to learning about disease prevention. Knowledge presented at hypertension training programs run by health professionals can be quickly implemented and reduced in blood pressure by highly educated people. On the other side, it might be challenging to manage medication and treatments for hypertension in people with low levels of education. The study's results contradict those of Parekh et al. (2022), who discovered that employment was linked to a lower risk of hypertension in the United States. This study demonstrates that the majority of hypertension patients were employed by either private businesses or governmental organizations. Only 54 people (24.9% of the population) were unemployed, according to table 3 above, and

26 of them were retired workers. Even though a lot of academics have claimed that hypertension worsens with aging and that a large proportion of retirees were predicted, neither of these things were found in this study. This might be because most retirees get treatment for hypertension at home and 'do not go to the government hospital in Kade. Also, this study disputes the findings of Rumbal-Smith et al. (2014), who claimed that there is no connection between occupational status and hypertension. It is important to note that participating in sports and working out reduces a person's risk of developing hypertension. This is because physical activity lowers blood pressure by 10 mm Hg. This supports the findings of Dosoo et al. (2019) who found that people in employment have a lower risk of hypertension than those who are jobless.

The findings of the present investigation, however, do not confirm Estrella et al. (2018) that ideal hypertension was more common among the unemployed. Contrarily, Estrella et al. (2018) found that Hispanic/Latina women who were at home or unemployed had a lower likelihood of having hypertension than their peers who were in full-time jobs. The differences in geographic location and employment type between the findings of the current study and the work of Estrella et al. (2018) may be to blame. Some jobs put employees at risk for hypertension because they must stay still for long periods of time without a break. On the other hand, some vocations include physical activity like running and walking, which promotes blood flow and lowers blood pressure. Due to their laborious roles as housewives or unemployed people, Hispanic/Latina women may have contributed to a reduced rate of hypertension.

Effect of educational intervention on patients' level of knowledge about hypertension

The result of this current study demonstrated that the changes in the frequencies of the number of participants who agreed to the statement that stress, smoking and overweight are the main cause of high blood pressure could be due to significant ($p < 0.001$) increase in the knowledge level of the participants after the educational intervention. Before and after the education intervention, there were significant variations in the frequency of participants saying that frequently checking blood pressure is an important management strategy for hypertension ($p < 0.001$). This suggests that their understanding of routine blood pressure monitoring was significantly influenced by their education. Prior to and following the education intervention, there was a substantial shift in the population's frequency of whether a person's family history makes them more likely to have hypertension ($p<0.001$). It suggests that an educational intervention improved knowledge. Additionally, before and after the educational intervention, there was a significant ($p<0.001$) difference in the participant's level of knowledge. Participants now firmly concur that using blood pressure medication may help regulate blood pressure even if there is lifestyle modification.

The primary goal of this study was to determine whether the educational interventions provided by the nurses at the government hospital in Kade had a substantial impact on patients' knowledge about hypertension and the treatments that relate to it. The results demonstrated an association between the patients' prior knowledge and their post knowledge following one month of educational intervention. A paired sample T-test was used to

compare the means of the overall knowledge level prior to the educational intervention and the knowledge level one month after the intervention to see whether there was a difference in the knowledge level of the patients living with hypertension. It was observed that there was a significant (P<0.001) difference in the overall knowledge level of the hypertension patients before the educational intervention (and after the educational intervention. This finding is consistent with the study by Magadza et al. (2009) on the effect of an educational intervention on patients' knowledge about hypertension, they concluded on a significant ($p < 0.001$) increase in the participant's levels of knowledge about hypertension and its therapy after the educational intervention.

In a similar study conducted by Ibrahim et al. (2022) to determine the effect of educational intervention on knowledge about hypertension and factors predicting adherence to drug therapy and reported positive effect on knowledge of the respondents (from 64% to 66.3%). However, the increase in the knowledge level of participants in Magadza et al. (2009) was relatively higher than the respondents in the Umar et al. (2022). Also, the study by Dsouza et al. (2022) on the effect of educational intervention on knowledge and level of adherence among hypertensive haemodialysis patients depicted an increase in the knowledge level of the intervention group compared to the control group. These results add to the arguments that educational intervention usually leads to an increase in the understanging level of patients.

Furthermore, the findings of this current study are congruent with findings of Akoko et al. (2017), who found that after an educational intervention was implemented, the knowledge level of patients living with

hypertension increased from 14% to 53.4%. Other studies, including Busari et al. (2010), Viera et al. (2008), and (Almas, Godil, Lalani, Samani, & Khan, 2012), agreed that subjecting patients with hypertension to educational intervention will result in an increase in the participants' knowledge level. A high level of hypertension knowledge may result in a shift in attitude toward medication and treatment. This may cause patients who are unaware of their condition to become more vigilant and visit a hypertension clinic on a regular basis. According to Tannor et al. (2019), to improve hypertension management and control, the knowledge status of hypertension patients should be thoroughly researched and understood. Tannor et al. (2019) also confirmed that the level of knowledge of patients with hypertension influences the cost of drugs, medication schedule, and duration of treatment. According to the study, the odds of having a high level of knowledge were two times higher in patients who had been on treatment for more than two years compared to patients who had been on treatment for less than two years. It could be inferred from the post educational intervention analysis that the highest mean recorded was on the statement that checking Blood pressure regularly is key in hypertension management (M=0.22, SD=0.02). This implies that the patients with hypertension understood to check their BP regularly in the near future in a way to reduce complications.

Familoni et al. (2004) advised that there should be deliberate efforts made and time set aside to educate patients living with hypertension about the importance of knowledge about hypertension and its management. Moreover, the formation of a "hypertension club or society" could be supported, according to Familoni et al. (2004). This will make it easier for healthcare

workers like doctors and nurses to plan educational initiatives and will also cut down on the amount of misinformation that patients living with hypertension spread to the public. This will significantly improve the ease of access to people with hypertension by the medical professional for treatment.

Effect of educational intervention on patients' belief about hypertension medications.

This current study revealed that participants propensity to claim that their current health was dependent on their antihypertensive medication varied significantly before and after the education session ($p<0.001$). This implies that the education had a substantial impact on how their current health is affected by the antihypertensive. Also, the participants beliefs of whether their future health will depend on their hypertension medications significantly changed between before and after the education session ($p<0.001$). It implies that a belief system can be improved by educational intervention. Additionally, the frequency of participants claiming that taking an antihypertensive does not interfere with their life changed significantly before and after the education session ($p<0.001$). This indicates that after receiving the education, participants understood the need of taking their prescription on a regular basis. Moreover, there was a significant difference in the percentages of participants who were concerned about becoming overly dependent on antihypertensive medication before and after the educational intervention (p 0.001). This suggests that their beliefs changed significantly.

According to the study's second objective, patient beliefs on hypertension and medication were significantly affected by educational intervention. When it was discovered that there was a significant ($p<0.001$)

difference between the participant's beliefs about hypertension before and after the educational intervention. To compare the means demonstrating the patients' overall beliefs prior to and one month after the educational intervention, a paired samples t-test was used. It was recorded that there was a significant ($p<0.001$) difference between the overall belief of patients with hypertension before the educational intervention and one month after the educational intervention. The finding of this current study is consistent with the assertion of Naeemi et al. (2022) and Magadza et al. (2009) who reported that patient's belief about medication can be essential to reduce the barriers of self-care behaviours.

According to Mahboobeh et al. (2017) and Magadza et al. (2009) increase in the participant's level of knowledge about hypertension has a positive influence on their beliefs about medicines and treatment. One example is the majority of participants' pre-educational intervention beliefs that taking medications will interrupt their lives that medications are mysterious, and that taking medications will cause them anxiety. Yet, following the educational intervention, their increased understanding led them to believe that medication prevents hypertensive individuals from getting worse and that their future health is likewise dependent on their medication. According to the study's findings, participants believed that antihypertensive therapy was essential to their ability to maintain their health. One of the major factors contributing to ineffective blood pressure control is the high levels of non-adherence to anti-hypertensive medications. More individuals die from stroke than from infectious diseases combined, which is one of the side effects of uncontrolled blood pressure.

Al-Noumani et al. (2018) concluded that significant effort must be made to lower the risks of having stroke and other high blood pressure consequences. The health belief model postulates that elements including cultural norms and understanding of a condition can alter beliefs and perceptions, which in turn can affect behaviour, such as adherence to therapy. However, since beliefs are not fixed, it is possible to change behaviour by influencing the factors that affect beliefs and perceptions. An individual may not recognize the necessity to follow a recommended therapy regimen unless they feel that their illness or condition poses a threat to their life. It is interesting to learn that one of the biggest obstacles facing medical professionals is persuading patients that there is a tangential relationship between their treatment and their health. This is significantly more apparent in challenging situations like asymptomatic conditions like hypertension. The patient may stop taking the medication if the motivations for adherence are not explained to them. Therefore, it is crucial that healthcare providers give patients relevant information about their illness, including causes, diagnoses, treatments, and prognoses. There are two types of drug-related beliefs: those about drugs prescribed especially for the patient and those regarding the generic characteristics of all drugs. The specific beliefs are further separated into two categories: the patient's anxiety about the therapy's potential side effects and the individual's perception of the necessity of the recommended therapy for maintaining health and saving life.

Finally, research by Nakagomi et al. (2022) and Jarelnape et al. (2016) stated that it is crucial to elicit patients with hypertension's views and experiences to identify key areas that require development and, ultimately,

enhance service delivery. As a result, beliefs are products of culture, environment, and individual experiences. As a result, many ideas regarding hypertension are both changeable and, more significantly, foster the mutual understandings required to successfully control hypertension.

Effect of educational intervention on respondents' level of adherence to hypertension medications.

The findings showed that there was significant difference ($p<0.001$) in the level of adherence before the educational intervention and the level of adherence one month after the educational intervention.

This finding is consistent with the work of Kamran et al. (2014) and Al-Dabbagh and Aswad (2010) who reported that adherence to medication increased from 24% to 54.6% in a study conducted in Iraq. The current study is also in agreement with a quasi-experimental study involving 600 patients conducted by Ibrahim et al. (2022) titled effect of educational intervention on knowledge about hypertension and factors predicting adherence to drug therapy. They found that following the educational intervention, the proportion of respondents with good adherence rose from 41.3% to 48.3% ($p = 0.369$). Also, this current study agrees with Magadza et al. (2009) who found that the educational intervention led to an increase in participant adherence. In Nigeria, Iyalomhe and Iyalomhe (2010); Thomas et al. (2011); and Ibrahim *et al.* (2022) all agreed that adherence to medication is vital and assist to improve the treatment of hypertension. According to Ghembaza et al. (2014) poor adherence to treatment regimens is considered as one of the most important reasons for uncontrolled blood pressure in hypertensive patients. This is

usually when hypertensive patients fail to follow the agreed treatment regimens with their physician.

Demoner et al. (2012); Ambaw et al. (2012); and (Lee et al. 2013) all agreed that cultural and economic characteristics are crucial factors that may explain different levels of adherence among different populations. This current study was conducted in the Kwaebibirem Municipality of Ghana, which is an underdeveloped area. The treatment adherence of hypertensive patients in undeveloped regions should be given the needed attention and be provided additional health care resources by health care professionals and policy makers. Xu et al. (2018) and Lee, Jang, and Park (2017) also added that there are many factors that may be associated with the rates of non-adherence, including gender, age, location, cost of the medications, and socioeconomic status. The association between gender and antihypertensive treatment adherence has remained a subject of debate within the scientific community. Several authors have argued positively while some have also retorted negatively in literature. A study conducted in the United States by Kamran et al. (2014) revealed that verbal education interventions can increase medication adherence and consequently, health outcomes among individuals with hypertension. Hence, regular verbal instructional interventions improve patient participation, engagement, medication literacy, and adherence.

Chapter summary

The study revealed that providing educational intervention to persons with hypertension causes an increase in the knowledge level of the patients which subsequently influences their beliefs and adherence to hypertension therapy. It was also found out that females were more susceptible to

hypertension at age 60 and over as compared to men. Also, it was discovered that region has significant effect on the prevalence of hypertension. Majority of patients living with hypertension who visited Kade Government hospital were Christians and married.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

This chapter gives a summary of the study, the conclusions drawn, and recommendations for further studies based on the findings. It is the expectation of the researchers that the conclusions and recommendations will receive the due attention from all stakeholders involved.

Summary

Hypertension has become a significant public health concern in developing countries due to its increasing prevalence and harmful effects on failing healthcare systems. The study assessed the effects of educational intervention on patients' knowledge on hypertension, beliefs, and adherence to therapy. The study used the quasi-experimental design. Stratified sampling technique was used to select 217 respondents who attended hypertension clinic at Kade Government Hospital in the Kwaebibirem Municipality from January to April 2023. The data collection instruments used were Magadza et al.'s tool on hypertension knowledge, Horne et al.'s tool on beliefs about medication, Zyoud et al.'s tool on medication adherence and education intervention tool based on WHO's Diagnosis and Management for Patients with hypertension. Data were processed using the Statistical Package for the Social Sciences Version 25.

Demographic data were analysed using descriptive statistics (means, frequencies, and percentages). Paired T-tests and McNemar-Bowker for dependent samples were performed to compare the participants' levels of knowledge about hypertension and its therapy, beliefs about medicines, and levels of adherence to antihypertensive therapy before and after the

educational intervention. There was significant increase in the patients' levels of knowledge about hypertension and its therapy (P<.001) after the educational intervention. Most of the parameters used to indicate patients' beliefs about medicines were significantly modified in a positive manner (P<.001) after the educational intervention. Also, there was a significant (p<0.001) difference in adherence scores before and after the educational intervention. The results of this study indicates a deliberate educational intervention had a positive effect on knowledge, belief and adherence. Health education should be organized weekly to improve knowledge and adherence among patient living with hypertension.

Key findings

In alignment with the specific objectives of the study, the following were the key findings:

1. There were significant increases in the patients' levels of knowledge about hypertension and its therapy (P<.001) after the educational intervention.
2. Most of the parameters used to indicate patients' beliefs about medicines were significantly modified in a positive manner (P<.001) after the educational intervention.
3. Also, there was a significant (p<0.001) difference in adherence scores before and after the educational intervention.

Conclusions

Based on the results obtained in this study, the following conclusions were drawn. It is evident that deliberate or intentional educational activities have beneficial consequences on patient outcome. Particularly, it can be

asserted that instituting a deliberate educational intervention has positive effect on the knowledge about hypertension, belief about therapy and also increases patient's adherence to hypertension therapy.

Also, it was established that educational intervention has a direct effect on patients' level of adherence to hypertensive therapy consistent with the conceptual framework that guided this study. Knowledge on hypertension has a direct influence on patients' level of adherence to hypertensive therapy. Furthermore, patients' beliefs about medication has a direct influence on their level of adherence to hypertensive therapy. It can therefore be asserted that the relationship between educational intervention and patients' level of adherence to therapy is mediated by both knowledge and beliefs about therapy.

Recommendations

Regarding the findings and the conclusions drawn from the investigations, the following recommendations are made:

1. Health professionals who work at the various hospitals in Ghana should organize regular (weekly) educational programmes for persons living with hypertension.
2. Individuals with hypertension may be educated on the importance of educational intervention programs on hypertension, organized by health professionals.
3. Patients living with hypertension and attend hypertension clinics should adhere to the therapy prescribed by health professionals.
4. The health educational intervention tool should be adopted by the Ministry of Health as an education policy tool for the various

health facilities in the country. The policy must be mandatory for every hospital to organise regular education.

5. Nurse educators must be employed to help facilitate the education programmes in the various hospitals.

Suggestions for further studies

The following suggestions have been put forward for further research:

1. The study could be replicated to include other hypertension clinics in other regions of the country.
2. The study could also be expanded to evaluate the effects of income level of patients with hypertension and its therapy.
3. A qualitative study should also be conducted to describe the experiences of patients with regards to living with hypertension, their therapy, and education.

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APPENDIX A

INFORMATION SHEET

Title: Effect of educational intervention on patients' knowledge on hypertension, beliefs, and adherence to therapy

Principal Investigator: Yaw Marfo Okyere

Address: Kwabeng Presbyterian Church, P. O. Box 1, Kwabeng E/R, Ghana

General Information about Research

The researcher is a practising general nursing health professional who is interested in the adult health of persons with chronic conditions. This study seeks to delve into the effects educational intervention have on persons living with hypertension. The education will focus primarily on knowledge, beliefs and adherence issues that are encountered by these individuals. The relationship between socio demographic variables and knowledge among people with hypertension will be explored. The study will use stratified sampling technique to select patients who attends hypertension clinic at Kade Government Hospital.

Procedures

I (Okyere Yaw Marfo) invite you to participate in this research project to find answers to some of these issues. You have been invited to participate in this discussion because I believe your experience as a client can add a lot to it. If you accept, you will be needed to complete a questionnaire that has been produced. "Do you have hypertension?" is one of the questions to be answered. 'You will be questioned about your beliefs concerning this/these conditions as well. Please let me know if you need any assistance understanding any of the questions so that I can reword the question to your

satisfaction. The questionnaire will be given to you to respond if you can read and provide answers. My research assistants (Patrick Aziago and Alex Offei) and I are here to assist you if you want us do so your native Ghanaian language. After answering kindly return the answered questionnaire to me or the research assistant.

Possible Benefits

In many respects, this project will be useful. It is intended that the outcomes of this study would serve as the foundation for producing educational guidelines to enable people with hypertension live better lives. The findings will be given special attention to develop an effective educational tool that will help health practitioners to improve the lives of people with hypertension.

Confidentiality

To the best of my abilities, I will safeguard information about you. You will not be named in any report or publication resulting from this study since all your responses will be kept secret and maintained under a unique participant's ID number. Please be aware that, as part of our commitment to perform this research properly, a few authorities from the University of Cape Coast - the ethics committee officials - may occasionally inspect the progress of this research and may be granted access to your records. Your identity will not be disclosed and will remain a secret in any case.

Compensation

All procedures will be completed at a time that is convenient for you. While you wait, you will be given a refreshment package as part of your involvement in this project. A token of 10-20 Ghana Cedis (depending on where you are coming

from) will be given to cover transportation costs to and from the interview place if you are called over for any activity outside of your own convenient time.

Voluntary Participation and Right to Leave the Research

It is completely voluntary for you to participate in this research. If you 'do not want to participate, you can withdraw your consent and stop participating at any moment. This decision will have no bearing on you or your healthcare services.

Contacts for Additional Information

If you have any question concerning the study, please do not hesitate to contact Yaw Marfo Okyere on phone number 0548107204 or email me at yaw.okyere001@stu.ucc.edu.gh

Your rights as a Participant

This research will be reviewed and approved by the Institutional Review Board of University of Cape Coast (UCCIRB). If you have any questions about your rights as a research participant, you can contact the Administrator at the IRB Office between the hours of 8:00 am and 4:30 p.m. through the phone lines 0558093143/0508878309/0244207814 or email address: irb@ucc.edu.gh.

Informed Consent for adult

I am (Okyere Yaw Marfo), a post-graduate student offering a Master of Nursing at the University of Cape Coast. I am undertaking a study on the Effect of educational intervention on patients' knowledge on hypertension, beliefs, and adherence to therapy.

This study is purely for academic purposes. I guarantee that there will be absolute confidentially and anonymity as far as this study is concerned. Any response you provide will not be disclosed to any third party without your prior consent. The

time it takes to complete a questionnaire should be between 10 and 20 minutes. You are not obliged to respond to all the questions.

If you are willing to participate in the study, kindly sign or thumbprint in the space provided below.

Respondent' Signature/thumbprint: ……

Date: ……

Thank you for your consent and cooperation.

APPENDIX B

QUESTIONNAIRE

UNIVERSITY OF CAPE COAST

COLLEGE OF HEALTH AND ALLIED SCIENCES

SCHOOL OF NURSING AND MIDWIFERY

I am a second year Master of Nursing student at the University of Cape Coast conducting a study as part of the partial fulfilment for the award of a Master of Nursing Degree. You have been selected to participate in the study. This questionnaire seeks to obtain information on the **Effects of Educational Intervention on Patients' Knowledge on Hypertension, Beliefs, And Adherence to Therapy at the Kade Government Hospital in the Kwaebibirem Municipality.** (This research is for academic purposes only. You are assured that your response will be kept confidential. There are no right or wrong answers so please answer as best as you can. It will take approximately fifteen (15) minutes to complete the questionnaire.

Please tick [√] in the most appropriate box or write short notes where necessary.

Demographic Data of Respondents

1. What is your age? ……

2. Gender a. Male [ ] b. Female [ ]

3. Marital Status: a. Never married [ ] b. Divorced [ ]
c. Married [ ] d. Widow [ ]
e. Separated [ ] f. Co-habiting [ ]

4. Religion: a. Christian [ ] b. Muslim [ ]
c. African Traditional [ ] d. Other (Specify) ……

5. What is your occupation? …….

6. What is the highest level of education you have completed?

(a) Post-graduate degree (b) Bachelor's degree (c) Higher National Diploma

(d) SHS/SSS (e) Middle School/JHS (f) Basic school (g) None

7. How many years/months have you lived in Kwaebibirem? ……..

SECTION A: Knowledge questions about hypertension and its therapy

Please indicate your response to each of the statements below, by ticking (√) in the appropriate space provided**. SD (strongly disagree), D (disagree), NS (not sure), A (agree), SA (strongly agree).**

No.	Statement	SD	D	NS	A	SA
High blood pressure						
1	Blood pressure is the measurement of the force of blood against the walls of your blood vessels					
2	If you feel fine, then your blood pressure is fine too					
3	Stress, smoking, and overweight are the main cause of high blood pressure					
4	High blood pressure is a normal part of aging, so you 'do not need any treatment for it					
5	There is no cure for high blood pressure					
6	If medications can control your high blood pressure, you 'do not need to change your lifestyle					
7	High blood pressure can cause stroke, heart attack and kidney failure if untreated					
8	The most desirable blood pressure is less than or equal to 120/80mmHg					

9	Family history of hypertension is predisposing factor for hypertension					
10	Checking BP regularly is key in hypertension management					
Medicines						
11	Tablets can cure high blood pressure					
12	Tablets alone are enough for keeping blood pressure under control					
13	If I have been taking my high blood pressure tablets, then my blood pressure will be under control					
14	If I make the necessary lifestyle changes, then I will not need to take any tablets for my high blood pressure					
15	Medicines and tablets for other diseases like flu and coughs can raise my blood pressure					
16	I must not take other medicines, besides my tablets for high blood pressure, without first asking the doctor, pharmacist, or nurse					
17	I must not take any herbs or traditional medicines without first asking the doctor, pharmacist, or nurse					
18	Visiting physicians regularly is key in hypertension management					

SECTION B: BELIEFS ABOUT MEDICINES QUESTIONNAIRE (BMQ)

Please indicate your response to each of the statements below, by ticking (√) in the appropriate space provided**. SD (strongly disagree), D (disagree), NS (not sure), A (agree), SA (strongly agree). Beliefs about hypertension medicines**

No.	Statement	SD	D	NS	A	SA
Your views about medicines prescribed for you						
1	My health, at present, depends on my medicines					
2	Having to take medicines worries me					
3	My life would be impossible without my medicines					
4	Without my medicines I would be very ill					
5	I sometimes worry about long-term effects of my medicines					
6	My medicines are a mystery to me					
7	My health in the future will depends on my medicines					
8	My medicines disrupt my life					
9	I sometimes worry about becoming too dependent on my medicines					
10	My medicines protect me from becoming worse					
Your views about medicines in general						
11	Doctors use too many medicines					
12	People who take medicines should stop their treatment for a while every now and again					
13	Most medicines are addictive					
14	Natural remedies are safer than medicines					
15	Medicines do more harm than good					

16	All medicines are poisons					
17	Doctors place too much trust on medicines					
18	If doctors had more time with patients, they would prescribe fewer medicines.					

SECTION C (ADHERENCE)

MORISKY 8-ITEM MEDICATION ADHERENCE QUESTIONNAIRE

	QUESTION	**ANSWER (YES/NO)**	**SCORE (Y=0, N=1)**
1	Do you sometimes forget to take your medicine?		
2	People sometimes miss taking their medicine for reasons other than forgetting. Thinking over the past 2 weeks were there any days when you 'did not take your medicine?		
3	Have you ever cut back or stopped taking your medicine without telling your doctor because you felt worse when you took it?		
4	When you travel or leave home do you sometimes forget to bring along your medicine?		
5	Did you forget to take all your		

	medicines yesterday?		
6	When you feel like your symptoms are under control do you sometimes stop taking your medicine?		
7	Taking medicine every day is a real inconvenience for some people. Do you ever feel hassled about sticking to your treatment plan?		
8	How often do you have difficulty remembering to take all your medicine? (A = 1 B-E = 0)	a. Never/rarely b. Once in a while c. Sometimes d. Usually e. All the time	
Persons are classified as low adherence if they have <6 points, medium adherence if they have 6-7 points, and high if they have 8 points.			

APPENDIX C

EDUCATION INTERVENTION TOOL FOR HYPERTENSION

Definition

Blood pressure is the force exerted by circulating blood against the walls of the body's arteries, the major blood vessels in the body. Hypertension is when blood pressure is too high.

Diagnosis

Hypertension is diagnosed if, when it is measured on two different days, the systolic blood pressure readings on both days is ≥140 mmHg and/or the diastolic blood pressure readings on both days is ≥90 mmHg. **Prehypertension** - Systolic: 120–139 mmHg • Diastolic: 80–89 mmHg **Hypertension stage 1** - Systolic: 140–159 mmHg • Diastolic: 90–99 mmHg **Hypertension stage 2** - Systolic: ≥160 mmHg • Diastolic: ≥100 mmHg

Risk Factors

Modifiable risk factors include unhealthy diets (excessive salt consumption, a diet high in saturated fat and trans fats, low intake of fruits and vegetables), physical inactivity, consumption of tobacco and alcohol, and being overweight or obese. Non-modifiable risk factors include a family history of hypertension, age over 65 years and co-existing diseases such as diabetes or kidney disease.

Common Signs and Symptoms

Hypertension is called a "silent killer", have no warning signs or symptoms. For this reason, it is essential that blood pressure is measured regularly. When symptoms do occur, they can include early morning headaches, nosebleeds, irregular heart rhythms, vision changes, and buzzing in the ears. Severe

hypertension can cause fatigue, nausea, vomiting, confusion, anxiety, chest pain, and muscle tremors.

Complications of Uncontrolled Hypertension

Elevated pressure and reduced blood flow can cause:

- Chest pain, also called angina.
- Heart attack, which occurs when the blood supply to the heart is blocked and heart muscle cells die from lack of oxygen.
- Irregular heart beat which can lead to a sudden death.
- Hypertension can also burst or block arteries that supply blood and oxygen to the brain, causing a stroke.
- Hypertension can cause kidney damage, leading to kidney failure.

Prevention/non-pharmacological management

- Reducing salt intake (to less than 5g daily).
- Eating more fruit and vegetables.
- Being physically active on a regular basis.
- Avoiding use of tobacco.
- Reducing alcohol consumption.
- Limiting the intake of foods high in saturated fats.
- Eliminating/reducing cholesterol and unsaturated fat in diet.

Management

- Taking your medication regularly.
- Reducing and managing stress.
- Regularly checking blood pressure.
- Treating high blood pressure.
- Managing other medical conditions.

Medications used to treat high blood pressure (Take you prescribed medications everyday)

Diuretics commonly used include hydrochlorothiazide (HTZ) etc.

Angiotensin-converting enzyme (ACE) inhibitors - such as lisinopril, captopril etc.

Angiotensin II receptor blockers (ARBs) - ARBs include losartan etc.

Calcium channel blockers - Includes nifedipine, amlodipine etc. Calcium channel blockers may work better for older people and people of African heritage than do ACE inhibitors alone.

APPENDIX D

NKYERJKYERJ KWAN A YJDE SC MOGYA MMOROSO (HYPERTENSION) ANO

Blood pressure yɛ ahoɔden a ɛde mogya di aforosian wɔ ntin ahorow a ɛwɔ yɛn nnipadua mu no mu. Mogya mmoroso (Hypertension) ne sɛ ahoɔden a ɛde mogya di aforosian wɔ ntin mu no bɛkɔ soro anaa ano bɛyɛ den.

ƆKWAN A WƆFA SO HU MOGYA MMOROSO (DIAGNOSIS)

Wohu sɛ obi anya mogya mmoroso (Hypertension) bere a sɛ wosusuw ahoɔden a ɛde mogya di aforosian w ɔ nnipadua mu no toa so nnanu a wohu sɛ asusude a ɛwɔ soro (Systolic blood pressure) no gyina ɔha aduanan (140 mmHg) anaa nea ɛboro saa na asusude a ɛwɔ fam (Diastolic blood pressure) no nso gyina aduɔkron (90 mmHg) anaa nea ɛboro saa.

NNEƐMA A ETUMI DE MOGYA MMOROSO BA (RISK FACTORS)

Nea wobetumi ayɛ ho biribi no bi ne sɛ wonni aduan a aho ɔden wɔ mu, sɛ ebia wodi nkyene bebree, sradeduan bebree, wɔntaa nni nnuaba ne atosode, wɔntenetene wɔn mpɔw mu, taa ne nsaden nom ne kɛseyɛ mmoroso.

Nea wontumi nyɛ ho biribi no bi ne sɛ ɛda abusua mu, efi mfe aduosia anum (65years) rekɔ ne sɛ ɛne nyarewa afoforo bi te sɛ asikyire yare ne asaabo mu yare bi nam.

MOGYA MMOROSO HO NSƐNKYERƐNNE

Mogya mmoroso (Hypertension) nni nsɛnkyerɛnne a ɛbɔ kɔkɔ nti ekum nnipa sie. Eyi nti ɛho hia sɛ yɛtaa susuw ahoɔden a ɛde mogya di aforosian wɔ nnipa no mu no. Nsɛnkyerɛnne a etumi da adi no bi ne sɛ wotaa nya tipae anɔpa, sɛ wo hwene mu befi mogya, akoma no mmɔ yiye, adehu sesa ne mogya befi wo aso mu. Mogya mmoroso a ano yɛ den n tumi de ɔbrɛ, abofono, afefeafefe, adwen mu kesreneeyɛ, kokoyaw ne ntini mu twetwe ba.

ƆHAW A SƐ YƐANHWƐ MOGYA MMOROSO YIYE EBETUMI DE ABRƐYƐN

Sɛ ahoɔden a ɔde mogya kyin yɛn nnipadua mu no kɔ soro na mogya nni aforosian yiye a:

- Etumi de kokoyaw ba
- Etumi de akoma yare ba bere mogya a ɛsɛ sɛ ɛkɔ akoma no ho no kwan asi na nkwammoa a ɛwɔ akoma no ho ntini mu no nnya mframa nti awu.
- Ɛmma akoma no mmɔ yiye na ebetumi de mpofirim wuo aba.
- Ebetumi apae anaa asi ntini a ɛde mogya kɔ adwen no mu no kwan ma ɛde nnwodwoe (stroke) aba.
- Ebetumi ama asaabo no ho atɔ kyema ma agyae adwumayɛ

ƆKWAN A YEBETUMI AFA SO ASI MOGYA MMOROSO ANO A YƐMFA ADURU

- Sɛ yɛbɛte nkyene di so (sɛ ennu susudua anum da koro– less than 5g a day)
- Sɛ yɛbɛtaa adi nnuaba ne atosode
- Sɛ yɛbɛtaa atenetene yɛn mpɔw mu
- Sɛ yɛbɛtwe yɛn ho afi taa nom ho
- Sɛ yɛbɛte nsaden nom so
- Sɛ yɛbɛte sradeduan di so

SƐNEA YEBETUMI AKORAKORA MOGYA MMOROSO

- Sɛ wobɛfa wo nnuru ne bere mu
- Sɛ yɛbɛkorakora adwen mu brɛ yiye na yɛate so
- Sɛ yɛbɛtaa asusuw ahoɔden a ɛde mogya kyinkyin nnipadua no mu.
- Sɛ yɛbɛte yɛn ani ahwɛ mogya mmoroso
- Sɛ yɛbɛhwɛ nyarewa a aka yiye

Nnuru a yɛde sa mogya mmoroso (Sɛ yɛbɛfa nnuru Dɔkota ahyɛ ama yɛn no da biara)

Diuretics a yɛde di dwuma no bi ne hydrochlorothiazide (HTZ) etc.

Angiotensin-converting enzyme (ACE) inhibitors – bi te sɛ lisinopril, captopril etc.

Angiotensin II receptor blockers (ARBs) - ARBs bi ne losartan etc.

Calcium channel blockers – Ebi ne nifedipine, amlodipine etc. Calcium channel blockers yɛ adwuma yiye ma mpanyimfo ne Abibifo sen ACE inhibitors nko ara.

NHOMA A MINYAA MU MMOA

World Health Organization (2018). *Non-communicable disease education manual: a primer for policy-makers and health-care professionals.*

TRANSLATED BY: RICHARD AGYEI ODAME (M. PHIL. GHANAIAN LANGUAGE)

NSƐMMISA A MEDE MAA NKURƆFO YII ANO

Saa nsɛmmisa yi botae ne sɛ ɛbɛda **ayarefo nimdeɛ ne gyidi wɔwɔ fa mogya mmoroso ho ne sɛnea wodi wɔn nnuru nhyehyɛe so wɔ Kade Aban Ayaresabea a ɛwɔ Kwaebibirem Mantam no mu**. Nhwehwɛmu yi botae yɛ nhomasua nti mmuae biara nkɔ abɔnten. Mmuae biara nni hɔ a ɛnyɛ nti bua no sɛnea wobetumi biara. Wode sema bɛyɛ dunum na ebebua nsɛmmisa yi.

Yɛ saa nsɛnkyerɛnne yi [√]wɔ adaka a ɛwɔ wo mmuae no anim no anaasɛ kyerɛw biribi kakra wɔ beae a ehia.

WO HO NSƐM

1. Woadi mfe ahe? ……
2. Bɔbea: a. Ɔbarima [ ] b. Ɔbea [ ]
3. Aware: a. Menwaree da [ ] b. Magyae aware [ ] c. Maware [ ]
   d. Okunani [ ]
   e. Yɛntam ate [ ] f. Me ne obi wɔ hɔ[ ]
4. Ɔsom: a. Kristoni [ ] b. Kramoni [ ] c. Ɔbosonsomni [ ]
   d. Ɔsom foforo bi(Bɔ din)…….
5. Woyɛ adwuma bɛn? ……

6. Woakɔ sukuu adu sɛn?

(a) Post-graduate (b) Bachelo's degree (c) Higher National Diploma

(d) SHS/SSS (e) Middle School/JHS (f) Primary School

(f) Menkɔɔ sukuu koraa da

7. Woatena Kwaebibirem ha bɛyɛ mfe anaa bosome ahe?.....

ƆFA "A" NSƐMMISA A ƐFA MOGYA MMOROSO (HYPERTENSION) NE ƐHO NNURU HO NIMDEƐ HO

Mesrɛ wo yɛ saa nsɛnkyerɛnne yi (√) wɔ beae a wɔagya no fa kyerɛ woadwen fa nsɛm no mu biara ho. **SD (me ne wo nyɛ adwen koraa), D (me ne wo nyɛ adwen), NS (minni ho adwen), A (me ne wo yɛ adwen), SA (me ne wo yɛ adwen pa ara)**

NO.	STATEMENT	SD	D	NS	A	SA
MOGYA MMOROSO (HIGH BLOOD PRESSURE)						
1	Blood pressure (BP) yɛ ahoɔden a ɛde mogya di aforosian wɔ ntin ahorow a ɛwɔ yɛn nnipadua mu no mu no susudua.					
2	Sɛ wo ho yɛ a na kyerɛ sɛ wo BP nso yɛ.					
3	Ɔbrɛ, taanom ne kɛseyɛ mmoroso ne nneɛma atitiriw a ɛde mogya mmoroso (high blood pressure) ba.					
4	Mogya mmoroso (High blood pressure) yɛ ade a ɛka onyin ho nti enhia sɛ wobɛyɛ ho aduru biara.					
5	Mogya mmoroso (high blood pressure) ano nni aduru					
6	Sɛ nnuru wɔ hɔ a ebetumi akorakora mogya mmoroso (high blood pressure) a, na enhia sɛ					

	wobɛsesa woabrabɔ anaa nneyɛe.					
7	Sɛ woansɔ mogya mmoroso (High blood pressure) ano a, ebetumi de nnwodwoe (stroke), koma yare (heart attack) ne asaabo mu haw (kidney failure) aba					
8	BP a ɛyɛ pa ara yɛ susudua 120/80mmHg anaa nea esua sen saa					
9	Sɛ mogya mmoroso (hypertension) abakɔsɛm bi wɔ abusua mu a ɛyɛ ade a ɛkyerɛ sɛ wobetumi anya mogya mmoroso (hypertension).					
10	Sɛ wobɛtaa asusuw BP no di akoten wɔ mogya mmoroso (hypertension) korakora mu.					
NNURU (MEDICINES)						
11	Nnuru betumi asa mogya mmoroso (high blood pressure)					
12	Wobetumi de nnuru nko ara akorakora BP.					
13	Sɛ mehwɛ so fa me mogya mmoroso nnuru no a ɛbɛma me BP agyina yiye.					
14	Sɛ mehwɛ m'abrabɔ ne nneyɛe yiye na meyɛ nsakrae a ehia ɛnne na enhia sɛ mɛfa nnuru biara de asɔ me mogya mmoroso (high blood pressure) ano.					
15	Nnuru a ɛsa nyarewa afoforo bi te sɛ papu ne ɛwa betumi ama BP akɔ soro.					
16	Ɛnsɛ sɛ mefa aduru foforo biara mogya mmoroso nnuru ho bere a memmisaa Dɔkotani, Oduruyɛfo anaa Nɛɛseni a ɔhwɛ me no.					
17	Ɛnsɛ sɛ mefa nhabannuru anaa abibiduru biara bere a memmisaa Dɔkotani, Oduruyɛfo anaa Nɛɛseni a ɔhwɛ me no.					
18	Sɛ wobɛtaa ahu apɔwmuden adwumayɛfo no hia pa ara wɔ mogya mmoroso (hypertension) korakora mu.					

ƆFA "B" NSƐMMISA A ƐFA NNURU HO GYIDI HO

Mesrɛ wo yɛ saa nsɛnkyerɛnne yi (√) wɔ beae a wɔagya no fa kyerɛ woadwen fa nsɛm no mu biara ho. **SD (me ne wo nyɛ adwen koraa), D (me ne wo nyɛ adwen), NS (minni ho adwen), A (me ne wo yɛ adwen), SA (me ne wo yɛ adwen pa ara)**

No.	ASƐNKA	SD	D	NS	A	SA
Woadwenkyerɛ fa nnuru a yɛde ama wo no ho						
1	Mprempren yi m'apɔwmuden dan me nnuru					
2	Ɛha me sɛ meda nnuru so					
3	Sɛ mannom nnuru a ɛnyɛ yiye					
4	Sɛ mannom nnuru a mɛyare pa ara					
5	Ɛtɔ da a na medwennwen nsunsuanso a me nnuru no de bɛbrɛ me daakye					
6	Me nnuru yɛ ahimtasɛm bi ma me					
7	Me daakye apɔwmuden dan me nnuru					
8	Me nnuru no teetee m'abrabɔ					
9	Ɛtɔ da a midi yaw sɛ mɛda nnuru saa ara					
10	Me nnuru no bɔ me ho ban na me tebea no annye nsam koraa					
Woadwenkyerɛ fa nnuru nyinaa ho ankasa						
11	Dɔkotafo de nnuru bebree di dwuma dodow					
12	Bere biara ɛsɛ sɛ nnipa a wɔfa nnuru gyae wɔn ayarehwɛ no kakra ansa					
13	Nnuru pii wɔ hɔ a wonom a na aka wo hɔ a wuntumi nnyae					
14	Ayaresa a ennyina nnuru so no yɛ sen nnuru					
15	Nnuru de ɔhaw ba sen sɛ ɛde mmoa papa bi ba					
16	Nnuru nyinaa yɛ awuduru					
17	Dɔkotafo ma yɛde yɛn ho to nnuru so dodow					
18	Sɛ Dɔkotafo nya bere dodow wɔ ayarefo ho anka wɔbɛma nnurur kakraa bi					

SECTION C (ADHERENCE)

MORISKY 8-ITEM MEDICATION ADHERENCE QUESTIONAIRE

	ASƐMMISA	MMUAE (YIW/DAABI)	MMA (Y=0, D=1)
1	Ɛyɛ a wo werɛ tumi fi sɛ wobɛfa w'aduru?		
2	Ɛtɔ da nnipa bi gyina botae afoforo bi so gya wɔn nnuru to hɔ a ɛnyɛ awerɛfiri. Sɛ wotwa w'ani hwɛ w'akyi nnawɔtwe abien a atwam yi a, nna bi wɔ hɔ a woantumi amfa w'aduru?		
3	Woagyae w'aduru bi nom pɛn a woanka ankyerɛ wo Dɔkota esiane sɛ wonom aduru no wuhuu sɛ yare no mu ayɛ den?		
4	Sɛ wotu kwan anaa wofi fie a ɛyɛ a wo werɛ tumi fi sɛ wobɛfa w'aduru akɔ?		
5	Wo werɛ fii sɛ wobɛfa wo nnuru nyinaa nnora?		
6	Ɛtɔ da a wogyae wo nnuru nom bere a woahu sɛ wo yare no ho nsɛnkyerɛnne akɔ fam?		
7	Da biara adunom yɛ haw ma nnipa bi. So ato wo da sɛ woberɛe pa ara sɛ wobedi w'ayarehwɛ nhyehyɛe so?		
8	Mpɛn dodow sɛn na ɛyɛ a etumi yɛ den ma wo sɛ wobɛfa wo nnuru nyinaa? (A = 1 B-E = 0)	a. Ensii da/Ɛntaa nsi b. Baako baako bi c. Ɛtɔ da bi a d. Ɛtaa si e. Bere biara	
Nnipa a wobenya mma a esua sen asia (6) no yɛ wɔn a wonni wɔn adunom so, wɔn a wobenya efi asia (6) kosi ason (7) no yɛ wɔn a wodi so kakra na wɔn a wobenya awɔtwe (8) no yɛ wɔn a wodi so pa ara.			

TRANSLATED BY: RICHARD AGYEI ODAME (M. PHIL. GHANAIAN LANGUAGE)

APPENDIX E

EDUCATION INTERVENTION PAMPHLET TO BE TAKEN HOME

Blood pressure is the force exerted by circulating blood against the walls of the body's arteries, the major blood vessels in the body. Hypertension is diagnosed **Prehypertension** - Systolic: 120–139 mmHg • Diastolic: 80–89 mmHg **Hypertension stage 1** - Systolic: 140–159 mmHg • Diastolic: 90–99 mmHg **Hypertension stage 2** - Systolic: ≥160 mmHg • Diastolic: ≥100 mmHg

Risk Factors

excessive salt consumption, a diet high in saturated fat and trans fats, low intake of fruits and vegetables), physical inactivity, consumption of tobacco and alcohol, and being overweight or obese, family history of hypertension, age over 65 years and co-existing diseases such as diabetes or kidney disease.

Complications of Uncontrolled Hypertension

Stroke, heart attack, chest pain, kidney failure, irregular heartbeat, coma and death

Lifestyle modifications

- Reducing salt intake (to less than 5g daily).
- Eating more fruit and vegetables.
- Being physically active on a regular basis.
- Avoiding use of tobacco.
- Reducing alcohol consumption.
- Limiting the intake of foods high in saturated fats.
- Eliminating/reducing cholesterol and unsaturated fat in diet.

Management

- Taking your medication regularly.
- Reducing and managing stress.
- Regularly checking blood pressure.
- Managing other medical conditions.

APPENDIX F

ETHICAL CLEARANCE

UNIVERSITY OF CAPE COAST
INSTITUTIONAL REVIEW BOARD SECRETARIAT
TEL: 0558093143 / 0508878309
E-MAIL: irb@ucc.edu.gh
OUR REF: UCC/IRB/A/2016/1664
YOUR REF:
OMB NO: 0990-0279
IORG #: IORG0011497

21ST DECEMBER 2022

Mr Okyere Yaw Marfo
Department of Adult Health
University of Cape Coast

Dear Mr Marfo,

ETHICAL CLEARANCE – ID (UCCIRB/CHAS/2022/149)

The University of Cape Coast Institutional Review Board (UCCIRB) has granted Provisional Approval for the implementation of your research on **Effect of Educational Intervention on Patients' Knowledge on Hypertension, Beliefs, and Adherence to Therapy.** This approval is valid from 21st December 2022 to 20th December 2023. You may apply for a renewal subject to the submission of all the required documents that will be prescribed by the UCCIRB.

Please note that any modification to the project must be submitted to the UCCIRB for review and approval before its implementation. You are required to submit a periodic review of the protocol to the Board and a final full review to the UCCIRB on completion of the research. The UCCIRB may observe or cause to be observed procedures and records of the research during and after implementation.

You are also required to report all serious adverse events related to this study to the UCCIRB within seven days verbally and fourteen days in writing.

Always quote the protocol identification number in all future correspondence with us in relation to this protocol.

Yours faithfully,

Kofi F. Amuquandoh

Ag. UCCIRB Administrator

ADMINISTRATOR
INSTITUTIONAL REVIEW BOARD
UNIVERSITY OF CAPE COAST

APPENDIX G

INTRODUCTORY LETTER

UNIVERSITY OF CAPE COAST
COLLEGE OF HEALTH AND ALLIED SCIENCES
SCHOOL OF NURSING AND MIDWIFERY
DEPARTMENT OF ADULT HEALTH

Telephone: 233-033-209 7282
Telegrams & Cables: University, Cape Coast
Email: adulthealth.nursing@ucc.edu.gh

UNIVERSITY POST OFFICE
CAPE COAST, GHANA

Our Ref: CoHAS/SNM/DAH/I.6/Vol.2/020

18th January, 2023

Your Ref:

The Director
Kwaebibirem Municipal Health Directorate
Kade

Dear Sir,

INTRODUCTORY LETTER: MR. OKYERE YAW MARFO

We write to introduce to you Mr. Okyere Yaw Marfo, a Master of Nursing student of the Department of Adult Health, School of Nursing and Midwifery, University of Cape Coast with registration number **SN/MNS/20/0019**.

As part of the requirements for the award of Master of Nursing degree, he has to undertake a research project. The topic of his research work is "**Effect of educational intervention on patient' knowledge on Hypertension , Beliefs and Adherence to therapy ".**

The Department has reviewed the ethical implications of the study protocol and has approved of it.

We shall therefore be grateful if he could be given the needed assistance to enable him to have relevant data for the study.

Thank you.

Yours faithfully,

Dr. Mrs. Christiana Asiedu
Head of Department

APPENDIX H

ACCEPTANCE LETTER

In case of the reply the number and the date of this letter should be quoted.

My Ref: KbrMHD/031/2023

GHANA HEALTH SERVICE

KWAEBIBIREM MUNICIPAL HEALTH DIRECTORATE

P. O. BOX 114

KADE.

20th January, 2023

THE HEAD OF DEPARTMENT

COLLEGE OF HEALTH AND ALLIED SCIENCE

SCHOOL OF NURSING AND MIDWIFERY

DEPARTMENT OF ADULT HEALTH.

Dear sir/Madam

RE: INTRODUCTION LETTER MR. OKYERE YAW MARFO.

Management of Kwaebibirem Municipal Health Directorate formally acknowledges receipt of your letter ref: No CoHAS/SNM/DAH/1.6/Vol.2/020

Mr. Okyere Yaw Marfo will be accorded all the needed assistance to enable him complete the data collection for the research project titled, '***Effect of education intervention on patient' knowledge on Hypertension, Beliefs and Adherence to therapy'***.

Thank you.

KWAEBIBIREM MUNICIPAL HEALTH DIRECTORATE P. O. BOX 114 KADE - E/R

DR. BRAINARD AYISI ASARE (MD, MPH, FGCP)

MUNICIPAL HEALTH OF HEALTH SERVICES

KWAEBIBIREM - KADE