

**Kwame Nkrumah University of Science and Technology, Kumasi College  
of Health Science Faculty of Pharmacy and Pharmaceutical Sciences**

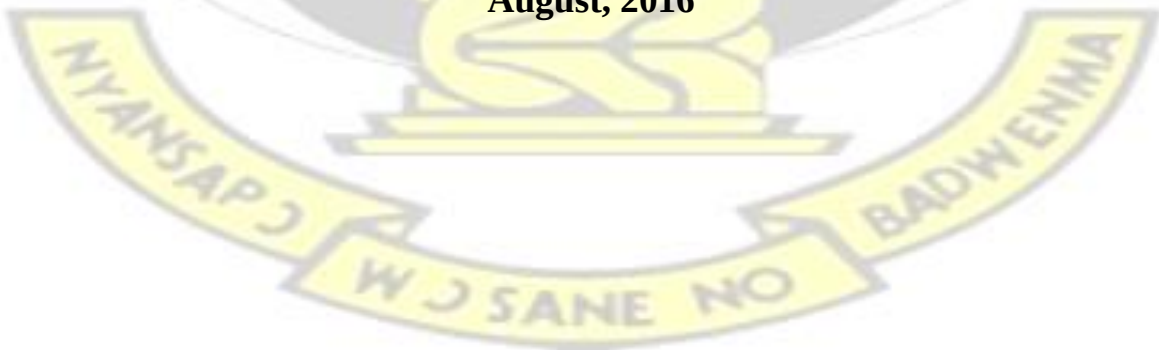
**KNUST**

**Patient Factors Influencing Adherence to Antihypertensive Therapy  
Among Patients Attending Presbyterian Hospital At Donkorkrom**

**This dissertation is submitted to the department of Clinical and Social  
Pharmacy, Kwame Nkrumah University of Science and Technology in  
partial fulfillment of the requirements for the award Master of Science in  
Clinical Pharmacy degree**

**By George Yankyera Afful**

**August, 2016**



## DECLARATION

I declare that except for references to other people's investigations which have been duly acknowledged, this dissertation is the result of my own research and that this dissertation either in whole or part has not been presented for another degree elsewhere.

.....  
Student Name

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Signature

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Date

Certified by:

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Supervisor (s) Name

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Signature

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Date

Certified by

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Head of Dept. Name

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Signature

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Date

## DEDICATION

To the memory of my Late Father

Mr. W. M. K. Afful



## ACKNOWLEDGEMENT

I thank the Lord Almighty for His unfailing love and faithfulness towards me.

I am very grateful to my supervisor, Mrs Marfo, for her support, constructive criticism and suggestions during the time of writing this thesis. I also appreciate Dr Buabeng and Dr Anto for their immense support and encouragement.

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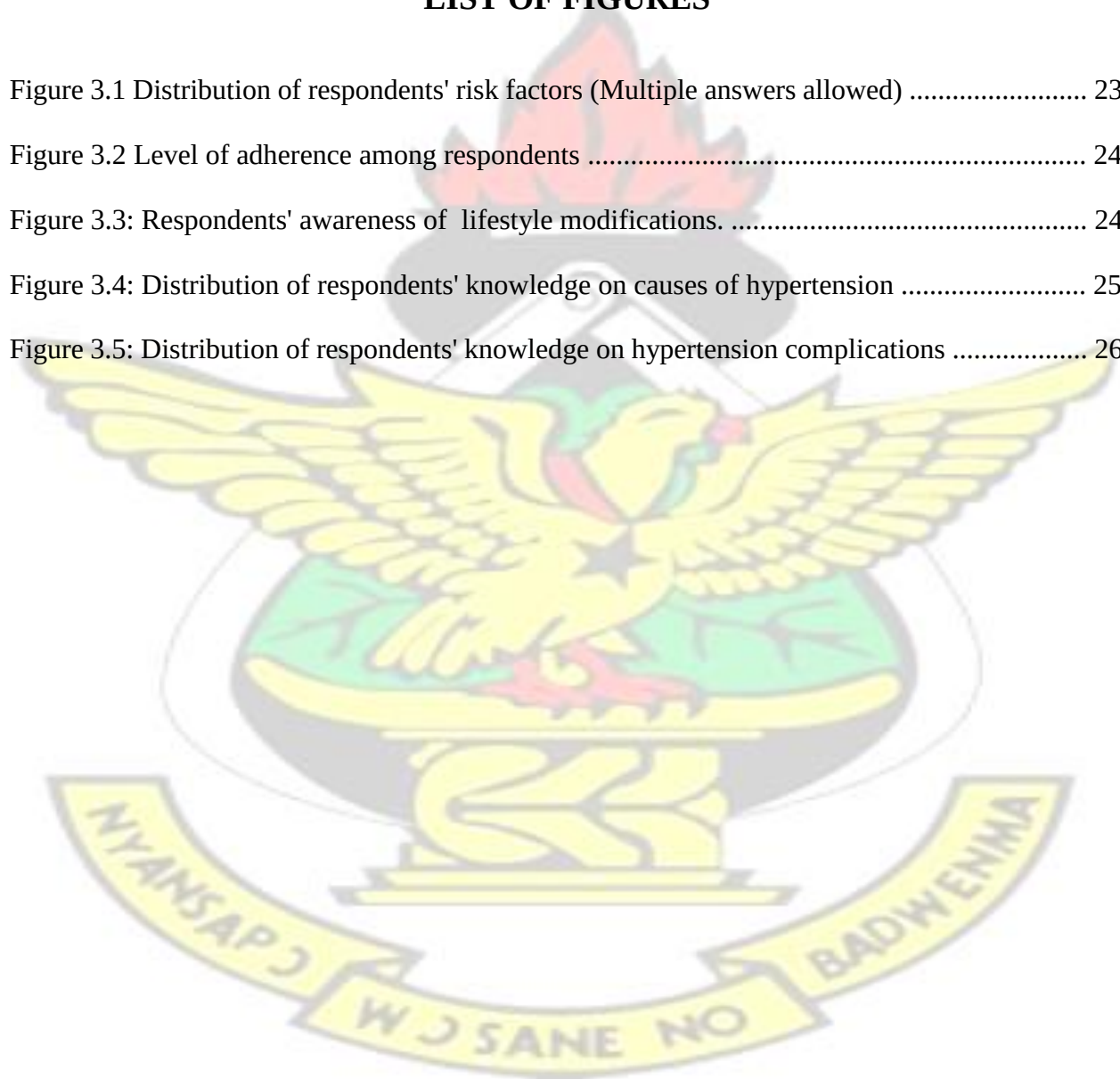
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## LIST OF ABBREVIATIONS



|       |                                         |
|-------|-----------------------------------------|
| BMI   | Body Mass Index                         |
| BP    | Blood Pressure                          |
| DALY  | Disability – Adjusted life years        |
| DASH  | Dietary Approaches to Stop Hypertension |
| DBP   | Diastolic Blood Pressure                |
| GHS   | Ghana Health Service                    |
| GSS   | Ghana Statistical Service               |
| HICs  | High Income Countries                   |
| IHD   | Ischemic Heart Disease                  |
| JHS   | Junior High School                      |
| JNC   | Joint National Committee                |
| KATH  | Komfo Anokye Teaching Hospital          |
| KBTH  | Korle-Bu Teaching Hospital              |
| LICs  | Low Income Countries                    |
| LMICs | Lower Middle Income Countries           |
| MMAS  | Moriskys Medication Adherence Scale     |
| MoH   | Ministry of Health                      |
| NGO   | Non Governmental Organization           |

|        |                                       |
|--------|---------------------------------------|
| NHIS   | National Health Insurance Scheme      |
| NSAIDS | Non Steroidal Anti-Inflammatory Drugs |
| OPD    | Out Patient Department                |
| SBP    | Systolic Blood Pressure               |
| SSA    | Sub-Sahara Africa                     |
| WHO    | World Health Organization             |



## ABSTRACT

Introduction: Hypertension is identified as an important public health disease which poses economic challenge for both high and low income countries. It is risk factor for renal, cardiovascular and cerebrovascular diseases and an important risk factor for global mortalities.

It is estimated that 40% of global adult population aged 25 years and above have hypertension. In Ghana, it is recorded that 34% of hypertensives are aware of their condition while 28% of those with raised BP are on treatment.

In spite of the important role adherence plays in therapeutic outcome, adherence level among those on antihypertensive therapy is 50%. Many factors like patients, physicians and health systems are acknowledged to influence adherence.

The objective is to measure the level of adherence and to determine patient factors which influence adherence to antihypertensive therapy.

Method: A cross-sectional study was conducted at Donkorkrom Presbyterian Hospital among hypertensive patients aged 18 years and older using Morisky Medication Adherence Scale.

Results: In all, 160 (50%) patients poorly adhered to therapy while 51 (15.9%) had excellent adherence level. After cross-tabulation, religious background ( $P=0.0001$ ), awareness of therapy ( $P=0.001$ ), level of awareness of causes of hypertension ( $P=0.002$ ) and marital status of hypertensive patients ( $P=0.042$ ) were the patient factors found to influence adherence to antihypertensive therapy.

Conclusion: The study found out that half of hypertensives utilizing Presbyterian Hospital at Donkorkrom adhered to therapy. Muslims, married patients and those who are aware of cause and complications of hypertension are more likely to adhere to treatment.

Hypertensive patients should be educated to increase their level of awareness on causes and complications of hypertension and to improve their understanding of their therapy.





# CHAPTER ONE

## 1.0 INTRODUCTION

Hypertension has been identified as an important public health disease which poses serious economic challenge to both low and high income countries (Kearney, et al, 2004). It has become a common health problem because of increase in life expectancy at birth and the prevalence of risk factors such as sedentary life style, unhealthy eating habits and obesity (Ezzati, et al 2005, Singh, et al 2000, Yusuf, et al 2001). The public health importance of hypertension is associated with its high global prevalence and as an important risk factor for cardiovascular, renal and cerebrovascular diseases (Wolz, et al, 2000, Pickering, 1952). It is also an important risk factor for global mortalities (Bromfield & Muntner, 2013).

Hypertension was traditionally thought to be a disease which afflicts persons living in economically developed nations (High income countries (HIC)) (Pearson, 1999). However, studies have revealed that highest burden is felt among people living in low and middle income countries (LMICs) (Singh, et al, 2000, Hernández-Hernández, et al, 2000, Gupta, 1999).

High blood pressure in most cases does not produce any symptoms. It however produces numerous structural changes in the arteries that supply blood to some vital organs like the brain, heart and kidneys (Thom, 1997). It is reported that the low rate of detection and increased complications of hypertension are partly attributable to the asymptomatic nature of the disease as well as low adherence to treatment (Wiredu & Nyame, 2001, Kumar & Hales, 2010).

## **1.1 Prevalence and burden of hypertension**

Prevalence of hypertension among populations in low economies is reported to be very high as that of the high income countries. This is especially so among the urban dwellers (Khor, 2001, Vorster, 2002, Addo, et al, 2007). Without effective and broad intervention, the prevalence of hypertension is expected to increase further (Chobanian, 2003).

## **1.2 Global prevalence and burden of hypertension**

According to the World Health Organization (WHO) (2011), an estimated 40% of global adult population aged 25 years and above had been diagnosed of hypertension in 2008. In terms of numbers, the report indicated that the population with hypertension had increased from 600 million in 1980 to one billion in 2008. The report indicated that the Africa Region has the highest prevalence of 46% among their adult population aged 25 years and above (WHO, 2011). On the average, the high income countries have lower hypertension prevalence than the lower and middle income countries (WHO, 2008, WHO, 2011).

According to Kearney et al (2005), the world's adult population with hypertension is likely to increase from the year 2000 figure of 972 million to 1.56 billion (1.54 billion - 1.58 billion) by the year 2025. Most of this increase however, is expected to occur in low and middle income countries (Addo et al, 2007, Kearney et al, 2005). Apart from the high prevalence of hypertension in low and middle income countries, more people are also affected in these countries because more people live in these countries (WHO, 2013).

Though hypertension is a major challenge in many parts of the world, commitment by global bodies towards its prevention, detection, treatment and control is not adequate (Lim, et al. 2012).

This is especially so in low and middle income countries (LMICs) where priority of global agencies is directed towards funding communicable diseases at the expense of chronic and non communicable diseases.

In the 2012 World Health Statistics, WHO estimated that, 13% of all global deaths in 2008 were attributable to raised blood pressure (WHO, 2013). According to Lim, et al (2012), an average of 9.4 million deaths occurred every year between 1990 and 2010 due to complications from hypertension. The WHO (2008) has estimated that about 80% of all complications and deaths from hypertension occurs in low and middle income countries. This is due to weak health systems which leads to high undiagnosed, untreated and uncontrolled cases of hypertension (WHO, 2013).

### **1.3 Prevalence and burden of hypertension in Ghana**

Hypertension which was once a rare condition in African societies has become a major chronic disease in Sub-Saharan Africa (Cappuccio et al, 2000). In Ghana, hypertension which was not considered as an important public health disease about four decades ago has become an important risk factor for morbidity (Addo et al, 2007). A study conducted by Pobee (1993) between 1972 and 1987 reported hypertension prevalence of 4.5% among rural dwellers and 8% to 13% among urban dwellers. Between 1988 and 2007, the number of reported cases of hypertension at the public health facilities increased more than ten folds, from 49,082 to 505,180 (GHS, 2008). In 2003, prevalence of hypertension among adult population in urban districts of Accra stood at 28.3% (Amoah, 2003) and 28.5% for urban areas in Kumasi (Cappuccio et al., 2004). High blood pressure is among the leading causes of admission and death and an important risk factor for heart and renal diseases in Ghana (Owusu, I. K., 2007, Plange-Rhule et al, 1999).

In 2006, the Ministry of Health (MoH) reported that hypertension was the second leading cause of outpatient morbidity among adults aged 45 years and above (MoH, 2006). According to a News Release by the MoH on October 30, 2007, hypertension is the major cause of stroke, heart attack, heart failure and chronic renal failure at Korle Bu Teaching Hospital. The release also attributed 70% of all adult deaths at the Korle Bu Teaching Hospital to hypertension (MoH, 2007).

The high morbidity and mortality associated with hypertension do not only reflect its high prevalence but also an indication of low case detection, control, treatment and adherence to therapy (Addo, et al, 2012).

#### **1.4 Level of hypertension awareness, treatment and control**

Increased awareness, treatment and control of hypertension is very important to reduce morbidity, mortality and burden of hypertension (Addo, J. et al, 2012). The level of awareness, treatment and control is found to increase with increase income status of countries and better in the urban centers than the rural areas (Kayima, J. et al, 2013).

In a study among 142,042 participants drawn from all the economic income settings, 57,840 were found to be hypertensive. Among the hypertensive groups, 46.5% were aware of the diagnosis. The study found that 87.5% of those who knew their status were on treatment. However, among those on treatment, only 32.5% had their blood pressure controlled below 140/90mmHg (Chow, et al, 2013). In the same study, the level of awareness was found to be 53.2%, 49.0%, 43.6% and 40.8% among persons in high-, upper-middle-, lower-middle- and low income countries respectively. Level of control below 140/90mmHg ranged from 38.3% in the high-income countries to 31.7% in the low-income countries (Cho, et al, 2013).

In Ghana level of awareness, treatment and control of hypertension is very low (Addo, J., et al, 2012). In 2006, a study conducted by Agyemang, C. et al in Accra found out that the level of awareness among hypertensive subjects was 34% while 28% of those with raised blood pressure were on treatment. The level of blood pressure control among those on treatment was found to be 6.2%. In another study by Awuah, et al (2014) in the poor communities in Accra, only 7.4% of respondents who had hypertension were aware of the diagnosis while 40% of those with hypertension were on antihypertensive therapy. The study reported that, among those on therapy, 3.5% had their blood pressure controlled below 140/90mmHg.

### **1.5 Medication adherence**

Adherence is defined as "the extent to which a patient behaviour in taking medication, following a diet and/or executing lifestyle changes, corresponds with agreed recommendation from a health care provider" (WHO,2003). The term 'adherence' is often used interchangeably with 'compliance' though they do not mean the same (Nichols-English & Poirier, 2000). Compliance is defined as the level at which a person's medication-taking behaviour corresponds with a health care provider's advice (Haynes, 1979).

Adherence is preferred over compliance because it involves a relationship between a patient and a health care provider (Nichols-English & Poirier, 2000). Compliance on the other hand places the patient in a submissive role and is expected to accept anything that comes from the health care provider (Felkey, 1995). Non adherence to antihypertensive therapy has been identified as an important but often unrecognized risk factor of cardiovascular disease (Rosemond, et al, (Dunbar-Jacob, et al, 2000).

Regardless of the important role adherence plays in realization of effectiveness of any therapy (Osterberg & Blaschke, 2005), incidence of non adherence is reported by WHO as 50% in high income countries (HICs) and higher in low income countries (LICs) (WHO, 2003). Among populations in LICs, studies have found out that the incidence of non adherence to antihypertensive therapy is as high as 80% (Costa, 1996, Cramer, et al, 2008, Elliott, 2008).

## **1.6 Factors influencing adherence to medication**

Many studies on adherence to antihypertensive therapy have examined many contributing factors to non-adherence (Monane, et al, 1996). Adherence to medication is not exclusively the responsibility of patients and that, many factors contribute to this effect (WHO, 2003). The WHO recognizes five factors contributing to medication adherence (WHO, 2003) which are summarized into three broader categories. These are; Patient related factors, Physician related factors and Health System related factors (Brown and Bussell, 2012). This research focuses on patient related factors affecting adherence.

### **1.6.1 Age of patients**

Age is an important demographic in any study. Different studies have found varying result with regards to its effect on medication adherence (Hill & Robert, 2011). While some studies findings show association between age and adherence, other findings show no correlation (Jing, et al, 2008). Studies which found association between age and adherence, adherence increased with age (Sirey et al, 2001, Kim et al, 2002, Senior et al 2004, Hertz et al 2005).

However, other studies found that adherence is inversely proportional to age and that adherence gets worse with advance age (Balbay, et al. 2005, Okuno, et al. 1999). A study by Iihara, et al (2004) in Japan however, did not establish any association between age and adherence.

### **1.6.2 Patients' gender**

Effect of gender on medication adherence is equivocal from many studies. While some studies have found an association, others could not find any significant association. According to some studies, female hypertensive patients are more adherent to their hypertensive therapy than their male counterpart (Kiortsis, et al 2000; Lindberg, et al 2001; Balbay, et al 2005; Choi-Kwon, 2005; Fodor, et al 2005; Lertmaharit, et al 2005). In sharp contrast, other studies have suggested that males are rather more adherent to their therapy than females (Sung, et al., 1998; Caspard, et al., 2005; Hertz, et al., 2005). Other studies however, hold opinion that there is no statistically significant association between adherence and gender (Menzies, et al. 1993; Buck, et al. 1997; Horne and Weinman, 1999; Ghods and Nasrollahzadeh, 2003; Spikmans, et al. 2003; Senior, et al. 2004).

### **1.6.3 Educational level of patients**

The effect of educational level on medication adherence does not follow a particular order as different studies have different effects (Jing, J. et al. 2008). From many studies, the level of adherence increases with increase in educational level of individuals (Apter, et al 1998; Okuno, et al 2001; Ghods and Nasrollahzadeh, 2003; Yavuz, et al 2004). Other studies however, found no statistically significant association between educational level of patients and adherence

(Norman, et al, 1985; Horne and Weinman, 1999; Spikmans, et al, 2003; Kaona, et al, 2004; Stilley, et al, 2004; Wai, et al, 2005). According to some researchers, patients with lower education have better adherence to their therapy as compared with their highly educated fellows (Kyngas and Lahdenpera, 1999; Senior, et al 2004). A group in the United Kingdom who conducted studies on adherence found that patients without any formal educational qualification had better adherence to their medication regimen (Senior, et al, 2004).

#### **1.6.4 Marital status of patients**

Effect of marital status of patients on their medication taking behaviour does not follow any particular order. A number of studies have suggested that patients who are married adhere better to their therapy than those who are not married (Swett and Noones 1989; Frazier, et al, 1994; De Geest, et al, 1995; Turner, et al, 1995; Cooper, et al, 2005). Other studies however, found no association between marital status and medication taking habits (Ghods and Nasrollahzadeh, 2003; Spikmans, et al, 2003; Kaona, et al, 2004; Wild, et al, 2004; Yavuz, et al, 2004).

#### **1.6.5 Patients' awareness of disease and treatment**

It is known that patients' knowledge of their condition and treatment is not always sufficient (Jing et al, 2008). Some patients also do not understand the role their therapies in the management of their conditions (Ponnusankar et al, 2004). Other patients do not have adequate knowledge about their diseases and effect of poor adherence (Alm-Roijer et al, 2004; Gascon et al, 2004). Many research findings have suggested that patients who have adequate knowledge about their disease, therapy and consequences of poor adherence always exhibit better adherence than those with inadequate knowledge (Olubodun et al 1990; Lorenc and Branthwaite 1993;

Menzies et al 1993; Milas et al, 1995; Chizzola et al, 1996; Hungin, 1999; Liam et al, 1999; Okuno et al, 1999; Viller et al, 1999; Lindberg et al, 2001; Thomas et al, 2001; Gascon et al, 2004; Iihara et al, 2004; Kaona et al, 2004; Ponnusankar et al, 2004; Seo and Min, 2005).

#### **1.6.6 Effect of smoking and Alcohol intake**

Studies from many parts of the world on hypertension have suggested that patients who smoke or are involved in alcohol intake are less adherent to their medication than those who do not smoke or take alcohol (Kiortsis et al, 2000; Kim et al, 2002; Ghods and Nasrollahzadeh 2003; Yavuz et al, 2004; Balbay et al, 2005; Cooper et al, 2005; Fodor et al, 2005)

#### **1.7 Problem statement**

Hypertension which was reported as a rare medical condition in African societies has become a major chronic disease in Sub-Saharan Africa (Cappuccio et al, 2000). Hypertension has become an important public health problem in Ghana with prevalence ranging between 19% and 54.8% (Addo et al, 2012). A study conducted by Pobee (1993) between 1972 and 1987 however, reported hypertension prevalence of 4.5% among rural dwellers and 8% to 13% among urban dwellers. Though hypertension was not considered as a major public health threat in Ghana about four decades ago, it has become an important risk factor for morbidity and mortality (Addo et al, 2007).

High blood pressure in most cases does not produce any symptoms. It however produces numerous structural changes in the arteries that supply blood to some vital organs like the brain, heart and kidneys (Thom, 1997). It is reported that the low rate of detection and increased complications of

hypertension are partly attributable to the asymptomatic nature of the disease as well as low adherence to treatment (Wiredu & Nyame, 2001, Kumar & Halesh, 2010).

High blood pressure is among the leading causes of admission and death and an important risk factor for heart and renal diseases in Ghana (Owusu, I. K., 2007, Plange-Rhule et al, 1999). In 2006, the Ministry of Health (MoH) reported that hypertension was the second leading cause of outpatient morbidity among adults aged 45 years and above (MoH, 2006). According to a News Release by the MoH on October 30, 2007, hypertension is the major cause of stroke, heart attack, heart failure and chronic renal failure at Korle Bu Teaching Hospital. The release also attributed 70% of all adult deaths at the Korle Bu Teaching Hospital to hypertension (MoH, 2007).

The high morbidity and mortality associated with hypertension do not only reflect its high prevalence but also an indication of low case detection, control, treatment and adherence to therapy (Addo, et al, 2012). Poor adherence to medication has led to a significant increase in the incidences of stroke, ischaemic heart disease, congestive heart failure and chronic renal disease and it sometimes causes sudden death irrespective of age, gender and settlement area (Buabeng et al., 2004).

In a study in Ghana, only 3.5% of patients on antihypertensive therapy have their blood pressure controlled below 140/90mmHg. A situation which is partly attributed to low adherence to medication (Agyemang, et al, 2006). Regardless of the important role adherence plays in realization of effectiveness of any therapy (Osterberg & Blaschke, 2005), incidence of non adherence is reported by WHO as 50% in high income countries (HICs) and higher in low income countries (LICs) (WHO, 2003). Among populations in LICs, studies have found out that the

incidence of non adherence to antihypertensive therapy is as high as 80% (Costa, 1996, Cramer, et al, 2008, Elliott, 2008). Low adherence also compromises the effectiveness of treatment, the quality of life of the patients and increases the burden on the limited resources of healthcare systems (WHO, 2003).

### **1.8 Research question**

What are the patient related factors that have association with adherence to antihypertensive medications?

### **1.9 Justification for the study**

Though many studies on this topic have been conducted in many parts of the world and a few in Ghana, the settings and geographical characteristics are entirely different from the setting of this study. The outcome of these studies cannot be generalized. It is therefore important to identify patient factors which influence adherence to medications for controlling blood pressure in Donkorkrom, a rural community in the Eastern region of Ghana.

The findings from the study would be shared with health managers of Presbyterian Hospital in Donkorkrom and all stakeholders in health in Kwahu Afram Plains North and South Districts. It will be used to influence policy and practice with regards to hypertension management. This would focus on the identified factors which can be strengthened to improve adherence to therapy. Improvement in therapy adherence will reduce hypertension related complications which in effect would improve quality of life of hypertensive clients and reduce mortality.

The findings will also be made available at the Graduate School and Department of Clinical and Social Pharmacy of Kwame Nkrumah University of Science and Technology and publish in free journals. This is to contribute to knowledge and be used as reference material for research.

### **1.10 Aim of the study**

To determine patient related factors which influence adherence to antihypertensive therapy and recommend ways to improve adherence.

### **1.11 Objectives**

1. To determine the socio-demographic and clinical characteristics of respondents.
2. To determine the level of adherence to antihypertensive therapy among respondents.
3. To assess patients level of awareness on the causes, management and complications of hypertension
4. To verify patients level of awareness on the medicines and lifestyle modifications for managing hypertension
5. To establish the influence of patients socio-demographic factors on adherence
6. To verify the association between awareness of causes, management and complications of hypertension and adherence
7. To assess the association between awareness of medicines and lifestyle modifications for managing hypertension and adherence

## **CHAPTER TWO**

## **2.0 METHODOLOGY**

### **2.1 Study design**

The study was descriptive, quantitative cross sectional design which was conducted between May and September, 2014. A cross sectional design involves the collection of data at one point in time. This method is easier and relatively economical. (Polit & Beck, 2010). It is due to time and financial constraint which informed the researcher to choose quantitative method.

### **2.2 Study area**

The study was conducted at the Presbyterian Hospital in Donkorkrom. Donkorkrom is the district capital of Kwahu Afram Plains North in the Eastern Region of Ghana. It shares borders with Kwahu Afram Plains South district at the south while the Volta Lake separates it from the Sene and Kpando districts at the north-west and north-east respectively. Majority of the inhabitants are into crop and fish farming.

The hospital is a 126 bed capacity facility with average of 145 clients visiting the out- patient department (OPD) daily. It is the only hospital serving both the Kwahu Afram Plains South and North Districts with an estimated population of two hundred and sixty thousand (260,000) (GSS, 2012). The study site was chosen because it is the only health facility in the area that is accredited to manage clients with hypertension.

### **2.3 Study Population and Sampling**

The study population was clients with hypertension who were using anti hypertensive medications to control their high blood pressure and attending Presbyterian Hospital at Donkorkrom.

A total of 320 clients were included in the study based on the formula

$$SS = \frac{Z^2 \times (P) \times (1 - P)}{C^2}$$

### Definition of variables

SS = Sample Size

Z = Z-value (e.g., 1.96 for a 95 percent confidence level)

P = Percentage of population picking a choice (30%), expressed as decimal (0.3)

C = Margin of error (5%) expressed in decimal

All clients with hypertension who were taking medications to control their blood pressure attending Presbyterian hospital at Donkorkrom, who met the inclusion criteria, were eligible for inclusion in the sampling list for the study. The research used simple random procedure in selecting the study participants. 'YES' or 'NO' were written on pieces of paper. 'YES' was used to represent the population targeted for inclusion into the study while 'NO' represented the population that were not to be included in the study. The pieces of paper with 'YES' or 'NO' inscription were put in a box from which the participants were made to draw the papers. Each paper in the box had an equal chance of been picked once therefore when a piece of paper is picked by a participant, it was not put back into the box again. Each participant was allowed to pick only once.

## **2.4 Development and validation of data instrument**

The study used an to collect data for the study. The questions are in agreement with the study objectives and literature.

The questionnaire was examined by the research supervisor together with the researcher to look into issues of clarity, specificity of variables to be measured and relevance of the contents of the questionnaire in the Ghanaian context.

According to Burn & Grove (2007), an instrument is reliable, if it yields the same measure when used on more than one occasion. The questionnaire was pretested on 20 hypertensive clients who met the inclusion criteria of the study. This helped to identify ambiguity in the questionnaire and clarified them. The pretesting was done after the questionnaire has been translated into the local language and back translated. The pretesting of the questionnaire helped to estimate the average time that could be taken to respond to the questionnaire which was found to be 20 minutes.

Participants involved in the pretesting were not included in the main study.

## **2.5 Inclusion criteria**

- Participants shall be known hypertensive
- They must have be on antihypertensive medication for at least six months
- They should be 18 years and above
- They should be of sound mind
- They must voluntarily accept to participate in the study after the purpose has been read to them

## **2.6 Exclusion criteria**

- Non hypertensive clients
- Hypertensive clients who have been on antihypertensive medication for less than six months
- Persons who are less than 18 years
- Persons who are mentally challenged
- Persons who do not want to participate in the study

## **2.7 Ethical Consideration**

Permission to conduct the study at the Presbyterian Hospital in Donkorkrom was obtained from the Head of the Medical Directorate. Throughout the study, strict ethical standards and procedures were followed. In order to ensure anonymity of the study participants, the data collection tool bore no identification which made it impossible to trace any information back to individuals. All the data collected was stored in a safe and locked place with only the researcher having access to the raw data. This was done to guarantee confidentiality of all participants' information obtained during the study.

Participation in this study was voluntary. Written informed consent was sought from respondents after the purpose and procedures of the study were well explained to them in a language they understood. Persons were free to refuse participation or terminate their participation at any point without any consequences. They could also decline to respond to any question they felt uncomfortable with. Modalities for the dissemination of the outcome of the study were also explained to participants in details.

## **2.8 Data collection**

This is a methodical manner of collating data from persons who have consented to participate in a study or research so as to achieve the set objectives (Burns & Grove, 2005). The data was collected by the researcher and two assistants who could speak the predominant local languages. A structured questionnaire with closed ended questions was used to collect the data. This enabled all participants to answer the same set of questions and choose their responses from predetermined options.

Data collected included participants' demographics, risk factors for hypertension and their knowledge in pharmacological and non pharmacological means of reducing their blood pressure. Other information extracted were respondents' knowledge of risk factors, causes and complication of hypertension as well assessing their levels of adherence.

The data collection lasted for 6 months with 25 minutes as the average time a respondent spent on a questionnaire.

## **2.9 Data entry and analysis**

Data collected were entered into a computer using SPSS version 20.0 software programme. The data was then cleaned and analyzed using the same SPSS version 20.0 software. Information generated were summarized into frequency tables, cross tabulations and graphs. Comparative analysis was done using chi-square test. A P-value of 0.05 or less was considered statistically significant.

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## CHAPTER THREE

### 3.0 RESULTS

#### 3.1 Socio-Demographic and clinical characteristics

In all 320 respondents were recruited for the study. The mean age was 54.9 years with a standard deviation of 11.9 years. Also the median BMI was 25.3 with an interquartile range of (23.4, 27.2). The other socio-demographic and clinical characteristics are presented in table 3.1 below.

*Table 3.1 Socio-Demographic and clinical characteristics of respondents*

| <b><u>Age (years)</u></b> | <b><u>Frequency</u></b> | <b><u>(%)</u></b> |
|---------------------------|-------------------------|-------------------|
| 25-34                     | 13                      | 4.1               |
| 35-44                     | 43                      | 13.4              |
| 45-54                     | 113                     | 35.3              |
| 55-64                     | 89                      | 27.8              |
| 65 and above              | 62                      | 19.4              |
| <b><u>Gender</u></b>      |                         |                   |
| Male                      | 142                     | 44.4              |
| Female                    | 178                     | 55.6              |
| <b><u>BMI status</u></b>  |                         |                   |
| Underweight (<18.5)       | 9                       | 2.8               |
| Normal (18.5-24.9)        | 144                     | 45.0              |
| Overweight (25-29.9)      | 139                     | 43.4              |
| Obese (30 and above)      | 28                      | 8.8               |
| <b><u>Education</u></b>   |                         |                   |
| Never attended school     | 95                      | 29.7              |
| Primary                   | 61                      | 19.1              |
| Middle/JHS                | 77                      | 24.1              |
| Secondary                 | 35                      | 10.9              |
| Tertiary                  | 52                      | 16.2              |
| <b><u>Occupation</u></b>  |                         |                   |
| Unemployed                | 65                      | 20.3              |

|                         |    |      |
|-------------------------|----|------|
| Student                 | 1  | 0.3  |
| Farmer                  | 88 | 27.5 |
| Artisan                 | 18 | 5.6  |
| Trader                  | 82 | 25.6 |
| Government employee     | 51 | 15.9 |
| Non-government employee | 15 | 4.7  |

#### **Religion**

|                |     |      |
|----------------|-----|------|
| Christian      | 221 | 69.1 |
| Muslim         | 80  | 25.0 |
| Traditionalist | 19  | 5.9  |

#### **Marital status**

|                       |     |      |
|-----------------------|-----|------|
| Single, never married | 11  | 3.4  |
| Married               | 202 | 63.1 |
| Separated             | 24  | 7.5  |
| Divorced              | 32  | 10.0 |
| Cohabiting            | 4   | 1.2  |
| Widowed               | 47  | 14.7 |

#### **NHIS**

|                      |     |      |
|----------------------|-----|------|
| NHIS Card bearer     | 309 | 96.6 |
| Non NHIS Card bearer | 11  | 3.4  |

### **3.2 Comorbidities of respondents**

Seventy one (22.18%) respondents had diabetes in addition to the hypertension as comorbidity. The blood pressure levels and the number of years patients had lived with hypertension are indicated in table 3.2 below.

*Table 3.2 Distribution of respondents' disease features and comorbidities*

| <b><u>Variable</u></b> | <b><u>Frequency</u></b> | <b><u>Percent (%)</u></b> |
|------------------------|-------------------------|---------------------------|
|------------------------|-------------------------|---------------------------|

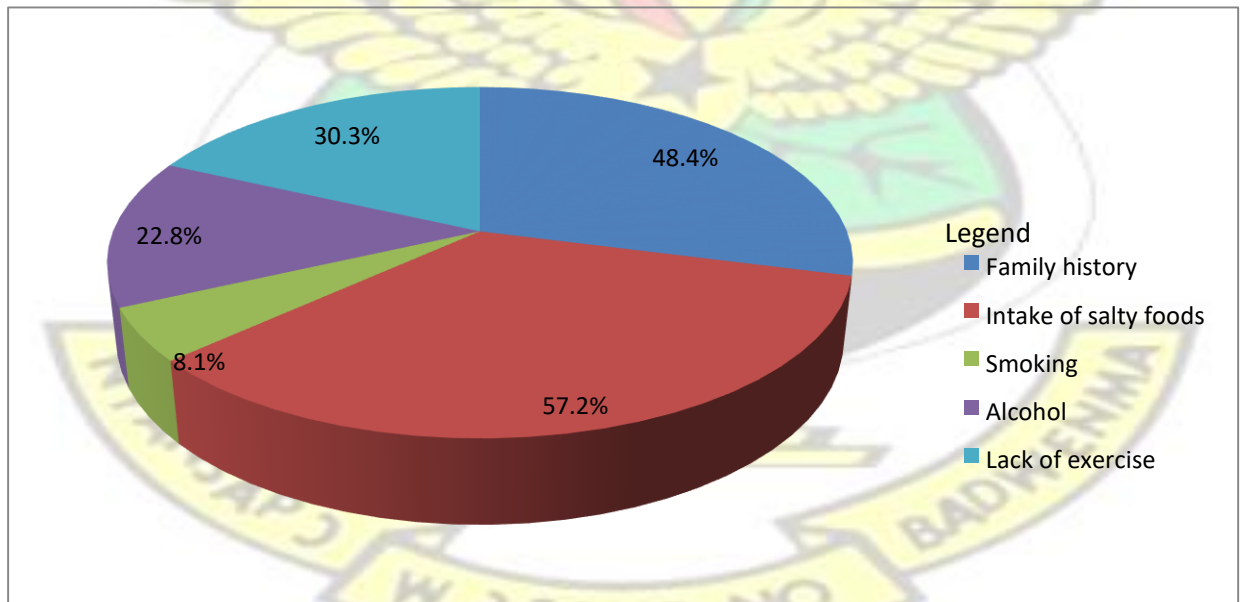
### **Categories of Blood Pressure (Using JNC 7 criterion)**

|                   |     |      |
|-------------------|-----|------|
| <120/80mmHg       | 48  | 15.0 |
| 120/80-139/89mmHg | 189 | 59.1 |
| 140/90-159/99mmHg | 55  | 17.2 |
| ≥160/100mmHg      | 28  | 8.7  |

| <b>Number of years lived with HPT</b> | <b>Frequency</b> | <b>%</b> |
|---------------------------------------|------------------|----------|
| 1-3                                   | 117              | 36.6     |
| 4-5                                   | 92               | 28.7     |
| 6-7                                   | 44               | 13.8     |
| 8 and more                            | 67               | 20.9     |

### **3.3: Risk factors of respondents**

Intake of salty food was the most prevalent risk factor (183, 57.2%) while smoking was the least prevalent risk factor (26, 8.1%). The distribution of the various risk factors is illustrated in figure 3.1 below.



*Figure 3.1 Distribution of respondents' risk factors (Multiple answers allowed)*

### 3.4 Level of Adherence

In determining adherence using the 8 item Morisky scale, a zero (0) score denotes high/excellent adherence. Patients with a zero (0) score would therefore have between 85% and 100% adherence and are rarely likely to miss recommendations on their therapy. A score of 1 or 2 is measured as medium/average adherence. Patients with these scores occasionally do not follow recommendations on their therapy. A score above 2 is interpreted as low/poor adherence and such patients often do not follow agreed recommendations on their therapy.

One hundred and sixty (50%) respondents had poor (low) adherence level compared to 51 (15.9%) of the respondents with excellent (high) adherence level.

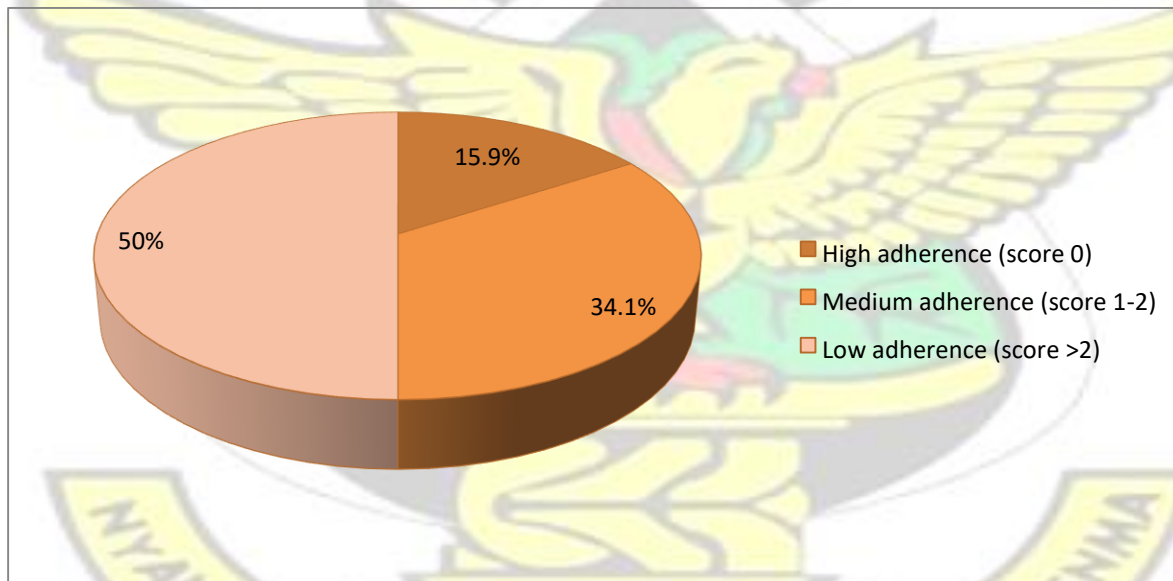


Figure 3.2 Level of adherence among respondents

### 3.5: Patients' awareness on lifestyle modifications for managing hypertension

Two hundred and seventy (84.4%) respondents were aware that reduced salt intake improved BP control while 156 of them (48.8%) knew of smoking cessation to improve BP control. Patients' awareness of other lifestyle practices is shown in figure 3.3 below.

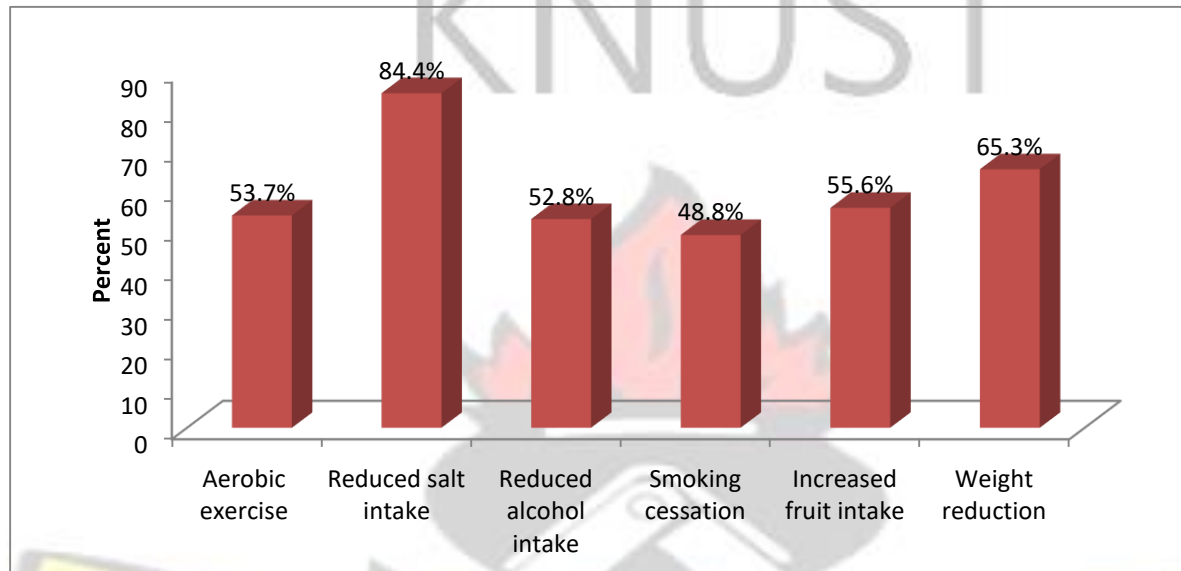
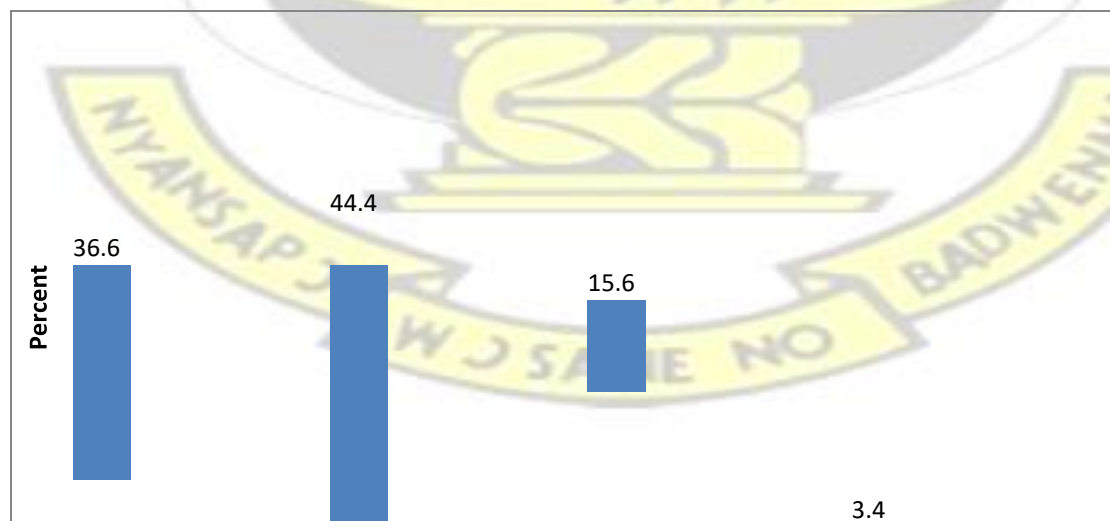


Figure 3.3: Respondents' awareness of lifestyle modifications.

### 3.6: Patients' awareness of Causes of Hypertension

One hundred forty two (44.4%) respondents had good knowledge of causes of hypertension. This was followed by 117 (36.6%) patients who had excellent, 50 (15.6%) patients who had fair and 11 (3.4%) patients who had low knowledge of causes of hypertension. None of the patients had no knowledge of the risk factors and causes of hypertension. This is illustrated in figure 3.4.



|           |      |      |      |
|-----------|------|------|------|
| Excellent | Good | Fair | Poor |
|-----------|------|------|------|

Figure 3.4: Distribution of respondents' knowledge on causes of hypertension

### 3.7 Patients awareness of complications of hypertension

One hundred and five (32.8%) respondents were fairly aware of complications of hypertension. This was followed by those with good level of awareness which constituted 89 (27.8%) respondents. Those with poor level of awareness were 88 (27.5%) while 37 (11.5%) of the respondents had excellent level of awareness. A respondent (0.3%) was not aware of any complication of hypertension.

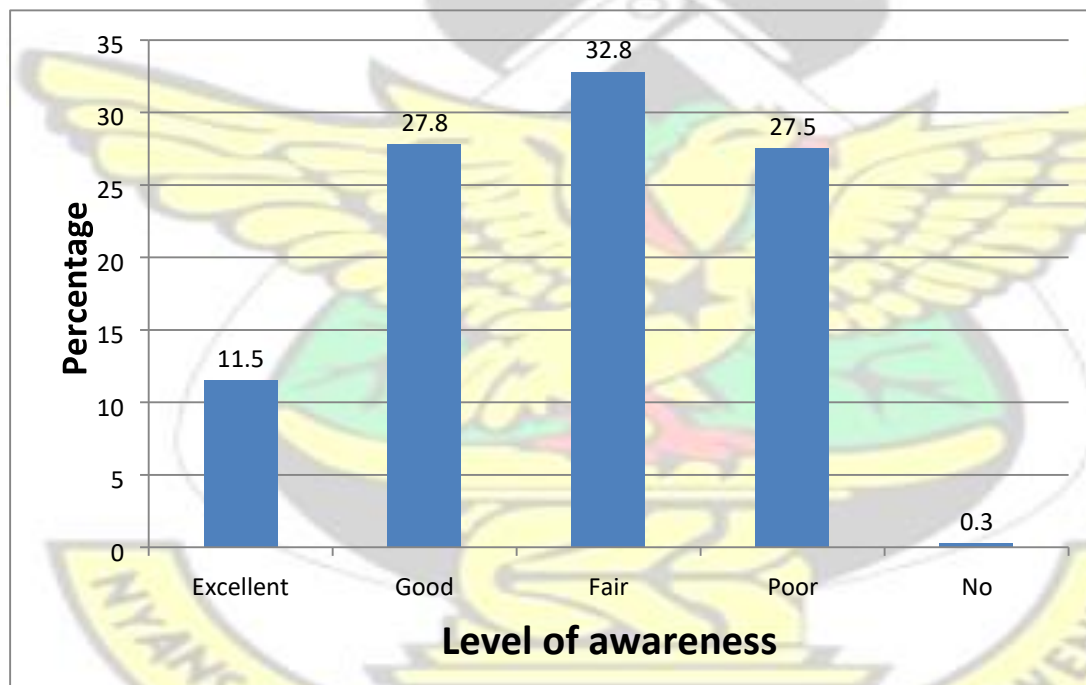


Figure 3.5: Distribution of respondents' knowledge on hypertension complications

### 3.8 Relationship between respondents' gender, religion as well as occupation and level of adherence

From the result of the cross tabulation (Table 3.3), 23 (16.2%) and 28 (15.7%) of males and females respectively in the study were highly adherent to their therapies. Also 49 (34.5%) and 70 (49.3%) of males had medium and low adherence respectively as against 60 (33.7%) and 90 (50.6%) of females whose adherence levels were rated as medium and low respectively.

*Table 3.3: Summary description of cross tabulation between respondents' sex, religion as well as occupation and level of adherence*

|                         |                | Adherence level of respondents |            |             |
|-------------------------|----------------|--------------------------------|------------|-------------|
|                         |                | High                           | Medium     | Low         |
| Gender of respondents   | Male           | 23 (16.2%)                     | 49 (34.5%) | 70 (49.3%)  |
|                         | Female         | 28 (15.7%)                     | 60 (33.7%) | 90 (50.6%)  |
| Religion of respondents | Christian      | 26 (51%)                       | 57 (52.3%) | 138 (86.2%) |
|                         | Muslim         | 22 (43.1%)                     | 38 (34.9%) | 20 (12.5%)  |
|                         | Traditionalist | 3 (5.9%)                       | 14 (12.8%) | 2 (1.3%)    |
|                         | Total          | 51 (100)                       | 109 (100)  | 160 (100%)  |

|                           |                |            |            |            |
|---------------------------|----------------|------------|------------|------------|
| Occupation of respondents | Unemployed     | 7 (13.7%)  | 24 (22.0%) | 34 (21.3%) |
|                           | Student        | 1 (2%)     | 0 (0.0%)   | 0 (0%)     |
|                           | Farmer         | 14 (27.4%) | 31 (28.4%) | 43 (26.9%) |
|                           | Artisan        | 3 (5.9%)   | 6 (5.5%)   | 9 (5.6%)   |
|                           | Trader         | 14 (27.4%) | 27 (24.8%) | 41 (25.6%) |
|                           | Gov't employee | 9 (17.6%)  | 17 (15.6%) | 25 (15.6%) |
|                           | NGO            | 3 (5.9%)   | 4 (3.7%)   | 8 (5%)     |
|                           | Total          | 51 (100%)  | 109 (100%) | 160 (100%) |

From a Chi Square ( $X^2$ ) Test calculation failed to establish and possible association between gender and adherence,  $X^2 = 0.509$ , Degree of freedom (df) = 2 and Probability value (P-value) = 0.975. Since the P-value (0.975) is higher than 0.05, which is the P-value at 95% confident interval (CI), the result failed to establish any significant association between gender of respondents and level of adherence.

The result also shows that 26 (51%), 57 (52%) and 138 (86%) of respondents whose level of adherence is high, medium and low respectively were Christians. On the other hand, 22 (43.1%) of high adherents, 38 (34.9%) of medium adherents and 20 (12.5%) of those with low adherence to medication were found to be Muslims. Among respondents with high adherence, 3 (5.9%) were traditionalists who also constituted 14 (12.8%) and 2 (1.3%) of those with medium and low adherence levels respectively.

From Chi Square ( $X^2$ ) test calculation,  $X^2 = 49.3$ , df = 4, P-value = 0.0001. Since the P-value is less than 0.05, there is statistically significant association between respondents' religion and level of adherence and that Muslims who are hypertensive are more likely to adhere to their medication than Christians and Traditionalists with hypertension.

With regards to a relationship between occupation and adherence, the table shows that 14 (27.4%) each of farmers and traders were those with high adherence level. They were followed by government employees with 9 (17.6%) and unemployed with 7 (13.7%) respondents. Also among respondents with low level adherence, 43 (26.9%) and 41 (25.6%) respectively were farmers and traders. This is followed by the unemployed with 34 (21.3%) and government employees 25 (15.6%) respondents. Chi Square ( $X^2$ ) test yielded  $X^2 = 7.29$ ,  $df = 12$  and  $P\text{-value} = 0.838$ .

### 3.9 Relationship between years lived with hypertension, presence of diabetes, level of BP control as well as number of drugs and level of adherence

*Table 3.4: Summary description of cross tabulation between some clinical characteristics of respondents and level of adherence*

|                                                          | Variables                 | Adherence levels of respondents |            |            | Total     | Chisquare Test                           |
|----------------------------------------------------------|---------------------------|---------------------------------|------------|------------|-----------|------------------------------------------|
|                                                          |                           | High                            | Medium     | Low        |           |                                          |
| Number of years respondents have lived with hypertension | 1 - 3                     | 17 (33.3)                       | 41 (37.6%) | 59 (36.9%) | 117       | $X^2 = 0.598$<br>$df = 6$<br>$P = 0.996$ |
|                                                          | 4 - 5                     | 16(31.4%)                       | 30 (27.5%) | 46 (28.8%) | 92        |                                          |
|                                                          | 6 - 7                     | 8 (15.7%)                       | 15 (13.8%) | 21 (13.1%) | 44        |                                          |
|                                                          | $\geq 8$                  | 10 (19.6%)                      | 23 (21.1%) | 34 (21.2%) | 67        |                                          |
|                                                          | Total                     | 51 (100%)                       | 109 (100%) | 160 (100%) | 320       |                                          |
| Respondents with diabetes                                |                           | 25 (35.2)                       | 22 (31%)   | 24 (33.8%) | 71 (100%) |                                          |
| Level of BP control of respondents (JNC 7 criterion)     | <120/80mmHg               | 7 (13.7%)                       | 18 (16.5)  | 23 (14.4%) | 48        | $X^2 = 1.18$<br>$df = 6$<br>$P = 0.978$  |
|                                                          | 120/80-139/89mmHg         | 32 (62.8%)                      | 60 (55%)   | 97 (60.6%) | 189       |                                          |
|                                                          | 140/90-159/99mmHg         | 8 (15.7%)                       | 21 (19.2%) | 27 (16.9%) | 56        |                                          |
|                                                          | $\geq 160/100\text{mmHg}$ | 4 (7.8%)                        | 10 (9.2%)  | 13 (8.1%)  | 28        |                                          |

|                                  |       |           |            |            |     |  |
|----------------------------------|-------|-----------|------------|------------|-----|--|
|                                  | Total | 51 (100%) | 109 (100%) | 160 (100%) | 320 |  |
| Number of drugs used by patients | 1     | 6 (11.8%) | 22 (20.2%) | 19 (11.9%) | 47  |  |
|                                  | 2     | 31(60.8%) | (67%)      | 84 (52.5%) | 188 |  |
|                                  | ≥3    | 14 (27.4) | 14 (12.8%) | 57 (35.6%) | 85  |  |
|                                  | Total | 51(100%)  | 109 (100%) | 160 (100%) | 320 |  |

The relationships between the number of years respondents have lived with hypertension, the level of BP control as well as the number of drugs used to control BP and level of adherence are described in the cross tabulation above (Table 3.4)

From the table, 17 (33.3%), 41 (37.6%) and 57 (36.9%) of respondents with high, medium and low adherence levels respectively had lived with hypertension between 1 and 3 years. Also 46 (28.8%) of low adherent, 30 (27.5%) of medium adherent and 16 (31.4%) of high adherent respondents have had hypertension between 4 and 5 years. The table also recorded 10 (19.6%), 23 (21.1%) and 34 (21.2%) of respondents with high, medium and low adherence levels respectively as those who have lived with hypertension for 8 years and above. Again, 21 (13.1%) of the low adherent respondents have lived with hypertension between 6 and 7 years compared 8 (15.7%) of high adherent respondents who have also lived between 6 and 7 years with hypertension ( $X^2 = 0.598$ ,  $df = 6$ ,  $P\text{-value} = 0.996$ ).

The table recorded 7 (13.7%), 18 (16.5%) and 23 (14.4%) of respondents with high, medium and low adherence levels respectively as those whose blood pressure measurement is below 120/80mmHg. Furthermore, participants with high, medium and low adherence levels whose

blood pressure measurements are between 120/80mmHg and 139/89mmHg were 32 (62.6%), 60 (55%) and 97 (60.6%) respectively. Again the results indicated 27 (16.9%) of those with low adherence level are those with their blood pressure measurement between 140/90mmHg and 159/99mmHg as against 8 (15.7%) of the high adherents who are within the same blood pressure measurements. Also, 4 (7.8%), 10 (9.2%) and 13 (8.1%) of respondents with high, medium and low adherence respectively were those with blood pressure at 160/100mmHg and above ( $X^2 = 1.18$ ,  $df = 6$ ,  $P\text{-value} = 0.978$ ).

### 3.10 Relationship between Patients Awareness of Causes of Hypertension and Level of Adherence

*Table 3.5: Summary description of cross tabulation between patients' awareness of the causes of hypertension and level of adherence*

|                                      |                  |                                               | Respondents awareness of causes of HPT |       |       |      |       |
|--------------------------------------|------------------|-----------------------------------------------|----------------------------------------|-------|-------|------|-------|
|                                      |                  |                                               | Excellent                              | Good  | Fair  | Poor | Total |
| Level of adherence among respondents | High adherence   | Count                                         | 26                                     | 22    | 3     | 0    | 51    |
|                                      |                  | % within Level of adherence among respondents | 51%                                    | 43.1% | 5.9%  | 0.0% | 100%  |
|                                      | Medium adherence | Count                                         | 39                                     | 55    | 15    | 0    | 109   |
|                                      |                  | % within Level of adherence among respondents | 35.8%                                  | 50.5% | 13.8% | 0.0% | 100%  |

|       |               |                                               |       |       |       |      |      |
|-------|---------------|-----------------------------------------------|-------|-------|-------|------|------|
|       | Low adherence | Count                                         | 52    | 65    | 32    | 11   | 160  |
|       |               | % within Level of adherence among respondents | 32.5% | 40.6% | 20.0% | 6.9% | 100% |
| Total |               | Count                                         | 117   | 142   | 50    | 11   | 230  |
|       |               | % within Level of adherence among respondents | 36.6% | 44.4% | 15.6% | 3.4% | 100% |

From the results of the cross tabulation (table 3.5), among the patients who had high adherence, 26 (51%), 22 (43.1%) and 3 (5.9%) of patients had excellent, good and fair awareness of risk factors and causes of hypertension respectively. Also among the patients with low adherence, 52 (32.5%) had excellent awareness of causes of hypertension compared with 65 (40.6%), 32 (20%) and 11 (6.9%) who had good, fair and poor adherence respectively ( $X^2 = 21.4$ ,  $df = 6$ ,  $P = 0.002$ ).

P-value of 0.002 which is less than 0.05 indicates evidence of association between patients' awareness of hypertension and adherence.

## **3.11 Association between patients' awareness of medicines for managing hypertension and level of adherence**

*Table 3.6: Summary description of cross tabulation between Level of adherence and respondents' awareness of medicines for managing hypertension.*

|                                      |        |                                                           | Respondents' awareness of hypertension medicines |       |       |       |       |
|--------------------------------------|--------|-----------------------------------------------------------|--------------------------------------------------|-------|-------|-------|-------|
|                                      |        |                                                           | Excellent                                        | Good  | Fair  | Poor  | No    |
| Level of adherence among respondents | High   | Count                                                     | 9                                                | 12    | 14    | 15    | 1     |
|                                      | Adh    | % within Respondents' awareness of hypertension medicines | 60.0%                                            | 25.5% | 13.2% | 10.4% | 12.5% |
|                                      | Medium | Count                                                     | 4                                                | 19    | 43    | 39    | 4     |
|                                      | Adh    | % within Respondents' awareness of hypertension medicines | 26.7%                                            | 40.4% | 40.6% | 27.1% | 50.0% |
|                                      | Low    | Count                                                     | 2                                                | 16    | 49    | 90    | 3     |

|       |       |                                                           |        |        |        |        |        |
|-------|-------|-----------------------------------------------------------|--------|--------|--------|--------|--------|
| Total | Adh   | % within Respondents' awareness of hypertension medicines | 13.3%  | 34.0%  | 46.2%  | 62.5%  | 37.5%  |
|       | Count |                                                           | 15     | 47     | 106    | 144    | 8      |
|       |       | % within Respondents' awareness of hypertension medicines | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% |

From the results of the cross tabulation as shown in table 3.6 above, 9 (60%), 4 (26.7%) and 2 (13.3%) of patients who had excellent awareness of hypertension had high, medium and poor level of adherence respectively. Also among the patients with poor awareness of hypertension, 15 (10.4%) had high adherence level compared with 39 (27.1%) and 90 (62.5%) with medium and low adherence respectively ( $X^2 = 40.5$ ,  $df = 8$ ,  $P\text{-value} = 0.001$ ).



A probability value (P) of 0.001 indicates an association between patients' awareness of hypertension medicines and level of adherence.

### 3.12 Association between patients' knowledge of medication and adherence

*Table 3.7: Summary description of cross tabulation between adherence and respondents' knowledge of medicines for managing hypertension.*

| Knowledge of;              | Respondents' level of adherence |            |            | Chi-Square Test                         |
|----------------------------|---------------------------------|------------|------------|-----------------------------------------|
|                            | High                            | Medium     | Low        |                                         |
| Name of medication         | 22 (43.1%)                      | 36 (33.0%) | 36 (22.5%) | $X^2 = 15.4$<br>$df = 4$<br>$P = 0.003$ |
| Dosage of medication       | 20 (39.2%)                      | 29 (26.6%) | 52 (32.5%) |                                         |
| Side effects of medication | 9 (17.7)                        | 44 (40.4%) | 72 (45.0%) |                                         |
| Total                      | 51 (100%)                       | 109 (100%) | 160 (100%) |                                         |

From the cross tabulation (Table 3.7), 22 (43.1%) respondents with high adherence knew the names of their medication as against 9 (17.7%) who knew the side effects of their medications. Also 72 (45.0%) of respondents with low adherence knew the side effects compared with 36 (22.5%) who knew the names of their medications. The table also shows 20 (39.2%) respondents with high adherence knew the dosages of the medications while 52 (32.5%) respondents with low adherence also knew the dosages. ( $X^2 = 15.4$ ,  $df = 4$ ,  $P = 0.003$ )

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## Association

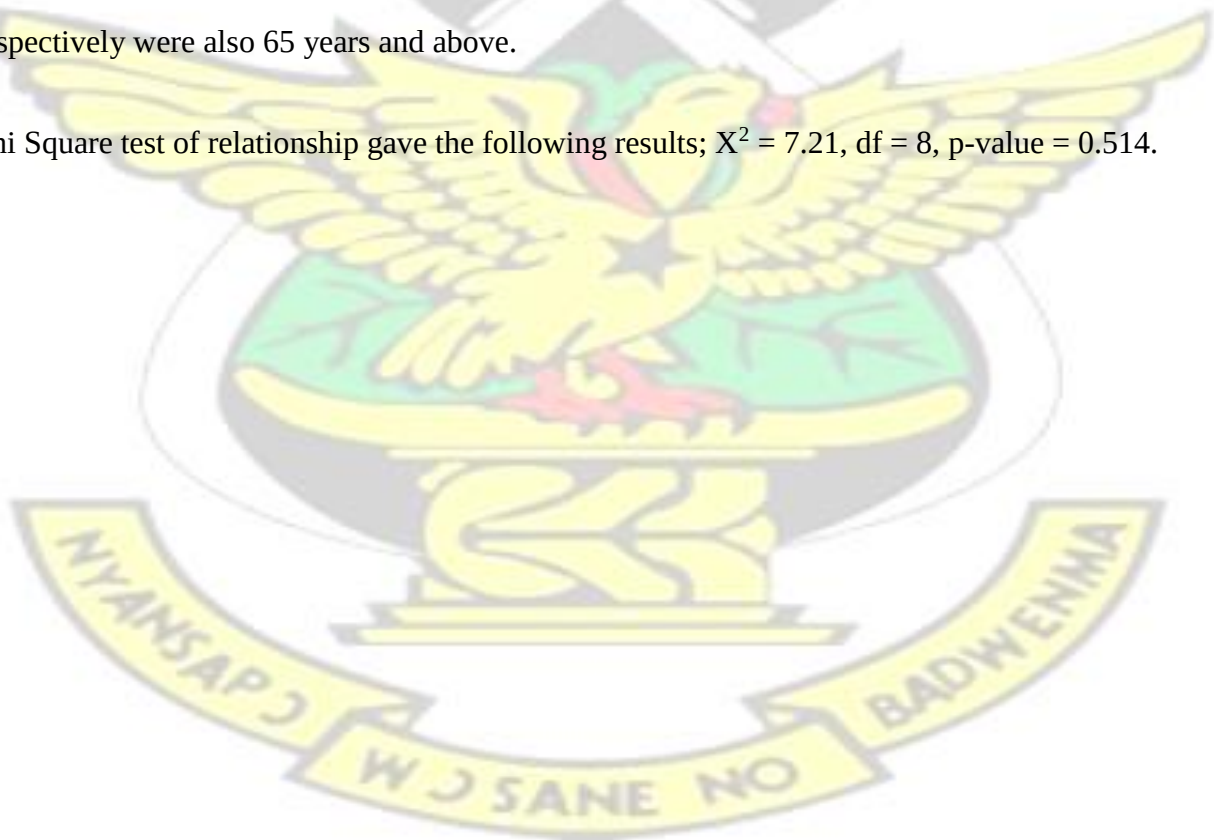
### 3.13 between Age of Patients and Level of Adherence

Table 3.8: Summary description of cross tabulation between Age of respondents and level of adherence.

|                    |              | Level of adherence among respondents |                  |               |        |
|--------------------|--------------|--------------------------------------|------------------|---------------|--------|
|                    |              | High adherence                       | Medium adherence | Low adherence |        |
| Age of respondents | 25-34        | Count                                | 1                | 3             | 9      |
|                    |              | % within Level of adherence          | 2.0%             | 2.8%          | 5.6%   |
|                    | 35-44        | Count                                | 11               | 13            | 19     |
|                    |              | % within Level of adherence          | 21.6%            | 11.9%         | 11.9%  |
|                    | 45-54        | Count                                | 17               | 35            | 61     |
|                    |              | % within Level of adherence          | 33.3%            | 32.1%         | 38.1%  |
|                    | 55-64        | Count                                | 12               | 34            | 43     |
|                    |              | % within Level of adherence          | 23.5%            | 31.2%         | 26.9%  |
|                    | 65 and above | Count                                | 10               | 24            | 28     |
|                    |              | % within Level of adherence          | 19.6%            | 22.0%         | 17.5%  |
|                    | Total        | Count                                | 51               | 109           | 160    |
|                    |              | % within Level of adherence          | 100.0%           | 100.0%        | 100.0% |

The relationship between age of respondents and level of adherence is described in the crosstabulation (Table 3.7) above. From the table, respondents with ages 25-34 recorded 9 (5.6%) low adherence, 3 (2.8%) medium adherence and 1 (2.0%) high adherence. Respondents within age 35-44 recorded 11 (21.6%) respondents with high adherence and 13 (11.9%) each of respondents with medium and low adherence levels. Also, respondents within age 45-54, 61 (38.1%) had low adherence as compared with a high adherence of 17 (33.3%) and a medium adherence of 35 (32.1%). Again, among the 55-64 age groups, 34 (31.2%) of the respondents had medium adherence, followed by 43 (26.9%) low adherence and 12 (23.5%) high adherence. Lastly, among respondents with medium level adherence level, 24 (22%) were 65 years and above while 10 (19.6%) and 28 (17.5%) of the respondents within high and low level adherence category respectively were also 65 years and above.

Chi Square test of relationship gave the following results;  $X^2 = 7.21$ ,  $df = 8$ ,  $p\text{-value} = 0.514$ .



## Association

### 3.14 between educational status of Patients and Level of Adherence

Table 3.9: Summary description of cross tabulation between educational status of respondents and level of adherence.

|                                |                       |                             | Level of adherence among respondents |                  |               |       |
|--------------------------------|-----------------------|-----------------------------|--------------------------------------|------------------|---------------|-------|
|                                |                       |                             | High adherence                       | Medium adherence | Low adherence | Total |
| Educational status of patients | Never attended school | Count                       | 9                                    | 33               | 53            | 95    |
|                                |                       | % within Level of adherence | 17.6%                                | 30.3%            | 33.1%         | 29.7% |
| Primary                        | Count                 |                             | 8                                    | 23               | 30            | 61    |
|                                |                       | % within Level of adherence | 15.7%                                | 21.1%            | 18.8%         | 19.1% |
| Middle/JHS                     | Count                 |                             | 12                                   | 26               | 39            | 77    |
|                                |                       | % within Level of adherence | 23.5%                                | 23.9%            | 24.4%         | 24.1% |
| Secondary                      | Count                 |                             | 10                                   | 8                | 17            | 35    |

|          |                             |       |       |       |       |
|----------|-----------------------------|-------|-------|-------|-------|
|          | % within Level of adherence | 19.6% | 7.3%  | 10.6% | 10.9% |
| Tertiary | Count                       | 12    | 19    | 21    | 52    |
|          | % within Level of adherence | 23.5% | 17.4% | 13.1% | 16.2% |

From table of cross tabulation, among respondents with low, medium and high adherence levels, 53 (33.1%), 33 (30.3%) and 9 (17.6%) respectively never attended school. Also 8 (15.7%), 23 (21.1%) and 30 (18.8%) of those within high, medium and low adherence levels respectively have had Primary education. Again, the respondents who have had Middle/JHS education constituted 39 (24.4%), 26 (23.9%) and 12 (23.5%) of those with low, medium and high adherence levels respectively. Furthermore 10 (19.6%), 8 (7.6%) and 17 (10.6%) of participants with high, medium and low adherence category respectively have had secondary education. Lastly, respondents within the Tertiary category represented 12 (23.5%) of those with high adherence, 19 (17.4%) medium adherence and 21 (13.1%) low adherence.

Test of association gave the following results;  $X^2 = 6.98$ ,  $df = 10$  and  $P\text{-value} = 0.189$ .

## 3.15 between Marital status of Patients and Level of Adherence

Table 3.10: Summary description of cross tabulation between marital status of respondents and level of adherence.

|                               |                       |                             | Level of adherence among respondents |                  |               |
|-------------------------------|-----------------------|-----------------------------|--------------------------------------|------------------|---------------|
|                               |                       |                             | High adherence                       | Medium adherence | Low adherence |
| Marital status of respondents | Single, never married | Count                       | 0                                    | 3                | 6             |
|                               |                       | % within Level of           | .0%                                  | 2.8%             | 3.8%          |
|                               | Married               | Count                       | 37                                   | 69               | 96            |
|                               |                       | % within Level of adherence | 72.5%                                | 63.3%            | 60.0%         |
|                               | Separated             | Count                       | 3                                    | 6                | 15            |
|                               |                       | % within Level of adherence | 5.9%                                 | 5.5%             | 9.4%          |
|                               | Divorced              | Count                       | 3                                    | 11               | 18            |
|                               |                       | % within Level of adherence | 5.9%                                 | 10.1%            | 11.2%         |

|       |                             |        |        |        |
|-------|-----------------------------|--------|--------|--------|
| Total | Cohabiting Count            | 0      | 2      | 2      |
|       | % within Level of adherence | .0%    | 1.8%   | 1.2%   |
|       | Widowed Count               | 8      | 18     | 21     |
|       | % within Level of adherence | 15.7%  | 16.5%  | 13.1%  |
|       | Count                       | 51     | 109    | 160    |
|       | % within Level of adherence | 100.0% | 100.0% | 100.0% |

The cross tabulation shows that 37 (72.5%) of respondents with high adherence levels are married compared to 8 (15.7%) and 3 (5.9%) who are widowed and divorced respectively.

Among the medium adherence group 69 (63.3%) were married compared to 18 (16.5%), 11 (10.1%) and 6 (5.5%) of respondents who were widowed, divorced and separated respectively.

Also within the low adherence group, married respondents constituted 96 (60%) compared with 21 (13.1%) and 18 (11.2%) respondents who were widowed and divorced respectively. The result of Chi-squared ( $X^2$ ) statistical test performed showed a P-value = 0.042.

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## CHAPTER FOUR

### 4.0 DISCUSSION

#### 4.1 Demographic, Clinical characteristics and risk factors of respondents

The mean age of persons included in the study was 54.9 (SD  $\pm$  11.9). This finding is comparable to the mean age (57, SD  $\pm$  11.6638) of participants in a study conducted by Marfo, et al (2014) in Accra and Kumasi. Another study at Korle Bu Teaching Hospital recorded a mean age of 57.8 (SD  $\pm$  12.45) (Laryea, J. G., 2013). Joho, A. (2012) in a study to determine patient factors that influence adherence to antihypertensive therapy in Tanzania recorded a comparable mean age of 56.3 (SD  $\pm$  13.1). The mean age of this study is also in line with a study on adherence in Pakistan by Nasir et al (2008) which recorded a mean age of 55.8 ( $\pm$  13.4) and another conducted by Almas et al (2006) which recorded average age of 58.1 ( $\pm$  12).

The sex distribution of participants in the study was 44.4% males and 55.6% females. The higher percentage of women with hypertension as recorded in the study is also recorded in many studies on hypertension. A study to determine patient factors influencing adherence by Joho, recorded 43.7% males and 56.3% females (Joho, A., 2012). Another study by Laryea also had 35.5 % males and 64.5% females (Laryea, J. G., 2013). A study to assess the prevalence and risk factors of hypertension at Adansi South district stated the prevalence males as 46.2% and 53.8% for females (Duah et al, 2013). This is in line with WHO (2013) findings that life expectancy at birth for females is higher than males. It also agrees with the sex distribution of Ghana's population (GSS, 2012).

The study found many (63.1) of the respondents as married. A study in Accra by Laryea (2013) also found 63.7% of the respondents to be married while a study in Tanzania had 60.7% married persona among the respondents (Joho, A., 2012).

The study found 43.4% of respondents to be overweight while 8.8% were obese. In line with the findings of this study, a similar study at Adansi South in Ghana recorded 41.7% of the subjects as obese (Duah et al, 2013). Approximately 46% of the respondents are not aware of the importance of exercise in the management of hypertension. Such individuals are likely not to engage in aerobic exercise which could contribute to the weight gain (Biritwum, et al, 2005). Over weight and obesity are also contributing factors of diabetes (Fletcher, et al, 2002). The study found 22.18% of respondents to be diabetics. This is comparable to the findings from a study conducted by Nshisso, et al (2012) in Ethiopia which found 27% of hypertensives as having diabetes. A study in Ethiopia however, reported that almost 42% percent of the hypertensive patients also had diabetes (Habtamu et al, 2014).

The study recorded 48.4% of its subjects as having a family history of hypertension. This is figure is comparable to a study by Tengey, J. (2012) at Atibie Government Hospital which found 48% of hypertensive subjects as having a family history of hypertension. Another study on hypertension however, found 34.9% of participants as those with family history of hypertension (Duah et al, 2013). Almost 23% of respondents in the study admitted to the use of alcohol. This figure is similar to the finding from a study conducted by Duah et al (2013), which recorded 24.6% as hypertensive patients who use alcohol.

## 4.2 Level of adherence

The study showed a general adherence level of 50%, (15.9% high adherence and 34.1% medium adherence) as seen in figure 3.2. This finding is comparable to a 47.7% adherence level reported in a study conducted at the Out-Patients Department (OPD) of Korle-Bu Teaching Hospital (Laryea, J. G, 2013). A similar study at Ghana Ports and Harbours Authority (GPHA) in 2006 reported absolute adherence among hypertensive patients as 19.3% (Jambedu, H. A., 2006) which is comparable to 15% in this study. Another study conducted at the Komfo Anokye Teaching Hospital (KATH) between December 2001 and April 2002 among 121 hypertensive patients however, found adherence to be 7% (Buabeng et al, 2004) which is lower than the finding from this study. In Bangladesh, a study reported absolute adherence (a Zero score for Morrisky's adherence scale) as 15% (Hussanin et al, 2011) which is same as the absolute adherence level found in this study. The 50% adherence level found by the study is also similar to a 53.3% from a study conducted by Joho, A. (2012) in Dar es Salaam and 48.3% reported by Nasir et al (2008) in a study at Karachi, all in Tanzania. However, studies conducted at teaching hospitals in Nigeria and Zimbabwe reported adherence level as 85.5% (Okoro & Ngong, 2012) and 40.2% (Mukora-Mutseyekwa & Chadambuka, 2013) respectively. Other studies which reported high adherence levels include one conducted at University of Gondar Referral Hospital which reported 64.6% (Ambaw et al, 2012) and a Chinese study with adherence level of 65.1% (Lee et al, 2013). The result from the study is also comparable to a WHO (2003) report in which put general adherence level at 50%.

### **4.3 Factors influencing adherence**

#### **4.3.1 Age**

The result of the study as Table 3.7 shows that age of patients has no association with their adherence to therapy (P-value 0.514). From the result the highest percentages of those with high adherence (33.3%) and low adherence (38.1%) were between 45 - 55 years. The effect of age on adherence according to the study does not follow any particular order. The finding is in line with other studies which also reported that age has no association with level of adherence (Wild et al, 2004, Wai et al, 2005, Menzie et al, 1993). On the other hand the finding is in contrast with the findings from a study conducted by Hashmi, et al (2007) on adherence and a similar one conducted by Okoro & Ngong (2012), which reported an increased in adherence with increasing age. Many other studies at different parts of the world also hold contrarily view and reported that adherence increases with age (Kim et al, 2002, Senior et al, 2004, Caspard et al, 2005, Lacasse et al, 2005). Other studies which oppose the findings of this study reported that the level of adherence decreases with increasing age (Joho, 2012, Krousel-Wood et al, 2009, Balbey et al, 2005, Benner et al, 2002).

#### **4.3.2 Gender**

The result of the study show that there is not enough evidence of association between gender of respondents and their level of adherence as shown in table 3.3 (P-value = 0.132) This finding is supported by research on medication adherence conducted by Ghods et al, (2003) and others which reported no association between gender and adherence (Spikmans et al, 2003, Senior et al,

2004). Other researchers however, reported that female patients are more adherent than males (Fodor et al, 2005, Jing et al, 2005). Contrarily, Caspard et al, (2005) and Hertz et al (2005), found males to be more adherent than females.

#### **4.3.3 Level of education**

The results of the study also show no evidence of association between educational levels of respondents and their level of adherence (P-value = 0.189) (Table 3.8). The finding is similar to findings from studies done by Stilley et al (2004) and Wai et al (2005) which reported no association between educational level and adherence. In the United Kingdom, a study done by Senior et al in 2004 found patients with formal educational qualification had lower adherence compared with those with no formal educational qualification (Senior et al, 2004). Other studies however, suggested that patients with higher education might have better adherence to their therapy (Okuno et al, 2001; Ghods & Nasrollahzadeh, 2003; Yavuz et al 2004).

#### **4.3.4 Marital status**

Marital status was found by the study to significantly affect the level of adherence (P-value = 0.042). From the study, 72.5% of respondents with high level of adherence were married as against 5.9% and 15.7% who were divorced and widowed respectively (Table 3.9). This result is comparable with the finding from a study by Cooper et al, (2005). The result is also similar to a study at Duke University Hospital in Durham (Trivedi et al, 2008) and a study in Nigeria (Okoro& Ngong, 2012) both of which reported high adherence among married hypertensive patients.

#### **4.3.5 Religion**

The result indicated that 122 (86%) respondents with low adherence were found to be Christian while 20 (12.5%) of the number were Muslims. Muslims were found to be more adherent to their medications than Christians and Traditionalists ( $P = 0.0001$ ). This finding is in line with a study in Ethiopia which found Muslims to three times more likely to be adherent to their therapy than Christians (Habtamu et al, 2014).

#### **4.3.6 Years patients have been on therapy**

The study found no evidence of association between years patients have lived with hypertension and adherence (Table 3.4) with P-value of 0.152. This finding is supported a report in New Orleans (Hyre et al, 2007) and in contrast with a report from a study in Bangladesh (Hussanin et al, 2011).

#### **4.3.7 Patients awareness of causes and complications of hypertension**

The result of the study show a statistically significant association between patients awareness of causes and complications of hypertension and adherence ( $P\text{-Value} = 0.005$ ). From the findings, 51% of all those who highly adhere to therapy also have excellent awareness of causes and complication of hypertension as against 35.8% and 32.5% (Table 3.5). Many studies have also reported that knowledge of causes and complications of hypertension is independently associated with adherence in a positive direction (Ponnusankar et al, 2004; Alm-Roijer et al, 2004; Gascon et al, 2004; Lawson et al, 2005). The reason for this could be that, patients know the causes of hypertension are less likely to attribute their condition to superstitious cause and would therefore

not abandon therapy. Since complications of hypertension could be fatal, patients with this knowledge are stick to their therapy to avoid complications (Millas et al, 1995).

#### **4.3.8 Patients awareness of therapy**

The study findings also gave evidence of significant association between patients knowledge of therapy for managing their condition and the level of adherence ( $P$ -value = 0.001). From the results, 60%, 26.7% and 13.3% of patients with excellent knowledge of their therapy had high, medium and low adherence respectively. On the hand, 10.4%, 27.1% and 62.5% of those with low knowledge had high, medium and low adherence respectively (Table 3.6). The result is in line with the findings of many studies which have suggested that patients with adequate knowledge of their therapy adhere better than those with low knowledge (Seo & Min, 2005; Kaona et al, 2004; Lindberg et al, 2001; Thomas et al, 2001; Olubodun et al, 1990, Liam et al, 1999). The reason for this association could be that, those with knowledge of their therapy are also likely to know the benefits of the therapy and the likely consequence of not following the agreed recommendation with their health care providers. They are therefore more likely to adhere to treatment than those with low knowledge.

The study also found significant association between knowledge of names, dosages and side effects of therapy and level of adherence ( $P$  = 0.003). Respondents who knew the names of their therapy were found to be more adherent than those knew the dosages and side effects. Among those with high, adherence, 22 (43.1%) knew the names as against 20 (39.2%) and 9 (17.7%) who knew the dosages and side effects respectively. The probable reason could be that those who knew the names could get a refill from other facilities and therefore would have the medications most times.

#### **4.4 Limitations of the study**

The study was conducted in one facility which happens to be the only hospital in the district. Though most persons with hypertension seek treatment from this facility, there are a few who seek treatment at some of the health centres who were not offered the chance to participate in the study. This may not significantly affect how the results can be generalized since those who seek care at the lower facilities are only a few.

The research was a descriptive quantitative cross sectional design using a structured closed ended questionnaire which respondents answered to achieve research aim and objectives. Though the researcher clearly explained questions to respondents, this design is unable to establish temporal association between the identified factors and levels of adherence. In this case, both qualitative and quantitative design would have been better.

Self reporting of therapy adherence is dependent on what the individual could remember. As a result, there could be recall bias which could result in either over reporting or under reporting. The researcher, however, clarify every question before asking respondents.

There may be other factors that could influence patients' level of adherence apart from the factors identified in the study such as Health System and Physician related factors.

## **CHAPTER FIVE**

## **5.0 CONCLUSION AND RECOMMENDATIONS**

### **5.1 Conclusion**

The findings from the study indicated that overall adherence to antihypertensive therapy among respondents was 50%. However, only 15.9% of respondents had excellent or high adherence to their medication. The study also found that 117 (36.6%) respondents have excellent level awareness of causes of hypertension. Approximately 39.3% of respondents were aware of complications associated with uncontrolled hypertension.

Factors that were identified to have statistically significant association with adherence level were marital status ( $P = 0.042$ ), religion ( $P = 0.0001$ ), awareness of causes and complications of hypertension ( $P = 0.002$ ) and awareness of medication for managing hypertension ( $P = 0.001$ ). The study suggested that religious affiliation, marital status are factors that are likely to influence the level of adherence to antihypertensive medication among patients at Presbyterian Hospital, Donkorkrom. Also respondents who are aware of the causes and complications of hypertension and those who are aware of their therapy are more likely to adhere to their medications.

Factors like age, educational level, occupation, years lived with hypertension and number of drugs used by patients were found to have no evidence of association with level of adherence.

### **5.2 Recommendations**

To improve the current level of adherence to antihypertensive therapy, all stakeholders should be involved to develop plans and strategies to improve adherence. In order to increase contact time with hypertensive patients, highly skilled professionals like Pharmacists should also be allowed front line positions in the management of patients with hypertension.

#### **5.2.1 Recommendations for clinical care team members**

1. Patients should be encouraged to make input to the planning of their therapy which should not unduly interfere the patients' activities
2. Patients should be provided with adequate information to understand the causes of hypertension, possible complications if treatment is not adhered to and to increase their knowledge on the medications prescribed for them.
3. As part of the patient history taking, they should be assessed to know if they are adhering to treatment. Adherence forms should be designed in facilities to guide the assessment process. Pharmacist should be encouraged to take up this responsibility.
4. Patients should be provided with effective adherence counselling services before the commencement of their treatment and continuous counselling on each review day. They should know that treatment is for life and have to continue taking the medications even if they feel well.
5. Patients should be encouraged to introduce a treatment monitor to the health care team who would also be counselled to provide support for the patients in taking their medications
6. Service provision for hypertensive patients should acceptable and of high quality.

#### **5.2.2 Recommendations for policy makers**

1. The health ministry should embark on rigorous education about hypertension, causes complications and the importance of adherence to treatment for hypertension. This can be done through mass media like radio, television and the use of posters. Stakeholders like religious leaders could be brought on board and use their platforms to provide education.
2. Health professionals should also be trained to provide adherence counselling to patients in a constructive and non judgemental manner with aim to improve on adherence.

### **5.2.3 Recommendation for research**

In the future, further research should be conducted to identify reasons for non adherence to antihypertensive medications.

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## **APPENDIXES**

### **APPENDIX I: Participants' consent form**

**KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY, FACULTY  
OF PHARMACY AND PHARMACEUTICAL SCIENCES, DEPARTMENT OF  
CLINICAL AND SOCIAL PHARMACY**

ID NO .....

## **Consent to participate in a research on patients factors influencing adherence to antihypertensive therapy at Donkorkrom Presbyterian Hospital**

Greetings! My name is George Yankyera Afful, MSc student from Kwame Nkrumah University of Science and Technology. It is my pleasure to invite you to participate in a study with the aim of identifying patient factors affecting treatment adherence among hypertension patients. When these factors are identified, I may be able to make recommendations that will improve patients' adherence to their therapy and ultimately improve their quality of life.

If you agree to participate, you will be asked some questions relating to aim of the study a structured questionnaire. You are not under any compulsion to answer questions you are not comfortable with and can terminate your participation at will at any level. You can also draw my attention if the environment is not conducive for you. The questions will last not more than 25 minutes and will not cause you any physiological, financial or psychological harm.

Identification number will be used rather than your real name and all data collected will be for the research purposes. The information you share with the researcher will be treated as confidential and cannot be traced back to you.

**Benefits** - Although you may not obtain immediate direct benefit by participating in this study, it is anticipated the outcome of this study will influence policies concerning both the management of hypertension and overall drug utilization in the hospital.

**Who to contact** - If you ever have any question regarding this study you should feel free to contact the study Coordinator or Principal Investigator, George Yankyera Afful (020 897 0062), P.O BOX.19, Donkorkrom.

Do you agree to be a participant of this study? Please sign the attached declaration form if you agree to participate.

# KNUST

## **APPENDIX II: Participants declaration form**

### **Declaration:**

“I have read the information given above, or the information above has been read and interpreted to me in my local language and I understood. I have been given a chance to ask questions concerning this study; questions have been answered to my satisfaction. I now voluntarily agree to participate in this study knowing that the researcher will maintain confidentiality and I have the right to withdraw at any”.

---

Name of participant

---

Signature/thumbprint

---

Date

---

Name of researcher

Signature

Date

# KNUST



## APPENDIX III: Questionnaire

### QUESTIONNAIRE

**A study on patient factors influencing adherence to antihypertensive therapy among hypertensive patients attending Presbyterian Hospital at Donkorkrom.**

Identification Number: .....

#### Section A: Participants' demographics

1) Age.....

2) Sex:

1. Male

2. Female

[   ]

3) What is your marital status?

1. Single, never married
2. Married
3. Separated
4. Divorced
5. Cohabiting
6. Widowed

[ ]

4) What is your religion?

1. Christian
2. Muslim
3. Traditionalist
4. Other (specify) .....

[ ]

5) What is your educational background?

1. Never attended school
2. Primary
3. Middle school/JHS
4. Secondary
5. Tertiary

[ ]

6) What is your occupation?

1. Unemployed
2. Student
3. Farmer
4. Artisan
5. Trader
6. Government employee
7. Non-government employee

[ ]

7) Do you hold valid NHIS identification card?

1. No [ ] 2. Yes [ ]

## SECTION B: Risk factors (initial assessment)

I. What is your body weight? ..... What is your height? .....

BMI .....

II. Do you have diabetes? 1. No [ ] 2. Yes [ ] 3. Don't know [ ]

III. Do any of your family members have hypertension? 1. No [ ] 2. Yes [ ]

3. Don't know [ ]
- IV. Do you enjoy salty foods? 1. No [ ] 2. Yes [ ]
- V. Do you like taking fried foods? 1. No [ ] 2. Yes [ ]
- VI. Do you smoke cigarette? 1. No [ ] 2. Yes [ ]
- VII a. Do you drink alcohol? 1. No [ ] 2. Yes [ ]
- VII b. If you answered Yes to VIIa.; What amount of alcohol do you consume per day?  
.....
- VII c. How often do you consume alcohol?.....
- VIII a. Do you engage in any form of exercise? 1. No [ ] 2. Yes [ ]
- VIII b. If you answered Yes to VIII a; How long do you exercise per day?  
.....
- VIII c. How often do you exercise? .....
- IX. What is your current blood pressure measurement?.....
- X. Respondent's BMI.....
- XI. How long have you had hypertension?.....
- XII Do you have any coexisting conditions? 1. None [ ] 2. Not known [ ] 3. Yes [ ]  
(Specify).....  
.....

### SECTION C: Patient's medication for the management of hypertension

| Name of Medicine | Dosage | Patient's knowledge of medication's |        |          |              |         |
|------------------|--------|-------------------------------------|--------|----------|--------------|---------|
|                  |        | Name                                | Dosage | Duration | Side effects | Purpose |
|                  |        |                                     |        |          |              |         |
|                  |        |                                     |        |          |              |         |
|                  |        |                                     |        |          |              |         |
|                  |        |                                     |        |          |              |         |
|                  |        |                                     |        |          |              |         |

#### SECTION D: Patients Awareness of Life style modification for reducing blood pressure

| Do you know the following life style modification can help reduce their blood pressure?                  | YES | NO |
|----------------------------------------------------------------------------------------------------------|-----|----|
| Aerobic exercise at least 30 minutes per day ,four days per week                                         |     |    |
| Reducing your dietary salt to less than 2.4g per day                                                     |     |    |
| Limiting alcohol intake to less than 21 units per week for men and less than 14 units per week for women |     |    |
| Avoiding cigarette smoking                                                                               |     |    |
| Eating a diet high in fruits ,nuts and vegetable and low in fat                                          |     |    |
| Losing weight                                                                                            |     |    |

#### SECTION E: Respondent's awareness of risk factors, causes and complications of hypertension

##### A. Risk factors and causes

| Do you know that the following are risk factors of hypertension? | No | Yes |
|------------------------------------------------------------------|----|-----|
| High alcohol intake                                              |    |     |
| High table salt intake                                           |    |     |
| Cigarette smoking                                                |    |     |
| Overweight/Obesity                                               |    |     |
| Stress                                                           |    |     |

|                                                           |  |  |
|-----------------------------------------------------------|--|--|
| Hypertension means high blood pressure                    |  |  |
| Hypertension means excessive thinking, worries and stress |  |  |
| Hypertension is hereditary                                |  |  |
| Hypertension is caused by witches and wizards             |  |  |
| Hypertension is caused by food poisoning                  |  |  |
| Hypertension has dangerous complications                  |  |  |

### **B Knowledge of hypertension**

| To what extent do you agree that;                                                                                  | Agree | Not sure | Disagree |
|--------------------------------------------------------------------------------------------------------------------|-------|----------|----------|
| Headache is a common symptom of hypertension                                                                       |       |          |          |
| Hypertension is symptomless                                                                                        |       |          |          |
| Hypertension is cured once and for all.                                                                            |       |          |          |
| Hypertension treatment is for life.                                                                                |       |          |          |
| Keeping appointment with your Doctor and regular intake of antihypertensive medications will prevent complications |       |          |          |

### **C. Complications of hypertension**

| To what extent do you agree that uncontrolled hypertension can result in the following complications? | Agree | Not sure | Disagree |
|-------------------------------------------------------------------------------------------------------|-------|----------|----------|
| Kidney related problems                                                                               |       |          |          |
| Visual impairment                                                                                     |       |          |          |
| Stroke                                                                                                |       |          |          |
| Heart related problems                                                                                |       |          |          |
| Burden on your family                                                                                 |       |          |          |

## SECTION F: Assessment of adherence

|   | Assessing adherence                                                                                                              | No = 0 | Yes = 1 |
|---|----------------------------------------------------------------------------------------------------------------------------------|--------|---------|
| 1 | Do you sometimes forget to take your hypertension medications?                                                                   |        |         |
| 2 | Over the past one week, were there days that you did not take your hypertension medicines                                        |        |         |
| 3 | Have you ever stopped taking your hypertension medicines without the consent of your healthcare provider because you felt worse? |        |         |
| 4 | Have you ever stopped taking your hypertension medicines because you travelled and did not carry my medicines?                   |        |         |
| 5 | Do you sometimes stop taking your medicines when you feel your hypertension is controlled?                                       |        |         |
| 6 | Did you take your hypertensive medicine yesterday?                                                                               |        |         |
| 7 | Do you ever feel hassled about sticking to your hypertension treatment plan?                                                     |        |         |

8. Did you have any difficulty remembering to take all your malaria medication?

Never/Rarely..... 0      Once in a while.....1      Sometimes..... 2

Usually.....3      All the time..... 4

Source: Morisky, D. E., Ang, A., Krousel-Wood, M., Ward, H. (2008). Predictive Validity of a Medication Adherence Measure for Hypertension Control. Journal of Clinical Hypertension 2008; 10 (5):348-354.

## APPENDIX IV: PERMISSION LETTER TO CONDUCT RESEARCH

# PRESBYTERIAN CHURCH OF GHANA

(Kwahu Presbyterian Health Services)  
Donkorkrom Hospital

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

**Bankers**  
Ghana Commercial Bank Ltd.  
Donkorkrom, Afram Plains  
Standard Chartered Bank  
High Street, Accra

Our Ref: DPH/PF/N.134/13  
Your Ref:



P.O. Box  
Donkorkrom, Afram Pla  
Eastern Reg  
Ghana - West Afr  
Tel: 03424-22  
Fax: 03424-22  
E-mail: donkorkompresbyhospital@yahoo.co

Date: 27<sup>th</sup> November, 20

Mr. George Yankyera Afful  
P. O. Box 19  
Donkorkrom

Dear Sir,

**RE: PERMISSION TO CONDUCT HEALTH RESEARCH ACTIVITIES  
IN PRESBYTERIAN HOSPITAL, DONKORKROM**

You have been granted permission to collect data for research work at Donkorkrom Presbyterian Hospital.

Your research proposal titled: Patients' factors influencing adherence to antihypertensive therapy among hypertension patients attending Presbyterian Hospital in Donkorkrom has been carefully studied.

This permission is to enable you fulfil part of the academic requirement for your MSc in Clinical Pharmacy Programme.

Copies of this letter has been sent to all departments so that they can offer you all the necessary assistance.

Thank you.

Yours faithfully,

Dr. George Darko Brown  
(Ag. Medical Administrator)  
MEDICAL ADMINISTRATOR  
DONKORKROM PRESBY HOSPITAL  
P. O. BOX 19  
DONKORKROM