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ASSESSMENT OF HEALTH PROVIDERS AND PATIENTS' COMMUNICATION ON ADHERENCE TO HYPERTENSION TREATMENT

BY

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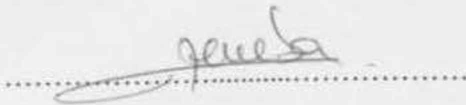
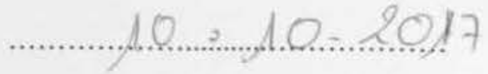
DECLARATION

I, Diallo Djeneba, hereby declare that apart from references to other people's works, which have been duly acknowledged, this dissertation is a result of my own independent work produced from research undertaken under supervision. I further declare that this dissertation has not been submitted for award of any degree in this institution and other universities elsewhere.





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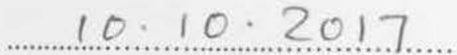

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DEDICATION

I dedicate this work to God Almighty for assisting me through this journey; and to my husband Emmanuel Kwasi Kumah, for his love and, to my lovely and amazing sons Yannick Nana Kwaku Kumah and Yohann Nana Kwasi Kumah, for your love and endurance; to Elizabeth Konadu for taking good care of my sons and myself.

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Finally, a lovely thanks to my husband Emmanuel K Kumah and our sons for their love and patience.

ABSTRACT

Introduction

Non-adherence to hypertension medications is a major cause of uncontrolled blood pressure which increases the risk of patients to develop complications. Good health provider and patient relationship is an important indicator of effective health care service delivery which can influence patients' adherence to medications. Little information is available on adherence to treatment among patients attending primary health care clinics such in district hospital and health provider and patient communication on medications adherence affect patients' medications behaviour in Ghana.

Objective: this study sought to assess patients' perceptions of health providers' communication on adherence to hypertension treatment at Apam Catholic Hospital in Gomoa West.

Method: The study was a cross sectional study. The MMAS 8 items was used to determined patients adherence to medications and a modified Interpersonal Processes of Care 29 items survey was used to assess patients perceptions of health providers communication. A consecutive sampling method was used to interview 307 hypertensive patients attending the OPD on daily basis from May to June 2017. Patients' adherence scores were dichotomized into optimal adherence and suboptimal adherence, (score <8). Each IPC scores were dichotomized into good IPC and poor IPC. Person's chi square test was conducted to determine the relationship between patients' characteristics; the IPC subscales scores and adherence type (optimal or suboptimal). Logistic regression was performed to test the strength of these associations ($p \leq 0.005$)

Results: the proportion of patients with optimal adherence was 56.7%, among patient's sociodemographic characteristics and medical background, patients' age and the number of pills taking were significantly associated with adherence ($p < 0.005$). Overall good IPC's scores range from 58% to 100%. A statistically significant relationship was reported between the scale "worked together" and adherence ($p < 0.005$).

Conclusion: the proportion of adherence was low,. The study found a significant relationship between the 'patients centered decision making" and adherence. Patients and health provider collaboration on patient treatment is capital to enhance patient adherence to hypertension treatment to

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LIST OF ACRONYMS

BP	Blood Pressure
CHAG	Christian Health Association of Ghana
DBP	Diastolic Blood Pressure
HBP	High Blood Pressure
HIV	Human Immunodeficiency Virus (HIV)
HTN	Hypertension
MMAS	Morisky Medication Adherence Scale
mmHG	Millimetre of mercury
OPD	Out Patient Department
PI	Principal investigator
SBP	Systolic Blood Pressure
SD	Standard deviation
TB	Tuberculosis

CHAPTER ONE

INTRODUCTION

1.1 Background

Hypertension, defines by WHO as a persistent elevation of blood pressure greater than 140/90 mmHg (WHO, 2013), is the primary cause of world cardiovascular diseases and was considered in 2002 as the third cause of disability-adjusted life years (DALY's) (Chockalingam, Campbell, & George Fodor, 2006). The number of hypertensive patients worldwide was 972 million in 2000 and this number is predicted to increase to 1.56 billion by the year 2025 (Kearney et al., 2005).

Earlier studies on hypertension (HTN) described it as a disease of high income countries. This was in relation with high modern lifestyles which include technological development, prospering fast food as mode of feeding, increase use of personal motor vehicles as mean of transport over others traditional means. Hypertension was initially low in developing countries and almost non-existent in Africa (Ibrahim & Damasceno, 2012).

However, this tendency has changed over the past three decades and HTN has become highly prevalent in Africa and other developing countries. The prevalence of hypertension vary according to regions and continents, and Africa is having the highest prevalence with 40 % (WHO, 2015). Mills, Bundy, Kelly, Reed, Kearney, Reynolds, Chen & He, (2016) found in a review study that the age standardized prevalence of hypertension had increase by 7.7% in low and middle income countries(LMIC).

In Ghana, Agyemang & Bruijnzeels, (2006) found in a cross-sectional study a hypertension prevalence of 29.4%. WHO later reported a prevalence ranging between 21.0 % to 40 % with an average of 29 % (WHO, 2015).

Hypertension and its complications are preventable and this depend on various factors including patient adherence to health provider's prescribed treatment and recommended life style changes needed to maintain the high blood pressure level under control (National Community Pharmacists Association, 2013; Osterberg & Blaschke, 2005).

Keeping one's blood pressure under control and modifying habits considered as risk factors for hypertension and its complications, are the main difficulties encounted by patients, since hypertension is a life time disease and therefore request patient to take his medications for all his life. Patient non-adherence to hypertension is the main factor for uncontrolled blood pressure level (WHO | Raised blood pressure, 2015).

According to WHO (2013), adherence to therapy is generally low worldwide with an average of 50 % patients adhering to their treatment and this estimate is even lower in developed countries, and lowest in developing countries. In Ghana, Laryea (2013) Botchway (2014) found respectively a adherence prevalence of 47.7 % and 32.7%. Adherence to therapy, mostly long term therapy such as in chronic diseases, optimizes patient health outcome, reduces healthcare cost and ensure quality of care and patient safety (Osterberg & Blaschke, 2005; Sabate, 2003).

Factors contributing to patient non-adherence to hypertension treatment include: patient awareness of hypertension; health provider communication; drug regiment and drug adverse reaction, health care accessibility, income, educational level, age; marital status (Sabate, 2003). The quality of health provider and patient communication is influential in patient adherence to hypertension treatment (Stavropoulou, 2011; Clever, Jin, Levinson, & Meltzer, 2008; Almas, Bhamani, & Khan, 2014) .

Despite several interventions and programs developed to address specifically the factors contributing to non-adherence to hypertension, non-adherence still remains a worldwide

important barrier in controlling high blood pressure (WHO, 2003). Adherence to treatment requires patient awareness, information, education and appropriate communication to understand the need to take hypertension medications, patient motivation and willingness to fully accept a long life term condition which may bring several consequences if the correct instructions are not followed.

1.2 Problem Statement

Adherence to treatment is a worldwide public health concern and at the same times a major indicator of healthcare effectiveness. Adherence to treatment is generally low worldwide and lowest in developing countries (WHO, 2003). Researchers suggested that health provider-Patient relationship plays an important role in patient adherence. In Ghana, Laryea (2013) and Botchway (2014), found that only 43.7% of patients attending Korle-Teaching Hospital and 32.7 % of patients in Achimota Hospital were compliant with their treatment. Studies on adherence in Africa focused mainly on patients attending teaching and regional hospitals, which constitute third referral level. Little is known on adherence to hypertension treatment among rural patients who attend district hospitals and which represent second referral level. Moreover few studies have assessed health providers' relationship with patients using an Interpersonal Processes Care Survey (IPC).

This study sought to determine the proportion of hypertensive patient adherent to their treatment and how health provider communication influences adherence to hypertension treatment in Gomoa West district hospital.

1.3 Conceptual framework

The conceptual framework was adopted from WHO's "five dimensions of medications adherence" identified as main barriers to effective adherence to drug regimen (Sabate, 2003) represented in Figure 1. The study focused mainly on the health provider and patient relationship.

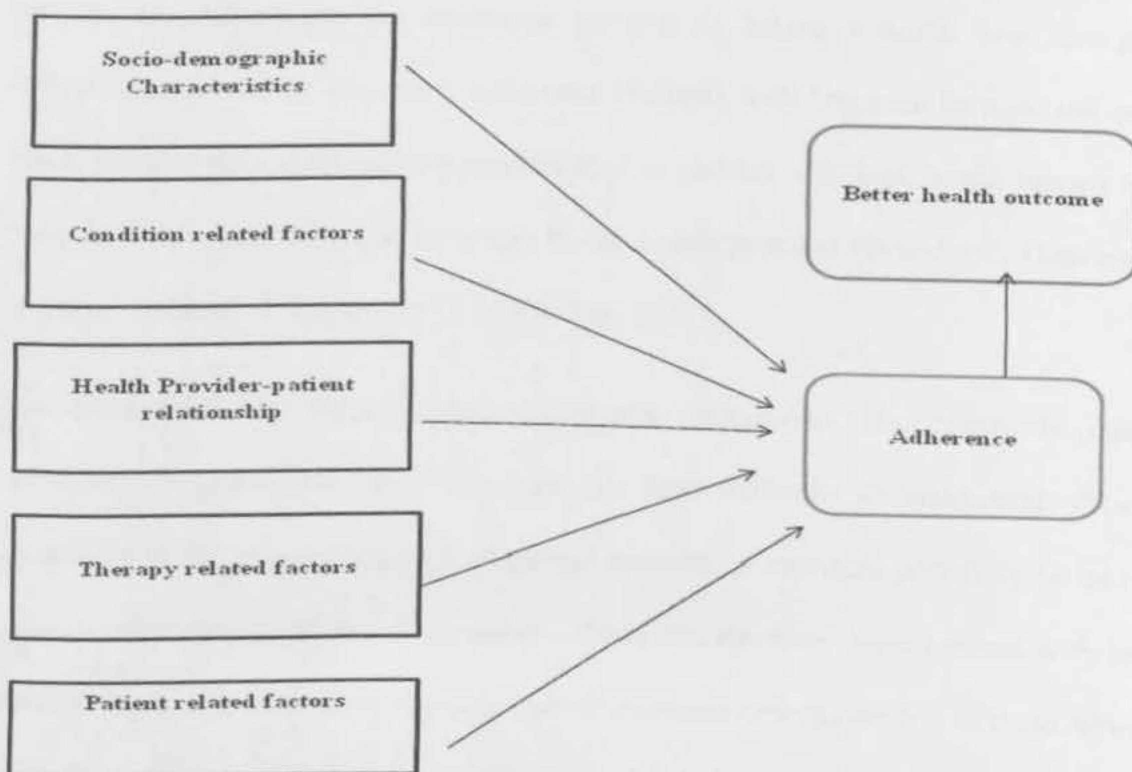

Figure 1.Conceptual framework on factors affecting adherence to medications Adapted from (Sabate, 2003).

1.3.1 The WHO's multidimensional medication adherence

Patient adherence to hypertension medications is recognized as the most effective way of controlling high blood pressure level. WHO stated that "adherence is a multidimensional phenomenon determined by the interplay of five sets of factors, termed "dimensions" (Sabate, 2003).

1. Socio-economic factors

2. Patient related factors
3. Condition related factors
4. Therapy related factors
5. Provider-patient/ Health care system related factor:

Socio-economic factors: educational and financial status, patient gendre, lack of family support, inability to pay for healthcare services or having a health insurance plan influence positively or negatively adherence. Patients with language barriers and poor health literacy have lower adherence compared to patients with high health literacy and patients who speak the same language as the health provider (Brundisini, Giacomini, Dejean, Vanstone, & Winsor, 2013; Sun & Rau, 2017).

Patient related factors: visual, hearing and cognitive impairment affect negatively patient adherence to medications since these patients have difficulty to understand. Patient awareness of the disease and high perceived benefits of treatment positively influence patient adherence (Gallagher & Levinson, 2004). On the other hand patients with low perceived risk of the disease and low perceived treatment benefits are less likely to adhere to their treatment (Alphonce, 2012; Botchway, 2014; Kamran, Sadeghieh Ahari, Biria, Malepour, & Heydari, 2014).

Condition related factors: Association of comorbidities in addition to hypertension has been identified as a barrier to effective adherence (Sabate, 2003).

Therapy related factors: patients with more than one pill to take and a frequency higher than twice daily have lower adherence compared to those with one pill to take. A diagnostic length of more than 10 years is associated with poor adherence as well as patients who perceived medications side effects (Eduardo sabate, 2010; Kamran et al., 2014; Venkatachalam, Abrahm, Singh, Stalin, & Sathya, 2015).

Health provider-patient relationship is the most important factor in patient adherence. Studies on health provider and patients' relationship have suggested that health provider communication style, interpersonal style and shared decision-making in patient's treatment plan, had great impact on patient behaviour and attitude toward adherence (Dubey & Gupta, 2015; Eduardo sabate, 2010; Osterberg & Blaschke, 2005)

1.4 Study justification

Patient adherence to hypertension treatment is crucial to improve patient health outcome and to tackle the increasing number of cardiovascular diseases caused by uncontrolled blood pressure. Very little is known of patient adherence to treatment in rural settling. This study was looking at patient adherence through patient perception of the quality of the health provider communication at Apam Catholic hospital. The results of the study will be an indicator of the quality of care delivery in Gomoa West and may serve as solutions on how to reduce hypertensive patient to develop cardiovascular diseases by adhering to their treatment.

1.5 Research questions

The study is looking to answering these questions

(1) What is the level of adherence to hypertension treatment?

(2) How does patient perceive the health provider communication on hypertension treatment adherence?

(3) Does health provider-patient communication influences adherence to hypertension treatment?

1.6 Objectives

1.6.1 General objectives

The general objective is to:

Assess health-provider communication on patient adherence to hypertension treatment

1.6.2 Specific objectives:

The specific objectives are to

1. Determine the level of adherence of patients to antihypertension medications
2. Assess patients' perception of health provider communication on adherence to treatment

Determine the relationship between health provider-patient's communication and patient adherence to hypertension medications.

CHAPTER TWO

LITERATURE REVIEW

This section reviews previous studies done on the state of hypertension in the world and related data on adherence to hypertension treatment and lifestyle changes and on methods and tools available to assess patient adherence. It also reviews works and studies related to health provider and patient relationship on patient adherence to medications.

2.1 Hypertension determinants and prevalence worldwide

Initially thought to be a disease of the developed and high economic countries, hypertension has become a worldwide public health concern due to the high burden of the disease and a tremendous increase in its prevalence in developing countries, where it was initially rare 40 years ago (Tibazarwa & Damasceno, 2014). Hypertension prevalence was found to be high in developing countries with Africa having the highest prevalence with 46 % whereas, Americas was having the lowest prevalence of 36 % (Joffres et al., 2013; WHO, 2015).

In Europe, data collected in 2010 showed Hungary having the highest prevalence of self-reported raised blood pressure with a prevalence of 35.4% followed by Slovakia (29.7%) and Germany (27.4 %). The lowest rate were recorded in France, with a prevalence of 14.7 % (Eurostat, 2015).

Joffres et al. (2013), in a comparative study between USA, England and Canada, found a higher prevalence of hypertension in England (30 %) compared to USA and Canada with respectively 29% and 19.5%.

In a systematic analysis of population-based studies and age-standardized, Mills, Bundy, Kelly, Reed, Kearney & Reynolds (2016) reported an increase in the number of hypertension in the world by 466.8 million between 2000 and 2010 among which 440.1

million increase was in low and middle income countries. According to the study the overall hypertension prevalence has increased by 5.2% (Mills et al.,2016).

Although the study found a 2.6% decrease in the age-standardized prevalence of hypertension in high income countries, it also reported an increase of 7.7% in LMIC.

Basu et al. (2013) in a systematic review and meta-analysis of hypertension in low and middle income countries found a prevalence rate of 32.3% (95% confidence interval [CI] 29.4–35.3) in a pooled prevalence by geographical region. The Middle East and North Africa region had the lowest prevalence (26.9% [95% CI 19.3– 35.3])

Similarly, in their systematic analysis, Mills et al., (2016), found a decrease in the hypertension prevalence in these same regions.

For the past 20 years, Africa has seen an increase in its hypertensive population, (Agyemang et al., 2006; Iwelunmor et al., 2014; Mills et al., 2016; Paolo, Michelle, & Miller, 2016; van de Vijver et al., 2013). The fast urbanization and modernization of the African cities and rural areas played an important role in this situation. The introduction of processed foods, the increase in tobacco and alcohol consumption and a sedentary life practically due to technological improvement, are aggravating risk factors which can be modifiable.

As in Europe and other parts of the world, the prevalence, risk factors, awareness and control of blood pressure in Africa showed significant disparities across the continent (Guwatudde et al., 2015).

Studies done in Africa used different objectives and approaches to determine the prevalence of hypertension, its determinants and the awareness and its control across the continent.

In a cohort study conducted across four African countries: Nigeria, Uganda, South Africa and Tanzania Guwatudde et al., (2015) used a standardized questionnaire and a physical

and biochemical measurement protocol to determine the prevalence of hypertension among different population group in these countries. The study reported a crude prevalence of 36.9% and an overall age-adjusted prevalence of 25.9%. Nurses' population in Nigeria had higher prevalence of hypertension compared to teachers' population in South Africa and Tanzania. The lowest prevalence was found in the rural population in Uganda which also recorded the lowest awareness level (14.3%). 77.9% of the Nurses' population were aware of their condition ($p<0.001$).

Prevalence of hypertension was associated with age, being overweight (BMI between 25-29.9 kg/m^2), tobacco use, fasting plasma glucose. Significant difference was reported between population groups. Thus occupation had a significant association with hypertension as well as living in urban areas compared to rural areas.

This was also confirmed by Doulougou, Kouanda, Rossier, Soura, & Zunzunegui (2014) in a cross sectional survey to find differences among formal and non-formal (slums) areas in Ouagadougou capital of Burkina Faso, found an overall hypertension's prevalence of 18.6% (95% [CI], 16.9-20.3). The prevalence in the formal areas was significantly higher than in informal areas (slums) (Doulougou et al., 2014). But this difference become non-significant after adjusting for age.

Similarly in a cross sectional study including major cities in Cameroon, Dzudie, Kengne, Muna, Ba, Menanga, Kouam, Kouam Abah, Monkam, Biholong, Mintom, Kamdem, Djomou, Ndjebet, Jules Wambo, Cyrille Luma, Henry Ngu, Kathleen Blackett (2012) found a high prevalence of hypertension (47.5%) associated with less than 50 % awareness 31.7% and a very poor blood pressure control. Age, sex and high level of BMI were the main determinants associated with high blood pressure.

In 2004 cross-sectional study, Agyemang et al., (2006), reported an overall hypertension prevalence of 29.4% in Ashanti region of Ghana . The study randomized six churches,

seven schools and two banks from the regional capital Kumasi and also included four surrounding villages. Hypertension awareness among these hypertensives was 34%, 28% had hypertension treatment, and only 6.2% had their blood pressure under control (Agyemang et al., 2006). In recent studies by Laryea (2013) and Botchway (2014) the prevalence of hypertension had significantly increased in Ghana with a hypertension prevalence of 47.7% and 32.7% respectively.

Patient awareness of his condition is a key factor in controlling high blood pressure as well as to increase patient adherence to hypertension treatment. There is evidence of disparities in hypertension awareness, treatment and control across countries, regions, urban and rural areas but also between male and female, different age groups and (Agyemang et al., 2006; Dzudie et al., 2012; Ibrahim & Damasceno, 2012; Joffres et al., 2013; Mills et al., 2016)

Studies showed developed countries and high income countries had greater awareness than developing countries and low and middle income (Joffres et al., 2013; Mills et al., 2016). Although developed countries showed higher awareness compared to developing countries, studies showed some differences in the level of hypertension awareness among some countries and continents. Joffres et al (2013), in a comparative cross national survey, found a higher awareness in Canada (83%) and USA (81%) compare to England.

Women generally had better awareness level and higher blood pressure control than men (Van de Vijver et al., 2013). Awareness also seems to increase with age (Botchway, 2014; van de Vijver et al., 2013). Hypertension awareness was also reported to increase with age and education and living in urban area. On the other hand, blood pressure control was shown to decrease with age and lowest in male and mentally challenged patient.

Except for factors such as low access to healthcare and poverty in low and middle income country, several studies found that the determinants and risk factors of hypertension

across all regions were identical (Basu & Millett, 2013; Bosu, 2010; Iwelunmor et al., 2014; Kearney et al., 2005; Nwankwo, Yoon, Burt, & Gu, 2013; Venkatachalam, Abraham, Singh, Stalin, & Sathya, 2015; WHO, 2013 Tibazarwa et al., 2014; Ibrahim et al., 2012). Healthcare accessibility, poor health infrastructure and low income influence patient health status and contribute to poor control of high blood pressure.

Modification of lifestyle such as reducing salt intake, exercising, reducing or stopping alcohol consumption and tobacco use, eating a balanced diet which include more fruits and vegetables, reducing fatty food from diet and stopping smoking are recommended for the control of high blood pressure level and to enhance the treatment of hypertension (Eduardo sabate, 2010; Ibrahim & Damasceno, 2012).These recommendations are advice given to patient during consultation by the health provider in the aim to prevent and reduce the complications caused by high blood pressure and the high financial cost associated with it (WHO, 2003).

2.2 Adherence to medication therapy

This section reviews the factors influence patients adherence and the tools used to assess patients adherence.

2.2.1 Adherence overview

Patient adherence to hypertension treatment has been recognized as the most effective way of controlling high blood pressure and to reduce the mortality and morbidity (WHO, 2003; Kamran, Sadeghieh Ahari, Biria, Malepour, & Heydari, 2014;). According to WHO (2003), adherence is an important determinant of health care effectiveness as well as a health modifier (p.22). This can positively or negatively influence the health outcome of hypertensive patients. Adherence to medications is generally low worldwide and particularly lowest in Africa (Ibrahim et al., 2012; WHO, 2003)

This study used the WHO definition of medication adherence which defined medication adherence as "the extent to which a person's behaviour taking medication, following a diet, and/or executing lifestyle changes, corresponds with agreed recommendations from a health care provider" (WHO, 2003).

WHO (2003), emphasis on the fact that adherence to therapy include different types of behaviours such as: Seeking medical attention, filling prescriptions, taking medication appropriately, obtaining immunizations, attending follow-up appointments, and executing behavioural modifications that address personal hygiene, self-management of chronic diseases, smoking, contraception, risky sexual behaviours, unhealthy diet and insufficient levels of physical activity (p.3).

On the other hand, medication non-adherence reflects the non-application of what was expected to be done in accordance with health provider's recommendations, either intentional or not. It is often described in terms of behaviours and attitudes which lead to the misuse and /or underuse of medications including: failure to fill or to refill a prescription, forgetting to take pills, missing a dose, taking a dose at the wrong time, taking less or more of a medication than prescribed or discontinuing a medication before completing the full course (Sabate, 2003). Multiple factors should be considered when addressing non-adherence to therapy, mostly long term therapy.

2.2.2 Measuring patients adherence to therapy

Patients' adherence to medication is measured either using the direct method which include: direct observed therapy, measurement of the level of a drug in blood or urine and detection or measurement of a biological marker added to the drug formulation, in the blood (Jimmy & Jose, 2011) or indirect method which include using a questionnaire to interview patients or patient self-report is behaviour toward medications(Morisky, Green, 1986; Jimmy et al, 2011).

2.3 Hypertension and medication non-adherence

Hypertension is the world leading cause of cardiovascular diseases and is responsible for 9.4 million deaths in the world every year (WHO, 2013). Hypertension is a chronic disease which requires patients to take medication for a lifetime once diagnosis has been made.

Studies on hypertension have reported significant low blood pressure control worldwide and Africa having the most import share (Ibrahim et al., 2012; Mills et al., 2016). Mills et al (2016), reported an increase in the number of hypertension worldwide by 466.8 million since 2000 among which 440.1 million increase was in low and middle income countries. Whereas hypertension awareness, treatment and control significantly improved in high income countries, low and middle income countries showed little increase in awareness and treatment whereas hypertension control decreased. This represents a major public health concern since poor blood pressure control is the leading cause of cardiovascular diseases and kidney failure and therefore increasing the medical and financial burden of hypertension (WHO, 2013).

2.3.1 Factors influencing non-adherence to hypertension medications

According to WHO, adherence to therapy is not the patient 'sole responsibility but instead and interplay of factors which are group into five main dimensions: socio-economic factors, patient factors, condition related factors, therapy related factors, provide-patient/ healthcare system related factors (Sabate, 2003).

Researchers reported evidence of strong association worldwide, between adherence and age, sex, educational status, marital status and self-perception (illness representation) of health status (Botchway, 2014; Joho, 2012; Kamran et al., 2014; Venkatachalam et al., 2015). Female hypertensive patients have better adherence than their male counterpart

(Botchway, 2014; Joho, 2012; Kamran et al., 2014; Venkatachalam et al., 2015; Yue et al., 2015). Patients with at least a basic education demonstrated higher adherence compared to patients with no formal and tertiary education. Literature suggests that adherence to medications is generally low among elderly patients, highlighting the difficulties encountered by this population group such as cognitive impairment, hearing impairment and abuse among other (Rajpura & Nayak, 2014). But recent studies found that adherence to hypertension medications was higher in elderly patient (65 years and above) than those younger (Botchway, 2014; Venkatachalam et al., 2015; Yue et al., 2015). Contrary to these studies, Joho (2012) reported a higher adherence among respondents aged 64 years and below. Also patients with high level of knowledge and social support were associated with better adherence to hypertension medications.

Patient perception of his condition is a major contributor to medication adherence. Adherence to therapy is influenced by patient knowledge, belief, motivation and understanding of his condition. Recent studies on factors influencing patients non-adherence to hypertension medications and using the Health Belief Model (HBM) as conceptual framework to measure patient's illness perception, found patients who perceived high susceptibility, and perceived low barriers reported better adherence compared to those who perceived low susceptibility and perceived high barriers (Alphonce, 2012; Kamran et al., 2014; Venkatachalam et al., 2015). On the other hand patients who perceived low severity of their condition were less likely to adhere to their medications compared to those with perceived high severity (Alphonce, 2012; Botchway, 2014; Kamran et al., 2014). Venkatachalam et al., (2015) found that non-adherence to hypertension medications was 24.5 times higher among participants who perceived low benefit than those who perceived very high benefits.

Patient medical conditions such as length of diagnosis, number of co-morbidity were reported playing significant roles in adherence to hypertension therapy. Patient with only one co-morbidity show better adherence (Botchway, 2014; Yue, 2015).

In developing countries like in Africa, access to healthcare, cost and availability of hypertension medications are negatively associated with hypertension medications adherence (Basu et al., 2013; Ibrahim et al., 2012). Holding a health insurance encourages patients to seek healthcare and was reported to improve adherence (Basu et al., 2013; Ibrahim et al., 2012; Yue et al, 2015).

Health provider and patient relationship is also an important factor which can influence patient adherence, mostly long term adherence. Yue et al, (2015) found in their bivariate analysis that the availability of professional guidance was significantly associated with hypertension medications adherence ($p < 0.001$).

2.4 Health provider and patient communication/ relationship

Health provider and patient relationship is an important component of the health care delivery which influences patient health outcome as well as patient behaviour toward medications adherence (Eduardo sabate, 2010; Ha et al., 2010) . Health provider is the epicentre of quality healthcare delivery; consequently, his ability to communicate, his attitude and behaviour toward patient are determinants to a good health provider-patient's relationship and patient satisfaction (Brown, 2006; Eduardo sabate, 2010; Ha et al., 2010; Udonwa & Ogbonna, 2012).

Different types of communication exist, but studies suggested that the most effective and efficient one is when a mutual collaboration exists between the health provider and the patient (Almas et al., 2014; Ha et al., 2010; Jimmy et al., 2011).

Earlier doctor- patient relationship focused on the doctor being the sole decision maker and the patient a follower but the recent healthcare system shift toward a more patient-centered care, involved engaging patient to take charge of his health in a proactive way on the patient side, and on the health providers side, to treat patient as a whole and not just the disease. This involves the health provider to be more inquisitive about patient health using adequate communication and interpersonal skills (Ha et al., 2010; Jimmy & Jose, 2011; Turner, 2013). Allowing patient to asked question and to receive appropriate and satisfactory responses, create awareness and lead to a better adherence to treatment. Studies have shown that patients who have collaborative relation with their health provider have their blood pressure more under controlled than those who do not collaborate with their health provider. These patients found their health providers more caring and compassionate (Almas et al., 2014; Brown, 2006; Schoenthaler et al., 2009).

Researchers also suggested that good health provider-patient collaboration in decision making about patient treatment leads to better patient health outcome and increase, patient and health provider's satisfaction with the service delivery (Almas, Bhamani, & Khan, 2014; Dubey et al., 2015). Patient and health provider built a trusting relationship base on the quality of the communication, health provider knowledge, empathy and behaviour toward patient. Once a patient is satisfied with the healthcare delivery, understand his condition and why he should adhere to his hypertension treatment, patient self-invests in the management of his sickness by correctly taking his medications and apply health provider recommendations (Gallagher et al., 2000; Sabate, 2003).

2.5 Gap in the literature

Most studies done to assess patient's adherence to medications worldwide focused on patients related factors, socio-economic factors therapy related factors and conditions related factors. Little is known on how patients and health provider relation may influence patient's behaviour toward medications. Little is also known on the state of patient adherence to hypertension treatment in district hospitals in Ghana, which are first level referral. This study sought to determine patients adherence to their treatment and how health-provider and patient relationship influence treatment adherence in a district hospital in Central Region of Ghana.

CHAPTER THREE

METHODOLOGY

This chapter describes the methodology of the study. It describes the study area, study design, sampling procedures, sample size determination, data collection techniques and tools, data analysis, ethical considerations and confidentiality. Informations about the study area were obtained from Apam Catholic Hospital.

3.1 Study design:

The study was a descriptive cross-sectional design among hypertensive patients aged 18 and above and attending the OPD at Apam Catholic Hospital. A quantitative approach with survey questionnaires was used to assess patients' adherence, patients' perception, and patients' socio-demographic and medical characteristics.

3.2 Study area

The study was conducted at St Luke Catholic Hospital at Apam in the Gomoa West district in Central Region of Ghana. Figure 2 1 shows location of Gomoa West.

The Gomoa West District is one of the twenty districts in the central region. The district is situated between Latitudes 5.14' north and 5.35' north and Longitudes 0.22' west and 0.54 West on the eastern part of the Central Region of Ghana. It shares border with Gomoa East, Mfantsiman, Ajumako Enyan Denkyira Agona West and Effutu and has seven town and Area councils for local administration. Gomoa West is one of the poorest districts in Ghana and was rank last in the 2015 District League in Development Table with only 37 % in development. It covers an area on 1,022.3 square kilometers and has a population of 135,189. The Fantes are the dominant ethnic group in Gomoa west.

Apam is the district capital and it is almost equidistant between Cape Coast and Accra. Apam Catholic Hospital is one of the five (5) faith-based hospitals within the

Archdiocese of Cape Coast in the Central Region of Ghana. It was established in the late fifties on the Coast first as a clinic by three (3) Dutch Reverend Sisters .Later some infrastructural developments were added to develop it into its present status as a dependable hospital rendering 24hr services to the people of Gomoa and beyond. The hospital is a member of the Christian Health Association of Ghana (CHAG) and has 105 beds for admissions, a 45 bed accidents and emergency unit, and offers services in the following; medical, surgical, basic ophthalmology, obstetrics and gynaecology, ultrasound scan, x-ray and laboratory services, reproductive health and the provision of anti Cock for TB clients and antiretroviral therapy for HIV clients.

The current medical team at the OPD is composed of one Obstetrics and Gynaecology specialist (01) which is also the medical director, one physician specialist, two medical officers (02), one dentist (01), two physician assistants (02), two principal nurse officers who help in managing hypertensive and diabetic patients on clinic day, and seven (07) nurses composed as follow: one (01) Nurse Officer, two (02) staff nurses, three (03) enrolled nurses and one (01) principal enrolled nurse. These nurses' roles are to

- screen patients at the OPD,
- administer treatment,
- explain treatment,
- deliver health education to patients

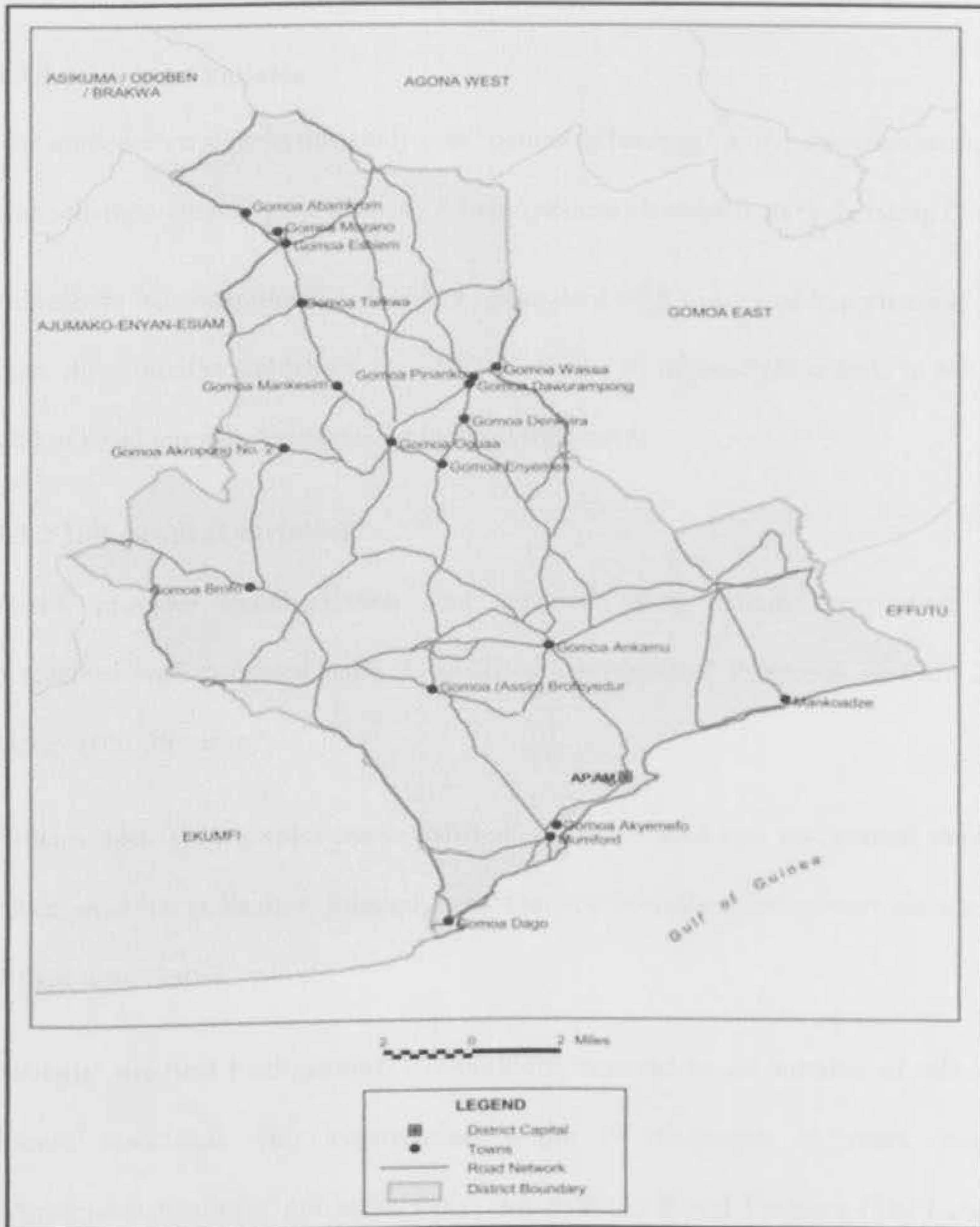

Figure 2 Map of Gomoa West (Ghana Statistical Service (GSS), 2014)

3.3 The study variables:

3.3.1 Dependent Variable

The outcome variable in this study was "patient adherence" to hypertension treatment and was self-reported using the Morisky 8 Items scale with two Likert scale rating (Yes/No).

Adherence was operationalized as any respondent with history of hypertension for more than three months and who successfully fulfilled all of the eight criteria in MMAS was said to be adherent to hypertension medical treatment.

3.3.2 Independent variables

Health provider communication was assessed using patient "perception". Patient perception was measured using a modified Interpersonal Processes of Care 29 items survey (IPC 29 survey).

Patients' socio-demographic characteristics: These included age, sex, marital status, educational status, income. Ethnicity was removed from the questionnaire since most patient were Fantes.

Patients' medical background: Co-morbidity referred to the number of other chronic disease associated with hypertension length of diagnostic in years, number of hypertension treatment pill taken daily, last Systolic Blood Pressure (SBP) checked in millimetre of mercury (mmhg), last Diastolic Blood Pressure (DBP) checked in millimetre of mercury (mmhg), having a health insurance card form National Health Insurance Scheme (NHIS).

Lifestyle change adopted by patients: referred to the types of lifestyle adopted by patients in addition to the medical treatment to control blood pressure. These were: drinking alcohol, smoking, exercising, adopted a low fat diet, reduction of salt intake

3.4 Study Population

The study population were hypertensive patients attending OPD at Apam Catholic Hospital, aged 18 and above and with disease duration not less than three months.

3.4.1 Inclusion criteria

The inclusion criteria for this study will be all hypertensive patients aged 18 and above, with a length of diagnosis not less than 6 months.

3.4.2 Exclusion criteria

The exclusion criteria were hypertensive patients with aged below 18, those with length of diagnosis less than six months, hypertension in pregnancy, patients who were too ill to talk/ or unable to talk for themselves.

3.5 Sampling

3.5.1 Sample size

The study sample was calculated using the formula $N=Z^2 P (1-P) / D2$

Where

N = sample size

P = assumed prevalence of compliance 32.7% (Botchway, 2014)

D = significant level at 95% confidence interval

Considering a margin of error of 5% and a 95% confidence level, then the minimum required sample size was 328.

3.5.2 Sampling procedure:

Due to time, financial mean, lower patient attendance because of the raining season a consecutive sampling technique was adopted to recruit participants of the study.

Consecutive sampling is a sampling technique which selects every subject who meets the inclusion criteria until the sample size is met.

All patients meeting the inclusion criteria and attending OPD on daily basis were interviewed after signing the consent form. Patients were interviewed after seeing their health provider at the OPD. The participants were interviewed according to their rank on the health provider's consultation list for each consulting rooms (4 consulting rooms). Interviews continued until the last patients.

3.6 Data collection and management

3.6.1 Determining the adherence to hypertension medications

Patient adherence to treatment was measured using the Morisky Medication Adherence Scale eight (8) Items. The MMAS is a self-reporting composed of eight questions. The first seven items are binary question with yes or no as answer, where a 'yes' scores 0 and a 'no' scores 1. The last question which has a 5-point Likert scale response option; (A) Never/Rarely (B) Once in a while (C) Sometimes (D) Usually (E)All the time had a score of 1 if the answer was A and a score of 0 if the answer was B to E. The higher score which is eight (8) represents high adherence, a score range between 6 and 8 but less than eight represents medium adherence; and a score less than six represents low adherence (Morisky, Ang, Krousel-Wood, & Ward, 2008).

3.6.2 Patient perception of health provider's communication

"Perception" was measured with a modified IPC 29 Items Scales from the University of California of San Francisco. The Interpersonal Processes of Care (IPC) Survey is a patient-reported and multidimensional tool designed to assess interpersonal aspects of care for patients from diverse racial/ethnic and lower socioeconomic status groups. It assesses three principal domains:

1. Communication,
2. Patient-centered decision making, and
3. Interpersonal style.

It includes 29 items representing 12 first-order and 7 second-order factors with equivalent meaning (metric invariance) across groups. Twenty five items assess doctors' interpersonal processes of care and 4 items assess office staff .Table 1 shows operationalized term for "health providers".

All responses were on a 5 Likert scale ranging from 1 to 5, where 1= Never, 2= r

Rarely, 3= Sometimes, 4= Usually and 5= Always

Table 1. Operationalization of study's health provider

Health Providers	Represented in the study by
Doctors	• 1 Obstetrician Gynaecologist • 1 Physician Specialist • 2 medical officers • 2 physicians assistants • 3 Principal Nurses
Office staff	• OPD nurses, • the record office staff, • the health insurance staff • the cleaning staff

According to Stewart et al.,(2006) the IPC survey can be used to describe disparities in interpersonal care, predict patient outcomes, and examine outcomes of quality improvement efforts to reduce health care disparities (Stewart et al., 2006). Table 2 presents details of the IPC 29 items survey.

Table 2. Details of IPC 29 items (Stewart et al., 2006)

‡DOMAIN ®2nd order factor (scale) ©1st order factors (scale)	# of items	Direction of scoring**	Items' (questions) Numbers
COMMUNICATION			
Hurried communication	**5**	–	**1, 2, 3, 4, 5**
lack of clarity	2	–	1,2
hurried, distracted	3	–	3,4,5
Elicited concerns, responded	3	+	6, 7, 8
Explained results, medications	4	+	9, 10, 11, 12
DECISION MAKING			
Patient-centered decision making	4	+	13, 14, 15, 16,
asked patient	2	+	13, 14
worked together	2	+	15, 16
INTERPERSONAL STYLE			
Compassionate, respectful	5	+	17, 18, 19, 20, 21
Emotional support, compassion	3	+	17, 18, 19
respectfulness	2	+	20, 21
Discriminated	4	–	22, 23, 24, 25
Assumed	2	–	22, 23
Discriminated due to race/ethnicity	2	–	24, 25
Disrespectful OPD staff	4	–	26, 27,28,29

‡Domains: Communication, Decision making, Interpersonal style
® First order factors (scale) in each domains
©Second order factors (subscales) measuring each scales
Items= Number of questions measuring the subscale
** Indicates the direction of the score on the 5 Likert scale: ** – indicates high score is worse processes, + indicates high score is better processes

Communication: Assesses quality of communication, measured by 12 items (questions) and comprises

- Three first order factors (Subdomains): Hurried communication; Elicited concerns, responded; explained tests, results
- Five second order factors (scales): "Clarity of communication"; "hurried, distracted"; "Elicited concerned, responded" (also a subdomain); "Explained tests"; "Explained results".

Patient decision-making: Assesses patient and doctor collaboration on treatment plan, was measured with four items (questions)

- One first order factor (subdomain): Patient centered decision making
- Two second order factors (scales): "Asked patient" and "worked together"

Interpersonal style: Assesses health providers' interaction with patient, measured by thirteen items (questions) and comprises

Three first order factors (subdomains): "Compassionate, Respectful", "Discriminated", and "Disrespectful staff"

Five scales: "Emotional support, compassion", "Respectfulness", "Assumed Socio-Economic Status (SES)", "Discriminated due to race/ethnicity", "Disrespectful office staff"(also a subdomain)

The scale "discriminated due to race/ethnicity" was removed from the survey to avoid any bias since our study was conducted in an area where majority of population were black and from the Akan's ethnic group.

The first order factor scale "discriminated due to ethnicity/race" was removed to avoid sample bias since the main race was black African, Ghanaian and the main ethnic group found in Gomoa West was Akans in general and Fantes particularly. This reduced the survey to 27 items and the first order factors (scale) to 11 instead of 12 found in the original survey

Scoring of the IPC Scales:

Direction of scoring: A higher score of an item indicates a higher frequency of labelled interpersonal process, which means in some cases higher scores indicate better processes and in other cases higher scores indicate worse processes.

The backgrounds variables: were collected through a designed questionnaire and were self-reported.

All questionnaires were translated into local language which is ''Fante'' by an expert for patient convenience.

3.7 Quality control

The MMAS 8 items and the IPC 29 items survey had been previously validated in other studies as fit for the purpose for which they were used (Morisky et al., 2008; Stewart et al., 2006). Two research assistants were recruited and trained. The research assistants were recruited if they were able to speak English and at Fante. Two days (02) training for the research assistants took place two weeks prior to the study, at the hospital premise and under the supervision of the Principal Investigator and the Medical Director of Apam Hospital and a Principal Nurse. A pre-test of both survey questionnaires and the designed questionnaire was conducted at in the Hospital to ensure that

- Participants understand the questions in their preferred language and
- To ensure the quality of reporting of the research assistants.

3.8 Data processing

This was done by coding and entering of the raw data into computer to obtain meaningful informations in relation with the objectives of the study. Data were reviewed by the PI after data collection to check for any missing information and then corrected with the research assistants. Data were codified, validated and entered into Excel then transferred to Stata 14.1.

3.9 Data analysis

Data were analysed using STATA version 14.1. Data were presented using mean and standard deviation for numerical variables and as frequency tables and proportions for categorical variables

Patient Adherence

Adherence was first analysed on a continuous scale. Patients' scores were obtained by adding the 8 items scores together. Adherence's mean and standard deviation were calculated. Adherence was then categorized into "low adherence" a score less than 6, "medium adherence" a score ≥ 6 and ≤ 8, "high adherence" a score of 8. To facilitate the chi square test, Adherence score were dichotomized into "optimal adherence" a score equal to 8 and "suboptimal adherence" a score less than 8.

Patient "perception" of health provider communication

The mean and standard deviation was calculated for each scale. The means were obtained by adding items from a specific scale then dividing the results by the number of items of the scale. The scores obtained were rounded up to the closest one digit number. Each scale was then dichotomized into

- "Good IPC"= IPC score ≥ 4 for all scales except for the scales "lack of clarity", "hurried, distracted" and assumed SES", "disrespectful office staff" were a score < 4 was considered as good IPC
- And "Poor IPC"= a IPC score $<$ to 4 for all scales except for the scale "lack of clarity", "hurried, distracted" and assumed SES", "disrespectful office staff" were a score ≥ 4 was considered as "poor IPC"

The Cronbach' alpha was calculated for all three domains to estimate the internal consistency reliability of the scales.

Independent t-test was used to determine the mean age for "optimal adherence patients" and "suboptimal population"

Bivariate analysis was conducted between adherence and socio-demographic, medical background variables and binary IPC's scores for each scale. (Good IPC and Poor IPC). The relationship between adherence and study's variables was examined using Person's chi square test.

All tests were set at a significant level of 5% Association with a P value equal or less than 0.005, were considered statistically significant. Simple logistic regression was conducted to find the strength of the association. Although few associations were reported, variables with a P value < 0.2 were considered for the logistic regression in addition to the IPC's variables. These variables were: patient age (categorized in group), length of diagnostic, number of co-morbidities and IPC's scales (binary form).

3.10 Ethical consideration

Ethical consideration is an important part of the research, which seek to protect both, the research participants and the researcher. Consequently approval to conduct this study was

sought from the Ghana Health Service Ethical Review Committee (GHSERC). Approval to conduct the study at Apam hospital was also sought from the Hospital management.

Risks and benefits: The study had no potential risks and the benefits were clearly explained to patients.

Confidentiality: There was no compensation for any participant and it was explained to participants their right to withdraw from the study at any point in time. All data collected were confidentially kept and stored electronically under password protection. Hard copies were stored and were only accessible by the principal investigator

Conflict of interest: The PI had no conflict of interest and the study was entirely funded by the PI as part of obtaining a Master of Public Health.

CHAPTER FOUR

RESULTS

4.1 Socio-demographic and medical characteristics of study participants

4.1.1 Socio-demographic characteristic of patients

A total of three hundred and seven hypertensive patients attending the outpatient department of Apam Catholic hospital were interviewed between May and June 2017. Patients age ranged from 22 years to 89 years with a mean age of 62.3 (SD= 12.2) and majority were female 237 (77.2 %) and Christians 291 (95 %). Half of patients were married 155 (50.8 %) and attended primary school 155 (50.5 %). Patients with an employment presented 138 (41.1 %) follow by those with no employment 103 (33.7 %) and 253 (80.7 %) earned a monthly income less than two hundreds Ghana Cedis. The details of participants demographic and socio-economics characteristic are provided in Table 3.

4.1.2 Medical characteristics of participants

The mean systolic and diastolic blood pressure of the study participants were respectively 142 mmHG (SD= 16.8) and 77.7 mmHG (SD= 10.03). High cholesterol was the main co-morbidity associated (15.3 %) followed by diabetes (12%). Almost all patients had a health insurance (98.4 %) and were hypertensive for less than five years (70.9 %). All patients self-reported doing physical activity, changed their diet, and reduced salt intake, not smoking and not taking alcohol (100%). Majority 201 patients (66.1%) were on one pill daily. Patient's medical characteristics are presented in Table 3.

Table 3. Socio-demographic characteristic of study participants

Variables	Frequency	Percentage
***Age in year M (SD)**	62.3 (12.3)	
Sex of respondent n (%)		
Male	70	22.8
Female	237	77.2
Marital status * n (%)		
Never married	9	3.0
married	155	50.8
Separated/Divorced	40	13.1
Widowed	101	33.1
Educational status n (%)		
No formal education	128	41.7
Primary	155	50.5
Secondary	21	6.8
Tertiary	3	1.00
Employment status n (%)		
not working	103	33.7
working	138	45.1
Retired	65	21.2
Religion n (%)		
Christian	291	95.1
Muslim	10	3.3
Income n % (GHS)		
less than 200	253	82.7
between 200-600	52	17.0
between 600-1000	1	0.3

*Mean and Standard deviation

4.2 Patients' adherence level to hypertension treatment

Patient's adherence level to medications was determined using the Morisky Medications Adherence Scale 8 items (MMAS 8 items). The mean adherence score of the study population was 7.3(SD=1.0) with a median of 8 and a score ranging from 1 to 8. More than half of the study participants (56.7%) had a score of 8 and (37.5%) a score between 6 and 7. Details of the MMAS 8 items are provided in Table 4.

Table 4. Summary of MMAS 8 items

MMAS 8 Items	Frequency N=307	%
Do you sometimes forget to take your antihypertensive drugs?		
No	255	83.06
Yes	52	16.94
Miss taking antihypertensive medications for reasons other than forgetting.		
No	296	96.4
Yes	11	3.6
Stopped taking medication without telling doctor, because felt worse when took it		
No	297	96.7
Yes	10	3.3
Forget to bring along antihypertensive medications when travelling		
No	278	95.6
Yes	29	9.4
took antihypertensive drugs yesterday		
No	300	97.7
Yes	7	2.3
When hypertension is under control stop taking your medicine?		
No	302	98.4
Yes	5	1.6
Feel hassled about sticking to blood pressure treatment plan		
No	303	98.7
Yes	4	1.3
Difficulty remembering to take antihypertensive drugs		
A. Never/rarely **n (%)**	210	(68.4)
B. Once in a while	28	9.1
C. Sometimes	67	21.8
D. Usually	1	0.3
E. All the time	1	0.3
Scoring: A= 1	**210**	**68.5**
B-E= 0	**97**	**31.5**
mean adherence score M (SD)	**7.3 (1.05)**	

Figure 3 presents the adherence level of study population. Two hundreds and fourteen patients had a high adherence level to their medications (69.7%), followed by medium adherence level 65 (21.2) and almost 28 (9.1%) of patients had low adherence. Adherence level was then dichotomized into optimal adherence (a score equal to 8) and suboptimal adherence (a score <8). Following this, 133 representing (43.3 %) of patients had suboptimal adherence. The main MMAS 8 items associated with non-adherence was "difficulty remembering to take medications", with 79 patients representing (31.5%) and among which, "sometime" represented the main frequency at which patients had difficulty remembering their medications with 67 participants representing (21.8%). Fifty two patients (17%) reported forgetting to take their medications and only 7 patients (2.3%) did not take their medications the day before the interview.

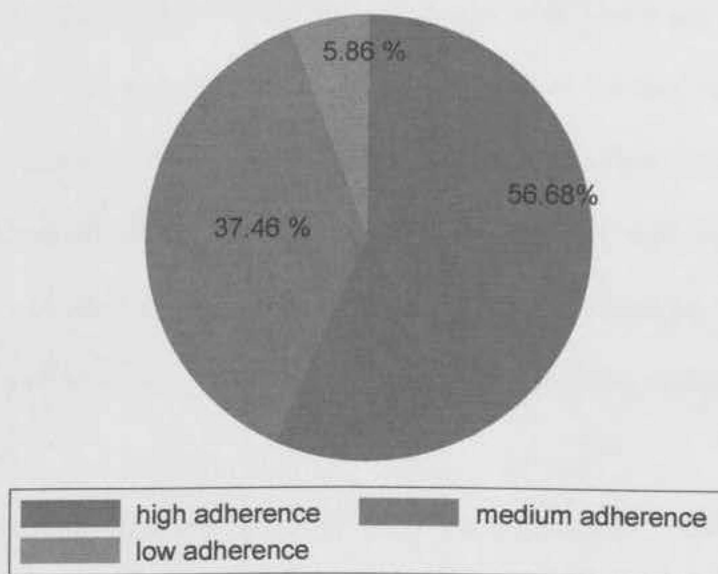

Figure 3 Adherence levels of study patients

4.3 Assessment of health provider's communication

Patients' perception of health providers was assessed by the IPC survey 29 items. The IPC survey was completed by all 307 patients. The Cronbach's alpha suggested good internal consistency reliability for the three domains and ranged from 0.50 to 0.88 and most items scores were positively skewed. IPC's scores were dichotomized for each subscale in good IPC and poor IPC.

4.3.1 Patients' perception of Health provider Communication:

Majority of patient reported good IPC scores for communication. The percentage of good IPC for the different sub-scales varied from 95.7 for "explained tests", results to 99.02 % for" lack of clarity", meaning they understand the health provider's communication. The mean score for lack of clarity was 1.03 with (SD= 0.3) and 1.21 (SD= 0.58) for "hurried, distracted".

4.3.2 Health providers- patients decision making

At the question "How often did doctors ask if you would have any problems following what they recommended?" (60.4 %) of patients responded "sometime". More than half of patients (55.7%) responded "sometime" when asked the question "How often did you and your doctors work out a treatment plan together" and only 21 (6.8%) responded" always". One hundred and sixty five patients (54.2%) responded "sometime "to the question "If there were treatment choices, how often did doctors ask if you would like to help decide your treatment?"

The mean score responses was 3.45 (SD= 0.66) for the subscale "Asked patient" and 3.45 (SD= 0.77) for the subscale "Worked together" (Table 5).

Table 5. ICP 29 means Scores

DOMAINS * 2nd order factors first order factors	Cronbach α	Mean score	Standard deviation	Min	Max
COMMUNICATION	0.71				
Hurried communication					
Lack of clarity (-)		1.03	0.23	1	4
Hurried, distracted (-)		1.21	0.58	1	5
Elicited concern, responded (+)		4.3	0.49	3	5
Explained results, medications					
Explained tests (+)		4.257	0.56	2	5
Explained medications (+)		4.25	0.56	1	5
DECISION MAKING	0.88				
Patient-centered decision making					
Asked patient (+)		3.45	0.66	1	5
Worked together (+)		3.45	0.77	1	5
INTERPERSONAL STYLE	0.50				
Compassionate, respectful					
Emotional support, compassion (+)		4.10	0.54	1	5
Respectfulness (+)		4.98	0.17	3	5
Discriminated					
SES (+)		1.84	0.36	1	2
Disrespectful OPD staff (+)		1.35	0.68	1	4

*all measures are on a scale of 1-5

(-) a higher score indicates worse IPC, (+) higher score indicates better IPC

α= internal consistency reliability of domains scale

4.3.3 Health providers interpersonal style

Patients responded positively on their health providers' interpersonal style. The mean responses on the five Likert scale for the subscale "Respectfulness" was 4.98 (SD= 0.17) and the proportion of good IPC for this subscale was 99.3 %. Only 32 patients (10.4%) reported a poor IPC for the subscale "Disrespectful office staff". Hundred percent of the patients reported a good IPC for the subscale "Assumed SES".

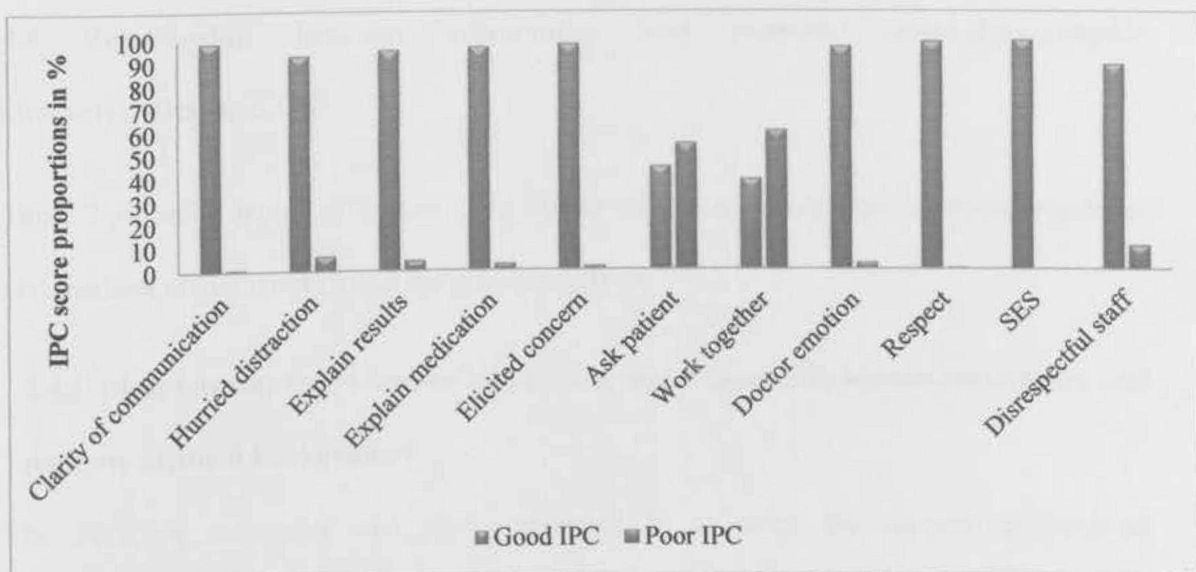

Figure 4: Proportion of patient's perceptions for each IPC

The scales "Asked patient\" and 'worked together "recorded higher scores of poor IPC

Table 6.Mean scores of IPC by adherence type

	α	Total Sample	Optimal adherence	Suboptimal adherence	P value
IPC scores **Domains** **2nd order factor (scale)** **1st order factor (scale)**		**Mean (SD)**	**Mean (SD)**	**Mean (SD)**	
Communication					
lack of clarity (2 items) (-)	0.78	1.04 (0.29)	1.01 (0.17)	1.06 (0.4)	0.129
Hurried, distracted (3 items) (-)	0.42	1.21 (.58)	1.22 (0.60)	1.18 (0.56)	0.463
Elicited concern, responded (3 items)	0.45	4.31 (0.5)	4.26 (0.48)	4.35 (0.51)	0.095
Explained results (2 items)	0.89	4.26 (0.56)	4.22 (0.56)	4.31 (0.57)	0.165
Explained medications (2 items)	0.9	4.25 (0.57)	4.22 (0.6)	4.29 (0.55)	0.290
Decision-making					
Asked patient (2 items)	0.86	3.45 (0.66)	3.47 (0.58)	3.43 (0.56)	0.590
Worked together (2 items)	0.9	3.57 (0.77)	3.66 (0.80)	3.46 (0.73)	**0.028**
Interpersonal style					
Emotional support (3 items)	0.82	4.10 (0.55)	4.04 (0.63)	4.17 (0.42)	0.04
respectfulness (2 items)	0.3	4.98 (0.17)	4.97 (0.23)	5 (0)	0.14
Assumed SES (2 items) (-)	1	1.84 (0.37)	1.80 (0. 0.40)	1.90 (0.29)	0.009
Disrespectful office staff (4 items) (-)	0.74	1.36 (0.69)	1.34 (0.68)	1.38 (0.70)	0.693

4.4 Relationship between adherences and patients' socio-demographic characteristics, and IPC

Table 7 provides details of Person's chi square test between patients' socio-demographic and medical characteristics and the adherence type

4.4.1 Bivariate analysis between adherence, socio-demographic characteristics and patients medical background

The Person's chi-square test was performed to examine the association between adherence to hypertension's treatment and study's variables.

Only age in mean was statistically associated with adherence ($p= 0.03$) for patients socio-demographic characteristics (Table 7) whereas for patients medical background, number of co-morbidities associated with hypertension ($p=0.052$) and the mean DBP ($p=0.021$) were statistically associated with adherence to hypertension treatment (Tables 7-8). Nonetheless, some important determinants of adherence were observed. Adherence was higher among female hypertensive patients (58.2%) than men ($p=0.313$), patients with a secondary school degree (62%) were more adherent compared to patient with a tertiary degree and patient with no basic education. Adherence was better among patients without work (60.2%) and patients with a diagnostic length ≥ 5year. Widows (60.4%), married 155 (56.8 %) and divorced/ separated population groups (52.5%) showed better adherence compared to the never married population (33%). Adherence was greater among patients age group ≥ 60 years (58.76 %) compared to the age group ≤ 60 years.

Table 7.Bivariate analysis between binary adherence and socio-demographic characteristics

Characteristics	Total N= 307	Optimal adherence n= 174	Suboptimal adherence n= 133	p-value
‡Age in year M (SD)	62.3 (12.3)	63.7 (11.71)	60.6 (12.8)	**0.03**
Sex of respondent n (%)				0.313
Male	70 (22.8)	36 (51.4)	34(48.6)	
Female	237 (77.2)	138 (58.2)	99 (41.8)	
Marital status n (%)				0.415
Never married	9 (3.0)	3 (33.3)	6 (66.7)	
married	155 (50.8)	88 (56.8)	67 (43.2)	
Separated/Divorced	40(13.1)	21 (52.5)	19 (47.5)	
Widowed	101 (33.1)	61 (60.4)	40 (39.6)	
Educational status n (%)				0.823
No formal education	128 (41.7)	72 (56.2)	56 (43.8)	
Primary	155 (50.5)	88 (56.8)	67 (43.2)	
Secondary	21 (6.8)	13 (62)	8 (38)	
Tertiary	3 (1.00)	1 (33.3)	2 (66.7)	
Employment status n (%)				0.663
not working	103 (33.7)	62 (60.2)	41 (39.9)	
working	138 (45.1)	75 (54.3)	63 (45.7)	
Retired	65 (21.2)	37 (57.0)	28 (43.0)	
Religion n (%)				0.401
Christian	291 (95.1)	168 (57.7)	123 (42.3)	
Muslim	10 (3.3)	4 (40.0)	6 (60.0)	
Other*	5 (1.6)	2 (40.0)	3 (60.0)	
Health insurance owner *n (%)				0.437
yes	300 (98.4)	172 (57.3)	128 (42.7)	
no	5 (1.6)	2 (40.0)	3 (60.0)	
Diagnostic length n (%)				0.140
< 5 years	214 (70.9)	115 (53.7)	99 (46.3)	
%5 to 10 years	78 (25.8)	52 (66.7)	26 (33.3)	
< 10 years	10 (3.3)	6 (60)	4 (40)	
Income n % (in GHS)				0.292
less than 200	253 (82.7)	140 (55.3)	113 (44.7)	
between 200-600	52 (17.0)	33 (63.5)	19 (36.5)	
between 600-1000	1 (0.3)	0 (0.00)	1 (100.0)	

‡Mean and Standard Deviation from ANOVA

Table 8. Bivariate analysis between adherence and patient medical backgroun

Characteristics	Total	Optimal adherence	Suboptimal adherence	
	N =307	n = 174	n = 133	P value
‡Systolic Blood Pressure M (SD)	142 (16.82)	141.8 (17.03)	142.2 (16.59)	0.816
‡Diastolic blood pressure M (SD)	77.7 (10.03)	76.5 (9.80)	79.2 (10.18)	**0.021**
Number of comorbidities				**0.052**
1	234 (76.47)	141 (60.26)	93 (39.74)	
2	54 (17.7)	23 (42.59)	31 (57.41)	
3	18 (5.88)	9 (50.0)	9 (50.0)	
Health insurance				0.437
yes	5(1.6)	2 (40.0)	3 (60.0)	
No	300 (98.4)	172 (57.3)	128 (42.7)	
Length of diagnostic				0.140
< 5 years	214 (70.9)	115 (53.7)	99 (46.3)	
%5 to 10 years	78 (25.8)	52 (66.7)	26 (33.3)	
< 10 years	10 (3.3)	6 (60)	4 (40)	
Number of pills				0.284
1	201 (66.1)	108 (53.7)	93 (46.3)	
2	92 (30.3)	56 (60.9)	36(39.1)	
3	11 (3.6)	8 (72.7)	3(27.3)	

‡ P value from ANOVA

4.4.2 Bivariate analysis between adherence and binary IPC

There was a statically significant association between patient adherence to medicat and subscale "worked together" (chi2 = 4.9299, P = 0.026). No significant differe were recorded between adherence and the other subscales (Table 9).

Table 9. Bivariate analysis between adherence and binary IPC

IPC scores DOMAINS **2nd order factor (scale)** 1st order factor (scale)	Total Sample Frequency (%)	Optimal adherence Frequency (%)	Suboptimal adherence Frequency (%)	P value
COMMUNICATION				
Hurried communication				
lack of clarity (2 items)				0.412
Good IPC	304 (99.02)	1 73(56.9)	131 (43.3)	
Poor IPC	1 (0.98)	2 (33.1)	2 (66.7)	
Hurried, distracted (3 items)				0.214
Good IPC	287 (93.5)	160 (55.8)	127 (44.2)	
Poor IPC	20 (6.5)	14 (70)	6(30)	
Elicited concern, responded (3 items)				0.880
Good IPC	305 (98.4)	171 (56.6)	131 (40)	
Poor IPC	5 (6.3)	3 (2.28)	2 (43.4)	
Explained results, medications				
Explained results (2 items)				0.132
Good IPC	294 (95.7)	164 (55.8)	4.31 (0.57)	
Poor IPC	13 (4.2)	10 (77)	3 (23)	
Explained medications (2 items)				0.195
Good IPC	298 (97.1)	167 (56)	131 (44)	
Poor IPC	9 (2.9)	79 (77.9)	2 (22.2)	
DECISION MAKING				
Patient centered decision making				
Asked patient (2 items)				0.679
Good IPC	138 (45)	80 (58)	58 (42)	
Poor IPC	169 (55)	94 (55.6)	75 (44.4)	
Worked together (2 items)				**0.026**
Good IPC	121 (30.4)	78 (64.5)	43 (35.5)	
Poor IPC	186 (60.6)	96 (51.6)	90 (48.4)	
Interpersonal style				
Compassionate, respectfulness				
Emotional support, compassion (3 items)				0.195
Good IPC	298 (97.1)	167 (56)	131 (44)	
Poor IPC	9 (2.9)	7 (77.8)	2 (22.2)	
Respectfulness (2 items)				0.21
Good IPC	305 (99.34)	172 (56.4)	133 (43.6)	
Poor IPC	2 (0.66)	2 (100)	0 (0)	
Discriminated				
Assumed SES (2 items)				
Good IPC	307(100)	174 (56.7)	133 (43,3)	
Poor IPC				
Disrespectful office staff (4 items)				0.959
Good IPC	275(89.6)	156 (56.7)	119 (43.3)	
Poor IPC	32 (10.4)	18 (56.3)	14 (43.7)	

4.5 Logistic regression between adherence and study variables:

A simple logistic regression was conducted to report the strength of the association between adherence type and patients' socio-demographic characteristics, medical background and the IPC's scales.

Table 10.Multiple logistic regression and adjusted odds ratio of factors affecting adherence

Variables	Crude Odds Ratio (95%CI)	p value	Adjusted Odds Ratio (95 % CI)	p value
Age in mean	1.02 (1.00 – 1.04)	**0.032**	1.02 (1.00 – 1.04)	**0.020**
Length of diagnosis				
≤5	Ref			
6 -10	1.72 (1.00 -2.96)	**0.049**	1.52 (0.84 – 2.80)	0.164
>10	1.29 (0.35 –4.70)	0.698	1.47 (0.34 – 0.81)	0.597
Number of co-morbidities				
1	Ref			
2	0.48 (0.27 – 0.90)	**0.019**	0.42 (0.22 – 0.81)	**0.009**
3	0.65 (0.25 – 1.72)	0.396	0.67 90.21- 2.09)	0.495
IPC*				
COMMUNICATION				
Lack of clarity,	0.37 (0.03 – 4.22)	0.43	0.52 (0.22 – 2.09)	0.690
Hurried, distracted	1.85 (0.69- 4.95)	0.220	2.18 (0.65 – 7. 34)	0.206
Elicited complains , responded	1.14 (0.19 – 6.97)	0.880	0.51 (0.07 – 3.36)	0.485
Explained tests	2.64 (0.71 – 9.90)	0.146	1.40 (0.21 – 10.36)	0.703
Explained results, medications	2.74 (0.56 -13.43)	0.213	3.05 (0.20 – 31.80)	0.350
DECISION MAKING				
Asked patient	0.90 (0.57 – 1.43)	0.679	1.25 (0.72 – 2.31)	0.379
Worked together	0.58 (0.37 – 0.94)	**0.027**	0.51 (0.28 – 0.92)	**0.027**
INTERPERSONAL STYLE				
Emotional support, compassion	2.74 (0.56 – 13.46)	0.213	1	-
Disrespectful office staff	0.98 (0.47 – 2.05)	0.959	0.95 (0.43 – 2.06)	0.906

‡ Reference= good IPC score (1)
Subscales "SES" and "emotional support" were not put into the model

A statistically significant association was reported between adherence and age (p=0.020). Patients aged 63 years and above were 1.2 times more likely adherent than patient aged below 63 years. As age increases, patient adherence to medications increases [OR=1.02 (95%CI=1.00 – 1.04)]. Patients with a duration of disease more than five years had better adherence compared to those with a duration of disease less than five years [OR=1.72 (95

% CI= 1.00 -2.96)]. Number of co-morbidities was strongly associated with patients adherence to medications (p= 0.019). Patients with two co-morbidities associated to hypertension were 0.48 times less likely adherent to their medications compared to those with one co-morbidity associated.

The IPC's scale "Worked together" was the only scale with a statistically significant association (p = 0.027). Patient who rated their health provider poor on this scale were more likely prone to non-adherence [OR=0.58 (95 % CI= 0.37 – 0.94)].

However, after controlling for variables which were statistically associated with adherence to hypertension treatment: length of diagnostic, number of co-morbidities, age, and the IPC's scales (except for "Assumed SES" and "Respectfulness"), the association between the length of diagnostic and adherence disappeared (p=0.164). Table 10 provides the details of the crude odds ratio and adjusted odds ratio of variables which were considered for multiple logistic regressions.

CHAPTER FIVE

DISCUSSION

The aim of this study was to assess patients' perceptions of health providers' communication on adherence to antihypertension medications among hypertensive patients at Apam Catholic Hospital in Gomoa West district.

5.1 Adherence level to hypertension treatment

The level of adherence among hypertensive patients attending Apam Catholic Hospital is 56.7%. This is higher compares to what has been previously reported in Ghana by Botchway (2014), and Laryea, (2013) who respectively found an adherence level of 32.7% at Achimota hospital and 47.7 % at Korle Bu Teaching Hospital . But it is closer to what Ramli, Ahmad, & Paraidathathu, (2012) found in a primary health care clinics in rural district in Malaysia with 53.4% of patients adherent to their hypertension medications and Joho,(2012) in Dar es Salam region, Tanzania with 53.3% in three district hospitals. However it was lower than what was reported by Lee et al., (2013) a adherence level of 65.1% among hypertensive patient in Hong Kong

Although Botchway and Laryea's studies were carried out in Ghana, the higher level of adherence found at Apam Catholic Hospital can be explained by the fact that this was a study done in district hospital, where most patients come from Gomoa West and surrounding areas. Barriers known for non-adherence to medications highlighted by researchers were healthcare accessibility, cost of medications, not having a health insurance and long waiting time at the OPD. Patients attend clinic at Apam Catholic Hospital, come there for proximity every month and could have been be motivated by the accessibility of the facility. Moreover almost all study participants had a health insurance which provides patients with their hypertension medications every month and this may have had encouraged them to take their health issues seriously. The study also used a self-

reported questionnaire which may have encouraged patients to overrate their adherence by fear of being found not taking correctly their medications.

Previous studies which have assessed patients' adherence to medications with MMAS 8 items reported forgetfulness of medications as main factor of non-adherence (Alphonce, 2012; Botchway, 2014; Kamran et al., 2014). This study recorded a higher proportion of patients with "Difficulty remembering to take antihypertensive drugs" 31.5%, followed by forgetfulness 17% and "Forget to bring along antihypertensive medications when travelling" 9.4 %. This could be explained by the old age of the study participants with a mean age of 62.3 (SD=12.3). This can also be supported by the fact that most patients had a normal BP and were not having symptoms reminding them to take their drugs.. When patients BP are normal, symptoms are practically non-existent and may influence patient's adherence behaviour toward medications.

The study reported a trend of socio-demographic factors generally associated with adherence to hypertension medications. Adherence in this study increases with age and women have better adherence compared to male patients. Also married and divorced patients have better adherence than patients who never married. Patients with a primary education and non-formal education have higher adherence. These findings are similar to findings in studies on factors to adherence to hypertension treatment (Botchway, 2014; Ibrahim & al, 2012; Kamran et al., 2014; Venkatachalam et al., 2015). However Joho, (2012) , reported a higher adherence among patients less than 64 years old .

5.2 Patients perceptions of health providers communication

Overall patients rated positively their health providers' interpersonal care. The means scored for all IPC scales are positively skewed except for the scales "Asked patient" and "worked together" which means are respectively 3.45 (SD=0.66) and 3.45 (SD= 0.77).Similar results were reported by previous studies which used the IPC 29 items to study health disparities among minorities and low functional health literacy people (Detz et al., 2014; Piette et al., 2002). Apam Catholic hospital, a district hospital but also the only second referral level hospital in Gomoa West has been operating for more than fifty years in Gomoa West. Most elderly hypertensive patients and health providers have a long period of relationship. This may have influenced the high positive scores of patients' ratings.

However, 55% of patients perceived they are not sufficiently asked about the difficulties following their treatment and 60.6 % also rated their collaboration with the health providers on their treatment plan as poor. The Patient involvement in their treatment plan is statistically associated with adherence ($p = 0.027$). The study found patients who perceived they are involved in their treatment plan have 49 % chances to be more adherent compared to those who perceived they are not involved.

These two scales look at health providers and patients share decision making about patient treatment plan. It has been suggested that health provider and patient collaboration on treatment plan increases patient adherence to medications (Jimmy et al., 2011; Schoenthaler et al., 2009). Poor share decision-making may happen if the health provider decides to adopt a more authoritarian or paternalistic way of interacting with patient rather than to be more open to patients concerns and suggestions. Experts suggest health providers to adopt a two way communication style which involved patient.(Dubey et al. 2015; Osterberg et al. 2005)

5.3 Study limitations

1. The study was a cross-sectional design and as such did not look at causal relationship
2. The Morisky Medications Adherence Scale 8 items as well as the IPC 29 are a self-reported survey; hence it only reflects what patients wanted us to know. As such the proportion of optimal adherence may have been overestimated.
3. This study was looking at the relationship between health providers communication and patient adherence to treatment and therefore others variables know as barrier to adherence to medication (HBM, waiting time) and determinants to hypertension (patient knowledge and awareness of hypertension) were not included in the study.
4. The study only looked at patients' perceptions of the health providers' communication and therefore health providers own views were not assessed.

CHAPTER SIX

CONCLUSION AND RECOMMENDATIONS

This chapter presents the concluding remarks based on the findings of this study and specific recommendations to improve health-provider and patients relationship in the aim to address hypertension treatment non-adherence.

6.1 Conclusion

Adherence to hypertension medications was low in this study (56.7%) but was found higher than previous studies conducted in Ghana. Although, majority of patients rated their health providers with good IPC's scores for the different scales, the study reported a statistically significant relationship between adherence and the scale "worked together". Patients who perceived they were not actively involved in their treatment plan and rated their health provider with poor IPC on this subscale were more likely non-adherent to their medications compared to patients who rated their health providers with a good IPC.

6.2 Recommendations

Implication for public health

1. Health care service providers must be trained as often as possible in patient centered care in general and particularly in good communication skills and interpersonal skill. This should be a policy to improve patient's health outcome.
2. Ghana health service must develop standard treatment guideline with simple hypertension medications regimen.
3. Appropriate and effective distribution of health providers in district hospitals which allow patients and health provider to have time to collaborate.

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APPENDICES

8.1 Consent form for study participants

Title: ASSESSMENT OF HEALTH PROVIDER COMMUNICATION ON PATIENT ADHERENCE TO HYPERTENSION TREATMENT AT THE OPD, AT APAM CATHOLIC HOSPITAL GOMOA WEST

Name of principal investigator: DJENEBA DIALLO

Address: SCHOOL OF PUBLIC HEALTH, UNIVERSITY OF GHANA, P.O BOX LG 43, LEGON

Thanks for showing interest in participating in this study. I am Djeneba Diallo a Master of Public Health student of the School of Public Health, University of Ghana, Legon.

I am undertaking this study to find the level of adherence amongst hypertensive patients in this hospital and to assess your perception of the health provider's communication on adherence to treatment.

I can be contacted on this phone number 0260855031 or by email aldjene@yahoo.fr/ aldjene@gmail.com

Participation in this study is absolutely voluntary. Whatever information you provide is totally confidential, limited to the purpose of this study and will not be disclosed to anyone. You have the right to change your mind at any time. The answers you give will not be used against you in the facility where you seek medication or anywhere else. We would thus be very grateful if you give answers which show a true reflection of your medication taking, and your perception of the health provider's communication about your treatment and the delivery of the health care, at Apam Catholic Hospital.

If you agree to take to part in this study please append your signature or thumbprint to indicate your consent.

....

Name of participant Signature /Thumbprint Date

....

Name of researcher Signature Date

8.2 Patients socio-demographic characteristic questionnaire

RESPONDENT ID.................	Interviewer code..................
1) Age (in years)	**2) Sex** o Male (1) .... o Female (2) ....
3) Last BP check Systolic Diastolic	**4) length of the diagnosis (in year)** (tick the correct answer) 1. <5 (1) .... 2. 5-10 (2)............... 3. >10 (3)................
5) what is your education level (tick the correct answer) 1. No formal education (1)............. 2. Primary (2).................. 3. Secondary (3)............... 4. Tertiary (4)...............	**6) Which religion do you practice?** 1. Christianity (1)........... 2. Islam (2)............... 3. Others (3)...................
7) What is your employment status (tick the correct answer) 1. Unemployed (1)........... 2. Working (2)............ 3. Retired (3).........................	**8) what is your marital Status** (tick the correct answer) 1. Never married (1)................ 2. Married (2)................... 3. Divorced (3).................. 4. Widow (4)................

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9) Apart from hypertension do you have any of the following medical conditions? (tick the correct answer)

1. High cholesterol
Yes (1) No (2)
2. o Diabetes
Yes (1) No (2)
3. Stroke
yes(1) No (2)
4. Chronic Kidney disease
Yes (1) No(2)
5. Others (5)…………………

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10) apart from taking oral drugs which of the following preventive measures have you adopted to control your BP (tick the correct answer)

1. Reduced Salt intake (1) Yes No
2. Low fat diet (2) Yes No
3. Exercise (3) Yes No
4. Smoking (4) Yes No
5. Alcohol (5) Yes No

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11) Do you have a Health insurance? (tick the correct answer)

Yes (1) No (2)

……………… ……………

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12) How much is your monthly income? (tick the correct answer)

1. Less than GH ₡ 200 GH ₡ (1)
2. 200 GH ₡ --- 600 GH ₡ (2)
3. 600 GH ₡ --- 1000 GH ₡ (3)
4. more than ₡ 1000 GH ₡ (4)

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13) How many hypertension tablets do you take every day? (tick the correct answer)

1. One (1)………………
2. Two (2)…………………
3. More than two (3)…………………..

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8.3 Interpersonal Processed of Care 29 items Survey

	Never	Rarely	Sometimes	Usually	Always
14. How often did doctors speak too fast? **speak fast**	1	2	3	4	5
15. How often did doctors use words that were hard to understand?	1	2	3	4	5
16. How often did doctors ignore what you told them? ignore	1	2	3	4	5
17. How often did doctors appear to be distracted when they were with you?	1	2	3	4	5
18. How often did doctors seem bothered if you asked several questions**?**	1	2	3	4	5
19. How often did doctors really find out what your concerns were?	1	2	3	4	5
20. How often did doctors let you say what you thought was important?	1	2	3	4	5
21. How often did doctors take your health concerns very seriously?	1	2	3	4	5
22. How often did doctors explain your test results such as blood tests, x-rays, or cancer screening tests?	1	2	3	4	5
23. How often did doctors clearly explain the results of your physical exam**?**	1	2	3	4	5
24. How often did doctors tell you what could happen if you didn't take a medicine that they prescribed for you?	1	2	3	4	5
25. How often did doctors tell you about side affects you might get from a medicine ?	1	2	3	4	5

	Never	Rarely	Sometimes	Usually	Always
26. How often did doctors ask if you would have any problems following what they recommended?	1	2	3	4	5
27. How often did doctors ask if you felt you could do the recommended treatment?	1	2	3	4	5
28. How often did you and your doctors work out a treatment plan together?	1	2	3	4	5
29. If there were treatment choices, how often did doctors ask if you would like to help decide your treatment?	1	2	3	4	5

	Never	Rarely	Sometimes	Usually	Always
. How often were doctors compassionate?	1	2	3	4	5
. How often did doctors give you support d encouragement?	1	2	3	4	5
. How often were doctors concerned out your feelings?	1	2	3	4	5
. How often did doctors really respect you a person?	1	2	3	4	5
How often did doctors treat you as an ıal?	1	2	3	4	5
How often did doctors make assumptions out your level of education?	1	2	3	4	5
How often did doctors make assumptions out your income?	1	2	3	4	5
How often did doctors pay less attention ou because of your race or ethnicity?	1	2	3	4	5
How often did you feel discriminated inst by doctors because of your race or nicity?	1	2	3	4	5

	Never	Rarely	Sometimes	Usually	Always
39. How often were office staffs rude to you?	1	2	3	4	5
40. How often did office staff talk down to you?	1	2	3	4	5
41 How often did office staff give you a hard	1	2	3	4	5
42. How often did office staff have a negative attitude toward you?	1	2	3	4	5

8.4 Morisky Medication Adherence Scale 8 items

Question	Yes = 0	No =1
43). Do you sometimes forget to take your antihypertensive drugs?		
44). People sometimes miss taking their antihypertensive medications for reasons other than forgetting. Thinking over the past two weeks, were there any days when you did not take your antihypertensive drugs?		
45). Have you ever cut back or stopped taking medication without telling your doctor, because you felt worse when you took it?		
46). When you travel or leave home, do you sometimes forget to bring along your antihypertensive medications?		
47). Did you take your antihypertensive drugs yesterday?		
48). When you feel like your hypertension is under control, do you sometimes stop taking your medicine?		
49). Taking antihypertensive drugs every day is a real inconvenience for some people. Do you ever feel hassled about sticking to your blood pressure treatment plan? **Feel**		
Scores		

50). How often do you have difficulty remembering to take your antihypertensive drugs?

A. Never/rarely

B. Once in a while

C. Sometimes

D. Usually

E. All the time

Scoring: A= 1 B-E= 0

GHANA HEALTH SERVICE ETHICS REVIEW COMMITTEE

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

Research & Development Divisi
Ghana Health Service
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Email: ghserc@gmail.com

My Ref. GHS/RDD/ERC/Admin/App/17/391
Your Ref. No.

Djeneba Diallo
School of Public Health
University of Ghana
Legon, Accra

The Ghana Health Service Ethics Review Committee has reviewed and given approval for the impleme your Study Protocol.

GHS-ERC Number	**GHS-ERC: 14/12/2016**
Project Title	Assessment of health provider communication on patient adherence to hypertension treatment at the OPD, at Apam Catholic Hospital, Gomo
Approval Date	14th March, 2017
Expiry Date	13th March, 2018
GHS-ERC Decision	**Approved**

This approval requires the following from the Principal Investigator

- Submission of yearly progress report of the study to the Ethics Review Committee (ERC)
- Renewal of ethical approval if the study lasts for more than 12 months,
- Reporting of all serious adverse events related to this study to the ERC within three days ver seven days in writing.
- Submission of a final report **after completion** of the study
- Informing ERC if study cannot be implemented or is discontinued and reasons why
- Informing the ERC and your sponsor (where applicable) before any publication of the research fi

Please note that any modification of the study without ERC approval of the amendment is invalid.

The ERC may observe or cause to be observed procedures and records of the study during implementation.

Kindly quote the protocol identification number in all future correspondence in relation to this approved

SIGNED..
DR. CYNTHIA BANNERMAN
(GHS-ERC CHAIRPERSON)

Cc: The Director, Research & Development Division, Ghana Health Service, Accra