PRESCRIPTION AWARENESS AMONG PATIENTS WITH CARDIOVASCULAR DISEASES AT MOI TEACHING AND REFERRAL HOSPITAL, KENYA

BY

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DECLARATION

Declaration by the candidate:

This thesis is my original work and has not been presented for a degree in any other University

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DEDICATION

This work is dedicated to my family for their moral support throughout my academic pursuit.

ABSTRACT

Cardiovascular disease (CVD) causes 30% of deaths globally and has been reported to be on the increase in sub-Saharan Africa. Medications prescribed for CVD are largely an ongoing lifetime commitment aimed to preserve optimal heart function for as long as possible and as a result patients must adhere to their prescription. However, prescription adherence is influenced to a large part by prescription awareness, which is having information about prescribed drugs and their side effects and the manner of administration of these medicines. Although prevention and control are anchored on prescription awareness and have been shown to prevent at least 250,000 CVD-related deaths annually, estimates of prescription awareness and of factors that influence it are largely unknown in developing countries such as Kenya. The goal of the study was to investigate factors that influence the level of prescription awareness among patients with cardiovascular diseases (CVD) at the Moi Teaching and Referral Hospital (MTRH). Specifically, the study determined the level of prescription awareness, the association between prescription awareness and socio-demographic characteristics of patients, and whether prescribing clinicians explain the nature of prescriptions given to patients with CVD. The study used a cross-sectional study design with a sample size of 204 as was derived from the target population of 344. Data was collected using questionnaires. On the level of prescription awareness, there was a significant difference ($x^2 = 144.75$, $p = 0.000$) in the frequencies between those who were aware and those who were not with more respondents having high level of awareness. However, gender (p=0.562), age (p=0.575), marital status (p=0.957), employment status (p=0.358), educational level (p=0.592), settlement (p=0.577), the respondents living arrangement (p=0.504) were not associated with prescription awareness. Nearly 98% of respondents indicated that clinicians explained prescriptions to them. However, there was a significant association between the language of communication by the respondents and level of prescription awareness (p=0.043). Consequently, it was concluded that CVD patients at the MTRH had a high level of prescription awareness implying they were aware of their medication. Further prescription awareness was found to be influenced by language used by prescribing clinicians perhaps because the use of language patients are versed in influenced their ability to communicate with the medical personnel. It is recommended that prescribing clinicians should ensure that they choose a language of communication that their patient is well-versed in or employ an interpreter if that is not the case. To the extent that prescribing clinicians are the primary source of prescription awareness to patients and further that key socio-demographic and economic factors were not significantly associated with prescription awareness, it can be concluded that prescribing clinicians were communicating with patients indiscriminately. Overall, the results suggest that clinicians' communication of prescription plan to cardiovascular patients at the MTRH was effective.

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ACRONYMS AND ABBREVIATIONS

CHD	:	Coronary Heart Disease
CVD	:	Cardiovascular Disease
HBM	:	Health Belief Model
MTRH	:	Moi Teaching and Referral Hospital
WHO	:	World Health Organization
BMI	:	Body Mass Index
MI	:	Myocardial Infarction

DEFINITION OF TERMS

Prescription awareness: Is used in this study to refer to the patient's level of knowledge, attitude and skills to appropriately follow the prescribed regime.

Cardiovascular patient: Is used in this study to refer to a person who has a chronic immune-inflammatory and fibro-proliferative disease of the arterial wall that begins during adolescence and slowly progresses throughout life.

Demographic factors Is used in this study to refer to factors that affect prescription awareness which includes; Age, Gender and marital status.

Socio-Economic factors Is used in this study to refer to factors that affect prescription awareness which includes; Occupation, Education, Settlement, live alone and Patient primary language of communication.

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CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

Cardiovascular diseases (CVD) are a group of disorders of the heart and blood vessels and they include: coronary heart disease which is a disease of the blood vessels supplying the heart muscle; cerebrovascular disease which is a disease of the blood vessels supplying the brain; peripheral arterial disease which is a disease of blood vessels supplying the arms and legs; rheumatic heart disease which is a damage to the heart muscle and heart valves from rheumatic fever, caused by streptococcal bacteria; congenital heart disease which is a malformations of heart structure existing at birth and deep vein thrombosis and pulmonary embolism which is a blood clots in the leg veins, which can dislodge and move to the heart and lungs (Hansson, 2005).

Heart attacks and strokes are usually acute events and are mainly caused by a blockage that prevents blood from flowing to the heart or brain. The most common reason for this is a build-up of fatty deposits on the inner walls of the blood vessels that supply the heart or brain. Strokes can also be caused by bleeding from a blood vessel in the brain or from blood clots. The cause of heart attacks and strokes are usually the presence of a combination of risk factors, such as tobacco use, unhealthy diet and obesity, physical inactivity and harmful use of alcohol, hypertension, diabetes and hyperlipidaemia (Hauptman *et al*., 2008).

Cardiovascular disease causes 30% of deaths globally (17 million deaths worldwide from an annual total of 57 million deaths) with an alarming 80 % of these deaths occurring in low- and middle-income countries (LMICs). By comparison, infectious diseases account for 10% of global mortality (Anderson & Chu, 2007). For instance coronary heart disease (CHD) is among

the major causes of hospitalization and death in Europe (Allender *et al*., 2008) as well as in the USA (Rosamond et *al.,* 2008). There is a trend toward a decrease in developed countries, for example CVD has been declining slightly in North America over the past four decades due, in part, to a parallel decrease in the prevalence of major CVD risk factors and improved care of patients with known CVD (Wong *et al*., 2008).

However, the burden of CVD is greatest in developing countries where its prevalence has increased to epidemic proportions. About 84 % of the total global burden of disease they cause occurs in LMICs. Further still, CVD mortality is on a steady rise in LMICs with rates of up to 300–600 deaths attributed to CVD per 100,000 populations, and is projected to increase causing preventable loss of lives (World Health Organization, 2011). The increase in CVD and its effect in developing countries have caused a huge economic burden due to required medical care, loss of productive workforce. CVD, for example is one of the causal factors of society and economic losses of companionship (Burykin *et al.,* 2016).

Management of CVD is through lifelong medication that requires patients to adhere to treatment regimens. Medication adherence is the ability and willingness to follow recommended health practices regarding medication management (Morisky *et al.,* 2008). To adhere to the treatment regimen, a patient must be aware and understand the prescription well. It follows; therefore, that adherence is influenced by prescription awareness, which is an understanding of how drugs work (Ankita *et al.,* 2015). Research by Eagle *et al.* (2004) showed that 10% to 25% of newly diagnosed patients with CVD discontinue medication within 6 months after diagnosis, whereas 21% to 47% do so within 24 months. In addition, 8% to 20% of patients with an MI or stable angina have been reported to stop taking prescribed medications after 6 months (Eagle *et al*., 2004). Benner *et al*. (2002) found that only 56% of patients aged 65 or older who were

prescribed statins were still taking them 6 months after initiation of therapy and only 35% were taking them 5 years later. Therefore, low prescription awareness is associated with high chances of not adhering to medication regimens, which can lead to more frequent hospitalizations, increased healthcare expenditures and a higher risk of adverse health outcomes or cardiac events (Julie *et al., 2006*).

This study adopted the definition of prescription awareness which states that prescription awareness is basically the patient's level of knowledge, attitude and skills to appropriately follow the prescribed regime (Ankita *et al*., 2015). Prescription awareness thus denotes having information about pharmacologic outcomes of drugs during treatment which can be therapeutic effects and the side effects of the drugs or adverse drug reactions. Accordingly, a patient must be aware of interactions between prescribed and other any other drugs the patient is using for other conditions, awareness about the dangers of prescription and over-the-counter medicine, awareness about the safe use, and safe storage and safe disposal of their prescription drugs.

Prescription awareness directly related to adherence. Nguyen *et al.* (2017), for example, demonstrated that increased awareness of complications related to hypertension was given as the main reason for increased adherence to therapy. Nguyen and colleagues also showed that interaction between the physician and patient is crucial for high-quality medical practice and medication adherence.

Chronic diseases require patient education to achieve adequate control and prevent adverse health outcomes such as is also the case also with CVD. Patients with hypertension, myocardial infarction, stroke, heart failure among other chronic diseases may need to understand why it is important to take their medications properly and consistently. Studies indicate that awareness on

the management of risk factors for CVD among diabetic/hypertensive patients in African populations is generally low (Gladys *et al* 2014). Yet adherence to medication is closely linked to prescription awareness to the extent that the WHO contends that prescription awareness may be as important to the health of a country as advancing medical technology (WHO, 2003). Low prescription awareness is associated with high chances of not adhering to medication regimens, which can lead to more frequent hospitalizations, increased healthcare expenditures and risk of adverse health outcomes (Julie *et al., 2006*). Poor adherence to anti-hypertensive medications among hypertensive patients remains a big challenge and has been attributed more specifically to lack of adequate awareness and cost of the prescribed drugs on the part of the patients (Mugwano *et al.,* 2016). Consequently, many patients do not take prescription medications as directed by prescribing clinicians, others miss or change doses, and up to 60% of patients may even discontinue medication use three months after beginning the prescription (Katz, Kripalani & Weiss, 2006). As such, there is need to study on the area of prescription awareness and determine the factors which influence it more so locally where there is a dearth of information. This study aimed to do this by looking at prescription awareness among patients with cardiovascular diseases at Moi Teaching and Referral Hospital, Kenya

1.2 Problem Statement

Cardiovascular disease (CVD) accounts for 30% of global mortality, compared to 10% of global mortality for infectious diseases. In 2012, for example, 17.5 million people died from cardiovascular diseases. Although prescription awareness has been shown to be important in reducing the burden of CVD such as frequent hospitalizations, increased healthcare expenditures and a higher risk of adverse health outcomes, the level of prescription awareness is not known among patients of CVD from developing countries such as Kenya. Similarly, although a range of

demographic and socioeconomic factors have been shown to be associated with decreased prescription awareness, it is not known whether such factors apply to contexts in developing countries where emerging data suggest increasing burden of CVD is on the increase. Lastly, although prescription awareness and thus medication adherence begins with prescribing clinicians, it is not known whether prescribing clinicians explain prescriptions to patients. In order to address these issues, this study sought to provide a local perspective of the matter by looking at prescription knowledge among patients with cardiovascular diseases at Moi Teaching and Referral Hospital, Kenya

1.3 Justification

Disease burden in developing countries including Kenya is increasingly shifting from traditional causes of diseases to cardiovascular diseases that require long-term medication. Low prescription awareness is associated with low adherence to medication regimens, which can lead to more frequent hospitalizations, increased healthcare expenditures and a higher risk of adverse health outcomes. Therefore knowledge on prescription awareness, demographic and socioeconomic factors that predict prescription awareness as well as whether prescribing clinicians explain prescriptions to patients as proposed in this study, is an important step in the process aimed at managing cardiovascular diseases in the country. In total, findings from the study are important baseline data needed to manage CVD in the country. Such data may be of use to prescribing clinicians and the Ministry of Health where the findings have potential to inform policy including those on targeted interventions.

1.4 Broad Objective

To investigate factors affecting prescription awareness among patients with cardiovascular diseases at Moi Teaching and Referral Hospital Kenya

1.4.1 Specific Objectives

1. To determine the level of prescription awareness among patients with cardiovascular diseases at the Moi Teaching and Referral Hospital, Kenya.

2. To determine the association between socio-economic and demographic factors and the level of prescription awareness among patients presenting with cardiovascular diseases at the Moi Teaching and Referral Hospital, Kenya.

3. To assess whether clinicians explain prescription plan to cardiovascular patients at the Moi Teaching and Referral Hospital, Kenya.

1.4.2 Research Questions

1. What is the level of prescription awareness among patients with cardiovascular disease at the Moi Teaching and Referral Hospital, Kenya?

2. What is the association between socio-economic and demographic factors and the level of prescription awareness among patients presenting with cardiovascular diseases at the Moi Teaching and Referral Hospital, Kenya?

3. Do clinicians explain prescription plan to cardiovascular patients at the Moi Teaching and Referral Hospital, Eldoret?

1.5 Significance of Study

The study is of significance to several parties but more so to clinicians and policy makers. To the clinician, the findings of the study provides information on prescription awareness among patients with cardiovascular diseases, and the role clinicians can play in increasing prescription awareness of their patients in order to positively influence the health outcome of cardiovascular disease patients. To policy makers, the study provides information that will guide formulation of policies geared towards increasing the level of prescription awareness among patients with CVD.

1.6 Assumptions

In order to conduct the study, the study made the assumption that prescription awareness affects the adherence and thus the adherence of patients to the medication was not tested.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

Recognition of the prescribing problems is one of the most fundamental steps towards improving the prescribing quality and medication safety; globally more than 50% of drugs are prescribed, dispensed or sold inappropriately (Sreedevi *et al.*, 2011). Correct diagnosis, accurate prescribing, proper dispensing, appropriate packing and good patient counseling are important criteria for rational use of drugs (Vijayakumar *et al.*, 2010). Misunderstandings over brand names, cost issue, unpredictable drugs supply, non-existence of formulary in hospitals and lack of knowledge by patients regarding dosing schedules are the major causes of irrational use of drugs which may leads to inadequate therapeutic effects, undesirable drug event and adverse drug interactions (Sreedevi *et al*., 2011). Use of multiple drugs not only complicates the cost and regimen but also increases the incidence of undesirable drug reactions and drug interactions (Vijayakumar *et al.*, 2010).

World Health Organization emphasizes drug utilization assessment so as to examine the use of drugs in the society. Such assessments are helpful to determine the prescribing patterns and to set the priorities to avoid the irrational drug use (WHO, 2010). It has been reported that drug treatment is likely to be effective only when patients are informed well about the therapy (Mohanty *et al.*, 2010). In countries practicing insurance-based health system, the prescribing pattern and drug cost are mainly influenced by strategies used by managed care organizations to control drug expenditures. These include formularies, generic substitution, drug benefit design, prior approval, product price control, profit control, target drug programs, therapeutic interchange, patients' co-payments and reference drug listing. Studies suggest that use of formularies, may change the prescribing attitude of physicians, increasing quality of drug

prescribing thus reducing costs of drug therapy (Sagardui *et al.,* 2005). Evidence suggests that more appropriate utilization of prescription drugs has the potential to lower total expenditure and improve the quality of care (Copeland, 1999). Effective plan design and strategies such as generic substitution, rational prescribing and use of formulary can help manage costs while maintaining quality and customer satisfaction.

2.2 Level of Prescription Awareness among Cardiovascular Patients

Globally, the prevalence of CVD has been increasing over the years. For instance, the prevalence of rheumatic heart disease, a cardiac vascular disease that normally arises from complications of hemolytic streptococcal infections has been increasing (Sriha *et al.,* 2016). Rheumatic mitral valve disease constituted almost half (46.7%) of all mitral valve repairs, ranging from 44.8 - 55.8 patients per year from 1997 - 2003 (Hung *et al*., 2016). Hypertension is the leading risk factor for CVD worldwide (Gladys *et al* 2014). Globally, nearly one billion people have hypertension. Over 80% of CVD related deaths occur in low- and middle-income countries. High blood pressure accounts for 9.4 million deaths, more than elevated BMI, fasting plasma glucose, and total cholesterol combined. As of 2008, almost 1 billion people had uncontrolled hypertension worldwide (Lim , Vos , Flaxman., *et al.* 2012).

Chronic disease has seen a rapid increase in sub-Saharan Africa from 1990 to 2010, ranking in the first few places (Uthman, Wiysonge, Ota, *et al.,* 2015). For example, stroke mortality rates, measured in both urban and rural Tanzania by validated verbal autopsies, were higher than those of England and Wales and of black people in Northern Manhattan (Walker, Whiting, Unwin, *et al*. 2010). suggesting that untreated hypertension is an important factor. Sub-Saharan Africa is experiencing a double burden of disease that calls for a more integrated approach for the detection, prevention and management of CVD in LMICs. The African region has the highest

hypertension prevalence rate, 46 % of adults aged 25 and above. It has been suggested that the prevalence of CVD and hypertension are increasing rapidly in sub-Saharan Africa (Seedat, 2014).The current prevalence in many developing countries, particularly in urban areas, is already as high as that seen in developed countries (Vorster, 2012). The number of adults with hypertension in 2025 is predicted to increase by about 60 % to a total of 1.56 billion (Kearney, Whelton, Reynolds, et al, 2015).

In Kenya, cardiovascular diseases (CVDs) accounted for more than 10% of total deaths and 4% of total Disability-Adjusted Life Years (DALYs) in 2015 with a steady increase over the past decade (Wainaina and Asiki, 2018). Hypertension is increasingly becoming a widespread problem as is the case in other low middle-income countries; available data on the burden of hypertension suggest prevalence rates of 21% in the country (Sonak, Pekny, Manyara and Fischer, 2017).

In Moi Teaching and Referral Hospital, according to Health Records and Information Services (HRIS), Research and Statistics department, CVD cases make up 40.25% of all Medical Outpatient clinics (MOPC) and Cardiac clinics, which is 1.37% of the all patients who visited the hospital in the year 2016.

Management of CVD is through chemotherapy and lifestyle changes, which for the most part, occurs throughout the patient's life. The quality of health care may depend on many activities such as correct diagnosis, rational use of drugs and dispensing drugs with proper direction (Sreedevi *et al.,* 2011). A patient must adhere to prescribed medications. Medication adherence is the ability and willingness to follow recommended health practices regarding medication management (Morisky *et al.,* 2008). To adhere to the treatment regimen, a patient must be aware

and understand the prescription well; medication adherence is influenced by prescription awareness, which is basic knowledge about commonly used drugs (Ankita *et al.,* 2015).

Low prescription awareness is associated with high chances of not adhering to medication regimens, which can lead to more frequent hospitalizations, increased healthcare expenditures and a higher risk of adverse health outcomes or cardiac events (Julie *et al., 2006*). Research has shown that patients with poor adherence to taking beta-blockers, for example, are 2.6 times more likely to die within 1 year after a myocardial infarction (MI) compared to patients who take their beta-blockers (Berra *et al.,* 2009). In addition, post-MI patients who have discontinued their beta-blockers, statins or aspirin, for one month, have been found to have a significant increased risk of mortality within one year (Ho *et al.,* 2006). Research by Eagle *et al.* (2004) showed that 10% to 25% of newly diagnosed patients with CVD discontinue medication within 6 months after diagnosis, whereas 21% to 47% do so within 24 months. In addition, 8% to 20% of patients with an MI or stable angina have been reported to stop taking prescribed medications after 6 months (Eagle *et al.,* 2004). Several studies have shown that patients often stop taking statin therapy prescribed to lower their cholesterol. For example, Benner *et al.* (2002) found that only 56% of patients aged 65 or older who were prescribed statins were still taking them 6 months after initiation of therapy and only 35% were taking them 5 years later. Another study by Jackevicius *et al* (2002) found that only 40% of patients aged 66 or older who had a heart attack or chest pain were still taking their medicines two years later, compared with 36% of those with chronic heart disease and 25% of these who were prescribed the drugs to prevent heart disease.

There is compelling evidence that patients are not taking their prescribed medications accurately, and they lack the knowledge to properly navigate medical management and the health system. Many patients do not take prescription medications as directed; they either miss or change doses,

and up to 60% may even discontinue medication use three months after beginning the prescription (Katz, Kripalani & Weiss, 2006). For hypertension, the awareness rate is (50-70%) (Yiannakopoulou *et al*., 2005). The importance of awareness to blood pressure medications lies in the finding that uncontrolled blood pressure is 27 times more likely in non-aware individuals (Gerth, 2002). Adequate control of hypertension is associated with taking at least 80% of a prescribed regimen (Garfield *et al.,* 2000).

In cardiac patients, lack of medication awareness has been estimated to be greater than 60% (Newby *et al*., 2006). Studies have revealed that 50% of patients discontinue antihypertensive medications within 6 months of a cardiac event (Newby *et al*., 2006) and only 40% of patients continue with lipid lowering medication beyond two years after an acute coronary syndrome event (Jackevicius *et al*., 2002). Observational studies have reported that the discontinuation rate of lipid lowering therapy after one year of treatment is 15-60%, depending on the patient population (Stack *et al.,* 2008). Similarly, research by Eagle *et al.* (2004) showed that 10% to 25% of newly diagnosed patients with CVD discontinue medication within 6 months after diagnosis, whereas 21% to 47% do so within 24 months. Reasons for medication non-adherence are multifactorial and include both patient and non-patient factors as discussed in the proceeding sections.

But it is equally important restate that medication adherence is influenced by prescription awareness that is also affected by a range of factors can be categorized into six dimensions: health care team practices, economics, social relationships, therapy-related events, patients' health-related conditions and patients' demographic characteristics (Morisky *et al.,* 2008).

Health care team practices refer to health care providers' knowledge of evidence-based practices, compliance with institutional guidelines, clinical decision-making, conveyance of the importance

of adherence to medication therapies, and comprehensive communication with patients about their medications (WHO, 2003).

2.3 Socio-Economic and Demographic Factors Influencing Prescription Awareness

In order to determine the effect of factors affecting prescription awareness on prescription awareness, the study utilized the patients socio-economic and demographic factors. These included; the age, gender, marital status, employment status the living arrangements and their primary language of communication. These factors were considered because according to Baroletti & Dell'Orfano, (2010), demographic and socioeconomic factors are important predictors of prescription awareness.

Gazmararian *et al*. (2006) explored factors associated with medication refill adherence in Medicare managed healthcare enrollees with hypertension, coronary heart disease, diabetes, and/or hyperlipidemia. The study demonstrated that demographic factors were associated with refill adherence. For instance, older patients had better adherence than younger patients (Yeaw *et al.,* 2009). More specifically patients less than 65 and those more than 80 years of age, are less likely to adhere to warfarin therapy (Berra *et al.,* 2009). Similarly patient's race, health knowledge and beliefs, educational level, marital status, gender, and economics are related to prescription awareness (Sakthong *et al.,* 2009). A population-based analysis of diabetic patients' indicated that age and geographic area (rural versus urban) were associated with prescription awareness to vascular protection drugs (ACE inhibitors and aspirin) (Asghari *et al.,* 2010). Findings are however inconsistent on the role of gender on prescription awareness. For instance, in a cohort of US managed care enrollees, women had better prescription awareness than men to calcium-channel blockers and statin medications (Chapman *et al.,* 2010). However, females had worse prescription awareness than males in another study (Yeaw *et al.,* 2009).

Socioeconomic factors that reflect a patient's inability to afford their medication include; lack of adequate healthcare coverage, unemployment, retirement, and general indigence (Zhang *et al*., 2010). Economic factors refer to the patient's personal financial status, while social relationships address the type of interactions patients' have with health care providers and family members (Morisky *et al.*, 2008). Adequate socioeconomic stability of the patient contributes to improved prescription awareness because quality medical care offered to the patient depends largely on the socioeconomic aspect, which consequently will have a positive impact on prescription awareness to cardiovascular and diabetes medications in patients with hypertension, diabetes, and/or hyperlipidemia (Zhang *et al*., 2010). Similarly, social support given to the patient by family and the patient's broader social network plays a critical role in prescription awareness. There are three types of functional social support (practical, emotional, and family cohesiveness). Structural social support refers to marital status and living arrangement of adults (DiMatteo, 2004). A meta-analysis of 122 studies indicated that prescription awareness and adherence was associated with cohesive families, marital status and patient living with another person modestly increased prescription awareness and adherence compared to families in conflict (DiMatteo, 2004). Forgetting to take medications is a major reason for non-adherence but this can be reduced by the foundational support systems that encourage patients to understand medication prescription (Hashmi *et al.*, 2007).

In addition to social support, a patient's beliefs and attitudes, such as lack of belief in treatment benefits and lack of insight into the illness, are predictors of prescription awareness (Baroletti & Dell'Orfano, 2010).

In Africa, Boima, Ademola, Odusola, et al (2015) conducted a study on factors associated with medication non-awareness and nonadherence among hypertensives in Ghana and Nigeria. The

study found that non-awareness and nonadherence is high among hypertensives in Ghana and Nigeria and is associated with depression, concern about hypertensive medications, formal education, and use of herbal preparations..

A study done by Almas *et al.,* (2006) 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 taken together, improper patient counselling, and cost constraints. Although no single solution works for everyone, taking medications around daily routine activities such as eating and prayers could be helpful in forming habits and remembering to take medications (Almas *et al.,* 2006). In the aggregate, however, empirical data on whether socio-demographic factors influence prescription awareness in Kenya is currently lacking despite both the role of prescription awareness to medication adherence and the fact that prevalence of CVD is increasing in the country.

Non-patient factors also play an important role in prescription awareness. Rational drug prescribing is defined as the use of the least number of drugs to obtain the best possible effect in the shortest period and at a reasonable cost (Gross, 2001). In countries with advanced health care systems, prescribing clinicians use guidelines such as drug formularies. The absence of prescription guidelines in most health facilities in developing nations such as Kenya makes it difficult to track drug use in health facilities and the behavior of prescribers, which may hinder the identification of issues such as drug use in health facilities and the behavior of prescribers, which together may hinder identification of issues such as of poly-pharmacy and other problems associated with chemotherapy (WHO, 2003).

2.4 Communication of Prescription Plan to the Patients by Clinician

Conveyance of message from prescriber to a patient is referred to as prescription writing (WHO, 1994). Unintended outcomes that may occur as a result of poor prescribing approach include higher cost, ineffective treatment and exacerbated illness along with distress and harm to the patient (WHO, 1994); which have adverse repercussions on medication adherence. Effective communication between patients and physicians is important for patients to understand their disease state and to fully understand and appreciate the need for medication and medication adherence (Baroletti & Dell'Orfano, 2010).

Effective communication between patients and physicians is important for patients to understand their disease state and to appreciate the need for medication and thus medication adherence (Baroletti & Dell'Orfano, 2010). Prescribing as an act, is prone to errors, most of which can be avoided. Ankita et al. (2015) indicated that 16.47% prescribers made mistakes as they don't ask for allergies in patients, 12.36% prescribe medications for wrong duration, 8.82%, 5.29%, 4.71%, 2.35% made errors due to not knowing what to prescribe, not knowing the brand names, wrongly filled prescriptions, not knowing the brand names of medications, and not giving a prescription respectively. Communication skills play an important role in establishing doctor-patient relationship (Sing et al., 2013).

Consequently, communication skills play an important role in establishing doctor-patient relationship (Sing *et al*., 2013). Relationship-building between physician and patient improve when physicians showed patience with and were non-judgmental of lapses in patients' adherence (Adele *et al.,* 2013). For example, Adele and colleagues found that relationships between cardiac patients and healthcare providers were important to maintain medication adherence and that patients returned for appointments when provided with non-judgmental care. The study also

demonstrated that collaborative relationship and good communication between a physician and pharmacist was associated with enhanced prescription awareness by patients. This relationship enables information exchange between pharmacists and physicians in order to clarify prescriptions or provide information regarding medications filled by the patients. Additionally, respect, understanding and trust between patient and the doctor were maintained when physicians and pharmacists engaged more openly with patients.

Overall, in the absence of feedback mechanisms, it is not known whether prescribing clinicians and dispensing pharmacists explain prescriptions to patients with CVD. Health literacy plays important role in management of cardiovascular diseases such that poor health literacy is a critical barrier to adequate care (William *et al* 2007).

Numerous studies and scholars have identified factors that affect prescription awareness among patients. The WHO describes five elements associated with medication prescription awareness and adherence. These include healthcare team, socioeconomic factors, therapy- related factors, patient- related factors such as communication barriers, socioeconomic reasons and motivation and condition related-factors (WHO, 2003). Zhang *et al.* (2010) indicated that quality medical care offered to the patient had a positive impact on prescription awareness to cardiovascular and diabetes medications in patients with hypertension, diabetes, and/or hyperlipidemia Other factors associated with prescription awareness include co-morbidity, psychiatric illness, regimen complexity, health literacy, patient beliefs and attitudes regarding medications, communication between physicians and patients, and social support (Chapman et al., 2010). Despite the vast literature on the factors affecting prescription awareness, there are a few studies that have been conducted locally on the same issue. This study aimed to fill this gap by looking at prescription

awareness among patients with cardiovascular diseases at Moi Teaching and Referral Hospital Kenya.

2.5. Theoretical Framework

This study adopted the Health Belief Model (HBM). HBM is a psychological health behavior change model developed to explain and predict health-related behaviors, particularly in regard to the uptake of health services (Janz & Marshall, 2004). The health belief model was developed in the 1950s by social psychologists at the U.S. Public Health Service (Rosenstock, 2004) and remains one of the best known and most widely used theories in health behavior research (Carpenter, 2010). The health belief model suggests that people's beliefs about health problems, perceived benefits of action and barriers to action, and self-efficacy explain engagement (or lack of engagement) in health-promoting behavior (Janz & Marshall, 2004). A stimulus, or cue to action, must also be present in order to trigger the health-promoting behavior (Rosenstock, 2004)

The health belief model proposes that individuals who perceive a given health problem as serious are more likely to engage in behaviors to prevent the health problem from occurring (or reduce its severity). Perceived seriousness encompasses beliefs about the disease itself (e.g., whether it is life-threatening or may cause disability or pain) as well as broader impacts of the disease on functioning in work and social roles (Glanz, and Bishop, 2010). For instance, when a diabetic patient perceives that diabetes has serious health consequences and could even lead to death, then the patient takes the precautions necessary such as get prescription awareness to know how they can reduce the severity of the disease and live a normal healthy life.

The health belief model predicts that individuals who perceive that they are susceptible to a particular health problem will engage in behaviors to reduce their risk of developing the health

problem (Rosenstock, 2004). Individuals with low perceived susceptibility may deny that they are at risk for contracting a particular illness (Rosenstock, 2004). Others may acknowledge the possibility that they could develop the illness, but believe it is unlikely (Rosenstock, 2004). Diabetic patients who believe they are at low risk of developing complication are more likely to ignore information and campaigns on prescription awareness. Those who perceive a high risk to complications are more likely to engage in behaviors to decrease their risk of developing the condition.

The combination of perceived seriousness and perceived susceptibility is referred to as perceived threat (Glanz, *et al*, 2008). Perceived seriousness and perceived susceptibility to a given health condition depend on knowledge about the condition (Rosenstock, 2004). The health belief model predicts that higher perceived threat leads to higher likelihood of engagement in health-promoting behaviors, which consequently increases awareness about their health conditions, lower perceived threat on the other hand leads to less likelihood of engaging in health promoting behaviors and hence low awareness about their health conditions.

Health-related behaviors are also influenced by the perceived benefits of taking action (Glanz, Rimer, &Viswanath, 2008). Perceived benefits refer to an individual's assessment of the value or efficacy of engaging in a health-promoting behavior to decrease risk of disease (Janz & Marshall, 2004). Diabetic patients who believe that prescription awareness will reduce susceptibility to a health problem or decrease its seriousness, then are likely to engage in that behavior regardless of objective facts regarding the effectiveness of the action.

Individual characteristics, including demographic, psychosocial, and structural variables, can affect perceptions (i.e., perceived seriousness, susceptibility, benefits, and barriers) of health-

related behaviors. Demographic variables include age, sex, race, ethnicity, and education, among others. Psychosocial variables include personality, social class, and peer and reference group pressure, among others. Structural variables include knowledge about a given disease and prior contact with the disease, among other factors (Rosenstock, 2004). The health belief model suggests that modifying variables such as age, gender, race, economy, characteristics affect health-related behaviors indirectly by affecting perceived seriousness, susceptibility, benefits, and barriers (Glanz, *et al,* 2008).

The health belief model posits that a cue, or trigger, is necessary for prompting engagement in health-promoting behaviors (Janz & Marshall, 2004). Cues to action can be internal or external (Janz & Marshall, 2004). Physiological cues (e.g., pain, symptoms) are an example of internal cues to action (Glanz, *et al,* 2008). External cues include events or information from close others, the media, or health care providers promoting engagement in health-related behaviors. Examples of cues to action include a reminder postcard from the clinic, the illness of a friend or family member, and product health warning labels. The intensity of cues needed to prompt action varies between individuals by perceived susceptibility, seriousness, benefits, and barriers (Rosenstock, 2004). For example, individuals who believe they are at high risk for a serious illness and who have an established relationship with a primary care doctor may be easily persuaded to get screened for the illness after seeing a public service announcement, whereas individuals who believe they are at low risk for the same illness and also do not have reliable access to health care may require more intense external cues in order to get screened.

These individual characteristics and external cues prompting the adoption of health related behavior which include socio-economic and demographic and communication were incorporated in the instrument designed for the study.

The health belief model suffers certain limitations which could negatively impact the outcome of this study. Thus, although HBM attempts to predict health-related behaviors by accounting for individual differences in beliefs and attitudes, it does not account for other factors that influence health behaviors. These include; habitual health-related behaviors (e.g., smoking, seatbelt buckling) which may become relatively independent of conscious health-related decision making processes. Additionally, individuals engage in some health-related behaviors for reasons unrelated to health (e.g., exercising for aesthetic reasons) (Janz and Marshall, 2014)

There are also environmental factors outside an individual's control may prevent engagement in desired behaviors (Janz and Marshall, 2014). For example, an individual living in a dangerous neighborhood may be unable to go for a jog outdoors due to safety concerns. Furthermore, the health belief model does not consider the impact of emotions on health-related behavior. Alternative factors may predict health behavior, such as outcome expectancy (Schwarzer, 2001). (i.e., whether the person feels they will be healthier as a result of their behavior) and self-efficacy (i.e., the person's belief in their ability to carry out preventative behavior).

2.6 Conceptual Framework

The study employed the following conceptual framework, Figure 1, to illustrate the relationship between independent and dependent variables considered in the study of prescription awareness among patients with cardiovascular diseases at Moi Teaching and Referral Hospital, Kenya

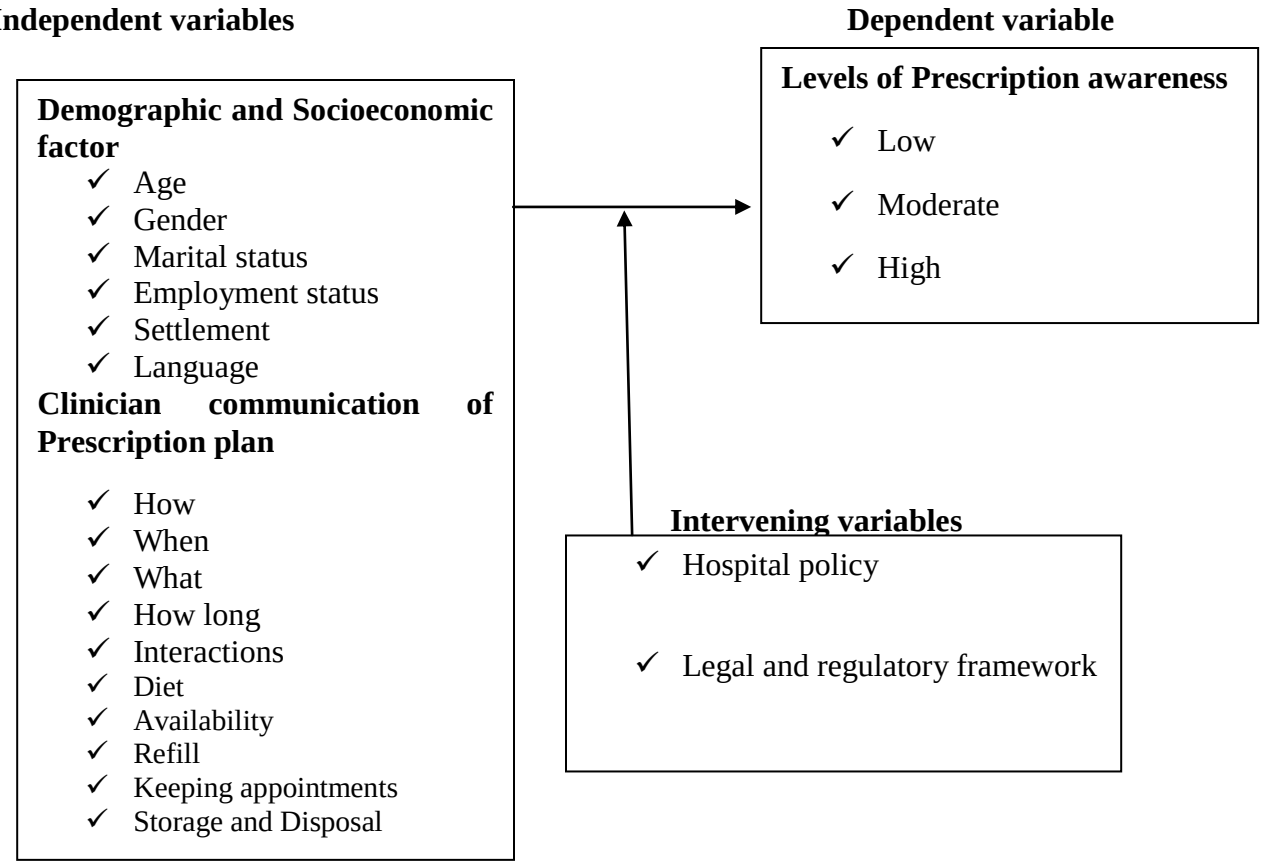

Figure 2.1 Conceptual framework.

2.7 Study Variables

2.7.1 Independent Variables

The independent variables are the factors which influences the prescription awareness of the respondents such as their demographics, their socio-economic factors and the prescription communication plan by the clinicians. The demographic and socio-economic factors were measured according to the brackets they were presented in while the clinicians' prescription communication plan was measured depending on the number of questions the patients answered correctly; the questions were adopted from the health behavior model. The effectiveness of

clinicians' communication of prescription plan to cardiovascular patients was measured on a 9-point scale where scores below 0-3 points had low level communication effectiveness, between 4-6 were considered to have moderate level communication effectiveness while those who answered yes to 7-9 questions were considered to have high level of communication effectiveness.

2.7. 2 Dependent Variable

The dependent variable of the study was prescription awareness of the patient. The questions posed to test this were adopted from the health behavior model. The prescription awareness level and specific knowledge variables were measured on a 15-point scale where scores below 5.0 points had low level of awareness, between 5-9 were considered to have moderate level of awareness while those who had 10 and above points were considered to have high level of awareness. The scoring of the points was determined by a coding decision on whether the answer given by the patient depicted prescription awareness or ignorance.

2.7.3 Potential Confounding Variables

The moderating variables in this study are hospital policy and legal and regulatory framework. These two concepts influence the relationship between the factors that affect the prescription awareness and cardiovascular patients' prescription awareness. However, these variables were not measured in this study.

CHAPTER THREE: METHODOLOGY

3.1 Study Area

The study was conducted at the Moi Teaching and Referral Hospital (MTRH). The hospital is located Uasin Gishu County, 0°31′13″ N and 35°16′11″ E, approximately 300 km west of Nairobi (Appendix VIII). It is the second largest referral hospital in Kenya and it has a large client base making it suitable for investigating the level of prescription awareness among patients with cardiovascular diseases in Kenya. The hospital was selected as the study area because it operates a cardiovascular clinic which operates every Tuesdays and Thursdays and there was no evidence of a similar study having been conducted in the facility,

3.2 Target Population

The target population for the study was all patients presenting with cardiovascular disease at MTRH cardiovascular diseases clinic. Cardio-vascular clinics are conducted twice every week at the hospital. A total of 2056 patients with cardio-vascular disease who attend the clinic in MTRH per month is summarized in **Table 3.2**. The study sought to target patients visiting the facility within a period of 2 months. On average, the hospital receives 172 patients per month therefore the target population was 344 respondents and the sample size was derived from the target population.

Table 3.2 Number of patients with cardiovascular disease who attend cardiovascular clinics between January and December 2016

Month	Number of patients
January	191
February	206
March	132
April	226
May	196
June	155
July	147
August	161
September	175
October	151
November	204
December	112
Total	**2056**

3.3 Sample Size and Sample Size Determination

Patients presenting with cardiovascular diseases at MTRH cardiovascular clinics were recruited into the study. The sample size for the study was derived using Yamane's formula for calculation of the sample size as shown below.

$$n = \frac{N}{1 + N(e)^2}$$

Where: n= sample size

N = population

e = level of significance desired (0.05)

$$n = \frac{344}{1+344\,(0.05)^2}$$

$$= 185$$

Hulley, Cummings, *et al.* (2001) asserts that sample sizes should be computed with attention to dropout rates and therefore account for the attrition rate. Therefore a 10% of the sample population was included in the study to account for spoilt instruments and ensure more than sufficient data was collected. The sample population was therefore 204 respondents

3.3.1 Sampling Procedure

Once the sample size was determined, the researcher employed simple random sampling to sample the respondents who took part in the study until an appropriate sample was obtained. Here the researcher and the research assistants picked at random cardiovascular patients who visited the facility without adhering to any specific procedure. The data collection was conducted on Tuesdays and Thursdays when cardio-vascular patients visited the clinic.

3.3.2 Inclusion and Exclusion Criteria

Inclusion criteria included all patients aged 18 years of age and above who had a prescription for CVD and attended the cardiovascular clinic at the MTRH. For them to be eligible, the patients had to be of sound mind and had to give informed consent. The study excluded prisoners, because they were under guard and not free to interact with the researcher.

3.4 Study Design and Data Collection Instruments

The study adopted a cross-sectional study design to collect quantitative data using a questionnaire (see Appendix 1I). The questionnaire utilized in the study was semi-structured allowing the study to collect comprehensive information on the area under study. The

questionnaires contained three sections that is; section A covered the socio-economic and demographic factors of the respondents; Section B covered the prescription awareness of the cardiovascular patients while section C covered the prescription plan communication to the patients by clinicians.

3.5 Validity and Reliability of Research Instrument

Items assessing HBM constructs were adapted from Champion (Department of Health and Human Services, 2010). Internal consistency, test-retest reliability, construct validity, and predictive validity of the HBM subscales have been reported in previous studies. Prior studies indicate the internal consistency of the subscales, as determined by Cronbach's alpha coefficients (ranging from 0.75 to 0.88), and 6-week test-retest reliability scores to be acceptable (ranging from 0.61 to 0.71) (Champion, 1999; Wu and Yu, 2003; Champion and Scott, 2007). Confirmatory factor analyses supported the construct validity of each subscale with factor loadings ranging from 0.68 to 0.90 for the perceived susceptibility scale, 0.40 to 0.83 for the benefits scale, and 0.44 to 0.69 for the barriers scale. For the present study, the items were modified by replacing “mammography” with “prescription awareness” or “communication of prescription plan by clinician” where appropriate.

3.6 Data Collection

The study design involved administration of structured questionnaire to study participants to collect data at the final exit point after consultation with the doctors. The questionnaire was administered by the principal investigator, and in some instances assisted by a trained research assistant. The research assistant was a graduate student who had a good understanding of the area under study and could interpret the question for the targeted respondent. She was trained through a days’ orientation where the researcher explained the nature of the study and what it sought to

establish, the target population and how the information was expected to be collected. She was informed on the day the diabetic clinic is opened and was required to be available till the sample was obtained. She was very instrumental in helping achieve the sample for the study.

3.7 Measurement of Variables

In order to measure the level of awareness among cardiovascular patients at MTRH, a research instrument derived from the health behavior model was adopted in developing the research question.

The prescription awareness level was measured on a 15-point scale where scores below 5.0 points had low level of awareness, between 5-9 were considered to have moderate level of awareness while those who had 10 and above points were considered to have high level of awareness. The scoring of the points was determined by a coding decision on whether the answer given by the patient depicted prescription awareness or ignorance. In the coding process, the researcher considered the questions which were posed to the respondents, for every response that showed the patient was aware a code of 1 was awarded while for every question where the patient showed lack of awareness a code of 0 was awarded. The summation of these codes was used to classify the level of awareness as either low, moderate or high.

The effect of factors influencing prescription awareness variables on the level of patient's prescription awareness was measured through a chi-square relationship between the two variables. Any variable that attained a significance of less than 0.05 was determined to affect the level of prescription awareness.

The effectiveness of clinicians' communication of prescription plan to cardiovascular patients was measured on a 9-point scale where scores below 0-3 points had low level communication

effectiveness, between 4-6 were considered to have moderate level communication effectiveness while those who answered yes to 7-9 questions were considered to have high level of communication effectiveness

3.8 Data Analysis

Data analysis refers to the application of reasoning to understand the data that has been gathered with the aim of determining consistent patterns and summarizing the relevant details revealed in the investigation (Zikmund, Babin, Carr & Griffin, 2010). To determine the patterns revealed in the data collected regarding the selected variables, data analysis was guided by the aims and objectives of the research and the measurement of the data collected. The researcher used (SPSS) Statistical Program for Social Scientists (SPSS version 21.0) to analyze the data.

Data on the level of prescription awareness and communication by medical practitioners to cardiovascular patients was summarized using descriptive statistics. Frequencies and percentages were used to analyze and present the data in tables

Chi-square test of independence was used to determine the association between factors influencing prescription awareness and level of prescription awareness. Statistical significance was set at $p \leq 0.05$.

3.9 Ethical Considerations

To ensure that the study complied with the ethical issues pertaining to research undertaking, all legal and ethical requirement related to data collection and access were complied with. These included; seeking ethical clearance from Moi Teaching and Referral Hospital Ethical Committee and informed consent from participants (See Appendix I and Appendix II).

A full disclosure of all the activities concerning the study was explained to hospital's ethical committee and the management of MTRH authorities. In order to ensure voluntary participation, the targeted respondents were informed about the study and what was required from them. Only those respondents who agreed to take part in the study were incorporated and they were all required to sign consent forms (Appendix 1). In order to ensure confidentiality and protect the anonymity of the respondents, the research did not seek the identities of the respondents. Further the data collected was presented in such a way that it did not biometrically link the patients to the data.

CHAPTER FOUR: RESULTS

4.1 Introduction

The study sought to determine the level of prescription awareness and factors influencing prescription awareness among patients with cardiovascular diseases at Moi Teaching and Referral Hospital. This chapter covers the socio-demographic characteristics of the respondents, level of prescription awareness among patients with cardiovascular diseases, the association between socio-economic and demographic factors on and the level of prescription awareness among patients presenting with cardiovascular diseases and assessing clinicians' communication of prescription plan to cardiovascular patients at the Moi Teaching and Referral Hospital.

4.2 Socio-Economic and Demographic Characteristics of Study Participants

The study sought to determine the socio-economic and demographic characteristics of the respondents. These included their age, gender, marital status, employment status the living arrangements and their primary language of communication. The findings on the socio-demographic characteristics of the respondents are presented in **Table 4.1.**

Table 4.1 Socio-demographic Characteristic of the Respondents

	Characteristic	Frequency	Percent
Gender	Male	74	36.5
	Female	130	63.5
	Total	204	100
Age	below 25 years	23	11.5
	26-35 years	36	17.3
	36-45 years	15	7.3
	46-55 years	31	15.4
	above 55 years	99	48.5
	Total	204	100
Marital	Single	39	19.2
	Married	130	63.8
	Divorced	5	2.3
	Widowed	30	14.6
	Total	204	100
Occupation	Employed	21	10.4
	not employed	183	89.4
	Total	204	100
Education	No formal education	35	17.3
	Primary	74	36.2
	Secondary	58	28.5
	Post- secondary	37	18.1
	Total	204	100
Settlement	Formal	24	11.9
	Informal	180	88.1
	Total	204	100
Live alone	Yes	4	1.9
	No	200	98.1
	Total	204	100
Language communication	English	11	5.8
	Kiswahili	120	59.2
	Mother tongue	35	16.5
	All	38	18.5
	Total	**204**	**100**

The findings on the gender of the respondents indicate that 63.5% were female while 36.5% were male. These findings indicate that a majority of the cardiovascular patients were female.

The findings on the ages of the respondents indicate that 48.5% were aged above 55 years, 17.3% were aged between 26-35 years, 15.4% were aged between 46-55 years, 11.5% were aged below 25 years while 7.3% were aged between 36-45 years. These findings indicate that the respondents were drawn from different age brackets. However a majority of the cardiovascular patients were aged above 55 years.

The findings on the marital status of the respondents indicate that 63.8% were married, 19.2% were single, 14.6% were widowed while 2.3% were divorced. These findings indicate that a majority of the respondents were married.

The findings on the occupation of the respondents indicate that 89.4% were not employed while 10.4% were employed. These findings indicate that a majority of the respondents were not employed.

The findings on the educational level of the respondents indicate that 36.2% had primary level education, 28.5% had secondary level education, 18.1% had post-secondary education while 17.3% had no formal education. These findings indicate that the respondents were drawn from different educational levels. However a majority had above primary level education.

The findings on the settlement of the respondents indicate that 88.1% were living in informal settlement while 11.9% lived in formal settlement. These findings indicate that a majority of the respondents lived in informal settlement.

The findings on whether the respondents lived alone indicate that 98.1% did not while only 1.9% lived alone. These findings indicate that a majority of the respondents did not live alone.

The findings on the language used in communication by the respondents indicate that 59.2% used Kiswahili, 18.5% used English, Kiswahili and mother tongue, 16.5% used mother tongue while only 5.8% used English only. These findings indicate that a majority of the respondents were able to communicate through the Kiswahili language which is the national language which therefore enabled to easily communicate with their care givers and get information required.

4.3 Prescription Awareness

The study sought to determine the prescription awareness among patients with cardiovascular disease at the MTRH cardiovascular clinics. The findings are presented in Table 4.2 and Table 4.3. The findings in Table 4.2 summarize the prescription awareness of the patients. In order to effectively interpret the results of the table, the responses were grouped into 2 categories; aware and not aware depending on the patient's response to each question. Further, the responses were averaged into 3 categories (low, moderate, and high) to determine the level of awareness.

Table 4.2 Prescription Awareness

Prescription awareness	Agree (%)	Disagree (%)
I know the name of the medication I am Taking	119 (58.5%)	85 (41.5%)
I know the doses of the medication	199 (97.7%)	5 (2.3%)
I know the frequency of administration for you medication	200 (98.1%)	4 (2.3%)
When I experience side effects from the drugs, I stop taking them	9 (4.6%)	195 (95.4%)
I know what to look for to determine if the medication is working	34 (16.1%)	170 (83.1%)
I can share drugs with other members of your family who present similar symptoms?	17 (8.5)	187 (91.5%)
Whenever I skip taking the medication, is it important to inform the doctor during my visits	191 (93.8%)	13 (6.2%)
Is it important to stick to medical prescription as per the doctor's advice	195 (95.8%)	9 (4.2%)
Is it important to seek information from the doctor concerning the condition	204(100%)	0 (0%)
I am aware of the risk factors of my medical condition	198 (96.9%)	6 (3.1%)
I would say that purchase of drug is my financial priority	130 (63.8%)	74 (36.2%)
Taking drugs as prescribed makes me fall sick less often	120 (58.8%)	84 (41.2%)
It is not a must that I take all the drugs as prescribed	13 (6.4%)	191 (93.6%)
I seek medication attention when I experience side effects	1 (0.4%)	203 (99.6%)
I can stop medication when I feel better	4 (1.9%)	200 (98.1%)

N=204

Patients with scores between 0-5 were considered to have low level awareness, scores between 5-9 were considered to have moderate level of awareness while those who had scores of 10 and above points were considered to have high level of awareness. With regards to level of prescription awareness more specifically, the findings show that 87.3% of the respondents had a high level of prescription awareness, 12.7% had moderate level awareness while 0% had low level of awareness. These findings indicate that a majority of the respondents who took part in

the study had a high level of prescription awareness. This therefore implies that they had awareness on their medication, administration, doses and effects they have.

Table 4.3 Average Prescription Awareness

Level of Prescription Awareness	Frequency	Percent
Low 0-5	0	0
Moderate 5-9	26	12.7
High 10 and above	178	87.3
Total	**204**	**100.0**

Further analysis of the frequencies and excluding the low level of prescription awareness (since there were no respondents in that category), was done through a Chi-Square goodness of fit test, the null hypothesis assumed that the frequencies of those who were aware and those who were not aware were the same. The results of the test however revealed that there was a significant difference between the two categories of prescription awareness (after dropping the category for low because there were no patients in that category), (x^2 = 144.75, p = 0.001), with more respondents having high level of prescription awareness than would be expected by chance.

4.4 Association between Socio-Economic and Demographic Factors and the Level of Prescription Awareness

The study sought to determine the effect of socio-economic and demographic factors on the level of prescription awareness of the respondents. The social-economic and demographic characteristics that were considered included: gender, age, marital status, occupation, educational level, settlement, live alone and language of communication. The findings are presented in **Table 4.4**

Table 4.4 Association between Socio-Economic and Demographic Factors and the Level of Prescription Awareness

Socioeconomic and Demographic Variable	Chi-square Value	P value
Gender	0.634	0.562
Age	2.9	0.575
Marital status	0.315	0.957
Employment	0.923	0.358
Educational level	1.909	0.592
Settlement	0.001	0.577
Respondents living alone	0.741	0.504
Language of communication	8.141	**0.043**

The findings indicated that of all the socioeconomic and demographic factors considered, only language of communication was significantly associated with level of prescription awareness (x^2_3 =8.141, p=0.043).

4.5 Prescription Plan Communication by Clinicians

The study sought to determine clinicians' communication of prescription plan to cardiovascular patients at the Moi Teaching and Referral Hospital Cardiovascular clinics. The findings are presented in **Table 4.5.**

Table 4.5 Effectiveness of Communication

		Frequency	Percent
Provided information on prescription	Yes	191	93.5
	No	13	6.5
	Total	204	100
How was the information communicated?	verbal	112	58.6
	written	26	13.5
	both	53	27.9
	Total	191	100
Language understandable	yes	190	99.6
	No	1	0.4
	Total	191	100

The results indicate that according to 93.6% (191) of the respondents, hospital practitioners provided information on prescription. With regards to how the information on prescription was provided, 58.6% said it was verbally communicated, 27.9% used both verbal and written means while 13.5% used written communication. Almost all respondents, 99.6%, said the information was understandable.

The effectiveness of the clinicians' communication of prescription plan to cardiovascular patients were measured on a 9-point scale where scores below 0-3 points had low level communication effectiveness, between 4-6 were considered to have moderate level communication effectiveness while those who answered yes to 7-9 questions were considered to have high level of communication effectiveness. The results were recorded as shown in **Table 4.6**.

Table 4.6 Prescription Communication by Medical Practitioners

	Agree	disagree (%)
I was explained to how am suppose take my medication	204 (100%)	0 (0%)
I was advised on when am supposed to take my medication	204(100%)	0 (0%)
I was told for how long I would be taking drugs	197 (96.5%)	7 (3.5%)
I was told about possible drug interactions	122 (60%)	82 (40%)
I was advised about diet while taking drugs	160 (78.5%)	44 (21.5%)
I was told about the availability of the drugs in the market and their prices	172 (84.2%)	32 (15.8%)
I was told that I needed to refill the prescription when i run out of drugs	193 (94.6%)	11 (5.4%)
I was told about told about keeping appointments	202 (98.8%)	2 (1.2%)
I was advised on proper storage and disposal of my drugs	201 (98.5%)	3 (1.5%)

N=204

The summary of the findings are presented in table 4.7

Table 4.7 Rating of Prescription Communication by Medical Practitioners

Rating	Frequency	Percent
Low 0-5	0	0
Moderate 5-9	5	2.3
High 10 and above	199	97.7
Total	204	100.0

The results of the clinicians' communication of prescription plan to cardiovascular patients indicate that on average, 89.6% (183) answered yes to the question posed seeking to determine

their receipt of communication from medical practitioners on prescription while only 10.4% (21) answered no to the questions.

These findings indicate that according to 97.7% of respondents the communication of prescriptions was highly effective while only 2.3% (5) had moderate level of communication effectiveness.

CHAPTER FIVE: DISCUSSION

5.1 Prescription Awareness

The results on prescription awareness indicate that a majority of the respondents who took part in the study had a high level of prescription awareness. This therefore implies that they had an understanding of their medication, administration, doses as well as on the counter-indications of the drugs they were prescribed. These findings concur with Ankita *et al.* (2015) whose study found that the respondents had a high level of prescription awareness having an understanding of how drugs work, and have a basic knowledge about commonly used drugs.

Given the definition adopted for this study with regards to prescription awareness which states that prescription awareness is basically the patient's level of knowledge, attitude and skills to appropriately follow the prescribed regimen (Ankita *et al.*, 2015), the findings of this study therefore imply that as a result of the high level of prescription awareness, the patients targeted had sufficient knowledge concerning prescription, had the appropriate attitude and skills which inclined to follow the prescribe regimen. Therefore, cardiovascular patients at the MTRH had higher chance of positive health outcomes and likely experienced less frequent hospitalizations, reduced healthcare expenditures and a lower risk of adverse health outcomes or cardiac events (Nguyen *et al*., 2017; WHO, 2003).

However, the findings differ with Yeaw *et al* (2009) which indicated that women had worse prescription awareness than men. It also differed with study by Asghari *et al* (2010) which indicated that age and geographic area (rural versus urban) were associated with prescription awareness to vascular protection drugs (ACE inhibitors and aspirin).

5.2 Effect of Socio-Economic and Demographic Factors on the Level of Prescription Awareness

The findings on the effect of socio-economic and demographic factors on the level of prescription awareness indicate that the gender of the respondents, age, marital status, occupation, educational level, settlement and living arrangement, whether patients lived alone or not, did not influence the level of prescription awareness of the respondents. This could be attributed to the fact that the socio-demographic characteristics of the respondents do not necessarily affect the awareness of the respondents but rather individuals' access to medical information. These findings concur with a study conducted by Ankita *et al.,* (2015), which indicated that level of prescription awareness is determined by an understanding of how drugs work, and whether patients have a basic knowledge about commonly used drugs.

The study findings however indicated that the there was a significant relationship between the language of communication by the respondents and clinicians and level of prescription awareness. This is because the language the patients are versed in determines their ability to communicate with the medical personnel and their ability to understand the information and use it effectively. These results therefore support the accumulating body of evidence that show that communication between patients and medical practitioners determine patient's level of prescription awareness. For example, Sing *et al*. (2013) indicated that communication skills play an important role in establishing doctor-patient relationship. They further stated that through the doctor- patient relationship information is passed on to the patients providing clarity and increasing prescription awareness.

5.3 Clinicians' Communication of Prescription Plan to Cardiovascular Patients

The findings on whether the hospital practitioners provide information on prescription show that 93.6% (191) of the respondents said they do. These findings indicate that the medical practitioners provided information on prescriptions to the patients. These findings concur with Julie *et al*. (2006) whose study indicated that effective communication between patients and physicians is important for patients to understand their disease state and to fully understand and appreciate the need for medication and medication adherence. In other words communication skills play an important role in establishing doctor-patient relationship is widely recognized throughout the world such that information passed on to the patients affects the treatment outcomes.

The results on prescription communication by medical practitioners further indicate that a majority of the respondents said that communication from prescribing clinicians was effective. It can thus be inferred that the patient's perception of effective communication from prescribing clinicians enabled patients to understand how they are supposed to take their medication, when, for how long, possible drug interactions, dietary issues, availability, refill, appointments and storage which made the medical process very effective. The high communication effectiveness may be the reason why a majority of the patients had a high level of prescription awareness.

These findings concur with Zhang *et al*. (2010) whose study indicated that adequate healthcare services offered to the patient contributes to improved prescription awareness, quality medical care offered to the patient had a positive impact on prescription awareness to cardiovascular and diabetes medications in patients with hypertension, diabetes, and/or hyperlipidemia

These findings however differ from those Morris, Tabak and Gondek (2007) who evaluated audiotaped office visits and found major shortfalls in the quality of information communicated to

patients about their prescribed medicines; physicians explained adverse effects and duration of therapy in only about a third of the discussions and provided patients with instructions for use in only 55 percent of the discussions. The study by Tarn (2006) also indicated that communication with pharmacists is also inadequate and as a result, many patients rely on written information, either on labels or in package inserts. The lack of concordance between the results of the present study and those of Morris, Tabak and Gondek (2007) and Tarn et al. (2006) may be attributed to increasing appreciation of the role of the relationship between clinician and patients in enhancing positive health outcomes in recent years.

CHAPTER SIX: SUMMARY, CONCLUSION AND RECOMMENDATIONS

6.1 Conclusions

The goal of the study was to investigate factors that influence the level of prescription awareness among patients with CVD at the Moi Teaching and Referral Hospital.

6.1.1 Level of Prescription Awareness Among Patients With Cardiovascular Diseases

First, the study determined the level of prescription awareness where the results reveal that 87.3% (178) had high level of awareness, 12.7% (26) had moderate level of awareness while 0% had low level of awareness.

6.1.2 Association Between Socio-Economic and Demographic Factors and The Level of Prescription Awareness

Second, the study sought to determine the association between prescription awareness and socio-demographic characteristics of patients; the findings indicated that of all the socioeconomic and demographic factors considered, only language of communication was significantly associated with level of prescription awareness (x^2 =8.141, p=0.043).

6.1.3 Clinicians' Explain Prescription Plan to Cardiovascular Patients

Third, the study assessed whether prescribing clinicians explain the nature of prescriptions given to patients with CVD and whether there was an association between the language of communication by the respondents and level of prescription awareness. The findings show that 93.6% of the respondents agreed that prescribing clinicians explained prescriptions. These findings indicate that the medical practitioners provided information to the respondents on their prescription.

6.2 Broader Implications of the Study

1. The high level of prescription awareness implies that patients with CVDs at the MTRH had an awareness of their medication, administration, doses and effects they have.

2. The absence of an association between socio-economic and demographic factors and level of prescription awareness other than the language of communication suggest the role of other factors in predicting prescription awareness. However, the study concluded that that the language used by the respondents to communicate influenced their level of prescription awareness perhaps because the language patients are versed in determines their ability to communicate with the medical personnel.

3. Communication by medical practitioners was very effective.

6.3 Recommendations

6.3.1 Recommendations from the Study

Based on the findings of the study the following recommendations were made;

i) The findings of the study indicate that there is a high level of prescription awareness among the patients. The hospital should therefore pick up the positives of awareness and translate it into patient adherence to prescribed medications which overly leads to improved quality of health care and patient wellbeing. Medical practitioners should ensure that they choose a language of communication in which their patient is well versed in. If they do not have a common language they should look for an interpreter, for example relatives, who will communicate the information to their patients. Agencies such as the government and other medical bodies should require medical

practitioners to verse themselves with people skills allowing them to communicate effectively

ii) The study has found that the clinicians have a good and effective communication plan to patients with CVDs. In order to ensure positive health outcomes from their effective communication, they should adopt a follow-up plan to ensure that their patients are adhering to this information.

6.3.2 Recommendations for Further Studies

1. From the study it is clear that the patients had a high level of prescription awareness. This study therefore recommends that a study be carried out to determine if high prescription awareness translates to prescription adherence.

2. The study also found that of all the socio-demographic characteristics considered only the language of communication influences prescription awareness. This study therefore recommends that a study should be considered to determine how language used during clinician – patient interaction influences adherence of prescription medication

3. This study recommends that a study should be carried out on the effect of clinician communication of prescription plan on adherence of prescription.

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APPENDIX I: QUESTIONNAIRE AND INFORMED CONSENT

A. INFORMED CONSENT

I am a post graduate student at Maseno University, School of Public Health and Community Development. I am undertaking a study on **An evaluation of prescription awareness among patients with cardiovascular diseases at MTRH**. You are requested to respond to the questionnaire to the best of your knowledge. The information given will be used for academic purpose only, and will be treated with utmost confidentiality. There will be no direct benefit to you as a participant, the results obtained will be kept privately and used only for the research purpose. You are free to accept or decline to participate in this study and your lack of participation will not interfere with the current services you are receiving in this program. Participation in this study is important as the findings of the study have the potential of being used to improve care.

The risks in this study include possible discomfort due to questions on health and personal behaviour/history. Every effort will be made to keep your study records confidential.

By signing my name below, I confirm the following:

I have read (or been read to) this entire consent document. All of my questions have been answered to my satisfaction. The study's purpose, procedures, risks and possible benefits have been explained to me. I agree to let the study team use and share the health information gathered for this study. I voluntarily agree to participate in this research study. I agree to follow the study procedures as directed. I have been told that I can withdraw from the study at any time.

Participant Sign---------- Date----------

Principal Investigator---------- Date----------

For more information contact principal investigator – 0723067400

1

Kiswahili Version

Fomu ya Idhini Kwa Mhusika;

Jina langu ni Paul Olesikamoi. Mimi ni mwanafunzi wa chuo kikuu cha maseno. Nina fanya uchunguzi **ya Kuthatmini kwamba wagonjwa wa roho na mishipa ya damu wanaelewa vyeti vyao vya dawa katika hospitali ya rufaa ya Moi, Eldoret**

Umechaguliwa kushiriki kwenye utafiti huu kwa sababu unatumia dawa za roho na magonjwa yanayohusika na mishipa ya damu, jibu maswali kwa uwezo lako.

Ukichagua kushiriki kwenye utafiti huu utahitajika kujibu maswali kwa ajili ya kujua kuelewa kwa vyeti vya dawa na matibabu mengine. Unaweza kutoa uamuzi wa kushiriki kwenye utafiti huu au pia kukataa. Ukisema la matibabu yako ya kawaida hayataathirika. Si lazima kubaki kama mshiriki unaweza ukakatiza kushiriki wakati wowote. Ni muhimu kufahamu kwamba hakuna faida za kifedha kwa kushiriki kwenye utafiti huu. Zaidi ya yote hautagharamika kifedha kwa njia yoyote. Kushiriki katika utafiti huu ni muhimu kwa sababu, uvumbuzi ama majibu ya utafiti huu yatasaidia katika matibabu na afya ya msingi kwa wagonjwa wote wanaotumia dawa na wanaopokea matibabu kama yako. Hatari zinazoambatana na kushiriki katika utafiti huu ni kama usumbufu kutokana na maswali ya kiafya na ya kibinafsi hasa tabia na historia yako. Juhudi zote zitafanywa kwa ajili ya kuhifadhi historia yako ya kiafya kwa njia ya siri.

Kwa kuweka sahihi jina langu nathibitisha yafuatayo:

1) nimesoma (ama nimesomewa) karatasi hii ya kutoa idhini ya kukubali, na maswali yangu yote yamejibiwa na nimeridhika; 2) Nimeelezewa nia, hatari na faida zinatokana na utafiti huu kwa njia mwafaka; 3) nakubali na kuruhusu timu ya utafiti kutumia na kugawa habari za kiafya ama aina yoyote ya habari zitakazokusanywa kutokana na utafiti huu; 4) nimekubali kwa hiyari kushiriki kwenye utafiti huu. Nakubali kushirikiana na watafiti hawa wakati wowote ninapohitajika; 5) Nimeelezwa kwamba ninaweza kukataa kushiriki wakati wowote.

Jina la mshiriki..... Sahihi..... Tarehe 19/9/17.....

Mtafiti mkuu/Msaidizi..... Sahihi..... Tarehe.....

Kwa lolote la ziada wasiliana na wafuatao

Mtafiti Mkuu – Paul Olesikamoi Tel. 0723067400

INSTITUTIONAL RESEARCH & ETHICS COMMITTEE
26 JUL 2017
APPROVED
P. O. Box 4606-30100 ELDORET

APPENDICES

APPENDIX II: QUESTIONNAIRE

Section A: Socio-Economic and Demographic information

1. What is your gender

   Male [ ] Female [ ]

2. What is your age

   < 25 yrs [ ] 26-35 [ ] 36-45 [ ] 46-55 [ ] Above 55 [ ]

3. Marital status

   Single [ ] Married [ ] Divorced [ ] Widow/ Widower [ ]

4. What is your occupation?

   Employed [ ] Not employed [ ]

5. What is your highest level of education?

   No formal education [ ] Primary [ ] Secondary [ ] Post secondary [ ]

6. Do you live in formal settlement or informal

   Formal ( ) Informal ( )

7. Do you live alone

   Yes ( ) No ( )-

8. Which language do you understand and communicate best in?

   English [ ]

   Kiswahili [ ]

   Mother tongue [ ]

   All [ ]

Section B: Prescription awareness of cardiovascular patients

1. Do you know the name of the medication you are under?

Yes [ ] No [ ],

2. Do you know the doses you are supposed to take?

Yes [ ] No [ ],

3. Do you know the frequency of administration?

Yes [ ] No [ ],

4. Do you know the indications that you should look for to determine whether the medication is working?

Yes [ ] No [ ],

If yes explain

……

……

5. Based on your knowledge on prescription respond to the question below by ticking on the appropriate box

	Yes	No
When you experience side effects from the drugs, you stop taking them		
You can stop medication when you feel better		
You can share drugs with other members of your family who present similar symptoms		
Whenever you skip taking the medication, it is important to inform the doctor during the visits		
It is important to stick to medical prescription as per the doctor's advice		
It is important to seek information from the doctor concerning the condition		
I am aware of the risk factors of my medical condition		
Purchase of drug is my financial priority		
Taking drugs as prescribed makes me fall sick less often		
It is not a must that you take all the drugs as prescribed		

Section C: Prescription plan communication by medical practitioners

1. Did the hospital practitioners provide you information on the prescription?

   Yes [ ] No [ ]

2. If yes, how was the information communicated to you?

   Verbal delivery [ ]

   Written communication [ ]

   Both [ ]

3. Was the language used understandable and clear?

   Yes [ ] No [ ]

4. If information was communicated to you respond to the question below by ticking on the appropriate box

	Yes	No
I was explained to how am suppose take my medication		
I was advised on when am supposed to take my medication		
I was advised on what would happen while I was taking drugs		
I was told for how long I would be taking drugs		
I was told about possible drug interactions		
I was advised about diet while taking drugs		
I was told about the availability of the drugs in the market and their prices		
I was told that I needed to refill the prescription when i run out of drugs		
I was told about told about keeping appointments		
I was advised on proper storage and disposal of my drugs		

5. What was the reason for inability to understand drug information

   Illegibility of the handwriting [ ]

   Inability to understand the language use [ ]

   Other (specify)……..

6. What can be done to improve the communication process?

……

……

……

APPENDIX III: LETTER OF APPROVAL

MASENO UNIVERSITY
SCHOOL OF GRADUATE STUDIES

Office of the Dean

Our Ref: EL/ESM/00618/2013

Private Bag, MASENO, KENYA
Tel:(057)351 22/351008/351011
FAX: 254-057-351153/351221
Email: sgs@maseno.ac.ke

Date: 4th April, 2017

TO WHOM IT MAY CONCERN

RE: PROPOSAL APPROVAL FOR PAUL OLESIKAMOI — EL/ESM/00618/2013

The above named is registered in the Master of Public Health in the School of Public Health & Community Development, Maseno University. This is to confirm that his research proposal titled "**Prescription awareness among Patients with Cardiovascular Disease at Moi Teaching and Referral Hospital**." has been approved for conduct of research subject to obtaining all other permissions/clearances that may be required beforehand.

DEAN SCHOOL OF GRADUATE STUDIES * MASENO UNIVERSITY 04 APR 2017 P.O. Box PRIVATE BAG, MASENO *

Prof. J.O. Agure
DEAN, SCHOOL OF GRADUATE STUDIES

APPENDIX IV: RESEARCH PERMIT

INSTITUTIONAL RESEARCH AND ETHICS COMMITTEE (IREC)

MOI TEACHING AND REFERRAL HOSPITAL
P.O. BOX 3
ELDORET
Tel: 33471//2/3

MOI UNIVERSITY
COLLEGE OF HEALTH SCIENCES
P.O. BOX 4606
ELDORET

Reference: IREC/2016/252
Approval Number: 0001925

26th July, 2017

INSTITUTIONAL RESEARCH & ETHICS COMMITTEE
26 JUL 2017
APPROVED
P. O. Box 4606-30100 ELDORET

Mr. Paul Olesikamoi,
Maseno University,
School of Public Health,
P.O. Box 3275-40100,
MASENO-KENYA.

Dear Mr. Olesikamoi,

RE: FORMAL APPROVAL

The Institutional Research and Ethics Committee has reviewed your research proposal titled:-

"Prescription Awareness among Patients with Cardiovascular Diseases at Moi Teaching and Referral Hospital, Kenya".

Your proposal has been granted a Formal Approval Number: ***FAN: IREC 1925*** on 26th July, 2017. You are therefore permitted to begin your investigations.

Note that this approval is for 1 year; it will thus expire on 25th July, 2018. If it is necessary to continue with this research beyond the expiry date, a request for continuation should be made in writing to IREC Secretariat two months prior to the expiry date.

You are required to submit progress report(s) regularly as dictated by your proposal. Furthermore, you must notify the Committee of any proposal change (s) or amendment (s), serious or unexpected outcomes related to the conduct of the study, or study termination for any reason. The Committee expects to receive a final report at the end of the study.

Sincerely,

for **PROF. E. WERE**
CHAIRMAN
INSTITUTIONAL RESEARCH AND ETHICS COMMITTEE

cc	CEO	-	MTRH	Dean	-	SOP	Dean	-	SOM
	Principal	-	CHS	Dean	-	SON	Dean	-	SOD

APPENDIX V: : CHI-SQUARE RESULTS

Gender * prescription awareness Cross-tabulation					
			Prescription awareness		Total
			Moderate	high	
Gender	Male	Count	8	67	75
		% within Gender	10.50%	89.50%	100.00%
	Female	Count	18	111	129
		% within Gender	13.90%	86.10%	100.00%
Total		Count	26	178	204
		% within Gender	12.70%	87.30%	100.00%

Chi-Square Tests					
	Value	Df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.634[a]	1	0.426		
Continuity Correction[b]	0.363	1	0.547		
Likelihood Ratio	0.649	1	0.42		
Fisher's Exact Test				0.562	0.276
Linear-by-Linear Association	0.631	1	0.427		
N of Valid Cases[b]	204				
a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 12.06.					
b. Computed only for a 2x2 table					

age * prescription awareness Cross-tabulation					
			Prescription awareness		Total
			Moderate	high	
age	Below 25 years	Count	4	20	24
		% within age	16.70%	83.30%	100.00%
	26-35 years	Count	7	35	42
		% within age	17.80%	82.20%	100.00%

	36-45 years	Count	2	13	15
		% within age	15.80%	84.20%	100.00%
	46-55 years	Count	2	29	31
		% within age	7.50%	92.50%	100.00%
	Above 55 years	Count	11	88	99
		% within age	11.10%	88.90%	100.00%
Total		Count	26	178	204
		% within age	12.70%	87.30%	100.00%
	Chi-Square Tests				
		Value	Df	Asymp. Sig. (2-sided)	
	Pearson Chi-Square	2.900[a]	4	0.575	
	Likelihood Ratio	2.913	4	0.573	
	Linear-by-Linear Association	1.803	1	0.179	
	N of Valid Cases	204			
	a. 2 cells (20.0%) have expected count less than 5. The minimum expected count is 2.41.				
marital * prescription awareness Cross-tabulation					
			Prescription awareness		Total
			Moderate	high	
Marital	single	Count	5	34	39
		% within marital	12.00%	88.00%	100.00%
	married	Count	17	113	130
		% within marital	13.30%	86.70%	100.00%
	divorced	Count	1	3	4
		% within marital	16.70%	83.30%	100.00%
	widowed	Count	3	27	30
		% within marital	10.50%	89.50%	100.00%
Total		Count	26	178	204
		% within marital	12.70%	87.30%	100.00%
	Chi-Square Tests				

		Value	Df	Asymp. Sig. (2-sided)	
	Pearson Chi-Square	.315[a]	3	0.957	
	Likelihood Ratio	0.317	3	0.957	
	Linear-by-Linear Association	0.05	1	0.824	
	N of Valid Cases	204			
	a. 2 cells (25.0%) have expected count less than 5. The minimum expected count is .76.				

Occupation * prescription awareness Cross-tabulation

			Prescription awareness		Total
			Moderate	high	
Occupation	Employed	Count	4	17	21
		% within occupation	18.50%	81.50%	100.00%
	Not employed	Count	50	183	233
		% within occupation	12.00%	88.00%	100.00%
Total		Count	26	178	204
		% within occupation	12.70%	87.30%	100.00%

Chi-Square Tests

	Value	Df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.923[a]	1	0.337		
Continuity Correction[b]	0.429	1	0.512		
Likelihood Ratio	0.836	1	0.36		
Fisher's Exact Test				0.358	0.245
Linear-by-Linear Association	0.919	1	0.338		

N of Valid Cases[b]	204				
a. 1 cells (25.0%) have expected count less than 5. The minimum expected count is 3.43.					
b. Computed only for a 2x2 table					
Education * prescription awareness Cross-tabulation					
			Prescription awareness		Total
			Moderate	high	
Education	No formal education	Count	5	30	35
		% within education	15.60%	84.40%	100.00%
	Primary	Count	9	65	74
		% within education	11.70%	88.30%	100.00%
	Secondary	Count	6	52	58
		% within education	9.50%	90.50%	100.00%
	Post-secondary	Count	6	31	37
		% within education	17.00%	83.00%	100.00%
Total		Count	26	178	204
		% within education	12.70%	87.30%	100.00%
	Chi-Square Tests				
		Value	Df	Asymp. Sig. (2-sided)	
	Pearson Chi-Square	1.909[a]	3	0.592	
	Likelihood Ratio	1.884	3	0.597	
	Linear-by-Linear Association	0.005	1	0.941	
	N of Valid Cases	204			
	a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 5.71.				
Settlement * prescription awareness Cross-tabulation					
			Prescription awareness		Total
			Moderate	high	
Settlement	Formal	Count	3	21	24

		% within settlement	12.90%	87.10%	100.00%
	Informal	Count	23	157	180
		% within settlement	12.70%	87.30%	100.00%
Total		Count	26	178	204
		% within settlement	12.70%	87.30%	100.00%

Chi-Square Tests

	Value	Df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.001[a]	1	0.97		
Continuity Correction[b]	0	1	1		
Likelihood Ratio	0.001	1	0.97		
Fisher's Exact Test				1	0.577
Linear-by-Linear Association	0.001	1	0.97		
N of Valid Cases[b]	204				

a. 1 cells (25.0%) have expected count less than 5. The minimum expected count is 3.93.

b. Computed only for a 2x2 table

Live alone * prescription awareness Cross-tabulation

			Prescription awareness		Total
			Moderate	high	
Live alone	Yes	Count	0	4	4
		% within live alone	0.00%	100.00%	100.00%
	No	Count	26	174	200
		% within live alone	12.90%	87.10%	100.00%
Total		Count	26	178	204
		% within live alone	12.70%	87.30%	100.00%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.741[a]	1	0.389		
Continuity Correction[b]	0.033	1	0.855		
Likelihood Ratio	1.371	1	0.242		
Fisher's Exact Test				1	0.504
Linear-by-Linear Association	0.738	1	0.39		
N of Valid Cases[b]	204				
a. 2 cells (50.0%) have expected count less than 5. The minimum expected count is .63.					
b. Computed only for a 2x2 table					

Language of communication * prescription awareness Cross-tabulation

			Prescription awareness		Total
			Moderate	high	
Language communication	English	Count	1	11	12
		% within language communication	6.70%	93.30%	100.00%
	Kiswahili	Count	13	108	121
		% within language communication	11.00%	89.00%	100.00%
	Mother tongue	Count	9	25	34
		% within language communication	25.60%	74.40%	100.00%
	All	Count	3	35	38
		% within language communication	8.30%	91.70%	100.00%
Total		Count	26	178	204

		% within language communication	12.70%	87.30%	100.00%
	Chi-Square Tests				
		Value	Df	Asymp. Sig. (2-sided)	
	Pearson Chi-Square	8.141[a]	3	0.043	
	Likelihood Ratio	7.094	3	0.069	
	Linear-by-Linear Association	0.241	1	0.624	
	N of Valid Cases	204			
	a. 1 cells (12.5%) have expected count less than 5. The minimum expected count is 1.90.				

APPRNDIX VII: MAP OF UASIN GISHU COUNTY

APPENDIX VIII: MAP OF KENYA