

**FACTORS AFFECTING TREATMENT COMPLIANCE AMONG
HYPERTENSION PATIENTS IN THREE DISTRICT HOSPITALS - DAR ES
SALAAM**

Angelina Alphonse Joho

MSc Nursing (Critical Care & Trauma) Dissertation

Muhimbili University of Health and Allied Sciences

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**FACTORS AFFECTING TREATMENT COMPLIANCE AMONG
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By

Angelina Alphonse Joho


**A Dissertation Submitted in (Partial) Fulfilment of the Requirements for the
Degree of Master of Science Nursing (Critical Care & Trauma) of Muhimbili
University of Health and Allied Sciences**

Muhimbili University of Health and Allied Sciences (MUHAS)

October, 2012

CERTIFICATION

The undersigned certify that has read and hereby recommend for acceptance by Muhimbili University of Health And Allied Sciences a dissertation entitled **Factors affecting treatment compliance among hypertension patients in three District hospitals - Dar Es Salaam, Tanzania**, in partial fulfilment of the requirements for the degree of Master of Science in Nursing (Critical care and Trauma) of Muhimbili University of Health and Allied Sciences.



Dr Sebalda Leshabari

(Supervisor)

Date 13th July 2012

DECLARATION AND COPYRIGHT

I, Angelina Alphonse Joho, declare that this **dissertation** is my own original work and that it has not been presented and will not be presented to any other University for a similar or any other degree award.

Signature.....Date..... 13th July 2012.

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ABSTRACT

Background: Hypertension is one of the most important cardiovascular risk factor but its control is still a challenge all around the world. Control of blood pressure can reduce cardiovascular morbidity and mortality, so the compliance to antihypertensive drugs and life style modification play an important role for the control of hypertension. With the guide of the Health Belief Model (HBM) conceptual framework, the study investigated factors affecting treatment compliance with antihypertensive therapy among patients attended three District hospitals in Dar es Salam.

Objectives: The study was guided by seven objectives, (1) To determine the proportion of treatment compliance among hypertensive study participants 2) To identify social demographic factors that affect treatment compliance among hypertensive study participants. 3) To determine how perceived susceptibility to hypertension complications affect treatment compliance among hypertensive study participants 4) To determine how perceived severity of hypertension affect treatment compliance among hypertensive study participants 5) To identify perceived barriers to treatment compliance among hypertensive study participants. 6) To identify how perceived benefits affect treatment compliance among hypertensive study participants and 7) To identify how cues to action affect treatment compliance among hypertensive study participants

Methodology: The study was descriptive cross-sectional design, which was conducted in three District hospitals in Dar es Salaam Region namely Amana, Mwananyamala and Temeke which are located in Ilala, Kinondoni and Temeke Municipalities respectively. The study population was hypertensive patients who are using antihypertensive treatment that attended the hypertensive clinics. A total of 135 patients were included in the study; the study used simple random sampling.

In this study data were collected using structured questionnaires. Data were analysed using SPSS software programme, Frequency distribution, Bivariate analysis using chi-square and Pearson correlation to compare proportions while Multivariate analysis was done using Linear Multiple Regression to identify variables which are

strongest predictor among variables of HBM. Where as, P value of equal and less than 0.05 was considered statistical significant.

Results: In this study the proportion of participants with treatment compliance was 56%, the mean age (SD) of participants was 56.3 (\pm 13.1) years. While Participants who were equal and below 64years of age (56.8%) had high level of treatment compliance compared to participants with equal or above 65 years of age (53.2%).The study also revealed that female were more compliant (63.2%) compared to male (36.8%) statistically significant. Married participants (61.0%) were more compliant than single participants and employed patients were more compliant compared to non married participants.

With the use of Bivariate analysis (Pearson correlation and Chi-square) the HBM variables (perceived susceptibility, perceived benefit, perceived barrier and cues to action) were statistically significant, the perceived severity did not show statistical significance. With multivariate analysis the strongest predictor was perceived barrier to hypertensive treatment.

Conclusion and Recommendation: Hypertensive patients participated in this study showed low compliance to antihypertensive treatment, the most significant factors with demographic characteristic was sex (female being compliant) and with the guide of HBM the strongest predictor was perceived barrier to antihypertensive treatment. In order for the patients to be compliant with medication, Nurses/Doctors should give health education to patients to every clinic visit on the importance of complying with medication, patients should be educated that antihypertensive drugs is for life use, the policy of cost sharing should be reviewed, strategies should be on the possibilities of giving antihypertensive drugs free of charge like BT and ARV drugs.

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ABBREVIATIONS

WHO

World Health Organization

MUHAS

Muhimbili University of Health and Allied Science

DALY	Disability – Adjusted life years
MMAS	Morsky 8-item Medication Adherence Scale
DMOs	District Medical Officers
BP	Blood Pressure
IHD	Ischemic Heart Disease
NHASES	National Health and Nutrition Examination Survey
ATH	Anti hypertensive Therapy
MARS	Medication Adherence Report Scale
HBM	Health Belief Model
TFNC	Tanzania Food and Nutrition Centre

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background

Hypertension is an important public-health challenge worldwide. Prevention, detection, treatment, and control of this condition should receive high priority. Hypertension is defined as an average systolic blood pressure 140 mm Hg or greater, diastolic blood pressure 90 mm Hg or greater (Kearney et al, 2005; Miller et al, 2009). Hypertension is an important worldwide public-health challenge because of its high frequency and risks factor for cerebrovascular, cardiovascular and kidney disease (Wolz et al, 2000). The World Health Organization (WHO) has estimated that about 62% of cerebrovascular disease and 49% of ischemic heart disease burden worldwide are attributable to suboptimal blood pressure levels where by high blood pressure is estimated to cause 7.1 million deaths annually, accounting for 13% of all deaths globally (WHO,2006)

Global burden of hypertension by Kearney et al, 2005 projected that the number of adults with hypertension will increase by 60% to a total of 1.56 billion (1.54 billion–1.58 billion) in 2025. Most of this rise can be attributed to an expected increase in the number of people with hypertension in economically developing regions, where by between 2000 and 2025, the worldwide prevalence of hypertension was predicted to increase by 9% in men and 13% in women because of projected changes in the age distribution of the population. Specifically, a larger proportion of the world population is expected to be older by 2025.

Tanzania is experiencing urbanisation and modernisation which cause changes in diet and physical activity particularly in the cities including Dar es Salaam. Like many other developing countries, as a result of increased longevity and improvement in the standard of living as well as the influence of the western lifestyle such as cigarette smoking and alcohol consumption, hypertension has assumed a major public health dilemma. Risk

factors for hypertension such as a sedentary lifestyle, obesity, consumption of fatty foods and resultant dyslipidemia are highly prevalent in the population and these factors contribute to the epidemic (Bovet et al, 2008; WHO, 2003).

Transportation in Dar es Salaam is very stressing due to traffic jams, one can stuck in traffic for four hours every day. One may acquire high blood pressure from witnessing too many reckless motorists obviously ignoring all traffic rules in their quest to get ahead in the traffic queue. Many workers prefer to stay at the office or a nearby drinking place until past eight pm when traffic jams start to ease; this is a risk factor for hypertension (Tonyzakaria, 2010).

Hypertension prevalence was 30% in men and 28.6% in women in Ilala (Maletnlema, 2002), 51% and 42% in men and women respectively in Temeke (Njelekela et al, 2009), and 22.5% in Kinondoni (Kamuhabwa & Lugina, 2010).

Uncontrolled hypertension is caused by non adherence to the antihypertensive drugs, patients understanding their drug regimens help to improve their adherence, thus will help prevent the complications of hypertension which are debilitating and if not prevented can increase the burden of a disease that is already on the increase (Kumar & Halesh, 2010). Non-adherence to prescribed drugs schedule has been and continues to be a major problem the world over. Studies on this subject show that adherence is about 50% for medications in chronic diseases including hypertension and much lower for lifestyle prescriptions (Blanca et al, 2001).

Poor adherence to long-term therapies severely compromises the effectiveness of treatment making this a critical issue in population health both from the perspective of quality of life and of health economics. Interventions aimed at improving adherence would provide a significant positive return on investment through primary prevention (of risk factors) and secondary prevention of adverse health outcomes (WHO, 2003).

1.2 Statement of the problem

A number of reviews have found that in developed countries, compliance to long-term therapies including hypertensive therapy in the population is around 50% and is assumed to be much lower in low income countries including Tanzania (WHO, 2003)

Study done by Hitt, 2010 in Tanzania revealed that two – thirds of patients who died from stroke had a history of hypertension. It is suggested that prevention of stroke in these populations should include control of high blood pressure where as compliance to antihypertensive therapy is important (Chobanian et al, 2003; Mazzaglia et al, 2009). Also the study done by Bovet, et al (2008) monitored to antihypertensive medications in Temeke-Dar es salaam over the period of 12 month. They found that only 34% (n = 161) were complaint at some point of time and this percentage decreased to 3% at the end of the 12-month follow – up which suggesting poor long term compliance. Another study done by Haynes et al (2002) showed that adherence rates are typically higher among patients with acute conditions, as compared with those with chronic conditions

Adopting lifestyle modifications or non-compliance with prescribed medications can also be associated with uncontrolled hypertension as well as the risks of developing complications (Campbell et al, 2006). Compliance with antihypertensive drug therapy (AHT) has been shown to reduce the risk of stroke and coronary heart disease by an estimate of 34% and 21%, respectively, (Law et al, 2003). However studies revealed that medication therapy improves life expectancy and quality of life. Several studies have shown that patients with chronic conditions such as hypertension adhere only to 50-60 percent of medications as prescribed. (Benner et al, 2002).

Little has been documented on the cause of poor compliance, therefore this study aimed to investigate the factors affecting treatment compliance in three district hospitals in Dar es Salaam.

1.3 Rationale

The findings from this study will be used to increase the scientific knowledge base to the scientific world. Also the findings will be used to inform the practice and policy makers (Ministry of health and social welfare) with the aim of planning interventions to improve patient compliance to antihypertensive therapy to reduce the impact of hypertension and its complications and improve the quality of life of the patients and the health cost burden.

1.4 Hypotheses

There are factors influencing non- compliance to antihypertensive treatment among hypertension patients.

1.5 Objectives

1.5.1 Broad objective

To assess factors affecting treatment compliance with antihypertensive therapy guided by the use of Health Belief Model variables among hypertensive patients attending hypertension clinics at Amana, Mwananyamala and Temeke-Dar es salaam.

1.5.2 Specific objectives

1. To determine the proportion of treatment compliance among hypertensive study participants
2. To identify social demographic factors that affect treatment compliance among hypertensive study participants.
3. To determine how perceived susceptibility to hypertension complications affect treatment compliance among hypertensive study participants
4. To determine how perceived severity of hypertension affect treatment compliance among hypertensive study participants

5. To identify perceived barriers to treatment compliance among hypertensive study participants.
6. To identify how perceived benefits affect treatment compliance among hypertensive study participants
7. To identify how cues to action affect treatment compliance among hypertensive study participants

1.6 Conceptual definition of terms

Hypertension - is a systolic blood pressure 140 mm Hg or greater, diastolic blood pressure 90 mm Hg or greater (WHO, 2003)

Hypertensive patient – in this study, hypertensive patient is patient with high blood pressure and has already starting antihypertensive medication.

Compliance is defined as “the extent to which a person’s behaviour (taking medicines, or executing lifestyle changes) coincides with medical or health advice” (Kaveh & Kimmel, 2001). Bloom (2001) describes compliance as an act of adhering to the regimen of care recommended by the clinician and persisting with it over time.

Adherence as "the extent to which a person's behaviour - taking medications, following a diet and/or executing lifestyle changes, corresponds with agreed recommendations from a health care provider" (WHO, 2003). For the purpose of this study compliance and adherence are used interchangeably.

Compliance with lifestyle modifications

Compliance with lifestyle modifications aimed at lowering blood pressure includes regular exercise (at least 30 minutes thrice per week), eating salt and fat free diets, cessation of smoking, and a reduction in the daily alcohol consumption to less than 20g of ethanol for men and less than 10g of ethanol for women (Svetkey et al, 2005).

Modification

In this study modification refers to a change (adjustment) in lifestyle, namely attitudes, habits and behaviours necessary for controlling hypertension.

Frequently

In the context of this study frequently on compliance to medication and life style modification refers to three days and above of not taking antihypertensive medications within a week.

Rarely

In this study rarely refers to one to two days of not taking antihypertensive medications within a week.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Conceptual framework

2.2 Basic Components of the Health Belief Model

The Health Believe Modal is an approach that is used to describe social behavior as well as individual's cognition. It was introduced in 1950s by Social psychologists so as to facilitate in reasoning individuals participation in health programmes such as health check up and immunization. The HBM was also widely used to explain a range of health behavior. The Model also bases on studying compliances with lifestyle modification and antihypertensive medication. It also bases on understanding that high blood pressure involves both drug treatment and lifestyle changes.

The HBM to an extent was applied in areas that included tuberculosis (Houchbaum, 1958); dental problems (Kegeles, 1963); contraceptive practices (Fisher, 1978); alcohol use and driving (Beck, 1981); dietary behavior (Becker et al, 1977); smoking (Winberger et al, 1981); exercises and physical activities (O'Connel et al, 1985). However the application of this Model had widely based on developed countries. While, there is little research evidenced of the implications in health behavior from low income countries such as Tanzania. Likewise, a person may take a preventive action when he or she has a positive expectation that by taking a recommended action, he or she will avoid a negative health condition (for instance, a belief that using antihypertensive is effective in preventing complications). Furthermore, to perform a healthy action, one has to believe that there are fewer barriers to successfully take a recommended health action. Moreover, verbal and nonverbal signals (such as seeing a person died due to complications of hypertension) may act as reminders to individual's performance of a healthy behavior.

The model has strength such as a patient diagnosed with hypertension will have to consider his or her severity and vulnerability to hypertension and its consequences before making decision as to whether the benefit to be gained from a particular (compliance) behavior is worth the cost (Stewart & Eales, 2002).

In this study the behavior examined is compliance with prescribed antihypertensive medication and lifestyle modifications. It is based on understand that high blood pressure control involve drugs and lifestyle modification. Compliance behavior is a complex and multidimensional phenomenon and various possible factors that influence the behavior (WHO, 2003). The factors include Scio-demographic, psychosocial, structural factors. Other factors that influence compliance behavior are cues to action and a sense of self efficacy (Winfield & Whaley, 2002).

2.2.1 The variables of the Health Belief Model

Perceived susceptibility to uncontrolled hypertension

Perceived susceptibility refers to patients risk awareness of diseases like hypertension or the complications of uncontrolled hypertension like heart attack, kidney failure, or stroke (Glanz et al, 2002). However the Health Belief Model believed that a patient who feels susceptible to hypertension and its complication is more likely to abide to treatment rather than the one who does not belief this concept

Perceived severity of hypertension

Perceived severity is the concept by which a disease can cause morbidity, disability or mortality. The Health Belief Model however believes that persons who accept hypertension to be a serious disease will be more compliant with medication and lifestyle modifications than the ones who do not feel this perception. (Glanz et al, 2002).

Perceived barriers of taking ant hypertension medications

It refers to the outstanding hindrances towards the way of accessing to the required health behavior like compliances health behavior. However some of the perceived barriers ever observed in ant hypertension medication in literatures are like problems associated with frequent changes of medications, high costs involved, medication side effects and complex dosing. It is further assumed that patients with greater perception of barriers are less likely to reveal compliance behavior than those who believe that the benefits outweigh the barriers (Green & Kreuter, 2000).

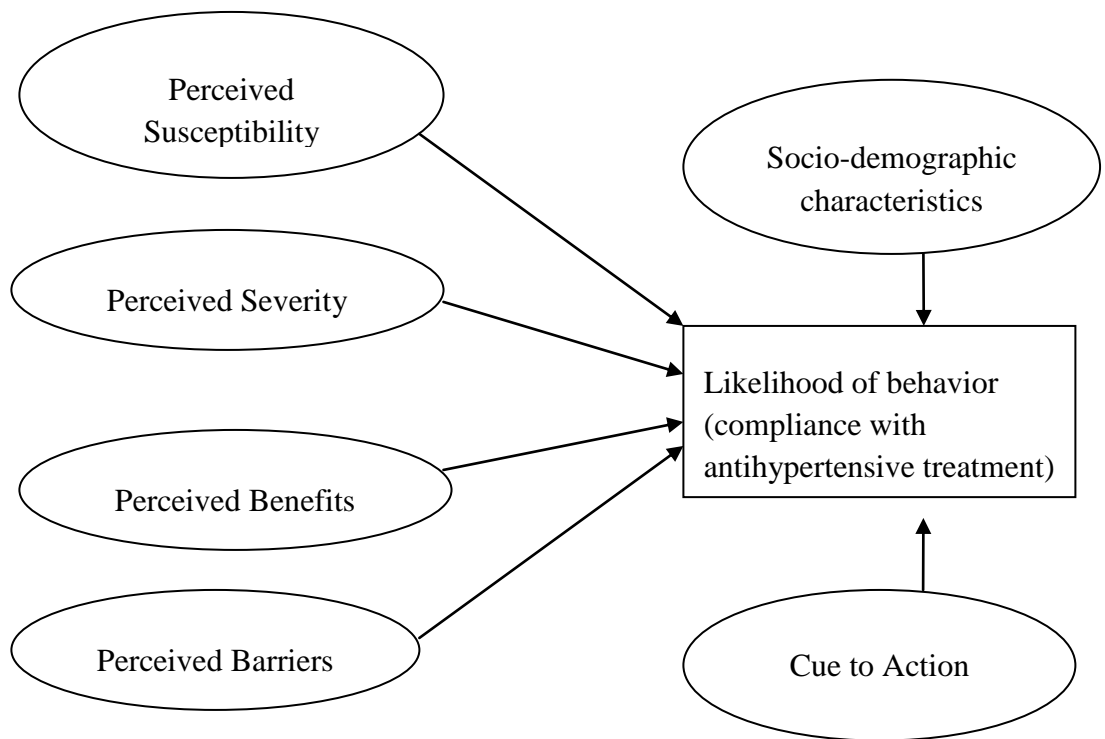
Perceived benefits of ant hypertension treatment

The perceived benefits correspond to the belief that, patients hold that a proposed course of action will be effective only in get rid of the potential risks. The Health Belief Model hypothesises that patients who perceive benefits from adopting particular health behaviour are more likely to demonstrate the required health behaviour than those who do not (Green & Kreuter, 2000). For example persons who perceive that changing lifestyle and taking antihypertensive medications is required health behaviour, will be more compliant than those who do not perceive that.

Cues to action

The Cues to action (reminders) are factors that can initiate an individual to take action. According to Green & Kreuter, (2000), they refer to cues as a “precipitating force that makes the person feels the need to take action” cue to action can be internal or external factors. Internal factors may be the appearance of the signs and symptoms of a disease (Glanz et al, 2002). External factors can be mass media advertising or effective health education directed at a target group (Glanz et al, 2002). Cues to action are things such as radio, television programmes, and advice from relatives, friends and health providers. These are important cues that can play an important role in compliance behavior by reminding patients to take their medications

Figure 1: The Health Belief Model (HBM)



Source: Modified from Rosenstock (1974).

2.2.2 An overview of hypertension

Hypertension can be defined as blood pressure (BP) consistently $\geq 140/90$ mm Hg, it is considered to be one of the most prevalent and serious risk factors for cardiovascular disease (Miller et al, 2009). However incidence of complications can be reduced through treatment, these including stroke, coronary heart disease, heart failure, and kidney disease. It is further estimated that by 2030, 23 million cardiovascular deaths would have occurred, with $\approx 85\%$ occurring in low- and middle-income countries (Mathers & Loncar, 2006)

The World Health Organization reports that suboptimal BP (>115 mmHg SBP) is responsible for 62 percent of cerebrovascular disease and 49 percent of ischemic heart disease (IHD), with little variation by sex. In addition, suboptimal BP is the number one attributable risk factor for death throughout the world (WHO, 2002) it has been identified as the leading risk factor for mortality, and is ranked third as a cause of disability-adjusted life-years (Ezzati et al, 2002).

A study done by Kearney et al., 2005 on Global burden of hypertension, indicates that more than a quarter of the world's adult total population is nearly one billion had hypertension in 2000, and that this proportion will increase to 29%—1.56 billion—by 2025. However it suggests that men and women will have similar overall prevalence of hypertension and that such prevalence increase with age consistently in all world regions.

Data from the National Health and Nutrition Examination Survey (NHANES) 2005–2006 showed that one in three adults in the United States have hypertension. It is estimated to be the same as 29% of the adult population (Ostchega et al, 2008), however the percentage is likely to continue to increase, primarily because of the aging of the population. The prevalence of hypertension rises sharply with age (Franklin, 2006) and

90% of persons with normal BP at age 55 will ultimately develop hypertension (Vasan et al, 2002), where other factors increase in prevalence include an increase in obesity (Ajani, & Ford, 2006) increased consumption of dietary sodium, a sedentary lifestyle, and suboptimal levels of health literacy (Cutler et al, 2008).

Several clinical trials in hypertension have shown that reduction of blood pressure (BP) is associated with significant decreases in the incidence of stroke, ischemic heart disease, congestive heart failure, and renal failure, irrespective of age, gender, race or ethnicity, type of antihypertensive used, or severity of hypertension. Studies worldwide indicate that despite the availability of effective medical therapy, over half of all hypertensive do not take any treatment (Chobanian et al, 2003).

Despite the availability of effective treatments, studies have shown that in many countries less than 25% of patients treated for hypertension achieve optimum blood pressure (Burt, 1995). The best available estimate is that poor adherence to therapy contributes to lack of good blood pressure control in more than two-thirds of people living with hypertension (Bethesda, 1997). Considering that in many countries poorly controlled blood pressure represents an important economic burden (e.g. in the United States the cost of health care related to hypertension and its complications was 12.6% of total expenditure on health care in 1998) (Hodgson & Cai, 2001)

A study done by Hashmi, et al., 2007 on factors associated with adherence on antihypertensive treatment in Pakistan showed that awareness about hypertension and its treatment was very low, as 24% of participants took their medication only when they thought they had symptoms of high blood pressure this patient group had very low adherence. Likewise a very small proportion of patients were aware of the risk factors for hypertension and an even smaller proportion knew about the complications.

In Sub-Saharan Africa, hypertension has also emerged as a serious public health problem. A meta analysis of hypertension studies in the region conducted by Addo et al, (2007) reported that hypertension is more prevalent in urban than rural areas in all countries of the region, also hypertension is a major public health problem in Sub-Saharan Africa but unfortunately, most countries of the region lack the resources to detect, prevent and treat the disease (Addo et al, 2007). Effects of Westernizations, urbanization, changes in dietary patterns and sedentary lifestyles are among the factors fuelling the epidemic of hypertension in sub-Saharan Africa (Opie & Seedat, 2005).

According to the latest WHO publication in April 2011 hypertension deaths in Tanzania reached 3755 or 0.85% of total deaths and age adjusted Death Rate is 24.07 per 100,000 of population ranks Tanzania number 109 in the world while stroke deaths in Tanzania reached 21,973 or 4.98% of total deaths and age adjusted Death Rate is 137, 69 per 100,000 of population ranks Tanzania number 43 in the world.

A study done by Maro & Lwakatare (1997) on medication compliance among Tanzanian hypertensive, through clinical records of 702 patients started anti hypertensive treatment, reviewed that at the end of the study period of three years 47% of the patients had dropped out of the cardiac clinic, however this data shows the degree of non adherence to the long term medication (anti hypertensive medications).

2.2.3 Factors affecting compliance with antihypertensive therapy

Compliance can be defined as “patient’s behaviors (in terms of taking medication, following diets, or executing life style changes) coincide with healthcare providers’ recommendations for health and medical advice” (Sackett & Gibson, 1975) whereby to achieve effective treatment and realize the benefits of treatment, strict adherence to treatment instructions are very critical. Sticking to the treatment instructions for a long term illness poses a great challenge to the patients (WHO, 2003).

To the larger society, compliance with drug treatment is a cost saving measure since it decreases the incidence of complications and the need for additional medications (WHO, 2003) however non-compliance with prescribed antihypertensive medication is an important contributor to the failure of antihypertensive therapy (Foder et al, 2005)

Adherence rates are typically higher among patients with acute conditions, as compared with those with chronic conditions; persistence among patients with chronic conditions is disappointingly low, dropping most dramatically after the first six months of therapy (Haynes et al, 2002).

A study done by Almas et al (2006) February 2005 at Aga Khan University Pakistan on factors affecting compliance to antihypertensive therapy indicates that non compliance was affected by forgetfulness, deliberately missing doses, due to side effects, increased number of tablets, not properly counselled, and due to cost issues. Also factors can be grouped into several categories, namely, patient-centered factors eg , age, ethnicity, gender, education, and marital status , therapy-related factors, healthcare system factors, social and economic factors, and disease factors (Jing et al, 2008

It is generally believed that, anti-hypertensive medications are effective in reducing high blood pressure and have been shown to significantly reduce the risk of cardiovascular illness. (Chobanian et al, 2003). It is further thought that patient's benefits to antihypertensive medication can be reduced because of low adherence (DiMatteo et al, 2002) while non-adherence can be unintentional (such as forgetting) or can be intentional, whereby patients make a decision not to take treatment based on their personal beliefs about their illness and treatment (Hashmi et al, 2007).

2.2.4 Measurement of compliance

Researchers who have tried to measure drug adherence have realized that there is no gold standard by which adherence can be quantified (Farmer, 1999). The method available for measuring adherence can be divided into direct and indirect methods of measurement (Wagner et al, 2001).

Directly observed therapy, measurement of concentrations of a drug or its metabolite in blood or urine, and detection or measurement in blood of a biologic marker added to the drug formulation are examples of direct methods of measures of adherence. Direct approaches are expensive, burdensome to the health care provider, and susceptible to distortion by the patient, while indirect methods of measurement of adherence include asking the patient about how easy it is for him or her to take prescribed medication, assessing clinical response, performing pill counts, ascertaining rates of refilling prescriptions, collecting patient questionnaires, using electronic medication monitors, measuring physiologic markers, asking the patient to keep a medication diary, and assessing children's adherence by asking the help of a caregiver, school nurse, or teacher. Questioning the patient (or using a questionnaire), patient diaries, and assessment of clinical response are all methods that are relatively easy to use, but questioning the patient can be susceptible to misrepresentation and tends to result in the health care provider's overestimating the patient's adherence. Patient's self reports can simply and effectively measure adherence (Walsh et al, 2002).

CHAPTER THREE

3.0 METHODOLOGY

3.1 Study design

The study was descriptive Cross sectional design which was conducted for 4 weeks from April to May 2012. The Cross –Sectional design, involves the collection of data at one point in time, which are easy to do and relatively economical. (Polit & Beck, 2010), the researcher selected quantitative method due to time limit and resource constrain (shortage of fund).

3.2 Study area

The study was conducted in three District hospitals in Dar es Salaam Region: Amana, Mwananyamala and Temeke hospitals which are located in Ilala, Kinondoni and Temeke Municipalities respectively. The study sites were chosen because majority of hypertensive patients who are diagnosed from dispensaries and health centres are referred to these hospitals for expertise and availability of antihypertensive drugs. Geographically, Dar es Salaam region is located between latitudes 6.36 degrees and 7.0 degrees to the south of the equator and longitudes 39.0 and 33.33 to the east of Greenwich meridian. It is also bounded by the Indian Ocean to the east and the Coast Region on the other side. Kinondoni, Temeke and Ilala are highly populated areas with approximately 3.1 million people (Dar es Salaam Regional Commissioner's Office, Strategic plan for 2010-2013)

3.3 Study population

The study population were patients with hypertension, who were using antihypertensive treatment and attending at Amana, Temeke and Mwananyamala hypertension clinics.

3.4 Sample size

Sample size calculations were made based on the following formula (Kirkwood, 2003):

$$n = \frac{Z^2 p(1-p)}{e^2}$$

Where by n = the required minimum sample size

e = margin of error (5%)

p = estimated proportion of compliance 9% (Bovet et al, 2008) in Temeke- Dar es salaam

z = standard normal deviate corresponding to 95% confidence level=1.96

Considering a margin of error of 5% and a 95% confidence level, then the minimum required sample size will be 139.

3.5 Sampling procedure

All patients attending hypertension clinics from 8:00am through 23:00pm from Tuesday to Friday in the selected hospitals, who met the inclusion criteria, were eligible for inclusion in the sampling list for the study. Simple random sampling procedure was employed to select the study participants. There were pieces of paper that were written YES or NO, the word YES was used to represent the targeted study population, and NO was used to represent the population that was not going to participate in the study. The procedure of drawing papers from the box by each study participant was used. Once the piece of paper was chosen, it was not included in the sample again and each participant was allowed to **pick** only once.

3.6 Data collection instrument

In the present study, data was collected using questionnaires; questions were developed by the researcher according to the research objectives, the literature review, as well as the theoretical framework of the study using Health belief model.

3.7 Data collection

Burns & Grove (2005) described data collection as the process of systematic data gathering from research subjects to answer research questions and achieve the research purpose and aim. In this study data were collected by researcher alone. A questionnaire consisting of closed ended questions was used during the interviews. The questionnaire was translated from English to Swahili language that is understood and well spoken by all Tanzanians. The structured data collection instrument permitted the researcher to ask the same questions to all participants and mark their responses using predetermined response options that were extracting information regarding patient's social demographic characteristics. It also highlighted perception of severity; perception of susceptibility; perception of benefits; perception of barriers and cues to action. The time used to complete one form was approximating 20 minutes; data was collected within a period of one month.

3.8 Validity

Questionnaire was examined by panel of two cardiologists working at Cardiac unit at Muhimbili National Hospital, discussion was held 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 our Tanzanian context.

3.9 Reliability

According to Burn & Grove (2007), for the instrument to be reliable, it must yield the same measure when used on more than one occasion. The questionnaire was pilot tested using 10 hypertensive patients at Mwananyamala by the researcher to find out unclear or ambiguous questions. Ambiguous questions were reworked or removed. The pilot

testing of the questionnaire helped to estimate the time that could be taken to respond to the questionnaire which was on average of 20 minutes. Patients involved in pilot were not included in the main study

3.10 The inclusion criteria

- 1) Patients of age 18 years and above,
- 2) Participants with a diagnosis of hypertension for at least one month with or without other co-existing medical conditions.
- 3) Participants who have been taking antihypertensive treatment for at least past one month ago.
- 4) Patients who agreed and consented to participate in the study

3.11 Exclusion criteria

- 1) Patients who had not started antihypertensive
- 2) Patients less than 18 years of age
- 3) Patients who could not respond eg too sick to be interviewed
- 4) Patients on antihypertensive medication who could not consent to participate in the study.
- 5) Patients who refused to participate in the study.

3.12 Data management

3.12.1 Variables and measurement

The outcome variable was treatment compliance, which comprised of medication regimen compliance and lifestyle modification. Medication regimen compliance was composed of 8 items, asking how often you forget to take your medicine. The responses were measured on a 4-point Likert scale: (1) Every day (2) frequently, (3) rarely or (4) never. For life style compliance was having 5 items, participants were asked to respond to the single question based on a 4 point Likert scale: how often do desirable or undesirable behaviors related to control of hypertension. The responses were: (1) Every day,(2) frequently, (3) rarely or (4) never. Some questions were set such that the highest

score did not reflect the worst scenario of none-compliance. To resolve these scores were reversed. Example, how often do you engage in physical exercise (4) Every day, (3) frequently, (2) rarely or (1) never. The 13 items measuring treatment compliance and life style compliance were added up to get sum index with a distribution ranging from 34 to 51 with mean 43.76 (SD =3.672), the median split was used (44.4), which was dichotomized into two groups i.e. 1 = those who are non treatment compliant and 2 = treatment compliant which was 34-43 and 44-51 The HBM variables were measured as described below. Perceived severity of having hypertension, perceived susceptibility of being at risk of hypertension complications and perceived benefit were each measured by six items. The reminders (cues to action) were measuring by seven items. Participants were then asked to respond: (1) strongly agree, (2) agree, (3) disagree or (4) strongly disagree.

Six items measuring perceived severity were added up to get sum index with a distribution ranging from 7 to 24 with mean 20.10(SD =2.85), the median split 50.4 was used as a cut point. Dichotomization was done into two frequency groups, those who had low perceived severity and those who had high perceived severity. Six items measuring perceived susceptibility were added up to get sum index ranging from 6 to 19 with mean of 10.79 (SD =2.83), the median split was 49.6. The sum index for perceived susceptibility was dichotomized into 1=, those with low perceived susceptibility and 2= those with high perceived susceptibility.

Six items measuring perceived benefit were added up to get sum index with a distribution ranging from 12 to 24 with mean (SD) 20.24(2.87) median split 51.1, then dichotomized into, those with low perceived benefit and those with high perceived benefit. Seven items measuring cues to action were added up to get sum index with a distribution ranging from 15 to 28 with mean (SD) 24.27(2.65) median split 42.2, then dichotomized into two frequency groups those with low perceived cues to action and those with high cues to action.

Five items measuring perceived barriers were added up to get sum index with a distribution ranging from 5 to 15 with mean (SD) 8.36 (2.48), median split 54.8, then dichotomized into, those with low perceived barrier and those with high perceived barrier. The aspects that might hinder respondents to comply with their treatment included not having enough time to do exercise. Responses were (1) strongly not a problem (2) not a problem (3) problem and (4) strongly a problem.

Frequency distributions were done then bivariate analysis using chi-square and Pearson correlation between HBM variables were done. Multiple linear regressions were done with treatment compliance as the outcome variable (behavior) and the rest of HBM variables as predictors of the behavior.

3.12.2 Data entry and analysis

Data were entered into the computer using SPSS software programme 17.0 version. Data were cleaned before being subjected to analysis. Data analysis was performed using SPSS software programme. Information was summarized using frequency tables and cross tabulations. The chi-square test was used to compare proportions; bivariate correlation (Pearson correlation) analysis was done. Multivariate analysis was done using Linear Multiple Regression to obtain strongest predictor variable between variables of HBM. A P-value of equal or less than 0.05 was considered a statistically significant.

3.12.3 Dependent variable

Treatment compliance to antihypertensive drugs

3.12.4 Independent variables

Social demographic characteristics are age, sex, marital status, level of education and occupation. Psychosocial- perceived severity of hypertension, perceived susceptibility to complications of hypertension, perceived benefit of complying with treatment, perceived barriers to comply with treatment, and cues to action for treatment compliance

3.13 Ethical consideration.

Ethical clearance was sought and granted from the Research and Publication Ethical Committee of the Muhimbili University of Health and Allied Science. The permission to conduct the study was obtained from Municipal Medical Officer In charge of respective municipal. Strict ethical standards and procedures were adhered to, the anonymity of the participants was ensured by not having any identification on the data collection tool so that information would not be traced back to individuals. Confidentiality was guaranteed by storing data in a safe and locked place, and only the researcher was having access to the raw data. Participation in this study was voluntary and details about the aim and objectives of the study was explained to the participants. Written informed consent was obtained, for those who cannot read and write was requested to provide their signature by putting thumb print as signature. The participants were free to withdraw from the research at any stage without incurring any consequences.

3.14 Dissemination

The findings of this study would generate important information on factors affecting compliance with antihypertensive therapy. The copy of the study will be disseminated to three district hospitals in Dar es Salaam, school of Nursing MUHAS, MUHAS Library, further the research findings will be sent to the Ministry of Health and Social Welfare. The research findings will be published in Nursing Journal and presented in scientific workshops and conferences both local and international.

CHAPTER FOUR

4.0 RESULTS

This study was conducted from April to May 2012; a total number of 139 hypertensive patients who were attending hypertension clinics in Temeke, Amana and Mwananyamala, from the age 18 years and above were selected. From these, 135 patients who agreed to participate were included in the study, and however four participants refused to participate. The socio-demographic characteristics of the respondents are shown in **Table 1**. There were 59(43.7%) males and 76 (56.3%) females, aged 33 to 84 years with mean age (SD) of 56.3 (\pm 13.1) years. Among participants more than half had primary school level of education and 33.3% never went to school. More than half of participants were married while 20.7% were widows while 55.6% had no employment and 44.4% were employed.

Table 1: Socio-demographic characteristics of respondents N=135

Characteristics	Frequency	Percentage
Age (years)		
≤ 64	88	65.2
≥ 65	47	34.8
Sex		
Male	59	43.7
Female	79	56.3
Marital status		
Married	82	60.7
Separate	25	18.5
Widower	28	20.7
Level of education		
No formal education	45	33.3
Primary education	74	54.8
Secondary education	16	11.9
Occupation		
Employed	60	44.4
Unemployed	75	55.6

Table2: Distribution of participant's demographic factors by treatment compliance

Characteristics	Treatment Compliance		P-value
	Non compliance No (%) n=60	Compliance No (%) n=75	
Age			
≤ 64	38(43.2)	50(56.8)	0.686
≥ 65	22(46.8)	25(53.2)	
Sex			
Male	32(54.2)	27(45.8)	0.044
Female	28(36.8)	48(63.2)	
Marital status			
Married	32(39.0)	50(61.0)	0.287
Separate	13(52.0)	12(48.0)	
Widower	15(53.6)	13(46.4)	
Education level			
No formal education	20(44.4)	25(55.6)	0.277
Primary education	30(40.5)	44(59.5)	
Secondary education	10(62.5)	6(37.5)	
Occupation			
Employed	27(44.0)	33(56.0)	0.908
Unemployed	33(45.0)	42(55.0)	

The association between socio-demographic factors and treatment compliance was explored. Table 2 shows that as the age increases, there is a tendency to decrease treatment compliance in hypertensive patients. The participants with less than 64 years of age (56.8) had high proportion of those who were compliant to treatment compared to participants with 65years age (53.2), however the difference was not statistically significant. Furthermore the study revealed that females had higher proportion of treatment compliant individuals 48(63.2) than males 27(45.8) with (P = 0.044). Married participants had high proportion of treatment compliance than those who did not have

partners. Proportion of treatment compliance decreases as the level of education increases, that is participants with primary school education and no formal education were treatment compliant compared to those with secondary school education, although it was not statistically significant ($P = 0.277$). Participants who were employed had high proportion of treatment compliance compared to those who were not employed.

Table 3: Distribution of participant's treatment compliance by HBM variables

Perception of	Treatment compliance		P- value
	Non compliant n= 60 No (%)	Compliant n=75 No (%)	
Severity			
Low	29(42.6)	39(57.4)	
High	31(46.3)	36(53.7)	0.672
Susceptibility			
Low	37(55.2)	30(44.8)	
High	23(33.8)	45(66.2)	0.012
Benefit			
Low	38(55.1)	31(44.9)	
High	22(33.3)	44(66.7)	0.011
Barrier			
Low	17(23.0)	57(77.0)	
High	43(70.5)	18(29.5)	0.000
Cues to action			
Low	34(59.6)	23(40.4)	
High	26(23.3)	52(66.7)	0.002

Table 3 shows the association between HBM variables with treatment compliance as the behaviour of interest by use Chi-square. There was no association between perceptions of severity with treatment compliance. Participants with high perceptions of susceptibility of having hypertension or hypertension complications had higher proportion of treatment compliance (66.2%) with $P = 0.012$ than those with low perceived susceptibility. The result had further revealed that participants who were having high perceptions of benefit of using antihypertensive treatment had higher

proportion of individuals who are compliant (66.7%) ($P = 0.011$) than those with low perception of benefit. Participants with low perception of barriers to treatment had higher proportion of individuals who are compliant (77.0%) ($P = 0.000$) compare with those with high perception of barrier, and participants who had high perception of cues to action had higher compliant rate (66.7%) with $P = 0.002$ compared to those with low cues to action.

Table 4: Distribution of participants by reason of not complying with medication

Item	Treatment compliance N=135			
	Daily	Frequently	Rarely	Never
Forgetting		16(11.9)	54(40.0)	65(48.1)
Stop medicine when feeling well	1(0.7)	31(23.0)	39(28.9)	64(47.4)
Stop medicine when feeling bad		5(3.7)	14(10.4)	116(85.9)
Believe that they are ineffective		5(3.7)	1(0.7)	129(95.6)
Fear side effects	2(1.5)	29(21.5)	18(13.3)	87(63.7)
Avoid addiction	1(0.7)	22(16.3)	19(14.1)	93(68.9)
Using traditional medicine		13(9.6)	27(20.0)	95(70.0)
Stop medicine because of expenses		65(48.1)	29(21.5)	41(30.4)

Table 4 above shows the pattern of medication compliance among hypertensive patients. Overall participants 88% reported rarely or never forget taking medication, among participants, 48% reported frequently stopped medication because they can't afford to buy drugs, and 23% reported frequently stopped using medication when feeling well (when there is no symptoms). About 21% reported frequently not using medication due to fear of side effects, 16.3% of respondents reported frequently stopped medication to avoid drug addiction while about 10% reported frequently stopped medication and use tradition medicine.

Table 5: Pearson correlation between HBM variables

Variables	1	2	3	4	5	6
1. Treatment compliance	-	0.104	0.141	0.274**	-0.528**	0.197*
2. Perceived severity		-	0.285**	0.090	-0.090	0.202*
3. Perceived susceptibility			-	-0.062	-0.061	-0.180*
4. Perceived benefit				-	-0.449**	0.323**
5. Perceived barrier					-	0.323**
6. Cues to action						-

***: $P \leq 0.05$; **: $P \leq 0.01$**

Treatment compliance showed significant positive association with perceived benefit ($r = 0.27$; $P = 0.001$) which means the higher the perceived benefit of using medicine the higher the treatment compliance. Treatment compliance showed significant negative association with perceived barrier to treatment ($r = -0.53$; $P = 0.000$), indicating the higher the perceived barrier the lower the compliance. Treatment compliance showed positive association with cues to action ($r = 0.19$; $P = 0.022$) which means that when people get more reminders of the importance of adhering with treatment become more compliant to treatment.

Perceived severity of hypertension showed significant positive association with perceived susceptibility of getting hypertension complications ($r = 0.29$; $p = 0.001$) indicating the higher the perceived severity of hypertension disease the higher the perception of being vulnerable to hypertension complications. Perceived severity showed positive significant association with cues to action ($r = 0.20$; $p = 0.019$) indicating the higher the perception of severity of hypertension the higher the following the cues to action (reminders). Perceived benefit of using medication showed significant negative association with perceived barrier ($r = -0.45$; $p = 0.000$), this meant that the higher the perception of benefit the lower the perception of barriers. Also perceived benefit of using medication showed positive association with cues to action ($r = 0.32$; $p = 0.000$), meant that the higher perception of benefit the higher the perception of following reminders.

Table 6: Multivariate linear regression of HBM variables

HBM variables	Beta	P- value
Perceived severity	0.092	0.238
Perceived susceptibility	0.147	0.062
Perceived Benefit	0.050	0.557
Perceived barriers	0.477	0.000
Cues to action	0.035	0.671

$R^2 = 0.303$; $F = 11.19$ ($P = 0.000$)

Behaviour = Compliance to treatment.

Multiple linear regression was used to operationalize the HBM with treatment compliance being dependant variable. The predictor variables were perceived benefit, perceived barriers and cues to action. Multivariate analysis indicated significant model fit for the data ($F = 11.19$ and P value = 0.000). The amount of variance in treatment compliance that is explained by the predictors is 30.3% ($R^2 = 0.303$) with perceived barrier being the strongest predictor of treatment compliance ($\beta = -0.477$; $P = 0.000$). A negative beta coefficient indicates a negative association between perceived barriers and treatment compliance. Other HBM predictor variables were not statistically associated with treatment compliance.

Table 7: Multivariate linear regression of perceived barrier variables

Perceived Barrier variables	Beta	P value
Ineffective of medication	-0.059	0.502
Lack of motivation that I cannot be cured	-0.339	0.000
Not having enough time to exercise	-0.006	0.947
Lack of discipline to comply with dietary	0.000	1.000
Lack of motivation to stop smoking	0.047	0.585

R²= 0.115; F=3.37 (P=0.000)

Behaviour = Compliance to treatment.

Multiple linear regression was used to operationalize perceived barrier variables with treatment compliance being dependant variable. The predictor variables were ineffective of medication, I cannot be cured, not having enough time to exercise, lack of discipline to comply with dietary and lack of motivation to stop smoking. Multivariate analysis indicated significant model fit for the data (F = 3.37 and P value = 0.000). The amount of variance in treatment compliance that is explained by the predictors is 11.5% (R² = 0.115) with lack of motivation because I cannot be cured being the strongest predictor of treatment compliance (β = -0.339; P = 0.000). A negative beta coefficient indicates a negative association between lack of motivation because the disease (hypertension) cannot be cured and treatment compliance. Other perceived barrier predictor variables were not statistically associated with treatment compliance.

CHAPTER FIVE

5.0 Discussion

This study explored factors affecting treatment compliance among hypertensive patients attended hypertension clinics at Dar es Salaam. The data obtained through self-reporting using questionnaires on compliance to medication regimen and lifestyle modification revealed the proportional of treatment compliance was 53.3%, the result is similar to study done at Civil Hospital, Karachi by Nasir et al, 2008 found that 54% of hypertensive patients were having good drug compliance and was also similar to study done by Almas et al which showed that 57% of hypertensive patients were compliant to antihypertensive therapy, while the study done by Nasir and others showed that 48.3% of hypertensive patients were complaints to antihypertensive drugs and 51.7% were not compliant to the drugs.

In this study the mean age (SD) of all included hypertensive patients was 56.3 (\pm 13.1) years; this is not surprising since hypertension is more common in older people. Nasir and colleagues in 2008 have done a study on compliance to antihypertensive drugs, salt restriction, exercise and control of systemic hypertension in hypertensive patients at Abbottabad – Pakistan found mean age of 55.8 \pm 13.4 years of hypertensive patients and study done by Almas et al on factors affecting the compliance to antihypertensive therapy, found the mean age of 58.1 (\pm 12) years of hypertensive patents.

The current study shows that, participants who were 64 and below years of age had higher level of treatment compliance compared to those with 65 and above years of age. These results are comparable to those reported from the study done in North America by Krousel-Wood et al, 2009. The possible explanation of these results might be the truth that, the young people have higher income since they are able to work and thus can afford to buy medication compared to older people. Another possible reason is that older people might have more than one disease due to aging reason, which might have led them using many drugs which make them tired, hence, stop taking drugs.

Cognitive and functional impairment in elderly patients increases their risk of poor drug compliance, so they need a family to remind, support and assist them in taking drugs (WHO, 2003).

In this study female were more compliant (63.2%) compared with male (45.8%) it was statistical significance (P 0.044). Female patients have found by some researchers to be better compliance to treatment (Jing et al 2005; Fodor et al 2005) Study done by Sulbarán and others on epidemiologic aspects of arterial hypertension in Maracaibo, Venezuela support the above point that female were more complicate than male. Impotence is the likely hood side effect which affects men on hypertensive medications; this might be the reason why male had low level of treatment compliance compared to female.

The finding showed that patients without formal education level (55.6%) had high treatment compliance compared to those with high education level (37.5%). In UK, a study done by Senior et al 2004 found that patients without formal education qualifications had better compliance with medication. This may be due to the reason that patients with lower educational level might have more trust in physicians' advice compared to those with higher level of education. From these results, it seems that educational level may not be a good predictor of treatment compliance. In contrary to several studies found that patients with higher educational level might have higher compliance (Okuno et al, 2001; Ghods & Nasrollahzadeh, 2003; Yaruz et al 2004) while other studies found no association (Stilley et al 2004; Wai et al 2005).

The relationship between marital status and treatment compliance was observed, married participants were more compliant with treatment (61.0%) than non married participants, and this result was comparable with result of study done by Cooper et al 2005, marital status might influence patients compliance with medication positively, the help and support from a spouse could be the reason why married patients were more compliant to treatment than single patients.

Distribution of participants by reasons of not complying with antihypertensive medication were determined, the reasons were stopping medication due to; cost of the medications, feeling well (asymptomatic), fear of the side effect, avoiding addiction of drugs and use of traditional medicine. Study done by Almas et al, 2005; Hashim et al 2007; support the point above.

From this study the relationship between HBM constructs and treatment compliance was observed; the constructs which were significantly showing relationship were perceived susceptibility of being at risk of getting hypertension complications, perceived benefit of using medicine, perceived barrier to treatment and cues to action. The perceived severity to hypertension did not show significant relationship with treatment compliance. Importantly, the present result corresponds closely to those of a previous Houston American study (Richardson et al 1993) which revealed perceived barrier was important predictor in non compliance to antihypertensive drugs and study done by Hershey et al at University of Pennsylvania in which perceived barrier was the strongest predictor of non compliance to antihypertensive treatment.

Uncontrolled hypertension is caused by non adherence to the antihypertensive drugs; Poor adherence compromises the effectiveness of treatment making this a critical issue in population health both from the perspective of quality of life and of health economics (WHO, 2003). The complications of uncontrolled hypertension are cerebrovascular, cardiovascular and kidney disease (Wolz et al, 2000).

When those complications arise patients end up in ICU leading to increased work load to both critical care nurses and doctors. Those patients in critical condition especially with myocardial infarction or stroke stay longer in ICU causing increased cost of hospitalization. This has a poor outcome to their quality of life as it may cause permanent disability or death which increasing the burden to their family, community and nation as a whole.

Patients understanding their drug regimens help to improve compliance to treatment thereby preventing complications of hypertension and the debilitating outcomes (Kumar & Halesh, 2010).

5.1 Limitation of the study

This study was conducted in government District Hospitals in three Municipal of Dar es Salaam only and did not include patients who attended private Hospitals. Therefore results cannot be generalized to all hypertension patients in Dar es Salaam. However, the results have important insights for some hospitals within the same characteristics.

Self reporting of treatment compliance could introduce recall bias by either over reporting or under reporting depending on patient's behaviour on the recent past. However the researcher was clarifying the questions when asking participants.

This study was conducted using a questionnaire which contains words like how often do you forget to take your medication 'frequently' and 'rarely', these words are sometimes difficult to compare, however the researcher explained the words well to the study participants.

The study was quantitative descriptive cross sectional design conducted using questionnaires which consisting of closed ended questions that the subjects answered research questions to achieve the research purpose and aim; thus the researcher explained clearly the questions to participants for deeper understanding. However the qualitative method would have been used.

CHAPTER SIX

6.0 Conclusion and recommendation

6.1 Conclusion

The study showed that compliance to antihypertensive treatment was low (53.3%) among study participants, female being more compliant to treatment than males, other social demographic factors were not significant. With the use of HBM the important strongest variable was perceived barrier to treatment, the remaining HBM variables were not statistically significant.

6.2 Recommendations

The following recommendations are derived from the findings:

6.3 Practical recommendation

Patients need advice, support and information from health professionals in order to be able to understand the importance of using drugs as prescribed. It is recommended that hypertensive patients should be counselled every time whenever they visit to physician to improve the compliance to anti hypertensive drugs, salt restriction and to do exercise daily, so that they should have better control of hypertension.

It also demonstrates that compliance is an important factor related to optimal blood pressure control. This requires health providers to orient themselves towards patients' behaviours (i.e barriers to compliance) that may interfere with compliance with therapy, in order to achieve control of hypertension in the community. It is also recommended that health education should be stressed to improve the rate of compliance by improving patient's knowledge about hypertension and its consequences.

Doctors/Nurse must educate hypertensive patients about their disease on the importance of complying with hypertensive medications, the consequences of non-compliance with treatment. Patients should be told that the drugs are for long term use (for life) and the disadvantage of skipping the dose.

Patients should know the importance of complying with medication whether they have symptoms or not, Doctors and nurses should stress on the removal of the barriers (lack of motivation because hypertension cannot be cured) of using antihypertensive treatment so that patients will comply with their treatment.

6.4 Policy maker's recommendation

Ministry of health and social welfare should plan strategies to improve antihypertensive compliance such as improving education campaign on the importance of compliance to antihypertensive medications, by the media, posters, and religion centres e.g. church and Mosque.

The Ministry of health and Social welfare should provide training to health provider on how to counsel patients in a constructive and non judgemental manner with the primary goal of helping the patients to comply better with the treatment regimen.

The Ministry of Health and Social Welfare should review the policy of cost sharing, there is a need of free treatment to hypertensive patients, because most of hypertensive patients are elderly, they can't afford buying medications.

6.5 Recommendation on further research

More research should be done to assess why people are having perceived barriers to treatment compliance, and why people with low education are more compliant than those with high education.

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APPENDIXES

Appendix 1: consent form (English version)



**MUHIMBILI UNIVERSITY OF HEALTH AND ALLIED SCIENCES
DIRECTORATE OF RESEARCH AND PUBLICATIONS, MUHAS**

ID-NO

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Consent to participate in a project about factors affecting treatment compliance among hypertensive patients in Dar es Salaam

Greetings! My name is Angelina. A. Joho, MSc student from **Muhimbili University of Health and Allied Sciences**, It is my pleasure to invite you to participate in a study with the objective of investigating factors affecting treatment compliance among hypertension patients.

The purpose of this study is to determine why some patients find it difficult to comply with their treatment for hypertension. Once I understand the reasons, I may be able to make recommendations that will improve the medical care which patients receive for hypertension and ultimately their quality of life.

Risk - The researcher will use questioners to ask you about factors affecting treatment adherence among hypertensive patients. The questions will last not more than 25 minutes and will not cause you any physiological, financial or psychological harm.

Rights - May I also stress that your participation in the study is entirely voluntary and you may decide not to participate or withdraw from the study. And should you withdraw from the study be assured that this will not affect the services you receive at the hospital.

Confidentiality - 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.

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 contact the study Coordinator or Principal Investigator Angelina. A. Joho (0784 788302) Muhimbili University of Health and Allied sciences, P.O BOX. 65004, Dar-es- Salaam. In case you have questions regarding your rights as a participant, you may call the Principal investigator or Prof. M. Aboud, Director of Research and Publication at MUHAS, P.O. Box 65001, Dar es Salaam. Tel: 2150302-6. PO BOX 65001.

Please sign this form if you agree to participate.

I ----- fully understand the nature of the study for which I have been invited to participate. I fully understand that the researcher will maintain my rights and confidentiality. Therefore I hereby voluntarily give my consent to participate in the study.

Participant's signature/thumb print: _____ Date: _____

Researcher's signature----- Date-----

Appendix 2: consent form (Swahili version)



**CHUO KIKUU KISHIRIKI CHA SAYANSI YA AFYA CHA MUHIMBILI
KURUGENZI YA UTAFTI NA MACHAPISHO**

Namba ya utambulisho

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Idhini ya kushiriki utafiti wa kuchunguza sababu zinazowafanya wagonjwa wa shinikizo la damu kutotumia matibabu yao kama inavyopaswa.

Habari, Mimi naitwa Angelina. A. Joho ni mtafiti kutoka Chuo kikuu cha afya na tiba Muhimbili.

Madhumuni ya utafiti - Utafiti huu unalenga kuchunguza sababu ambazo zinachangia wagonjwa kukotumia matibabu yao ya shinikizo la damu inavyohitajika. Matokeo baada ya utafiti huu yatashirikisha uongozi wa hospitali kwa lengo la kuboresha afya za wagonjwa wa shinikizo la damu kwa kutumia matibabu yao kama inavyohitajika.

Utunzaji wa siri – Unahakikishiwa kwamba maelezo utakayotowa yatakuwa ni siri na yatatumika kwa utafiti tu.

Uhuru wa kushiriki - Ni hiari kushiriki kwenye utafiti huu na pia unaweza kujitoa wakati wowote bila ya kuaadhiri huduma ya afya unayopata.

Faida za kushiriki - Mshiriki hatopata faida ya hapo kwa hapo lakini ni matumaini yangu kwamba matokeo ya utafiti huu yatashirikisha uongozi wa hospitali na wadau wa afya kama wizara ya afya kuhusiana matibabu ya shinikizo la damu na utumiaji wa

dawa kwa ujumla kwa lengo la kuborosha maisha ya wagonjwa wa shinikizo la damu.

Madhara ya kushiriki - Hakuna madhara yanayotegemewa kupatikana kwa kushiriki utafiti huu.

Mtu wa kuwasiliana naye

Kama una maswali zaidi juu ya utafiti huu, tafadhali wasiliana na mtafiti mkuu ANGELINA JOHO. Muhimbili University of Health and Allied Sciences, P.O.Box 65001, Dar es Salaam). Pia kama una maswali juu ya haki zako katika kushiriki kwenye utafiti huu unaweza wasiliana na mtafiti mkuu au Prof. M. Aboud, Mkurugenzi wa tafiti na machapisho hapa MUHAS, P.O. Box 65001, Dar es Salaam. Tel: 2150302-6.

Makubaliano

Mimi..... ninakubali kushiriki katika utafiti huu ambao unahusu kuchunguza sababu zinazopelekea wagonjwa wa shinikizo la damu kutotumia matibabu yao ya shinikizo la damu kama inavyotaki . Ruhusu inatolewa kwa makubaliano kwamba maelezo kutoka kwenye majadiliano yatumika kwa ajili ya utafiti tu na mtafiti husika, ninaelewa dhumuni la utafiti pia faida na madhara yake.

Saini ya mshiriki/Dole gumba..... Tarehe.....

Saini ya mtafiti..... Tarehe.....

Appendix 3: questionnaire (english version)

A study on factors affecting treatment compliance among hypertension patients in dar es salaam.

Respondent identification code:

Section A: Demographic information

- 1) Age.....
- 2) Sex: 1. Female 2. Male []
- 3) What is your marital status?
 1. Never married
 2. married
 3. Divorced
 4. Separate []
 5. Widowed
 6. Cohabiting
- 4) What is the highest level of education you have completed?
 1. Never went
 2. Primary school
 3. Secondary school []
 4. Post secondary school (eg college)
 5. University
- 5) What your occupation?
 1. Government employee

- 2. Non- government employee
 - 3. Self – employed []
 - 4. Student
 - 5. Unemployed
- 6) When were you told that you have high blood pressure?
- 1. Less than one year ago
 - 2. One year ago
 - 3. Two years ago []
 - 4. Three years ago
 - 5. Four years ago
 - 6. five years ago
 - 7. More than five years ago
- 7) What health complaints other than high blood pressure do you have?
- 1. Yes 2. No
- Heart problems []
- Paralysis of limb []
- Visual impairment []
- Kidney problem []
- None []
- 8) How many kinds of medicine are you taking for high blood pressure?
- 9) Do you smoke cigarettes? 1. Yes 2. No []
- 10) How many cigarettes do you smoke per day?
- 11) Do you consume alcohol? 1. YES 2. NO []

12) How often do you consume alcohol per day

1. More than once per day
2. Once per daily
3. A few times per week
4. About once a week
5. Less than once per week
6. Seldom (rare)
7. Never

[]

Section B: Compliance with Medication regimen

	How often	Daily 1	Frequently 2	Rarely 3	Never 4
14	do you forget to take your medicine?				
15	do you stop taking your medicine because you feel better?				
16	do you stop taking your medicine because you feel worse?				
17	do you stop taking the medication because you believe that they are ineffective?				

18	do you stop taking your medicine because you fear side effects? Or have caused side effect eg importance for men, Dizziness/weakness				
19	do you stop taking medicine because you try to avoid addiction?				
20	do you stop medication because you are using traditional medicine (healer) or Religions belief?				
21	Do you stop medication because of cost of medication				

Section C: Compliance with Lifestyle Modification regimen

	How often	Daily 1	Frequently 2	Rarely 3	Never 4
22	do you smoke?				
23	do you drink alcohol?				
24	do you engage in physical exercise?				
25	eat table salt?				

26	do you eat meat with high animal fat?				
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Section D: Perception of Severity

	To what extend do you agree or disagree with the following statements?	Strongly agree 1	Agree 2	Disagree 3	Strongly agree. 4
27	My blood pressure condition is serious				
28	I am worried about my blood pressure condition				
29	Getting hypertension would be so serious				
30	Getting hypertension complication would be so dangerous				
31	Being permanently disabled due to hypertension would be so dangerous				
32	Dying due to hypertension complications would be so dangerous				

Section E: Perceptions of Susceptibility

	To what extent do you agree or disagree with the following risks happen to you as a result of your high blood pressure	Strongly disagree. 1	Disagree 2	Agree . 3	Strongly agree. 4
33	having stroke				
34	developing visual impairment				
35	developing heart problems				
36	developing kidney problem				
37	becoming a burden for my family				
38	Career being negatively affected				

Section F: Perception of Benefits

	To what extent do you agree or disagree with benefits of complying with treatment?	Strongly disagree 1	Disagree 2	Agree 3	Strongly agree. 4

39	Keeping my blood pressure under control				
40	Increasing my quality of life				
41	Increasing my sense of well-being				
42	Protecting me from complications				
43	Avoiding added financial burden to treat complications				
44	Decrease my chance of dying				

Section G: Perception of Barriers

	To what extent do you think the following hinder you from complying with your treatment?	Not at all 1	To some extent. 2	To a lager extent 3	very much extent.4
45	Ineffective of the medicine to stabilize my blood pressure				
46	Lack of motivation because I cannot be cured				
47	Not having enough time to exercise				

48	Lack of discipline to comply with the dietary restrictions				
49	Lack of motivation to stop smoking				

Section I: Cues to Action

	To what extent do you remember to comply with your blood pressure treatment?	Strongly disagree 1	Disagree 2	Agree 3	Strongly agree 4
50	TV programmes on high blood pressure				
51	Radio programmes on high blood pressure				
52	Advice from my doctor				
53	Advice from friends				
54	Advice from health care workers other than my Doctor				
55	Advice from family member				
56	Death of a relation or friend due to high blood pressure				

Appendix 4: questionnaire (Swahili version)

Utafiti kuhusu utumiaji wa dawa miongoni mwa wagonjwa wa shinikizo la damu dar er salaam.

Namba ya utambulisho:

Sehemu A: Taarifa binafsi

1) Umri (katika miaka)

2) Jinsia 1. Mke 2. Mme []

3) Hali ya ndoa yako

1 Sijaoa.

2. Nimeoa

3. Tumeachana []

4. Tumetengana

5. Nimefiwa

4) Kiwango chako cha elimu?

1. Siku soma

2. Elimu ya msingi

3. Elimu ya sekondari []

4. Elimu ya kidato cha sita

5. Elimu ya chuo

5) kazi yako

1. Muajiriwa

2. Nimejiari []

3. Mwanafunzi

4. Sinaajira

6) Lini uligudulika unaugonjwa wa shinikizo la damu?

1. Chini ya mwaka uliopita

2. Mwaka mmoja uliopita

3. Miaka miwili iliyopita

4. Miaka mitatu iliyopita []

5. Miaka mine iliyopita

6. Miaka mitano iliyopita

7. Zaidi ya miaka mitano iliyopita.

7) Zaidi ya shinikizo la damu unamatatizo mengine ya:

Moyo. 1. Ndiyo 2. Hapana []

Kupooza miguu 1. Ndiyo 2. Hapana []

Kuona 1. Ndiyo 2. Hapana []

Matatizo ya figo 1. Ndiyo 2. Hapana []

8) Unatumia dawa za aina ngapi kutibu shinikizo la damu?

9) Unavuta sigara? 1. Ndio 2. Hapana []

10) Unavuta sigara ngapi kwa siku?

11) Unakunjwa pombe? 1. Ndio 2. Hapana []

Sehemu B: Matumizi ya dawa

	Ni kwa kiasi gani	Kila siku 1	Mara kwa mara2	Mara chache 3	Sijawahi 4
14	huwa unasahau kumeza dawa zako?				
15	huwa unaacha kumeza dawa pale unapooa afya imekuwa nzuri ?				
16	huwa unaacha kumeza dawa sababu unajisikia vibaya?				
17	unaacha kumeza dawa kwa kuamini haikusaidii?				
18	unaacha kumeza dawa sababu unaogopa madhara yatokanayo na dawa?				
19	unaacha kumeza dawa kwa kuopa dawa kukuzoea?				
20	unaacha kumeza dawa na badala yake unatumia dawa za asili?				
21	Unaacha kumeza dawa sababu unashindwa kuzinunua?				

Sehemu C: Mabadiliko ya maisha

	Ni kwa kiasi gani huwa;	Kila siku 1	Mara kwa mara 2	Mara chache 3	Sijawahi 4
22	unavuta sigara?				
23	unakunjwa pombe?				
24	unafanya mazoezi?				
25	unaongeza chumvi kwenye chakula?				
26	Unakula chakula chenye mafuta ya				

wanyama?				
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Sehemu D: Ufahamu kuhusu uzito wa hatari wa shinikizo la damu

	Ni kwa kiasi gani unakubaliana au kupingana na mambo yafuatayo:	Sikubali kabisa 1	Sikubali 2	Nakubali 3	nakubali kabisa 4
27	ha yangu ya shinikizo la damu ipo mbaya				
28	nina wasisi na hali ya shinikizo langu la damu				
29	.kupata shinikizo la damu ni hatari sana				
30	Kupata madhara ya shinikizo la damu ni hatari sana				
31	Kupata ulemavu wa kudumu kutokana na shinikizo la damu ni hatari sana				
32	Kunahari ya kupoteza maisha kutokana na madhara ya shinikizo la damu				

Sehemu E: Ufahamu kuhusu hisia za kuwa hatarini kupata shinikizo la damu

	kwa kiasi gani unaweza kubaliana au kutokubali kwa madhara yafuatayo kutokea sababu ya shinikizo lako la juu la damu;	Sikubali kabisa 1	Sikubali 2	Nakubali 3	Nakubali kabisa 4
33	Kupata kiharusi				
34	Matatazo ya macho (kutokuona)?				

35	Mtatatizo ya moyo				
36	Matatizo ya figo				
37	Kuwa mzigo kwenye familia				
38	Kushindwa kuendelea na kazi/ shughuli				

Sehemu F: Ufahamu kuhusu umuhimu wa kufuatilia matibabu

	Kwa kiasi gani unakubaliana au kutokubaliana na manufaa/faida ya kufuata masharti ya utumiaji wa dawa kama yafuatayo?	Sikubali kabisa 1	Sikubali 2	Nakubali 3	Nakubali kabisa 4
39	Kuzuia shinikizo ladamu lisipande juu				
40	Kuongeza ubora wa maisha				
41	Kujisikia vizuri				
42	Kunilinda nisipate madhara/adhari za shinikizo la juu la damu				
43	Kupunguza gharama za matibabu yatokanayo na madhara/adhari za shinikizo la damu.				
44	kuniongezea muda wa kuishi				

Sehemu G: Ufahamu wa vikwazo vya utumiaji dawa

	Ni kwa kiasi gani unafikiri mambo yafuatayo yanakuzuia kufuatilia Matibabu?	Si tatizo sana 1	Tatizo 2	Tatizo kiasi tu 3	Si tatizo kabisa 4
45	Dawa kutokuwa na ufanisi sitahiki kutibu shinikizo la damu				
46	Kukosa motisha kwa kuamini siwezi kupona				
47	Kukosa muda wa kufanya mazoezi				
48	Kutokufuatilia masharti ya ulaji wa chakula				
49	Kukosa motisha ya kuacha kuvuta sigara				

Sehemu I: Viashiria vya kukumbusha kutumia dawa

	kwa kiasi gani unapata motisha wa kunjwa dawa zako kutokana na haya yafuatayo?	Sikubali kabisa 1	Sikubali 2	Nakubali 3	Nakubali kabisa. 4
50	vipindi vinavyohusu shinikizo la damu kupitia luninga				
51	vipindi vinavyohusu shinikizo la damu kupitia radio				
52	Ushauri wa daktari				
53	Ushauri toka kwa marafiki				

54	Ushauri kutoka kwa wahudumu wengine wa afya mfano nurse				
55	Ushauri toka kwenye familia.				
56	Kifo cha rafiki/ndugu kutokana na shinikizo la damu				

Appendix 5: Ethical Clearance letter

**MUHIMBILI UNIVERSITY OF HEALTH AND ALLIED SCIENCES
DIRECTORATE OF POSTGRADUATE STUDIES**

P.O. Box 65001
DAR-ES-SALAAM
TANZANIA
Telefax: 255-022-2150465
Telegrams: UNIVMED



E-MAIL dpgs@muhas.ac.tz
TEL: (255-022)-2150302-6 Ext. 207
Direct line: 2151378

Ref. No. MU/PGS/SAEC/Vol. VI/

11th April, 2012

Ms. Angelina A. Joho,
MSc. In Critical Care & Trauma Nursing,
MUHAS.

RE: APPROVAL OF ETHICAL CLEARANCE FOR A STUDY TITLED "FACTORS AFFECTING TREATMENT COMPLIANCE AMONG HYPERTENSION PATIENT SIN THREE DISTRICT HOSPITALS – DAR ES SALAAM"

Reference is made to the above heading.

I am pleased to inform you that, the Chairman has on behalf of the Senate approved ethical clearance for the above-mentioned study.

Thus ethical clearance is granted and you may proceed with the planned study.

Please liaise with bursar's office to get your research fund.


Prof. Z. Premji

DIRECTOR, POSTGRADUATE STUDIES

/emm
c.c. Vice Chancellor, MUHAS
c.c. Deputy Vice Chancellor – ARC, MUHAS
c.c. Dean, School of Nursing, MUHAS

Appendix 5: Permission letters to conduct research

KINONDONI MUNICIPAL COUNCIL

ALL CORRESPONDENCES SHOULD BE DIRECTED TO THE MUNICIPAL DIRECTOR

Tel: 2171022

In reply please quote:

Ref. No. FD/K/



MUNICIPAL MEDICAL OFFICER OF
HEALTH,
KINONDONI MUNICIPAL COUNCIL
P.O. BOX 61665,
DAR ES SALAAM

Date: 23rd ^{Apr} ~~March~~ 2012

Medical officer Incharge
Mwananyamala Hospital
KINONDONI MUNICIPAL.

RE: RESEARCH PERMIT

Angelina A. Joho

The above-mentioned is a student from **Muhimbili University of Health and Allied Sciences (MUHAS)** pursuing studies in critical care and trauma nursing. MMOH office has given a permit to the mentioned student to conduct her study titled **factors affecting treatment compliance among hypertension patients in three district hospitals Dar es Salaam** in your facility starting from 23rd April 2012 to 30th April 2012.

Kindly provide the necessary assistance.

Best wishes,


Aleswa Zebedayo

Research Coordinator

KINONDONI MUNICIPAL COUNCIL

Copy: To above mentioned Candidate.

**MUHIMBILI UNIVERSITY OF HEALTH AND ALLIED SCIENCES
DIRECTORATE OF POSTGRADUATE STUDIES**

P.O. Box 65001
DAR-ES-SALAAM
TANZANIA
Telefax: 255-022-2150465
Telegrams: UNIVMED



E-MAIL dpgs@muhas.ac.tz
TEL: (255-022)-2150302-6 Ext. 207
Direct line: 2151378

Ref. No. HD/MUH/T.52/2010

16th April, 2012

District Medical Officer,
Amana Municipal Council
DAR ES SALAAM.

HYPERTENSION CLINIC
Kandy Asch
July 24/24/2012
FOR DISTRICT MEDICAL OFFICER I/C
AMANA HOSPITAL
P. O. BOX 45411
DAR-ES-SALAAM

Re: INTRODUCTION LETTER

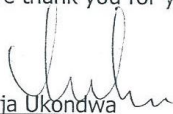
The bearer of this letter Ms. Angelina A. Joho is a student at Muhimbili University of Health and Allied Sciences (MUHAS) pursuing in Critical Care and Trauma Nursing.

As part of her studies she intends to do a study titled: "**Factors affecting treatment compliance among hypertension patients in three District Hospitals Dar es Salaam**".

The research has been approved by the Chairman of MUHAS Research Ethics Committee.

Kindly provide her the necessary assistance for her to conduct the research.

We thank you for your cooperation.


Tija Ukondwa

For: DIRECTOR, POSTGRADUATE STUDIES

TU/emm

cc: Ms. Angelina A. Joho
cc: Dean, School of Nursing

TEMEKE MUNICIPAL COUNCIL

ALL COMMUNICATIONS TO BE ADDRESSED TO MUNICIPAL DIRECTOR

P.O.Box. 45232
Tel: 2850142



TEMEKE MUNICIPAL MEDICAL
OFFICE OF HEALTH
DAR ES SALAAM
TANZANIA.

Date 20/04/2012

MEDICAL OFFICER INCHARGE
TEMEKE MUNICIPAL HOSPITAL
P.O. BOX 45232
DAR ES SALAAM
TANZANIA

REF; PERMISSION TO CONDUCT HEALTH RESEARCH ACTIVITIES IN TEMEKE MUNICIPALITY.

Please refer to the above heading.

Permission has been granted to Mr. /Mrs/Ms/Prof. /Dr. ANGELINA A. JOHO.
From (Institution) MUHAS Address P.O. Box 65001 DSM,
Tel. No: 255 21 51 328 to collect data for research work at your institution.

The research title is

FACTORS AFFECTING TREATMENT
COMPLIANCE AMONG HYPERTENSION PATIENTS IN THREE
DISTRICT HOSPITALS IN DAR ES SALAAM.

S/he has submitted a proposal for the mentioned study to the MMOH Office as a pre - condition prior to authorisation.

The researcher has been instructed and agreed to submit the research progress reports and final results to the MMOH prior to any publications.

Data collection will start from 23/04/2012 to 25/05/2012
Sample size 135

This research work is part of academic fulfilment for Diploma/Advanced Diploma/Degree/Master/PhD /its part of the ongoing research in your Institution.

I am kindly requesting you to give him/her the necessary assistance so as to accomplish this task timely.

Yours Sincerely

FOR MUNICIPAL MEDICAL OFFICER
Dr. L. Chyatta
OFFICE OF HEALTH

For; Temeke Municipal Medical Officer of Health

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