COMPLIANCE TO HYPERTENSION TREATMENT BY PATIENTS ATTENDING PRIMARY HEALTH CARE SERVICES IN MAFETENG DISTRICT, LESOTHO

by

Mannini Shaabe

2013120148

Submitted in accordance with the requirements for the degree

Master of Social Sciences in Nursing

School of Nursing

Faculty of Health Sciences

University of the Free State

Supervisor: Dr Lily Van Rhyn

Co-supervisor: Mrs. A. Welman

January 2019

DECLARATION

I, Mannini Shaabe, declare that the Master's Degree dissertation that I herein submit for the Master's Degree of Social Sciences in Nursing at the University of the Free State is my own independent work, and that I have not previously submitted it for a qualification at another institution of higher learning.

_____

M Shaabe

_____

Date

ACKNOWLEDGEMENTS

I am grateful to Almighty God for granting me the opportunity to work on this research, and to Him be the glory and honour.

I am indebted to my supervisor, Dr Van Rhyn, and co-supervisor, Mrs. Welman, for their valuable guidance, encouragement and supervision throughout the duration of this degree.

I am grateful to Mr Cornel Van Rooyen for his assistance with the data analysis.

A round of applause goes to the librarian who always assisted with information in time of need.

I wish to pass my sincere thanks to my family and friends for their support throughout the entire journey of the study. I would like to thank my husband, who is my pillar of strength, for his support every time I felt like giving up.

A big thank you goes to my fellow professional nurses working at the primary health care clinics in Mafeteng, who helped me with recruitment of patients to participate in the study.

I would also like to thank the patients who agreed to take part in the study. There would be no study without them.

To Mrs Hettie Human, thank you for the splendid work with the language editing and technical editing.

ABSTRACT

Lesotho is among three countries with the highest incidence of hypertension, which accounts for an increased number of deaths and hospital admissions due to non-communicable diseases. Though treatment compliance is an important component of the effective management of hypertension, the extent of compliance behaviour of patients in Lesotho is not well known.

The objectives of this study were to assess compliance behaviour to hypertension treatment with regard to medication taking, sodium use and the keeping of appointments with healthcare providers, as well as the identification of factors that contribute to compliance behaviour. The self-determination theory formed the theoretical framework of the study.

A quantitative descriptive design was applied. Ethical clearance from the Health Sciences Research Ethics Committee of the University of the Free State and the Health Research and Ethics Committee of the Ministry of Lesotho were obtained. The three ethical principles that guided the study were respect for people, justice and beneficence. Convenient sampling of the primary healthcare clinics in Lesotho was followed by purposive sampling of the participants. The sampled clinics were St Andrew's, Ribaneng, Masemouse, Emmaus, Matelile, Malealea, Motsekuoa and Ts'akholo. These clinics are all situated in the rural area of the Mafeteng district. Data was collected from 159 participants using the Hill-Bone Compliance to High Blood Pressure Therapy questionnaire, and data included the pilot and the main results. Demographic data and Hill Bone Compliance scale data were analysed by descriptive analysis, frequencies and percentiles were calculated while open-ended questions were analysed by open coding and thematic analysis.

The majority, 62.2% of participants, were women, married (59.1%), and had attained at least a primary school education. The mean years since the participants had been diagnosed with hypertension were 9. The overall scores of the Hill-Bone Compliance to High Blood Pressure Therapy questionnaire and the three domains (medication taking, sodium use and keeping appointments) indicated good compliance levels by the participants. The identified factors that contribute to compliance behaviour include control

of blood pressure, maintenance of good health, location of health facilities, and use of technology, as well as social support.

These findings led to recommendations related to strategies that could improve and maintain compliance, which highlighted the need for revision of hypertension-management-related pamphlets, the establishment of hypertension support groups and the improvement of the current health education programmes.

Key terms: hypertension patient, hypertension treatment, compliance, Lesotho.

DEFINITION OF CONCEPTS

For the purpose of this study, theoretical and operational definitions of the applicable concepts are provided.

A hypertension patient is defined as a person with a systolic blood pressure of 140 mmHg and greater, and a diastolic blood pressure of 90 mmHg or greater for three consecutive readings (Lesotho, 2017:12). In this study, a hypertension patient is any person aged 18 years and above with a blood pressure reading above 139/89 mmHg, on three clinical visits with a minimum of two days or maximum of a week apart, prior to the commencement of treatment.

Hypertension treatment refers to both drug regimen/s (medication) and lifestyle modification that may reduce or control high blood pressure (Lesotho, 2009:10). For the purpose of this study, hypertension treatment refers to medication taking, sodium use and keeping of appointments with healthcare providers.

Compliance is defined as the extent to which a patient's behaviour (in terms of taking medication and executing lifestyle changes) coincides with the healthcare provider's recommendations for health advice (Partridge, Avorn, Wang, & Winer, 2012:655). In this study it is defined as the extent to which hypertensive patients adhere to their set appointments, take their anti-hypertensive medication and eat low-salt-content food. Compliance and adherence are used interchangeably in this study.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF ABBREVIATIONS

CHAL – Christian Health Association of Lesotho

CVA – Cerebro-vascular accident

DHMT – District Health Management Team

LPPA – Lesotho Planned Parenthood Association

LRCS – Lesotho Red Cross Society

PHC – Primary healthcare

PSI – Population Services International

UFS – University of the Free State

UNAIDS – United Nations Programme on HIV and AIDS

UNICEF – United Nations International Children's Emergency Fund

WHO – World Health Organization

CHAPTER 1: OVERVIEW OF THE STUDY

1.1 Introduction

Based on the 2012 World Health Statistics report, one in three adults have raised blood pressure (hypertension) – a condition that causes around half of all deaths related to stroke and heart diseases (World Health Organisation (WHO), 2012a:6). The number of adults with this condition increased from 594 million in 1975 to 1.13 billion globally, in 2015 (Nulu, Aronow & Frishman, 2016:38). If not adequately controlled, hypertension has been estimated to account for over half of all cerebrovascular diseases and close to half of all coronary heart diseases (Huein, Stanley & Williams, 2010:406). The age-standardised percentage of individuals between 35 to 59 years who have been diagnosed with hypertension, is the highest in the United States, followed by Uzbekistan and Lesotho, and the lowest incidences for these age groups are found in Bangladesh, Egypt and Thailand (Ikeda, Sapienza, Guerrero, Aekplakorn, Naghavi, Mokdad, Lozano, Murray & Lim, 2013:online).

Treatment of hypertension, which commences immediately after diagnosis, reduces the cardiovascular risk of individuals, therefore, compliance to hypertension treatment is the key factor in the control of high blood pressure (Daniel & Veiga, 2013:336; Duncan, Howe, Manakusa & Purdy, 2014:301; Osamor & Owumi, 2011:625; Steward, Stocks, Burrell, Looze, Esterman, Harris, Hung, Swemmer, Kurstjens, Jennings & Carrington, 2014:1348). Control of high blood pressure is related to compliance behaviour (Ambaw, Alemie,Yohannes & Mengesha, 2012:4). Compliance is defined as the extent to which a patient's behaviour (in terms of taking medication, executing lifestyle changes or keeping appointments with the healthcare provider) coincides with the healthcare provider's recommendations for health advice (Partridge, Avorn, Wang & Winer,2012:603).

Chronic diseases require long-term compliance to treatment to ensure positive health outcomes (Nagarkar, Gadhave, Sharma, Choure & Morisky, 2013:562), and hypertension is no exception. However, the rates of non-compliance to medication in patients with chronic diseases on long-term treatment in developing countries, such as Lesotho, are approximately of 50% (WHO, 2010:online).

Lesotho's Standard Treatment Guidelines for the management of diabetes and hypertension at primary healthcare level states that compliance to both pharmacological and non-pharmacological treatments is required for effective blood pressure control (Lesotho, 2009:13). Lifestyle modification as part of non-pharmacological treatment is essential for almost all hypertensive patients. A healthy diet is beneficial to hypertension control, which includes adhering to a low-salt diet, with a subsequent decrease in systolic blood pressure by 2-8 mmHg (Zabihi, Ashktorab, Banaderakhshan & Zaeri, 2012:190). However, Nkosi (2010:38) reports that some hypertensive patients who have knowledge regarding blood pressure management measures, such as a healthy diet, do not apply this information to improve and maintain their health. Consequently, they miss clinical appointments for various reasons. Lack of knowledge about the disease hinders compliance and this implies that patients will not take their medication as expected (Mweene, Banda, Mweene & Lakhi, 2010:259).

Mafutha and Wright (2013:1-2) reports that assessing compliance by asking questions regarding both medication and lifestyle modification regimens can be the best way to determine compliance behaviour and improving high blood pressure control.

1.2 Problem statement

Hypertension presents a huge challenge in developing countries, especially in South East Asia and the African region (Mohan, Sedaat & Pradeepa, 2013:9). Its prevalence is the highest in Africa (46% of adults) (WHO, 2013a:9-10) and it is the leading risk factor for death from non-communicable diseases in Tanzania (Peck, Green, Mtabaji, Majinge, Smart, Downs & Fitzgerald, 2013:online). Based on the statistics of hypertension reports from the past years, the WHO (2012a:7) predicted that by the year 2025, almost 75% of the world's hypertension population will be found in developing countries. Lesotho is among the three countries with the highest incidence of hypertension (Ikeda et al., 2013:online), with a prevalence of 31% (WHO, 2014:3) and remains one of the top 10 conditions treated in outpatient departments at primary healthcare (PHC) clinics in Lesotho (World Health Federation, 2012:3). A WHO report compiled in Lesotho in 2012 indicated that hypertension complications accounted for 6% of deaths in men and 2% in

women with 7% of hospital admissions being due to uncontrolled high blood pressure (WHO 2013b:online). It is expected that provision of free health services should have a positive impact on adherence, however, that is not the case in most countries that are providing free services (Adeyemo, Tayo, Luke, Ogedegbe, Durazo-arvizu & Cooper, 2013:206). Lesotho is not an exception, and despite the availability of anti-hypertensive medication and advances made in adherence through the provision of daily health education at PHC clinics, the researcher noticed that non-compliance still exists. Moreover, adherence rates are not well reported in Lesotho and, therefore, this research was undertaken to explore and describe adherence behaviour of patients at primary health care clinics in the Mafeteng district, Lesotho. Mafeteng is one of the 10 districts in Lesotho; it has seven government PHC clinics and 10 Christian Health Association of Lesotho (CHAL) clinics. CHAL is a faith-based organisation. Both the government and CHAL clinics have standard clinical equipment, render similar services and are managed by professional nurses.

The results of this research study provide clinically verified baseline data on compliance behaviour of patients with hypertension, as well as on the factors contributing to such compliance behaviour. These results may be utilised by professional nurses in their respective healthcare facilities to identify gaps in the management of hypertension. In addition, the recommendations could be used by policy makers and other stakeholders as part of the planning of appropriate interventions that can improve patient compliance to antihypertensive therapy and hopefully reduce the mortality and morbidity rates of patients due to hypertension.

1.3 Research question

What is the extent of compliance behaviour towards hypertension treatment and the factors contributing to it?

1.4 Aim and objectives

The main aim of this study was to explore and describe compliance behaviour of hypertensive patients attending PHC clinics in Mafeteng district, Lesotho. The research

objectives were to assess compliance behaviour to hypertension treatment with regard to:

* medication taking,
* sodium use,
* the keeping of appointments with health care providers, and
* to identify factors that contribute to adherence behaviour.

1.5 Theoretical framework

Self-determination theory provides the theoretical framework for this study. It is described as the theory of personality development and self-motivated change of behaviour (Schiffbauner, 2013:online).

Self-determination theory focuses on the process through which an individual acquires the motivation for initiating new health-related behaviours and maintaining them over time. This process contains critical components for self-regulation and sustainability of favourable health and wellbeing behaviours. As a result, the individual will develop a sense of autonomy, competence and relatedness. Autonomy refers to the individual's condition of self-governance without influence of external regulators. Competence refers to the ability to exercise one's capacities and capabilities for successful results. Gaining a sense of competence is normally afforded through health practitioners' provision of relevant inputs and feedback in terms of health behaviour changes. Relatedness refers to a need for sense of belonging and association with other people to gain support.

The need for autonomy, competence and relatedness postulates that individuals have to be in control of their own lives, have efficient interaction with the environment and form relationships, for behaviour change (Schiffbauner, 2013:online). With regard to this study, the motivation to comply with treatment are explored with the open-ended questions of the questionnaire, after participants described their compliance behaviour using the Hill-Bone Compliance to High Blood Pressure Therapy scale (Schiffbauner, 2013:online).

1.6 Methodology

Only a brief overview of the methodology is given in this chapter. Refer to Chapter 3 for an in-depth discussion of the methodology.

1.6.1 Research design

A quantitative descriptive design was used for this research, as it allowed the researcher to quantify pre-specified health-related behaviour. The pre-specified health-related behaviour was the compliance behaviour to hypertension treatment of patients in Mafeteng district, Lesotho.

1.6.2 Research method

A questionnaire was used as research technique to obtain numerical data from patients who were receiving hypertension treatment. The questionnaire consisted of three sections and was divided as follows:

* Section A- Demographic information
* Section B- The Hill-Bone Compliance to High Blood Pressure Therapy scale
* Section C- Open-ended questions

1.6.3 Population

The study population consisted of all hypertensive patients on treatment attending services in 17 PHC clinics in the Mafeteng district, Lesotho, who were available at respective healthcare facilities during data collection.

1.6.4 Sampling and sample size

For this research, both the PHC clinics and the participants were sampled. Convenience sampling was applied to select the eight sample clinics while purposive sampling was used to select participants. These participants were selected based on the inclusion criteria that will be discussed in Chapter 3.

1.6.5 Pilot study

A pilot study was conducted at one of the sample PHC clinics and five hypertension patients were included. The participants were selected based on the predetermined inclusion criteria. Data collected during the pilot study were included as part of the main results of this research, as no changes were made to the questionnaire after the pilot study.

1.6.6 Data collection

The data collection process commenced after permission was granted by the respective committees and management. The researcher gained entry to the field through professional nurses in charge of the clinics who recruited eligible participants to report to the multipurpose hall. The researcher then provided participants with information leaflets, which notified them of their rights when taking part in the study and the concept of implicit consent. Patients who were willing to participate in the study completed the questionnaires individually, while the researcher remained in the background to clarify questions they had. The completed questionnaires were placed in a box located at the exit of the hall. The researcher visited the eight sample PHC clinics twice and followed the same procedure during the visits. The collected data were then coded and entered on an Excel spreadsheet. The questionnaires were kept under lock and key.

1.7 Validity and reliability

Validity and reliability measures were maintained throughout the process of this study (Botma, Greeff, Mulaudzi & Wright, 2010:174; Leedy & Ormrod, 2016:103).

1.7.1 Validity

In this research, two aspects of validity were adhered to, namely, content validity and construct validity. Both these validity measures will be discussed in detail in Chapter 3.

1.7.2 Reliability

Internal reliability, as applied to this study, will be discussed further in Chapter 3.

1.8 Ethical considerations

This study was guided by ethical actions that include submission of the research proposal to various committees for approval, and three ethical principles, namely, respect for people, justice and beneficence (Botma et al., 2010:17). These ethical matters will be discussed in detail in Chapter 3.

1.9 Data analysis

The Department of Biostatistics at the University of the Free State (UFS) performed the data analysis for demographic information and the Hill-Bone Compliance to High Blood Pressure Therapy scale. Descriptive analysis and standard deviations or medians and percentiles were calculated for continuous data, while frequencies and percentages were calculated for categorical data. The researcher analysed open-ended questions by open coding and thematic analysis.

1.10 Conclusion

This chapter provided an overview of the study. It focused on the reasons for performing the research, how it was conducted and who the participants were. The next chapter will provide a detailed discussion of the hypertension literature and the factors that influence or hinder treatment compliance.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

A review of existing literature conducted by the researcher in keeping with the aim of the study, namely, to explore and describe compliance behaviour of hypertensive patients attending PHC clinics in Mafeteng district, Lesotho, will be discussed in this chapter. Hypertension is explained in terms of epidemiology, pathophysiology and associated complications, and its management. The background of the phenomenon of compliance to hypertension treatment will be reviewed, focusing on the three domains that are of interest to the study: medication taking, sodium intake and keeping appointments, followed by the factors that influence compliance that might be useful for nurses and other stakeholders. An overview of the health care system in Lesotho will also be included.

2.2 Health care system in Lesotho

A health care system is defined as all activities whose primary purpose is tailored to promote, restore and/or maintain health (World Bank Group, 2015:online). A well-functioning health system consists of trained and motivated healthcare workers, a well-maintained infrastructure, and a reliable source of medicines and technologies, with adequate funding, strong health plans and evidence-based policies. The World Bank Group (2015:online) lists the functions of an individual health system as health service provision, health service inputs, stewardship, and health service financing.

Health service provision is the core function and the most visible product of the health system, since it entails delivery of health services to clients in need (WHO, 2007:1). Health service inputs involve resources required for health service delivery, which are human resources, medicines, medical equipment and clients. Stewardship, also known as governance, is defined as the functions implemented by the government to accomplish national health policy objectives, which are framed in terms of equity, coverage, access, quality and patients' rights (World Bank, 2015:online). Health service financing refers to the various mechanisms of paying for health services, through external funding, insurance contributions, taxation and health investment (World Bank, 2015:online). These functions are all fulfilled as part of the Lesotho health system and are governed by the Ministry of

Health jointly with support partners, which include civil society, the WHO, United Nations Children's Fund (UNICEF), United Nations Programme on HIV/AIDS (UNAIDS) and other donor agencies. To provide an overview of the health services in Lesotho, the health service function will be discussed further in the following paragraphs.

The service provision of the health system in Lesotho was adapted after the Alma Ata Declaration of 1978, which expressed the need for urgent action by all governments, all health and development workers and the world community to protect and promote the health of all through primary healthcare (WHO, 1978). PHC has since become the most efficient, cost-effective, affordable and acceptable intervention used to address diseases, through a package known as essential healthcare package (Lesotho, 2012:15; Lesotho, 2013a:7). An essential healthcare package refers to the provision of coordinated, comprehensive and integrated health services (Lesotho, 2013a:4). The healthcare providers in Lesotho are mainly the government, faith-based organisations, non-government organisations, public-private partnership and private doctors and nurses.
The major healthcare service providers are the government of Lesotho and a faith-based organisation (CHAL), which own approximately 60% and 40% of the health institutions respectively. CHAL was formed in 1974 as an association between six churches (Lesotho, 2013a:13). The non-government organisations responsible for the provision of health services include the Lesotho Planned Parenthood Association (LPPA), Lesotho Red Cross Society (LRCS) and Population Services International (PSI). Other health service providers include the three private hospitals, which provide secondary-level care for patients who have medical insurance. There is also a public-private partnership between the government of Lesotho and a consortium led by Netcare, which is a South African private healthcare provider that operates three clinics and the only tertiary hospital in Lesotho (Lesotho, 2013b:8-9).

All the above aforementioned healthcare service providers are regulated by legislations governing Lesotho health services. An overview of the legal framework will be provided below.

2.3 Legal framework governing Lesotho health services

The three major acts and health policies governing the health services in Lesotho are the Public Health Order No.12 of 1970, the Health Professionals Act No.6 of 2012 and the National Health and Social Welfare Research Policy (Lesotho, 2008:45). These legislations will be discussed below.

2.3.1 Public Health Order No. 12 of 1970

The Public Health Order No. 12 of 1970 regulates the scope of practice for doctors and professional nurses, and advocates for effective governance, health financing, decentralisation of health services and their effective utilisation. It furthermore explains the function of the Ministry of Health, which is mainly health promotion and disease prevention (Lesotho, 1970).

2.3.2 Health Professions Act No. 6 of 2012

The Act ensures the establishment and regulation of the nursing, medical, dental and pharmacy councils, which warrant that all the health service providers, such as professional nurses and doctors, are accountable. It further regulates education, training and registration of the respective professions (Lesotho, 1970).

2.3.3 National Health and Social Welfare Research Policy

The primary purpose of the National Health and Social Welfare Research Policy is to strengthen the research capabilities of the Ministry of Health through talent support, innovation encouragement and the use of research-based knowledge, and development of well-resourced agendas for priority research (Lesotho, 2008:13).

The content of the Public Health Order, Health Professions Act and the National Health and Social Welfare Research Policy are relevant for primary, secondary and tertiary levels of healthcare in Lesotho. Primary care is the first level of contact between patients and the health system and the main access point for healthcare services (Lesotho, 2013b:9). PHC clinics are situated in both urban and rural areas, for easy access, and they offer various healthcare services, including the management of hypertension. The standard

staffing pattern for each government, faith-based organisation or public-private PHC clinic comprises five professional nurses supported by a medical doctor, who makes occasional visits or who is based full-time at other facilities. Village health workers (trained lay individuals) support PHC clinics through promotional, preventive and rehabilitative care, such as condom distribution, education gatherings and follow-up visits for patients with chronic diseases (Lesotho, 2013b:9). PHC personnel refer patients with complications to district hospitals (secondary level) for further investigations and management.

The secondary level serves as the entry point for specialised care that is provided through 17 acute hospitals operated by the government and faith-based organisations. There are also three small private hospitals, which provide secondary-level care for patients who have medical insurance. Each of the 10districts in Lesotho has at least one district hospital. The staffing pattern in the district hospitals include medical doctors and specialised nurses who are able to deal with complicated conditions referred from the PHC clinics (Lesotho, 2013b:13). If a case cannot be dealt with at the district hospital, it is referred further, to the tertiary level.

At tertiary level, there is only one referral hospital in Lesotho, and it is located in the capital city, Maseru. It is staffed with specialist doctors and professional nurses across all the departments of the hospital. The hospital refers its patients to neighbouring South Africa, to the nearest city, Bloemfontein, for further specialist care (Lesotho, 2013b:14).

This study focused on PHC clinics, because hypertension treatment is mostly managed at these facilities. Figure 2.1 illustrates the healthcare services hierarchy in **Mafeteng** district.

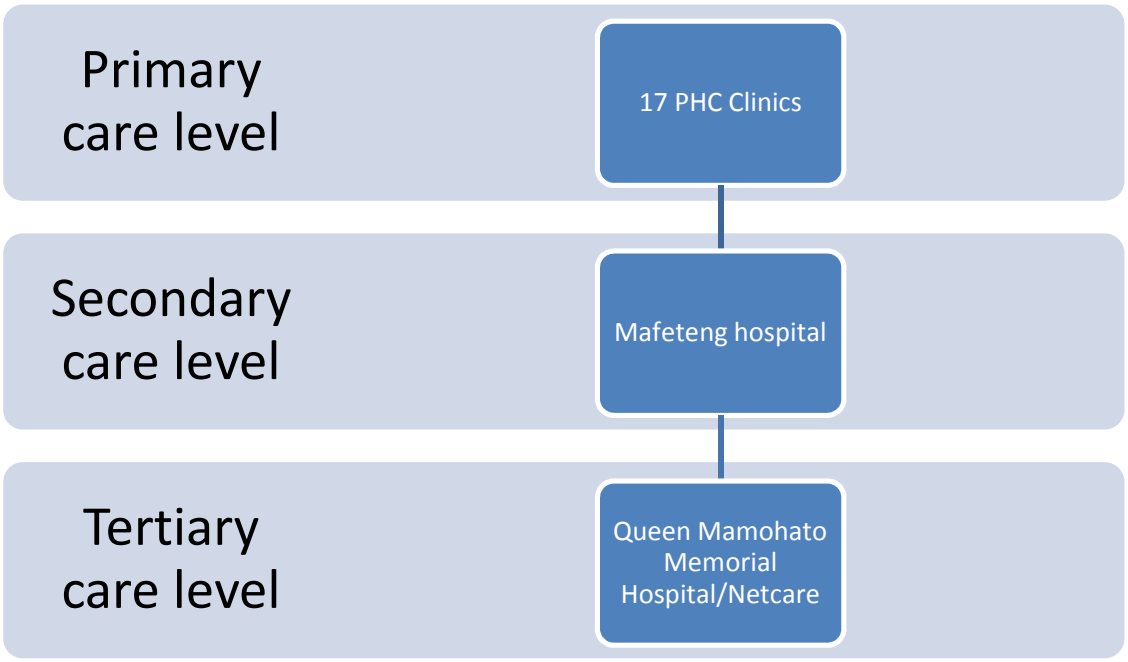

Figure 2.1: Health care services hierarchy in Mafeteng district

2.4 Hypertension

Hypertension can be classified as either primary (also known as essential hypertension or idiopathic hypertension) or secondary hypertension. In primary hypertension, there is no identifiable cause of the condition, though it is thought to be linked to genetics, poor diet, lack of exercise and the presence of obesity. Secondary hypertension can be caused by other diseases, which include renal disorders, endocrine disorders and atherosclerosis. It can also occur in pregnancy, when it is commonly known as pregnancy-induced hypertension (Geyer, Mogotlane, Young, Boshof, Chauke, Matlakala, Mokoena, Naicker & Randa, 2016:345)

2.4.1 Epidemiology

Hypertension is reported to be the leading risk factor associated with morbidity and mortality from non-communicable diseases and the highest cause of premature deaths worldwide (WHO,2012a:4). The global prevalence of hypertension in adults aged 18 years and over was around 24.1% for men and 20.1% for women in 2015. The number of adults with raised blood pressure globally increased from 594 million in 1975 to 1.13

billion in 2015, with the increase largely in low and middle-income countries (Nulu et al., 2016:38). Based on the statistics of hypertension reports for the past years, the WHO (2012a:7) predicts that, by the year 2025, almost 75% of the world's hypertension population will be found in developing countries. However, the global action plan has a target of a 25% reduction of the global prevalence of hypertension (WHO, 2013c:5)

Despite the aforementioned global action plan target to reduce hypertension, the prevalence of this chronic disease is increasing drastically in the African region (Ntsekhe & Damasceno, 2013:1233; Ogah & Rayner, 2013:1394). Hypertension is present in 46% of adults aged 25 and above and its prevalence significantly varies between urban and rural areas of African countries (Njuguna & Vedanthan, 2017:486; Nulu et. al., 2016:38; WHO, 2013a:9-10). Based on WHO surveys conducted in 2011 and 2012 in the African region, the prevalence of hypertension in Lesotho, Liberia and Tanzania is 31%, 30.7% and 26% respectively (WHO, 2014:3) In Lesotho, hypertension ranks among the top causes of morbidity and mortality, and is the third-most-common cause of hospital admissions in the country (Lesotho, 2010:3; Thinyane, Mothebe, Sooro, Namole & Cooper, 2015:424). A comparative analysis of a national survey conducted in 2012 in WHO member countries on the control of hypertension with medication indicated that the age-standardised percentage of individuals diagnosed with hypertension in Lesotho within the age group of 35-49 years was high (Ikeda et. al., 2013:online). Nonetheless, recent statistics on the prevalence of chronic diseases in Lesotho indicate that the presence of hypertension was reported to be at 41% in 2015 (Bosu, Aheto, Zucchelli & Reilly, 2017:196). This represents a 10% increase since the WHO study conducted in 2012.

The risk factors associated with the development of primary hypertension and its effect on the function of the heart will be explained as part of the pathophysiology below.

2.4.2 Pathophysiology of hypertension

Hypertension is associated with a raised pressure in the blood vessels. The systolic reading represents the highest pressure present in the aorta during contraction of the left ventricle and the diastole is a representation of the lowest pressure in the arteries during

dilation of the left ventricle. The heart, through the vessels, is responsible for the provision of blood to the various body parts of the human body. Each time the heart contracts, the blood is pumped into the vessels. The force of blood pushing against the walls of the blood vessels (arteries), as the heart pumps, creates blood pressure. As a result, the higher the force (caused by the resistance to blood flow in the arteries) required to push the blood forward, the harder the heart has to pump, thus, resulting in raised arterial pressure known as hypertension (Walker, Colledge, Ralston & Penman, 2014:429; WHO, 2013d:online). Various risk factors associated with the development of primary hypertension and their effects on the function of the heart include high sodium intake, decreased mobility and obesity.

Sodium plays an important role in the process of blood circulation through the process of fluid balance and cellular homeostasis. Sodium is the chemical component of common table salt and is usually found in other products, such as milk, snack foods, fish, sauces, processed and take-away foods. It is normally referred to as dietary sodium or salt (Aronow, 2017:406; WHO, 2012b:11). Sodium is an essential nutrient that is required for the maintenance of extracellular fluid, plasma volume and cardiac output (Walker et al., 2014:432). An excessive intake of sodium in a diet results in the increase of plasma volume through water retention in the blood vessels, which ultimately increases cardiac output. Cardiac output is defined as the amount of blood that the heart has to pump through the circulatory system in a minute. Increased cardiac output will, therefore, require more force for blood to circulate to all parts of the body, which can result in increased peripheral resistance caused by vasoconstriction and later narrowing of the arterioles, thus, resulting in raised blood pressure (Farquhar, Edwards, Jurkovitz & Weintraub, 2015:1044; Geyer et al. 2016:345; Walker et al., 2014:432).

In obesity-related hypertension, there is physical compression of the kidneys by fat, which increases the sympathetic nervous system activity with activation of the rennin-angiotensin-aldosterone system, resulting in renal compression. In renal compression, there is increased tubular reabsorption, which subsequently causes volume expansion, which leads to raised blood pressure (Walker et al., 2014:440). The likelihood of mobility

limitation increases linearly with obesity, thus, resulting in obesity-related hypertension (Welmer, Angleman, Rydwik, Fratiglioni, & Qui, 2013:5).

2.4.3 Complications associated with hypertension

Narrowing of the arterioles, which characterises hypertension, can lead to fatal complications, which include renal failure, cardiac failure, cerebro-vascular accidents, and eye disorders. If it is not managed and treated accordingly, hypertension can consequently result in disability and death (Walker et al., 2014:1235).

2.4.3.1 Cardiac failure and renal failure

Hypertension is the second leading cause of kidney failure globally (World Health Federation, 2017:4). The kidneys and the circulatory system are dependent on each other. High volumes of blood is filtrated through the nephrons and extra fluid and waste products removed. As a result, when the blood vessels are damaged, oxygen and nutrients are not provided to the nephrons. Over time, uncontrolled high blood pressure can result in the narrowing, weakening and hardening of the arteries surrounding the kidneys. Damaged arteries are not able to deliver adequate blood to the kidneys tissues, thus, resulting in renal failure (Garbuzenko, 2012:123; Oparil & Schmieder, 2015:1086)

2.4.3.2 Cerebro-vascular accidents

Raised blood pressure can cause hardening and thickening of the arteries to the brain. When either of these occurs, a blood vessel in the brain can be blocked by a clot (ischemic stroke) or bursts (haemorrhagic stroke), resulting in what is known as cerebro-vascular accident (CVA). In this case, the brain tissue no longer gets the blood and oxygen needed, and it starts to die. A stroke does not only affect the central nervous system, but can also result in impaired movement (nerve function) and memory loss and affect the ability to think and function. In severe strokes, paralysis and death can occur (Garbuzenko, 2012:123; World Health Federation, 2017:8).

2.4.3.3 Hypertensive retinopathy

Raised blood pressure can affect eye sight negatively. It can cause the blood vessels in the retina (tissue layer located in the back of an eye) to thicken. This layer is responsible for transformation of light into nerve signals, which are sent to the brain for interpretation. Thickening of blood vessels in the retina narrows the blood vessels, which results in blood restriction of the retina. In some cases, it causes swelling of the retina itself. Over time, raised blood pressure can damage the retina's blood vessels, limit its function and increase the pressure on the optic nerve, thus causing a vision problem, which is referred to as hypertensive retinopathy (Walker et al., 2014:609). The symptoms associated with retinopathy include retinal changes, sub-conjuctival haemorrhages, haziness of vision and sudden loss of vision (Geyer et al., 2016:346; Tientcheu, Ayers, Das, Mcquire & De Lemos, 2015:2160).

It is clear from the information provided above that the complications associated with the poor control of hypertension are life changing, thus, confirming the importance of treatment compliance, which will be discussed in the following section.

2.4.4 Diagnosis

The diagnosis of primary hypertension is based on the accurate measurement of blood pressure (Uys, 2017:462). A normal blood pressure in an adult is defined as 120/80 mmHg (WHO, 2012b:15). A person is diagnosed with hypertension if their blood pressure reads above 139/89 mmHg on three consecutive clinical visits with an interval of a minimum of two days to maximum of seven days in between (Lesotho, 2009:1; Lesotho, 2017:12). The Lesotho national guidelines on the management of diabetes and hypertension at PHC level correlate with this global definition of hypertension. The signs and symptoms associated with hypertension can include tiredness, headaches, confusion, vision changes, angina-like pain, and the presence of blood in the urine, nosebleeds, irregular heartbeat as well as ear noise or buzzing sounds (World Health Federation, 2017:2).

The invasive tests associated with the diagnosis (for example, electrocardiogram (ECG), blood serum tests) of secondary hypertension are not discussed, since the focus of this research falls on the management of primary hypertension at a primary healthcare level.

2.4.5 Management of hypertension

Hypertension can be managed successfully, but many people do not seek treatment (World Health Federation, 2017:2). The WHO (2013c:20-21) recommends that once a patient is diagnosed with hypertension, as based on the nation's guidelines, both pharmacological and non-pharmacological management measures must be initiated immediately. In Lesotho, the treatment of increased blood pressure is guided by the national guidelines on the management of diabetes and hypertension at primary care level (Lesotho, 2009:1). With regard to pharmacological management, the guidelines advise that diuretics, beta-blockers, calcium antagonists, converting enzyme inhibitors and angiotensin II receptor blockers are suitable for initial and follow-up treatment, as monotherapy and in combination. Further advice on the prescription of the drugs, dosages and expected intervals for medication taking are included. However, treatment differs according to the individual's blood pressure and compliance to treatment at the time of check-up. Furthermore, the guidelines recommend psychosocial support in terms of the suggested lifestyle changes (exercise, reduced dietary salt intake, reduced alcohol and tobacco intake). Patients with uncontrolled blood pressure despite medication adherence and lifestyle changes are referred to the secondary level of care for further investigations and management (Lesotho, 2009:13).

2.4.6 Compliance to hypertension treatment

The effectiveness of hypertension treatment and experiencing its benefits relies critically on strict compliance to treatment instructions (Vrijens, Antoniou, Burnier, De la Sierra & Volpe, 2017:6). Compliance is, furthermore, considered to be a primary determinant of the effectiveness of treatment, which intensifies optimum clinical benefit and promotes good health (Rao, Kamath & Kamath, 2014:996). For a larger society, it is a cost-saving measure, since a decrease in the incidence of complications and less need for additional medications is experienced (WHO, 2013a:45). However, despite increased awareness of

the effect of chronic conditions, compliance rates to their treatment are typically low, and dropping dramatically globally, compared to acute conditions (Njuguna & Vedanthan, 2017:486). Even in populations with relatively high adherence rates, there is still a need for improvement. This is a requirement worldwide, as reported in a national population-based cohort study conducted in pulmonary arterial hypertension centres in Sweden (Ivarsson, Hesselstrand, Rådegran & Kjellström, 2018:699).

Little research has been completed on the compliance of patients suffering from non-communicable diseases in Lesotho. Most of the published research work on hypertension is based on the knowledge of patients regarding antihypertensive treatment. An observational, descriptive cross-sectional study conducted at a district hospital in Lesotho found that the level of knowledge of hypertensive patients regarding their treatment and adherence is low (Khothatso, Moshoeshoe, Saroni& Ross, 2015:28). Subsequently, Mugomeri, Ramathebane, Maja, Chatanga and Moletsane (2016:44) reported that inadequate knowledge about antihypertensive treatment is significantly associated with uncontrolled high blood pressure, and the associated complications. A study conducted at Domicilliary Health Clinic in Maseru, Lesotho, reports that the prevalence of chronic, uncontrolled high blood pressure remains high in patients on treatment, and claims an important intervention in this population would involve identifying factors that can help improve compliance to the hypertension treatment (Thinyane et. al., 2015:430). A report of a selective literature review study in various countries indicates, furthermore, that it is desirable to carry out studies on the promotion of compliance in Germany and countries facing the same national challenge of conditions prevailing in the healthcare system (Matthes & Albus, 2014:41).

2.5 Measurement of compliance

Compliance to hypertension treatment is measured by various methods, ranging from self-reports, pill counts, and electronic monitoring to measuring plasma drug levels. Some of these methods are costly to undertake in developing countries, especially in a clinic setup and when dealing with a high number of patients. Such methods include electronic monitoring, where certain equipment is used to establish the number of times the drug

containers have been opened by the patient within a given period (Moise, Schwart, Bring, Shimbo & Kronish, 2015:721). However, validated instruments have been developed to estimate compliance to hypertension treatment through eliciting patients' self-reported compliance-related activities. Self-reports have been discovered in the last few years (2005-2012) and are relatively cheap, easy to administer, non-intrusive and provide information on attitudes and beliefs regarding hypertension treatment. Examples of self-reports include the Medication Adherence Questionnaire, Self-Efficacy for Appropriate Medication Use, The Medication Adherence Rating Scale and Hill-Bone Compliance to High Blood Pressure Therapy Scale (Culig & Leppee, 2014:55).

Due to the complex nature of hypertension disease, and because it varies between individual patients, there is no gold standard for measuring treatment compliance. In the present study, the researcher proposed to use the Hill-Bone Compliance to High Blood Pressure Therapy scale to estimate the compliance of patients on three domains, namely, hypertension medication use, salt intake and keeping appointments. A review of literature on the three domains will be discussed below.

2.5.1 Medication taking

Compliance to the taking of prescribed medications leads to the establishment of therapeutic levels in patients with chronic diseases, which means that the patient is taking the right drug, the right dosage and at the right time. It is required of patients to apply self-discipline and determination in order to achieve therapeutic effects of medications. As part of health promotion, the taking of medications as prescribed by health professionals is a key part of compliance (Akgol, Eser & Olmez, 2017:454; Lee, Halimatun, Steven & Ong, 2012:794). Despite the availability of effective medical therapy, less than half of hypertensive patients from community centres in Hong Kong had blood pressures under the 139/89 threshold (Lo, Chau, Woo, Thompson & Choi, 2016:300).

A review of literature on various studies conducted in different types of settings and populations indicates that improving medication-taking adherence is a significant aspect in both clinical practice and research (Matthes & Albus, 2014:45). Monotherapy has been suggested as an option that can promote medication adherence and reduce the number of times that patients forget to take their prescribed drugs, since there is a correlation

between the number of drugs a patient uses and recall barrier (Vancini-Campanharo, Oliveira, Andrade, Okuno, Lopes, & Batista, 2015:1154). Accetto, Korencan, Radenkovic and Milenkovic (2017:10) indicate that the successful management of hypertension requires at least one hypertensive medication to achieve target blood pressure. However, a need for more than one medication to manage the raised blood pressure is common for most patients, and this usually poses a challenge regarding medication compliance (Bhandari, Bhahattari, Ghimire, Pokharel & Morisky, 2015:40).

Research conducted in Eastern Nepal demonstrated that improved adherence is associated with the simplification of a triple antihypertensive regimen from three to at least two pills. The study was conducted to explore the extent of adherence towards prescribed antihypertensive medications and to identify the factors of non-adherence in Dharan Municipality in the Eastern region of Nepal from September 2009 to February 2010 (Bhandari et al., 2015:40). Similar findings were obtained from a study conducted in the United States (Panjabi, Lacey, Banroft, & Cao, 2013:58).

To address the multifaceted nature of patients' medication-taking behaviour directly, new, innovative methods are needed (Alsolami, Correa-Velez & Hou, 2015:186). The findings of research conducted in hypertensive African-Americans can be used to guide intervention efforts in patients who do not comply with prescribed medications. For instance, assessing individual adherence patterns can assist in developing tailored patient-specific interventions that could maximise medication-taking behaviours (Knafl, Schoenthaler & Ogedegbe, 2012:218). Furthermore, motivational interviewing gives health professionals and patients an opportunity to acknowledge the barriers associated with prescribed medications and gives the patient autonomy to make healthier choices that will improve adherence (Sansbury, Dasgupta, Guthrie, & Ward, 2014:109).

In addition, a descriptive study carried out in Nigeria concluded that patients who are satisfied with their medications and blood pressure control show improved compliance rates. The study was conducted at a primary healthcare clinic in Nigeria with 140 adult hypertensive patients who had been on treatment for at least six months. Their hypertension medication satisfaction and medication adherence were assessed using a pretested administered questionnaire on self-reported satisfaction and adherence to medications, in the past 30 days (Iloh & Amadi, 2017:79)

Conversely, the results of research on patients suffering from hypertension and attending an outpatient department of the Health Insurance and Rural Health Unit (El-Halafy), which was affiliated to the Ministry of Health of Kafr EL-Sheik governorate in Egypt, found that patients require more knowledge regarding the importance of treatment regimens if they are to improve compliance and quality of life. Data were collected from a sample of 300 hypertensive patients using three tools: Hill-Bone Compliance to High Blood Pressure Therapy scale, Health-related Quality of Life scale and a structured questionnaire sheet that composed three parts: Part 1: socio-demographic characteristics of the patient, Part 2: Health history and patients' lifestyle, Part 3; patient knowledge about hypertension (Awad, Gwaied, Fouda & Essa, 2015:33).

2.5.2 Low dietary sodium intake

The WHO (2013c:10) strongly recommends reduced dietary salt intake as one of the top priority actions to address the global cardiovascular disease crisis, and has urged member nations to take action to reduce population-wide dietary salt intake in order to decrease the number of deaths from hypertension and other cardiovascular diseases. It is even advisable for children to lower their sodium intake during their early lives and prior to the introduction of solid foods, as well as throughout their childhood, since this will assist them in adopting a lower sodium threshold (Van Horn, 2015:67). Reduced dietary salt intake can be attained through various measures, namely, limiting the amount of salt added to food, consuming foods low in salt and reducing consumption of processed foods (Mafutha & Wright, 2013:4). Processed foods contain approximately seventy percent of sodium in the diet, hence it is advisable to limit their consumption as much as possible (Farquhar et al., 2015:1047).

Studies that have been conducted worldwide have proved that high salt intake is associated with high blood pressure and, therefore, there is a need to comply with WHO recommendations to limit or lower sodium intake (Farquhar et al., 2015:1047; Halfoun, Mattos, Lauredo, Selorico, Ferreira & Albuquerque, 2014:18). An observational study conducted in the Japanese population revealed that high dietary salt intake is associated with uncontrolled blood pressure, thus, there is a need for hypertensive patients to comply with low dietary salt intake recommendations. Individual salt intake was estimated by

calculating 24-hour urinary sodium excretion from spot urine in 4523 participants who visited the hospital for check-ups. The results of the study revealed that blood pressure remained high in 1027 participants (22.7%) who had high dietary salt intake. The blood pressure of 2 691 participants (59.5%) remained below the threshold; of which 805 participants (17.8%) did not consume dietary salt at all, while the other 1886 participants (41.7%) had minimal salt intake (Takase, Sugiura, Kimura, Ohte & Dohi , 2015:10).

To affirm the association of sodium intake and hypertension further, an in-depth study was conducted in the United States as a National Health and Nutrition Examination Survey, where the 24-hour urine specimens were collected from the 766 participants, and urine electrolyte excretion levels and blood pressure were measured at least twice per day. In over half of the participants with high blood pressure, sodium excretion also remained high; these results confirm the strong, direct relationship between sodium levels and blood pressure control (Jackson, Cogwell, Zhao, Terry, Wang, Wright, King, Bowman, Chen, Merritt, & Loria, 2018:240).

A study conducted in the urban-rural fringe of Altay, a country-level city in northern Xinjiang, China, between October 2012 and February 2013, obtained similar results. In this cross-sectional study, a stratified cluster random sampling of 1805 participants elicited a 92.4% compliance to low sodium intake in patients with controlled blood pressure. Sodium intake was assessed by sodium excretion from urine sample (urine creatinine concentration) (Hong, Zhang, Han, Xue, Liang, Zhang, Asaiti, Wang, Pang, Wang, Wang, Qlu & Jiang, 2017:10).

2.5.3 Appointment keeping

Keeping set appointments is generally helpful to both patients and the caregivers, as preparations for the services to be offered are done prior to consultation. Himmelfarb and Commodore-Mensah (2016:246), therefore, support a need to schedule more frequent visits to counsel non-adherent clients and to contact and follow-up with the ones who missed appointments. The findings of a study conducted in an urban area in Turkey concluded that regular clinical visits are the major element for improving compliance to hypertension treatment. This cross-sectional study was conducted in hypertensive patients who are older than 40 years (total 535 patients), who were registered at Izmir,

Konak EmineBaguier Health Care Centre, at the date of 1 January 2014. The data were collected through face-to-face interviews using a Antihypertensive Treatment Adjustment Questionnaire form enquiring about socio-demographic features of patients, and their attitudes, knowledge and behaviours towards hypertension disease (Akgol et al., 2017:454).

Despite the benefits of keeping appointments, defaulter rates for follow-up appointments remain high in patients on hypertension treatment, which subsequently leads to poor medication adherence. Research conducted in Lesotho, which evaluated the levels of knowledge of hypertension and the associated medications among hypertension patients, reported that 52.4% to 64.6% of the patients defaulted on their appointment dates and did not take their prescribed medications at least once during the six months prior to data collection (Mugomeri et al., 2016:45). Defaulting on appointments and failing to take medications as prescribed remain major challenges with patients suffering from chronic hypertension. Hacihasanoglu and Gozum (2011:702) report that 50% of hypertension patients in Turkey defaulted on their appointment dates, and 40% did not take their medications as prescribed. In contrast, Mafutha and Wright (2013:4) argue that non-compliance to follow-up appointments to collect medications does not correlate with medication-taking. Their study reported that 57% of patients at primary healthcare clinics in Tshwane, South Africa, were non-adherent to follow-up appointments, yet 81% of patients were compliant regarding medication-taking.

Non-compliance to appointments can have consequences for both the individual and society. At an individual level, it can result in resistance or uncontrolled hypertension, while it is found to have cost implications at societal level (Onoruoiza, Musa, Umar & Kunle, 2016:14). Various factors that are associated with missed appointments include lack of hypertension knowledge, experience of medication side effects, forgetfulness, transportation challenges, a feeling that appointments are not helpful, lack of trust, and health professionals' communication behaviour during consultations (Martin, Roter, Beach, Carson & Cooper, 2013:155; Nwabuo, Morss Dy, Weeks& Young, 2014:4). Consequently, interventions that improve appointment compliance among hypertension clients should be individualised, depending on the factor associated with non-compliance (Himmelfarb &Commodore-Mensah, 2016:246; Nwabuo et al., 2014: 4).

2.6 Other factors that influence compliance to hypertension treatment

In the healthcare context, compliance refers to the extent to which patient behaviour coincides with medical advice (Partridge et al., 2012:655). Some of the factors that have an influence on compliance to hypertension treatment include patient variables, health-care-provider-related issues, client-related and social factors, as well as the use of technology.

2.6.1 Variables

Studies conducted worldwide have found a wide range of variables that have a positive impact on compliance to hypertensive treatment. These variables include demography, health status, perceived effects of medication, age, level of income, number of pills taken each day, socio-economic class, and living with a partner.

A study proposing and testing a conceptual model of the psychological factors underpinning good compliance to antihypertensive medication suggests that compliance is influenced by three sets of variables, namely, demography, health status and perceived effects of medication (mainly cognition, motivation and intention to adhere).Patients who feel healthy and perceive that hypertension treatment has a therapeutic effect on their disease will comply well with their treatment (Quine, Steadman, Thompson &Rutter, 2012:215).

On the other hand, different income levels, the number of pills taken each day and the frequency of blood pressure control measures were also associated with a high degree of compliance among patients (Zabihi et al., 2012:193). In this descriptive study, the level of adherence of 120 hypertensive outpatients admitted to teaching hospitals affiliated to Urmia University of Medical Sciences, Iran, was determined by using the Hill-Bone Compliance to High Blood Pressure Therapy scale. The ranges of patients' mean scores of compliance to medication, diet and appointment keeping, were 72-100%, 50-100% and 12-100%. These compliance rates were associated with participants with a higher level of income, taking a minimum of one pill per day and with blood pressure control occurring at least once in six months. In addition to the aforementioned variables, age was found to be a significant predictor of treatment compliance in Northern Ireland (Maguire, Hughes

& McElnay, 2012:374).Middle-aged patients (40-60years old) complied better to treatment than younger and advanced-age patients (Maguire et al., 2012:374).

2.6.2 Health-care-provider-related factors

Health care professionals play an important role in patients' compliance to treatment. Health education on control of hypertension offered at clinics, improves patients' knowledge on the disease and, ultimately, lead to good compliance to treatment (Chelkeba & Dessie, 2013:107; Goverwa, Masuka, Tshimanga, Gombe, Takundwa, Bangure & Wellington, 2014:7; Gupta, Patel, Horne, Buchanan, Williams & Tomaszewskis, 2016:89). To obtain precise information regarding the effectiveness of health education, an intervention study was conducted to test the effectiveness of an educational intervention with the use of educational technology (a flipchart) to promote treatment compliance in people with hypertension. The study was conducted with 116 hypertensive people registered at primary healthcare units of a capital city located in the northeast of Brazil, and the finding was that using educational technology (flipcharts) provided valuable information regarding medications and possible measures that can be undertaken to control patients' blood pressure. In their next clinical visits, the participants' blood pressure control and compliance to treatment improved (De Souza, Moreira, Oliveira, Menezes, Loureiro, Silva, Linard, Almeida, Mattos & Borges, 2016:7).

Moreover, pharmacists were found to play a similar role in improving adherence to treatment. Pharmacist intervention comprised collaborative care actions, medical review of records and tailored adherence counselling, including motivational interviewing and telephone follow-ups of hypertension patients. In this study, 532 patients were recruited from three hospital outpatient clinics and randomised to usual care of 6-month pharmacist intervention. At 12 months, 231 patients (20.3%) in the intervention group were non-adherent, compared with 30.2% in the control group (n=285) who were adherent (Patel, Chang, Greysen & Chopra, 2015:28).

In addition, counselling and patient education about the disease, diet modification and appropriate time and frequency of medication-taking were reported to promote patients' compliance to hypertension treatment (Sultana, Sirisha, Priyanka, Sireesha, Sultana,

Krishna & Rao, 2016:4725). Roumie, Greevy, Wallston, Elsay, Kaltenbach, Kotter, Dittus, and Speroff (2013:250) recommended that patient-centred care is an essential component in the treatment of chronic illness, since it determines compliance with treatment.

2.6.3 Patient-related factors

Dong-Soo and Chun-Ja (2013:340) established that controlled blood pressure has been associated with compliance to hypertension treatment. Hanus, Simoes, Amboni, Ceretta, and Tuon (2015:384), furthermore, confirmed that quality of life is associated with good compliance to hypertension treatment. This was deduced in their cross-sectional study with 432 patients, in which individuals with higher scores in assessment of quality of life (between 60% and 75%) complied extremely well to antihypertensive treatment compared to individuals with lower scores for quality of life, who were classified as non-compliant.

2.6.4 Social-related factors

Studies have shown that there is a relationship between social support and compliance to treatment in patients with hypertension. Taher, Abredari, Karimy, Abedi & Shamsizadeh (2014:65) report that social support is a determinant of hypertension treatment compliance, as patients with moderate-to-high levels of social support complied well to the treatment, as opposed to subjects with poor compliance that were found to have limited social support. In addition, family involvement in the overall management of hypertension is crucial regarding compliance to treatment (Alabi, Otoru, Uvomata, Adekanye & Ojebode, 2015:32). The results of a randomised controlled trial that was conducted in the urban area of south-eastern Brazil showed that a strategy involving home visits by healthcare professionals promoted compliance to dietary changes (Ribeiro, Ribeiro, Dias, Ribeiro, Castro, Suarez-Varela & Cotta, 2013:640). In this study, participants were divided into two groups, of which one received interventions that consisted of different strategies of nutritional guidance and monthly health workshops alone, while, in the other group, it was done as family orientation through home visits by healthcare professionals. The group of patients that received family orientation complied

well with dietary changes in the following six months compared to the group that received individual nutritional guidance.

2.6.5 Use of technology

Using medication reminder software on mobile phones is one of the technologies that have been reported to enhance compliance (Patel, Jacobus-Kantor, Marshal, Ritchie, Kaplinski, Parvinder, Khurana & Katz, 2013:635). The researchers evaluated its effectiveness by reviewing pharmacy refill rates before, during and after availability of the medication reminder software and found a significant difference between activation and post-activation phases of mobile software reminders regarding compliance to hypertension treatment (Patel et al, 2013:635). Mobile health (m-health) strategies are also reported to be cost-effective, are user-friendly methods of improving treatment compliance, and have a broad reach (Buis, Hirzel, Dawood, Katee, Nichols, Artinian, Schwiebert, Yarandi, Roberson, Plegue, Mango, & Phillip, 2017:697). This strategy utilised fully automated text messaging support to remind patients of their appointments and that it was time to take their medication. Akhu-Zaheya and Shiyab (2017:74) report that setting a reminder on a mobile phone manually improves compliance too, as it reminds patients to take their medication at the set time.

2.7 Conclusion

This chapter provided a discussion of the literature regarding hypertension treatment and the factors influencing treatment. The discussion included important information on the Lesotho healthcare system and the legal framework that governs the system. Hypertension, particularly primary hypertension, was also discussed in depth in relation to the epidemiology, pathophysiology, complications and management. Chapter 3 will present the methodology of the study.

CHAPTER 3: RESEARCH METHODOLOGY

3.1 Introduction

In Chapter 2, the phenomenon of hypertension treatment compliance was discussed. The existing literature portrays a picture of compliance to hypertension treatment, but does not necessarily describe the current situation in Lesotho, thus, making the current research a necessity. The research methodology which was used to achieve the research aim and objectives will be discussed in this chapter. The logical and linear flow of steps followed to explore and describe compliance behaviour of hypertensive patients attending PHC clinics in Mafeteng district, Lesotho, will also be described.

The research question, aim and objectives form a foundation for the research design and the methodology that were used to collect data. A description of data analysis will also be provided in this chapter. The sequential steps of the process as they occurred will be discussed next.

3.2 Research aim and objectives

The research aim and objectives of the study were derived from the research question, which reads: “What is the extent of compliance behaviour towards hypertension treatment and the factors contributing to it?”

The research aimed to explore and describe compliance behaviour of hypertensive patients attending PHC clinics in Mafeteng district, Lesotho, while the objectives were to assess compliance behaviour to hypertension treatment with regard to medication taking, sodium use and keeping appointments, and to identify factors that contribute to compliance. Table 3.1 shows the link between the study objectives and the sections of the questionnaire (see Addendum 4). Section A of the questionnaire describes demographic information of hypertension patients attending primary health care services in Mafeteng district, Lesotho.

Table3.1: Link between questionnaire questions and study objectives

Objective	Questionnaire sections
Assess compliance behaviour to hypertension treatment with regard to • Medication taking • Sodium use • Keeping appointments with health care providers	Section B (Hill-Bone Compliance to High Blood Therapy scale)
Identify factors that influence compliance to hypertension treatment	Section C (open-ended questions)

3.3 Research design

The research design is the overall plan for addressing a research question (Brink, Van Der Walt & Van Rensburg, 2012:113). This includes the plan, collection, organisation and analysis of data, which occur prior to discussion of the results of the study (Gerring, 2012:78).In this research, a quantitative descriptive design was used. This choice was based on the aim of the study, which was describing the phenomena in the natural setting (Botma et al., 2010:108; Brink et al., 2012:10). Identifying a research design helps the researcher to consider the theoretical, ethical and practical implications that will apply to the study (Botma et al., 2010:108). A brief discussion of the quantitative descriptive design will be presented here.

3.3.1 Quantitative research

A quantitative design was used to generate more knowledge about the area of interest, which is the compliance behaviour of hypertensive patients. Quantitative research is fundamentally about gathering numerical data to explain a particular phenomenon (Brink et al., 2012:11). The compliance behaviour was determined by calculating the Hill-Bone Compliance to High Blood Pressure Therapy scale scores to obtain numerical values.

The factors that contribute hypertensive patients' compliance with treatment were identified through open-ended questions. Leedy and Ormrod (2016:95) state that there is more objectivity in quantitative than qualitative research since the researcher does not participate in the study and try as much as possible to detach themselves from the participants. The questionnaire had all the instructions that guided participants on how to complete the questionnaire, therefore there was no opportunity for the researcher to intervene with personal feelings or opinions thereby eliminating possibility of bias.

3.3.2 Descriptive design

In descriptive designs, different aspects are observed, described and documented as they occur naturally (Burns & Grove, 2012:536). A descriptive method of inquiry was applied in this study, as the researcher wanted to describe the compliance behaviour of patients. Descriptive designs are also concerned with gathering a large amount of information from a representative sample (Brink et al., 2012:113). This design was fairly inexpensive to apply, since not all the PHC clinics in Mafeteng district were included in the data-collecting process. However, a large amount of information was gathered.

3.4 Population

An important step in the research process was to choose accessible participants who would be able to provide the information required to answer the research question. Participants are referred to as the research population and are defined as the whole collection of individuals or objects with similar characteristics, and who meet certain criteria to be included in the research (Brink et al., 2012:130; Gerring, 2012:75). In this research, the population consisted of all hypertensive patients who visited17 PHC clinics in Mafeteng district, Lesotho. According to the District Health Management Team (DHMT) and Department of Statistics, the average number of patients seen at all 17 health centres was 3 000 per month (Lesotho, 2013b:303). For this research it was not, however, possible to select the entire population, because some participants were not available on the days of data collection, as it was not their appointed date for a check-up at the PHC clinics. Therefore, the accessible population was considered to be those participants who

met the eligibility criteria and were accessible to the researcher during data collection. To explain the processes followed in obtaining data from the population better, the sampling process, pilot study and data collection will be discussed below.

3.5 Sampling

Sampling involves the selection of specific research participants for inclusion in the study (Botma et al., 2010:274; Holzemer, 2010:87). The sampling method and inclusion and exclusion criteria were clearly set out before patients were invited to participate (Botma et al., 2010:123; Brink et al., 2012:139). For this research, both the clinics and the participants were sampled. Convenience sampling was used to select the clinics while purposive sampling was used to select participants. Eight rural PHC clinics were conveniently selected, based on the geographical area where the researcher is based. They were nearest, most easily available and linked to the phenomenon in terms of the services that are rendered at these facilities.

The researcher visited each of the eight clinics twice to collect the questionnaires. All patients who reported to the clinics on the days of data collection were recruited and those who met the inclusion criteria were included in the sample. On the advice of the biostatistician, that the sample was sufficient to be analysed, data collection was terminated when a total of 159 questionnaires had been completed. The sample size was influenced by time constraints and resources for travelling to all the clinics (Botma et al., 2010:274).

The eligibility of participants was based on the inclusion and exclusion criteria that had been set. The inclusion criteria were that participants had to be men and women aged at least 18 years, who had been diagnosed with hypertension and who had been receiving treatment for at least six months continuously, kept their appointments for three consecutive months, and who could read and write Sesotho. Patients who could not write due to medical problems were excluded from the study.

3.6 Research method

The research method used in this study was that of a questionnaire. A questionnaire provides a broad spectrum of information from a group of people with a common interest (Botma et al., 2010:135; De Vos, Strydom, Fouché & Delport, 2013:186). For the present study, a questionnaire with three sections was used to obtain quantitative and descriptive data from the patients who were receiving hypertension treatment. Section A consisted of demographic information with seven questions, Section B was the Hill-Bone Compliance to High Blood Pressure Therapy scale which has 14 questions, and Section C had six open-ended questions. The questionnaire was written in English language, the researcher translated it to Sesotho language and re-checked by Sesotho language expert who ensured that no changes were made to the questionnaire.

The Hill-Bone Compliance to High Blood Pressure Therapy scale focuses mainly on compliance behaviour in three domains: medication taking, salt use and keeping of appointments. The six response categories are none of the time, some of the time, most of the time, all the time, do not know and not applicable (Culig & Leppee, 2014:58). The Hill Bone Compliance scale was available online for use at no cost therefore the researcher did not require permission to utilise it (John Hopkins School of Nursing, 2019:online). Even though the scale has been validated and utilised in various populations, ranging from South Korean, black Americans and South Africans, it has been suggested as suitable for use in predominantly black populations (Lam & Fresco, 2015: 6).

Questionnaires have several strengths. To begin with, they can generate large amounts of data across a wide section of population. Furthermore, the researcher has a limited effect on the data presented on the questionnaires (Le May & Holmes, 2012:84). During the present study, participants completed the questionnaires individually while the researcher remained in the background to clarify questions they might have. The questionnaire can also be administered, completed and scored easily.

Notwithstanding the above-mentioned strengths, questionnaires have limitations, which include a risk of poor response rates, especially with illiterate populations (Le May & Holmes, 2012:84). However, in this research, all the participants were literate, and that

helped to achieve a high response rate. Questionnaires are, furthermore, usually structured in a straightforward format, which limits participants' answers. In this research, open-ended questions provided richer and more diverse data than what would have been obtained with the use of closed-ended questions, since open-ended questions allow participants to respond in their own words, in a narrative fashion (Botma et al., 2010:110; Brink et al., 2012:154; Polit & Beck, 2017:270).

3.7 Pilot study

A pilot study is seen as a pre-test that collects a limited set of data prior to the implementation of full-scale data collection (Polit & Beck, 2017:198). St Andrew's Health Centre was selected as a pilot study, and five patients who met the inclusion criteria were recruited to complete the questionnaire. The researcher opted for St Andrew's Health Centre because the clinic is easily accessible, as it is the researcher's workplace; hence, it was cost effective. The pilot study was undertaken to determine whether the instructions and the question structure of the information leaflet and questionnaire were clear and to determine the total time that was needed to complete the questionnaire. No problems were encountered with either the information leaflet or the questionnaire; the participants were able to read and understand them. The completed questionnaires were reviewed by the researcher's supervisors and a statistician, who indicated that data from the pilot study could be included in the main study. Full-scale data collection followed the same pattern used in the pilot study, as nothing changed after the pilot study (Botma et al., 2010:275).

3.8 Data collection

The actual collection of data for the study was done after completion of the pilot study. The necessary approvals were obtained before conducting the pilot study and full-scale data collection. The research proposal was approved by the Evaluation Committee of the School of Nursing and the Health Sciences Research Ethics Committee of the University of the Free State (see Addendum 1), before the researcher proceeded with the study. Thereafter, the researcher obtained approval to collect data at Mafeteng PHC clinics from the Research Ethics Committee of the Ministry of Health of Lesotho (see Addendum 2).

Upon receiving approval from the respective committees, the public health nurse in charge of the clinics was informed about the study, and she notified the professional nurses in charge of each clinic where data was to be collected. The researcher then visited the respective clinics on various days as per the clinics' schedules for hypertension check-ups. Entry to the field was gained through the professional nurses in charge. The researcher explained the purpose of the study to the professional nurses in charge and requested them to screen and recruit eligible patients. The participants who were recruited were invited by the professional nurse to a reserved room (multipurpose hall) to complete the questionnaire. The researcher provided the participants with an information leaflet (see Addendum 3), which informed them of their rights when taking part in the research. The concept of implicit consent was used, which involved the participants being informed that they were giving consent by completing the questionnaire, but that they could withdraw from the study at any time. The questionnaire was completed within an average of 45 minutes.

The completed questionnaires were placed in a box located at the exit of the room. The researcher was present during the data-gathering process, but remained in the background and only clarified questions that the participants had. The questionnaires were locked away for safe storage in a cabinet to which only the researcher had access. The data from the completed questionnaires were captured on an Excel sheet and the coding was double checked with the biostatistician prior to submission for data analysis. Table 3.2 indicates the number of patients who participated in the research at the respective clinics for two consecutive weeks during which data was collected.

Table 3.2: Names of the clinics and numbers of participants

Clinics	Number of participants-Week1	Number of participants- week2
St Andrew's	9	11
Ribaneng	11	5
Masemouse	9	9
Emmaus	12	7
Matelile	11	7
Malealea	8	9
Motsekuoa	15	12
Ts'akholo	13	11

3.9 Validity

Validity is defined as the degree to which the instrument measures what is intended to measure in the sample population, and the degree to which the findings can be generalised to the study population (Leedy & Ormrod, 2016:105). The researcher identified and applied various measures during the process of the study to prevent and minimise threats to validity. In this study, content and construct validity were enhanced and are explained as follows.

3.9.1 Content validity

Polit and Beck (2017:723) define content validity as the degree to which the items in an instrument sufficiently represent the universe of content for the concept being measured. To address the threats to content validity, the researcher submitted the study protocol and the questionnaire to various expert panels for assessment, namely, the Evaluation Committee of the School of Nursing and, thereafter, the Health Sciences Research Ethics

Committee of the University of the Free State. Members of both committees provided inputs that the researcher incorporated. The biostatistician, as part of the Evaluation Committee, scrutinised the data-collecting instrument and advised on the appropriate statistical techniques for determining the sampling method, sample size and data analysis.

3.9.2 Construct validity

Construct validity mainly assesses the quality of the study (Polit & Beck, 2017:339). Construct validity was enhanced by a thorough review of literature on the topic, which provided clear and logical definitions of concepts (Holzemer, 2010:98). The researcher deployed an existing standardised scale (Hill-Bone Compliance to High Blood Pressure Therapy scale), which had been pretested in different settings (Lam & Fresco, 2015:6). Triangulation enhanced construct validity further, since the Hill-Bone High Blood Therapy Compliance scale was used together with a set of open-ended questions to gather data that would address the aim of the study.

3.10 Reliability

Reliability is defined as the consistency with which the measuring instrument yields a certain result when the entity being measured has not changed (Burns &Grove, 2012:74). According to Polit and Beck (2017:333), Cronbach's alpha values, that measure the internal consistency of the instrument, of 0.6 to 0.75 or higher are very good. The internal consistency of the Hill-Bone High Blood Pressure Therapy Compliance scale was evaluated and the standard Cronbach's alpha for the total scale was 0.74,which is considered to be reliable (Kim, Hill, Bone & Levine, 2000:online). The aforementioned Cronbach's alpha value represents the internal consistency reliability of the scale for the first pilot study conducted. To increase reliability of the study, the researcher standardised instructions on the data-collecting forms for all participants, and controlled the environment where the instrument was completed.

3.11 Ethical considerations

Any research must be guided by ethical actions, which ensure that the rights of the participants are protected. An explanation of the ethical matters which were considered throughout the process of the research follows.

Firstly, the researcher identified key persons who could assist in the research process. These key persons included the research supervisors, the biostatistician and the health sciences faculty librarian. Secondly, while reporting on the review of the literature and the research process, the researcher refrained from any form of plagiarism. This was ensured by applying paraphrasing methods during the citing and referencing of all ideas from other authors. Thirdly, once the research design had been decided upon, the researcher was guided by the research supervisors during the study process. This ensured that the researcher followed the study guidelines for a quantitative descriptive design. The participants' rights were also protected by applying solid research ethics for obtaining the necessary approval and consent before conducting the study (Botma et al., 2010:6).

The research proposal was submitted to various review boards and ethical committees for approval before commencing the data collection, namely, the Evaluation Committee of the School of Nursing, the Ethics Committee of the Faculty of Health Sciences of the University of the Free State and the Research Ethics Committee of the Ministry of Health Lesotho. Furthermore, the research was guided by the principles of respect for people, beneficence, and justice (Botma et al., 2010:3). A brief explanation of how the researcher upheld these principles is provided below.

3,11.1 Respect for people

Respect for people encompasses the right to self-determination, and that means participants must be treated as independent beings who can make their own decisions (Polit & Beck, 2017:340).The participants were allowed to decide willingly whether they wanted to participate in the study, or not. They received information regarding the research and had the opportunity to consent implicitly or refuse to participate. The participants could withdraw from the study at any time during the research, without having to give any reason for this decision (Brink et al., 2012:35). They were informed that there

was no cost implication for taking part and that no numeration was being offered for taking part in the study. Four key areas that guide maintenance of confidentiality were addressed, namely, the content of data-capturing forms, limited access to data, safe and secure storage of data and anonymous reporting of data (Botma et al., 2010:18-19).

The content of data-capturing forms did not require participants to include their personal information or any other identifying information. Data collected during the study were accessed by only individuals who were involved in the research process, who were the researcher, supervisors and the biostatician. Furthermore, all data-collecting forms were kept safely in the files of a locked cabinet and no identifiable data were stored on the computer during data entry. Even though the researcher had access to the identities of the participants when they met during data collection; neither names nor any personal information that could identify individuals were written on the questionnaires. Participants' questionnaires were only identified with numerical codes, which were used when discussing the data with the supervisors and the biostatistician.

3.11.2 Justice

The principle of justice entails fair selection and treatment of participants and their right to privacy (Botma et al., 2010:19-20). The selection of participants was based on the sampling method and inclusion and exclusion criteria, and all participants who met the eligibility criteria took part in the study. During data collection, information provided on the information leaflet was followed accordingly (Le May & Holmes, 2012:99). Included in the information leaflet was the average time of 45 minutes required to complete the questionnaire, which had been determined during the pilot study. Contact numbers, where the participant could lodge a complaint if they felt that their rights had been violated, were also included in the information leaflet (see Addendum 3).

3.11.3 Beneficence

The principle of beneficence is grounded in the premise that the participant has the right to be protected from harm and discomfort (Botma et al., 2010:20). The study adhered to this principle and ensured minimal risk to the participants, including emotional harm,

which was minimised by explaining the purpose of the research to allay participants' anxiety and fears (Botma et al., 2010:25; Le May & Holmes, 2012:99). For further protection of participants from harm, the contact information of people at the Ethics Committee who could be contacted in the case of complaints appeared on the information leaflet. Even though the benefits were not immediate, future patients may benefit from this research after its completion and dissemination of results to the respective health centres and Ministry of Health, Lesotho. Participants were informed that the results of this research might be used for publication or presentation, but were assured that they would not be implicated by name.

3.12 Data analysis

The data that were gathered were analysed by means of descriptive statistics, such as means and standard deviations or medians and percentiles, which were calculated for continuous data. Furthermore, frequencies and percentages were calculated for categorical data. Open-ended questions were analysed by coding and thematic analysis.

3.13 Conclusion

This chapter provided a detailed discussion of how the research was carried out using a quantitative descriptive design. Questionnaires were used as the data gathering method. The researcher indicated the strengths of using a questionnaire and how its limitations were minimised. Population and sampling were described. This chapter also explained in detail how the pilot study and full-scale data collection were conducted. The researcher also showed how content and construct validity were enhanced, as well as how reliability of the questionnaire was ensured. A detailed description of how the researcher upheld the ethical principles and how data was analysed was also provided. The results of data analysis will be discussed in Chapter 4.

CHAPTER 4: PRESENTATION AND DISCUSSION OF RESEARCH FINDINGS

4.1 Introduction

The process of data analysis was used to transform the raw data into meaningful results. This was a quantitative descriptive study, conducted at PHC clinics in the Mafeteng district, Lesotho, during which 210 respondents, who were purposively sampled according to the predetermined inclusion criteria, participated in the research study. Nobody refused to participate in the study in all the respective clinics. However, out of the 210 questionnaires which were issued and received back, 51 were considered to be incomplete due to the number of “not applicable” and “do not know” responses given. Questionnaires with these two responses on the Hill-Bone Compliance to High Blood Pressure Therapy scale were considered as having missing responses, and could, therefore, not be included in the data analysis. As a result, data analysis was performed on 159 questionnaires. The research focused on exploring and describing the compliance behaviour of patients to hypertension.

The results of the descriptive statistics will be presented in this chapter by means of bar charts and tables. Percentages were rounded off to one decimal place and, therefore, the cumulative percentages may not add up to 100.00 in all cases.

Data analysis will be presented in sections based on the questionnaire used for the study, which are the demographic profile of the participants, the Hill-Bone Compliance to High Blood Pressure Therapy scale and responses from the open-ended questions.

4.2 Section A: demographic profile of the participants

Section A, which consisted of demographic information, is considered important, as it provided a descriptive socio-cultural background of the participants in this research. The demographic information includes gender, age, marital status, highest level of education attained, employment status, and distance travelled to the facility, as well as the number of years since being diagnosed with hypertension.

4.2.1 Gender of participants

The participants were asked to indicate their genders. Table 4.1 shows that, of 159 participants, 60 (37.7%) were men and 99 (62.2%) were women. The predominance of women corresponds with the findings of Duncan et al. (2014:300), who found 73% of their participants to be women, and also found that women complied better with treatment than men.

Table 4.1: Participants' genders (N=159)

Gender	Frequency	Percentage
Male	60	37.7
Female	99	62.2
TOTAL	**159**	**100**

4.2.2 Ages of participants

Each participant was asked to indicate their age. The participants' ages were grouped into six categories for analysis (refer to Table 4.2). The majority of the participants (n=51, 32.1%) were in the category 40-49 years, followed by 49 (30.8%) in the category 50-59 years, 32 (20.1%) in the category 30-39 years and 15 (9.4%) in the category 60-69 years. Seven (4.4%) were older than 70 years, while only 5(3.1%) were aged younger than 30 years.

In overall, 72.3% of participants were older than 40 years, while only 27.7% were younger than 40 years. This finding is not surprising, as hypertension is largely seen in adults. Even though the present study did not correlate demographic information of participants with their compliance behaviour, the existing literature reports that middle-aged patients comply better with treatment than young and advanced-age patients (Maguire et al., 2012:374).

Table 4.2: Ages of participants (N=159)

Age	Frequency	Percentage

<30 years	5	3.1
30-39 years	32	20.1
40-49 years	51	32.1
50-59 years	49	30.8
60-69 years	15	9.4
>70 years	7	4.4
TOTAL	**159**	**100**

4.2.3 Marital status

Participants were asked about their marital status (single, married, living with partner, divorced, separated or widowed). As can be seen in Table 4.3, the majority of the participants, namely 94 (59.1%) were married, 42 (26.4%) were widowed, 13 (8.2%) single, 6 (3.8%) were living with partners, 3 (1.9%) were separated and one (0.6%) participant was divorced.

These findings are comparable with the results of Osamor's study (2015:31), which had been conducted in Nigeria, in which the majority of the participants were married and their good compliance behaviour was perceived to be a result of social support from their partners.

Table 4.3: Participants' marital status (N=159)

Marital status	Frequency	Percentage
Single	13	8.2
Married	94	59.1
Living with partner	6	3.8
Divorced	1	0.6
Separated	3	1.9
Widowed	42	26.4
TOTAL	159	100

4.2.4 Highest level of education

The participants had to indicate their highest level of education. Figure 4.1 illustrates that the majority, 66 (41.5%) of the participants, had attained primary school level. Participants who had attained high school level were 46 (28.9%); a further 30 (18.9%) of the participants had tertiary education and 17 (10.7%) had not attended school.

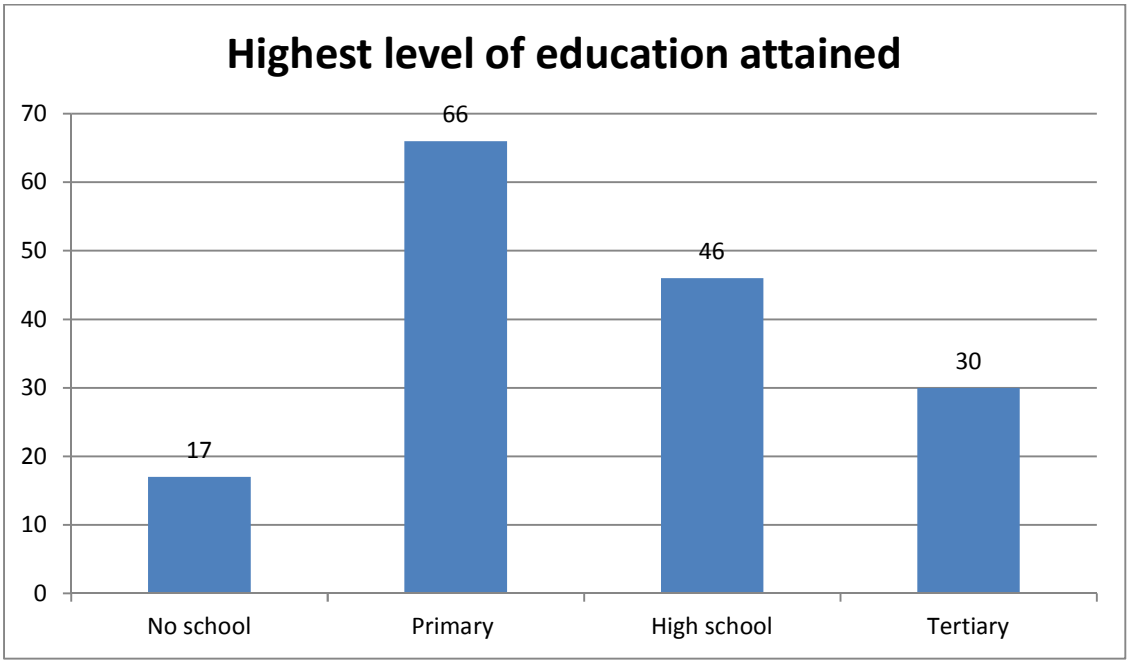

Figure 4.1: Highest level of education attained

Completing at least primary school has a significant relation to knowledge and good compliance (Awad et al., 2015:33). However, these authors question the effectiveness of patients' level of education in treatment compliance, as intrinsic motivation is lacking. This information is relevant, since the self-determination theory discussed in Chapter 2 suggests that individuals require motivation to initiate new health-related behaviours, and to maintain them over time (Schiffbauner, 2013:online).

4.2.5 Employment status

Participants were asked to indicate their employment status. Unemployed was selected by 80 (50.3%), while 34 (21.4%) selected employed. A further 26 (16.4%) of the participants were self-employed and 16 (10.1%) had retired. This information is presented in Figure 4.2.

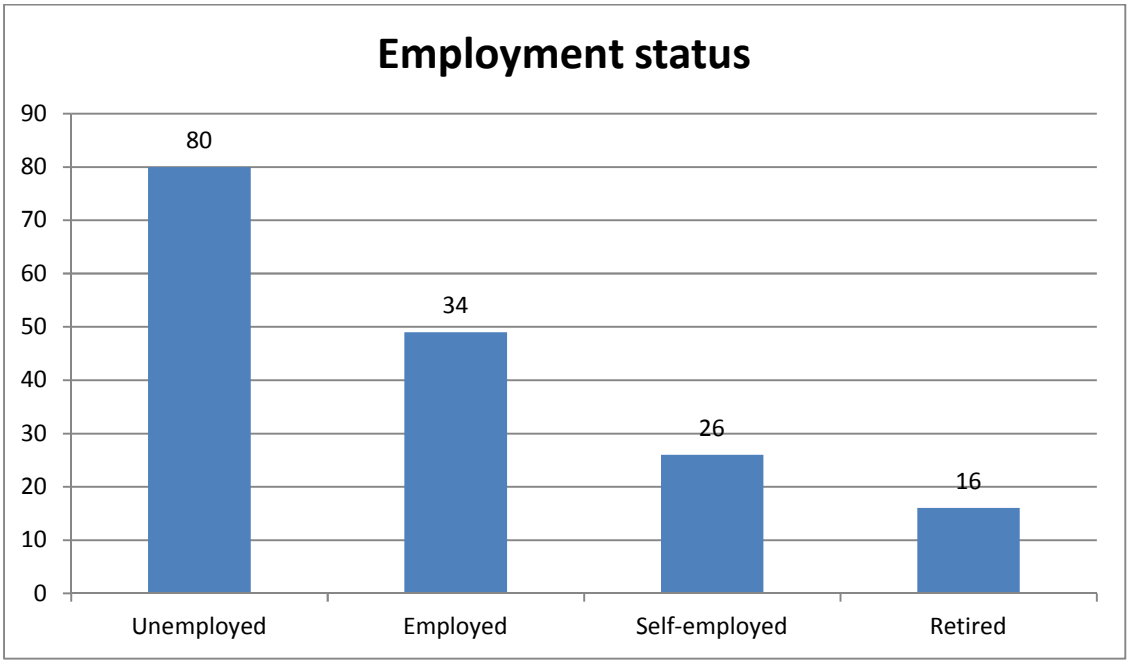

Figure 4.2: Employment status of participants

According to Roumie et al. (2013:250), employed patients tend to forget to take their medication, due to their busy work schedules, compared to unemployed and retired patients who have the time to take treatment as prescribed. As a result, for compliance, patient-centred care is recommended as an essential component of the treatment of chronic illness (Roumie et al., 2013:250).

4.2.6 Distance travelled to the facility

Consideration of Figure 4.3 indicates that the highest number of participants (n=37, 23.3%) travelled between one and two kilometres to the facility, while 15 (9.4%) travelled between four and five kilometres. Thirty-four (21.4%) travelled less than one kilometre and 22 (13.8%) travelled more than five kilometres. A further 26 (16.4%) of the participants travelled between three and four kilometres, while 25 (15.7%) travelled between two and three kilometres.

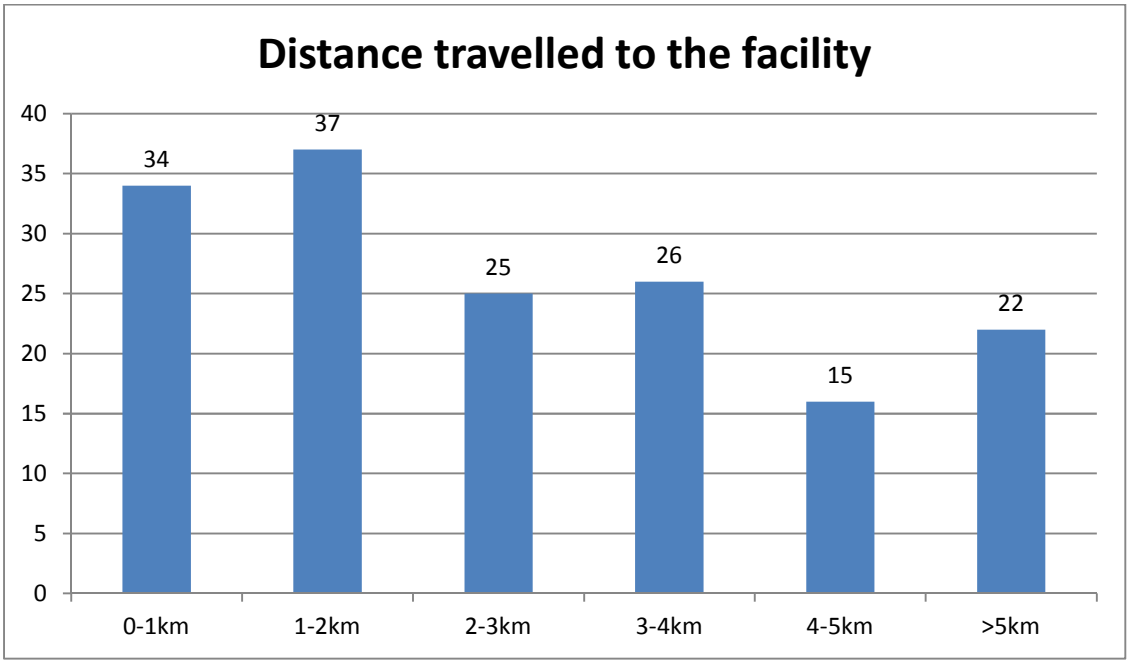

Figure 4.3: Distance travelled to the facility

Patients who are based near a health facility or who travel a short distance to the facility comply better with treatment than patients who have to travel for long distances – these are the results of a study that found that patients who travelled for short distances had higher scores on quality of life and, subsequently, good compliance to hypertension treatment, while patients with low scores on quality of life were mostly those who travelled long distances and presented with poor compliance to treatment (Hanus et al., 2015:384).

4.2.7 Number of years since diagnosis of primary hypertension

Participants were asked to indicate the number of years since they were diagnosed with hypertension. One year was the minimum number of years participants were diagnosed with hypertension, and the maximum years indicated was 57. The mean years for all the participants, was nine years

Patients diagnosed with hypertension a long time ago are usually more compliant to hypertension treatment than newly diagnosed ones (Hanus et al., 2015:384), which was also the case in the present study.

4.3 Section B: hill-bone compliance to high blood pressure therapy scale

Section B of the questionnaire consisted of the Hill-Bone Compliance to High Blood Pressure Therapy scale, which assessed participants' compliance behaviour regarding three domains, namely, medication taking, salt intake and appointment keeping. The scale has 14 items with a four-point response format: 1) none of the time, 2) some of the time, 3) most of the time and 4) all of the time (see Addendum 4). The scores of the items are additive and are summed to elicit compliance level; the lower the score the better the compliance. The maximum score for each item is 4 points, where 4 points indicates the poorest score and 1 point indicates the best compliance. However, the scoring pattern differs for item 6 of the scale, for which "all the time" scores 1 point and "none of the time" scores 4 points. Since there is no validated cut-off point for compliance on the scale, a decision was made to consider a score of more than 70% to represent non-compliance. The aforementioned decision was made with consultation of the biostatician based on the existing literature (Song et al., 2011:185). Table 4.4 lists the results of the compliance the overall scores of the participants.

Table 4.4: Compliance scores as per the Hill-Bone Compliance to High Blood Pressure Therapy scale (N=159)

Compliance score (%)	Frequency-n (%)
25	2 (1.3)
26.8	3 (1.9)
28.6	3 (1.9)
30.4	10 (6.3)
32.1	11 (6.9)
33.9	17 (10.7)
35.7	11 (6.9)
37.5	18 (11.3)
39.3	20 (12.6)
41.1	20 (12.6)
42.9	6 (3.8)
44.6	13 (8.2)
46.4	8 (5.0)
48.2	5 (3.14)
50	5 (3.14)
51.8	1 (0.63)
53.6	3 (1.89)
55.4	2 (1.26)
60.7	1 (0.63)

In table 4.4 above, the Hill-Bone Compliance to High Blood Pressure Therapy scale total scores was significantly low, reflecting good adherence (below 70%). These results are consistent with previous studies that utilised the same scale in South Africa and Namibia

(Mafutha & Wright, 2013:3; Nashilongo, Singu, Kalemeera, Mubita, Naikaku, Baker, Ferrario, Godman, Achieng & Kibuule, 2017:570). However, lower compliance levels have been reported for other countries, such as Saudi Arabia and South Korea (Alsolami et al., 2015:184; Song, Han, Song, Nam, Nguyen & Kim, 2011:185). Cultural setting and patient characteristics may have an effect on the differences in compliance levels of patients (Song et al., 2011:186). Compliance scores of the three individual domains are evident of good compliance, and they are discussed below.

4.3.1 Medication taking

Table 4.5.1 below show the compliance scores of medication taking domain of the Hill Bone Compliance scale.

Table 4.5.1 Compliance scores of medication taking domain

Domain	Compliance scores (%)	Frequency n (%)
Medication taking	25	29 (18.2)
	28.1	34(21.4)
	31.3	23 (14.5)
	34.4	20 (12.6)
	37.5	18 (11.3)
	40.6	12 (7.6)
	43.8	8 (5)
	46.9	6 (3.8)
	50	3 (1.9)
	53.1	3 (1.9)

Domain	Compliance scores (%)	Frequency n (%)
	56.3	1 (0.6)
	59.4	2 (1.3)

For patients with high blood pressure, taking medications as prescribed is a significant factor in preventing complications to body systems, promoting health and increasing patient wellbeing (Akgol et al., 2017:454; Lee et al., 2012:794). In table 4.5.1, compliance levels for medication taking were generally satisfactory, compared to other domains. These results affirm the findings of previous studies, which reported good compliance with medications compared to compliance with lifestyle modifications (Mafutha & Wright, 2013:3).Even in studies that report low overall compliance levels, there is consistency in disparity of medication compliance and lifestyle modifications compliance (Alsolami et al., 2015:184; Song et al., 2011:185).

4.3.2 Sodium use

Table 4.5.2 below show the compliance score of sodium use domain of the Hill Bone Compliance scale.

Table 4.5.2 Compliance scores of sodium use domain

Domain	Compliance score	Frequency (%)
Low dietary sodium intake	25	4 (2.5)
	33.3	11 (6.9)
	41.7	19 (12)
	50	59 (37.1)
	58.3	29 (18.2)

	66.7	27 (17)
	75	7 (4.4)
	83.3	3 (1.9)

With regard to compliance with low dietary sodium intake, the participants of the current study complied well to low dietary sodium use (refer to table 4.5.2). Similarly, a study that was conducted in the urban-rural fringe of Altay country level city in northern Xinjiang, China, revealed 92.4% compliance to low sodium intake prescriptions in 1805 participants (Hong et al., 2017:10). As a way to adopt a lower sodium threshold, Van Horn (2015:67) advises to lower sodium intake during children's early lives, prior to the introduction of solid foods, as well as throughout their childhood. In addition, the WHO (2013c:10) recommends reducing dietary salt intake as a way to decrease the number of deaths from hypertension and other cardiovascular diseases.

4.3.3 Appointment keeping

Table 4.5.3 below show the compliance score of appointment keeping domain of the Hill Bone Compliance scale.

Table 4.5.3 compliance scores of appointment keeping domain

Domain	Compliance scores	Frequency (%)
Appointment keeping	25	43 (27)
	33.3	40 (25.2)
	41.7	17 (10.7)
	50	47 ()29.6
	58.3	10 (6.3)

	66.7	1 (0.6)
	75	1 (0.6)

In the current study, compliance levels of the participants to appointment keeping were also good as it can be seen in table 4.5.3 Regular clinical visits have been reported as the major element for improving compliance with hypertension treatment (Akgol et al., 2017:454). Himmelfarb and Commodore-Mensah (2016:246) recommend implementing scheduled clinical visits, to counsel clients and follow-up those who miss appointments.

4.4 Section C: responses to open-ended questions

Section C of the questionnaire consisted of six open-ended questions that focused on the following aspects: 1) the importance of hypertension treatment, 2) motivation to take treatment, 3) keeping appointments, 4) ensuring low salt diet, 5) regular intake of medication and 6) support that patients get from different personnel. The responses to the questions emerged in categories, so, similar concepts were clustered together as sub categories, which were then coded with a numeric system. Findings are presented and discussed according to the categories and subcategories identified from an analysis of the data that were collected, which are summarised in Table 4.6.

Table 4.5: Results of the categories and subcategories that emerged from open-ended questions (N=159)

Open-ended questions	Category	Subcategory	Frequency (%)
What is the importance of antihypertensive treatment to your health?	Importance of treatment	Avoid complications	32(20.1)
		Control blood pressure	123(77.4)
		Do not know	4(2.5)

Open-ended questions	Category	Subcategory	Frequency (%)
What motivates you to comply with your hypertension treatment?	Motivation to comply	Absence of motivation	7(4.4)
		Maintaining of good health	70(44)
		Family	12(7.5)
		Effectiveness of treatment	47(22.4)
		Benefits of service at clinics	23(14.5)
Please describe how you manage to keep your appointments.	Keeping to appointments	Reminder (family, dates, cards)	42(26.4)
		Schedule dates	45(28.3)
		Clinics nearby	72(45.3)
How do you ensure a diet with low salt?	Reducing salt intake	No added salt	22(13.8)
		Measuring amount of salt	137(86.1)
How do you remember to take your medication regularly?	Strategies to enhance medication compliance(reminder)	Technology (TV, radio, mobile phone)	60(37.7)
		Family	45(28.3)
		Daily routine activities (meal times, time of the day)	54(34)
What support do you get from health care providers, family and friends?	Support	No support	18(11.3)
		Health education	52(32.7)
		Social support	89 (56)

4.4.1 Importance of antihypertensive treatment

When participants were asked about the importance of hypertension treatment, the majority of the participants seemed to know how important hypertension treatment is, and only 4 (2.5%) participants did not know it. In total 123 (77.4%) participants indicated that the importance of treatment relates to controlling their blood pressure, while 32(20.1%) indicated that it is important for avoiding complications. Some of the responses were as follows:

> *ke li noa hobane ho ke ts'aba ho ts'oaroa ke stroke(Participant 3)[The importance of treatment is to prevent me from getting a stroke]*
>
> *Bohlokoa ba tsona ke ho laola phallo e phahameng ea mali (Participant 4)[The importance is to control the high blood pressure]*

In the existing literature, controlling high blood pressure is reported to be the factor most known about in relation to its importance for patients being treated for hypertension (Weber, Schiffrin, White, Mann, Lindholm, Kenerson, Flack, Carter, Materson, Ram, Cohen, Cadet, Jean-Charles, Taler, Kountz, Townsend, Chalmers, Ramirez, Bakris, Wang, Schutte, Bisognano, Touyz, Sica & Harrap, 2014:8). Dong-Soo and Chun-Ja (2013:340) established that controlled blood pressure has been associated with compliance to hypertension treatment.

4.4.2 Motivation to comply

Participants were asked to indicate what motivates them to comply with their hypertension treatment. Maintenance of good health was the response given by the majority of the participants (n=70, 44%). Only 7 (4.4%) participants reported that they do not have any motivation to comply with their treatment; 12(7.5%) indicated that their family members motivate them, 47(22.4%) mentioned the effectiveness of the treatment motivates them, while 23(14.5%) participants mentioned that the benefits of services at the clinics motivates them to comply with treatment. Participants wrote the following comments regarding what motivates them to comply with their treatment:

Ha hona letho le etsang horeke li noe (Participant 10)[I do not have any motivation]

Ho lula ke phetse hantle kamehla (Participant 13)[Maintenance of my good health at all times]

Ke bana ba ka le litlhoholo tsa ka tse ke lulang le tsona (Participant 15)[It's my children and grandchildren that I am staying with]

Melemo ea lits'ebeletso eke fumanang setsing sa bophelo (Participant 11)[The benefits of services that I get from the clinic]

Ho theoha hoa phallo e phahameng ea mali (Participant 21)[The effectiveness of the treatment in lowering the high blood pressure]

The results of the current study correlate with the findings of a study conducted by Quine et al. (2012:215), who proposed and tested a conceptual model of the psychological factors underpinning good compliance to antihypertensive medication. Patients who feel healthy and perceive that hypertension treatment has a therapeutic effect on their disease comply well with their treatment. This information is relevant, since the self-determination theory, as discussed in Chapter 2, identifies self-efficacy as the most significant and prominent determinant of adherence (Holmes, Hughes & Morrison, 2014:870).

4.4.3 Keeping appointments

When asked to describe how they manage to keep their appointments, 72(45.3%) participants reported that the facilities are nearby, 45(28.3%) always adhere to the scheduled dates and 42(26.4%) have reminders, such as family members, dates and cards, to help remember the appointments. Three participants reported the following responses:

Bana ba ka ke bona ba lulang ba nkhopopa letsatsi leo ke lokelang ho itlaleha setsing ka lona (Participant 19)[My children always remind me of my appointment date]

Ke lula ke ts'oaea letsatsi leo ke le fuoang la ho khutlela setsing (Participant 16)[I schedule the date that have been set as my appointment]

Setsi sa bophelo se haufi le nna (Participant 17)[The clinic is in near my village]

The results of compliance level regarding appointment keeping on the Hill-Bone Compliance to High Blood Pressure Therapy scale of participants in this study confirm good compliance. Various measures aid in improving compliance to appointment keeping. Other studies reported additional measures, which include mobile health strategies and manual setting of reminders on mobile phones (Buis et al., 2017:697; Akhu-Zaheya & Shiyab, 2017:74). These strategies remind patients of their appointments on the scheduled dates. The findings of these studies confirm the results of the current study, in which 42 (26.4%) participants have reminders that assist them in keeping their appointments.

4.4.4 Reducing dietary salt intake

According to Mafutha and Wright (2013:4), reducing dietary salt intake can be attained through various measures, namely, limiting the amount of salt added to food, and consuming foods low in salt. Farquhar et al. (2015:1047), furthermore, advise that limiting consumption of processed foods as far as possible is another measure to reduce dietary salt intake.

In this research, the majority of the participants (n=137, 86.1%) indicated that they measure the amount of salt added to food, and 22(13.8%) participants indicated that they do not add salt to their food. The overall results of compliance to reduced dietary sodium use of the participants in this study showed good compliance. Participants' responses included the following:

Ke lula ke metha letsoai leo ke le ts'elang lijong (Participant 34)[I measure the amount of salt I add to the food]

Ha ke ts'ele esale ke tseba hore kena le phallo e phahameng ea mali(Participant 30) [I never add salt to my food ever since I was diagnosed with hypertension]

4.4.5 Taking medication regularly

Participants were asked to indicate the strategies they use to ensure that they take their medication regularly. A total of 60 (37.7%) participants indicated that they use technology (for example, television, radio or mobile phones) as a time reminder, 42 (28.3%) participants were reminded by their family members, and 54 (34%) were reminded by their daily routine activities (meal times and time of the day). Participants provided the following responses:

Ke setela fono hore e nhopotse kapa ebe se ke hopola ha ele nako ea litaba thelefishioneng (Participant 35)[I set the reminder on my phone or remember when it is time for news on television]

Ha letsatsi le na le nakonyana le chabile ke qeta ho ja kea tseba hore ke tlameha ho noa litlhare (Participant 38) [After some time the sun rises, I know I have to take my medication after taking food]

Mobile phones have been reported as one of the effective strategies used to enhance compliance with taking medications regularly. A study by Akhu-Zaheyaand Shiyab (2017:714) supports the findings of this research, that a reminder on a mobile phone is an effective reminder to take medication. With a mobile health (m-health) strategy, fully automated text messaging support reminds patients of their appointments and time to take their medication (Buis et. al., 2017:697). In the Hill-Bone Compliance to High Blood Pressure Therapy scale, compliance level for medication taking of participants in this study was good.

4.4.6 Support

When asked about the support they get from health care providers, family and friends, out of 159 participants, only 18(11.3%) indicated that they do not have any support. A

higher number (n=89, 56%) indicated that they have social support, and 52 (32.7%) participants indicated that they get the support through health education. The following responses were given:

> *Thuto eke fumanang setsing ke eona e lulang e nts'ielitse leha ke utloa hore ke li tlohele ka nako e 'ngoe (Participant 40) [The health education I get during my clinical visits is of great support even in times when I feel like not taking the drugs]*
>
> *Kena le metsoalle le lelapa le lulang le nts'ielitse ka nako tsohle (Participant 42) [My friends and family members always support me]*

Participants receive support from their social peers and health professionals. This is consistent with the published findings. According to Duncan et al. (2014:304),a combination of social support and health education is effective in improving compliance. Taher et al. (2014:65) report that social support is a determinant of hypertension treatment compliance. Health education on control of hypertension offered at clinics is reported to improve patients' knowledge on the disease and, ultimately, leads to good compliance to treatment (Chelkeba & Dessie, 2013:107; Goverwa et al., 2014:7; Gupta et al., 2016:89).

4.5 Conclusion

In this chapter, the research findings were presented, interpreted and discussed. The researcher presented the results of the descriptive statistics as frequencies and percentiles. The responses to the open-ended questions were presented according to the categories and subcategories that had emerged. The information presented in this chapter forms the basis for the recommendations and conclusion that will be presented in the next chapter.

CHAPTER 5: RECOMMENDATIONS OF THE STUDY

5.1 Introduction

This chapter concludes the research, which aimed to describe and explore compliance behaviour of patients attending PHC clinics in Mafeteng district, Lesotho. Prior to providing recommendations, an overview of results presented in Chapter 4 will be provided. Limitations of the research will be acknowledged and the possible value of the study will be highlighted. Lastly, the researcher's reflection of the study will be discussed briefly.

5.2 Overview of results

5.2.1 Demographic information

The study sample comprised of 159 participants, of whom 99 were women and 60 men. Altogether 72.3% of participants were aged above 40 years, while 27.7% were aged 39 years and younger. The majority (59.1%) were married and had attained at least primary school level education. About half the participants were unemployed, and 10.1% had retired. The mean years since the participants had been diagnosed with hypertension were 9.

5.2.2 Hill-Bone Compliance to High Blood Pressure Therapy scale

The data obtained from the scale indicated that the participants were generally compliant with hypertension treatment, since all their scores were below 70%, which was the determined percentage point associated with good compliance. The compliance scores of the three domains of the scale followed the trend of good compliance, except an insignificant number of participants who failed to comply to low dietary sodium intake. Seven (4.4%) participants had a compliance score of 75%, while only 3 (1.9%) scored 83%.

5.2.3 Open-ended questions

Generally, the participants were aware of the importance of hypertension treatment for their health, the control of blood pressure and prevention of complications, such as stroke, were indicated by some of them; however, 4 (2.5%) participants did not know why the treatment was important. Maintaining good health and effective treatment are the main reasons that motivate participants to comply. The majority (n=72, 45.3%) of the participants indicated that the location of the clinics near their residences help them to attend their follow-up appointments on schedule.

Regarding reducing dietary salt intake, the majority (n=137, 86.1%) of the participants measure the amount of salt added to their food, and 22 (13.8%) do not add salt to their food. Participants utilise various strategies to ensure that they take their medications regularly: 60 (37.7%) participants use technology, such as television, radio or mobile phones as time reminders,42 (28.3%) participants are reminded by their family members, and 54 (34%) are reminded by their daily routine activities (meal times and time of the day). A higher proportion (n=89, 56%) of participants have social support for their treatment, while 18(11.3%) do not have any support from health care providers, family or friends.

5.3 Conclusions of the study

Compliance behaviour of hypertensive patients living in Lesotho has not been well described in the literature, and a decision was taken to explore and describe the compliance behaviour of patients attending PHC clinics in Mafeteng district, Lesotho. The aims of the study were met, namely, to assess compliance behaviour and identify factors that contribute positively to this behaviour. The results reveal high compliance levels to hypertension treatment with regard to medication taking, low sodium use and the keeping of appointments with healthcare providers.

The factors that contribute to compliance behaviour that were identified include control of blood pressure, maintenance of good health, location of health facilities, use of technology, and social support. The recommendations of the study that are based on these findings are mainly to improve or review the current practices and introduce new

strategies that have been proven to improve compliance behaviour. The findings could potentially contribute towards evidence-based practice in the interest of improved patient care.

The recommendations that are presented in this chapter are based on the theory of self-determination, as discussed in Chapter 2, and which relates to autonomy, relatedness and motivation behaviours.

5.4 Recommendations related to the self-regulation needs and motivation of patients to comply with treatment

Recommendations regarding the self-regulation needs and motivation of patients to comply with treatment are presented in Tables 5.1 and 5.2. The corresponding link to the self-determination theory is also highlighted.

Table 5.1: Recommendations related to self-regulation needs linked to self-determination theory

Recommendations	**Link to self-determination theory**
Autonomy	
Professional nurses should continue providing information to patients about the importance of hypertension treatment, mainly control of blood pressure and prevention of complications.	Patients' knowledge about the importance of hypertension treatment will assist them to make informed decisions about treatment compliance.
Relatedness	
Patients with moderate-to-high social support comply well with treatment, compared to subjects with limited support (Taher et al., 2014:65).	Social interaction with others with the same diagnosis, such as a hypertension support group, will improve patients' sense of belonging and provide support to each other, which would consequently

Therefore, the researcher recommends that professional nurses at the clinics establish hypertension support groups that facilitate knowledge and experience sharing about the condition of hypertension among the patients. Encourage the use of available technology at home for time reminders to take medications. The introduction of mobile health strategies, involving automated text messages sent to patients to remind them of appointments, has been established as a cost-effective and user-friendly strategy to promote treatment compliance (Buis et al., 2017:697) and could be implemented on a small scale at each clinic.	influence their compliance behaviour positively. Using available technologies/strategies as a time reminder for either medication taking or appointments would enhance compliance.
Competence	
To enhance patients' competence regarding the management of hypertension, the following recommendations are suggested. The current hypertension health-related pamphlets that are available should be reviewed by the Ministry of Health, Lesotho, and the dietary implications of hypertension included.	Knowledge capacitating is required for competent practices, as it would strengthen patients' current practices and lead to health behaviour changes. This can be achieved through reviewing hypertension education material, providing health education during clinical visits and health practitioners providing relevant information through counselling.

Current health education about hypertension disease, diet modification and appropriate time and frequency of medication taking should be improved, given that they improve adherence (Sultana et al., 2016:4715). Pharmacy intervention strategies should be implemented at the clinics. These strategies could comprise tailored adherence counselling for hypertension patients (Patel et al., 2015:28).	

Table 5.2: Recommendations related to motivation to comply with treatment (sustainability) linked to self-determination theory

Recommendations	Link to self-determination theory
Motivation	
Professional nurses at clinics could mobilise patients who are healthy (those with controlled blood pressure and good compliance) to act as role models, and discuss effectiveness of treatment to their wellbeing with other hypertensive patients. Educate family members and friends about hypertension, so they can motivate patients to comply with treatment. Family involvement has been reported to be crucial in the overall management of hypertension (Alabi et al., 2015:32)	A forum of individuals who live with hypertension and who can provide evidence of how treatment changed their lives can motivate others to sustain their compliance too. Family members and friends are always in the company of patients and, if family members and friends have been capacitated with information about hypertension treatment, they can motivate patients to comply with treatment

5.5 Limitations of the study

The study was limited to the context of 17 PHC clinics in Mafeteng district; the eight sampled clinics were conveniently selected due to geographical distribution and financial constraints, as a result generalisation of the findings is limited. The response rate was reduced by a large number of “do not know” and “not applicable” responses on the Hill-Bone Compliance to High Blood Pressure Therapy scale, which resulted in 51 incomplete questionnaires to be excluded in the data analysis.

5.6 Value of the study

The results of the study will be significant to the following stakeholders:

- Adult patients with hypertension in Lesotho;
- Professional nurses at the PHC clinics in the Mafeteng district;
- District Health Management Teams in Lesotho;
- Ministry of Health, Lesotho; and
- Other researchers.

In the future, adult patients with hypertension could benefit from the reviewed pamphlets that address compliance to treatment and lifestyle modifications. Professional nurses will have a better understanding of patients' compliance to hypertension treatment and, therefore, provide appropriate care accordingly. The District Health Management Team and Ministry of Health, Lesotho, which act as administrative and support systems, will benefit from the findings and recommendations of the study, and can ensure compliance with treatment guidelines of other stakeholders, and review hypertension health-related programmes. The study will also provide a new platform for further research in other contexts.

5.7 Researcher's reflection about the study

Doing a Master's degree study involved travelling on a bumpy road, but was rewarding for the researcher. This study developed the researcher both personally and academically. On a personal level, this study enhanced the researcher's determination to achieve the study's objectives, despite the psychosocial challenges that repeatedly resulted in discouragement to continue with the study. The researcher also learned to achieve a healthy balance between the needs of family, school and work.

Academically, the researcher had not been exposed to academic writing prior to this study; as a result, the initial months were the most challenging. However, each chapter of the study was a learning phase in the researcher's knowledge and growth in the field of nursing research, guided by the study supervisors. The researcher developed critical thinking skills, which helped her to formulate a researchable topic. The researcher also developed skills relating to literature search through various electronic sources, and its

appropriate use. Lastly, the writing and computer skills of the researcher improved during the entire period of the study.

5.8 Conclusion

Chapter 5 provided an overview of the data collected, and a discussion of the recommendations, limitations and the value of the study. The researcher's personal reflection of the study from the beginning to the end was also reported in this chapter.

REFERENCES

Accetto, R., Korencan, S., Radenkovic, S. & Milenkovic, J. 2017. Treatment of Patients with Risk Factors: Compliance and Adherence. *Acta Facultatis Medicae Naissensis*, 34(1):5-11.

Adeyemo, A., Tayo, B.O., Luke, A., Ogedegbe, O., Durazo-arvizu, R. & Cooper, R.S. 2013. The Nigerian Antihypertensive Adherence Trial: A Community-Based Randomised Trial. *Journal of Hypertension*, 31(1):201-207.

Akgol, J., Eser, E. & Olmez, E. 2017. Factors Predicting Compliance among Hypertensive Patients in an Urban Area. *Medicine Science International Medical Journal,* 6(3):447-456.

Akhu-Zaheya, L.M. & Shiyab, W.Y. 2017. The Effect of Short Message System (SMS) Reminder on Adherence to a Healthy Diet, Medication, and Cessation of Smoking among Adult Patients with Cardiovascular Diseases. *International Journal of Medical Informatics,* 98(1):65-75.

Alabi, A.O., Oturu, O., Uvomata, A.O., Adekanye, O.S. & Ojebode, T.O. 2015. Family Support and Blood Pressure Pattern in Adult Patients Attending Baptist Medical Centre, Saki. *Nigerian Journal of Family Medicine*, 6(2):27-34.

Alsolami, F., Correa-Velez, I. & Hou, X.Y. 2015. Factors Affecting Antihypertensive Medications Adherence among Hypertensive Patients in Saudi Arabia. *American Journal of Medicine and Medical Sciences*, 5(4):181-189.

Ambaw, A.D., Alemie, G.A., Yohannes, S.M.W. & Mengesha, Z.B. 2012. Adherence to Antihypertensive Treatment and Associated factors among Patients on Follow Up at University of Gondar Hospital, Northwest Ethiopia. *BioMed Central Public Health*, 1(12):1-6.

Aronow, W.S. 2017. Reduction in Dietary Sodium Improves Blood Pressure and Reduces Cardiovascular Events and Mortality. *Annals of Translational Medicine*, 5(20):405-408.

Awad, E.Y., Gwaied, B.E., Fouda, L.M. & Essa H.A.E. 2015. Compliance of Hypertensive Patients with Treatment Regimen and its Effect on their Quality of Life. *Journal of Nursing and Health Sciences*, 4(2):26-36.

Bhandari, B., Bhahattari, M., Ghimire, A., Pokharel, P.K. & Morisky, D.E. 2015. Adherence to Antihypertensive Medication: Population Based Follow Up in Eastern Nepal. *Journal of Nepal Health Research Council*, 13(1):38-42.

Bosu, W. K., Aheto, J. M. K., Zucchelli, E. & Reilly, S. 2017. Prevalence, Awareness, and Associated Risk Factors of Hypertension in Older Adults in Africa: A Systematic Review and Meta-Analysis Protocol. *BioMed Central*, 6:192-200.

Botma, Y., Greeff, M., Mulaudzi, F.M. & Wright, S.C.D. 2010. *Research in Health Sciences*. Cape Town: Heinemann.

Brink, H., Van Der Walt, C. & Van Rensburg, G. 2012. *Fundamentals of Research Methodology for Health Care Professionals.* 3rd Ed. Cape Town: Juta.

Buis, L., Hirzel, L., Dawood, R.M., Katee, L., Nichols, L.P. Artinian, N.T. Schwiebert, L., Yarandi, H.N., Roberson, D.N., Plegue, M.A., Mango, L.C. & Phillip, D. 2017. Text Messaging to Improve Hypertension Medication Adherence in African Americans from Primary Care and Emergency Department Settings: Results from Two Randomized Feasibilty Studies. *Journal of Medical Internet Research,* 19(2):691-700.

Burns, N. & Grove, S.K. 2012.*Understanding Nursing Research: Building an Evidence Based Practice.* 5th Ed. Maryland: Elsevier Saunders.

Chelkeba, L. & Dessie, S. 2013. Antihypertension Medication Adherence and Associated Factors at Dessie Hospital, North East Ethiopia, Ethiopia. *International Journal of Research in Medical Sciences,* 1(3):101-107.

Culig, J. & Leppee, M. 2014. From Morisky to Hill-Bone; Self-reports Scales for Measuring Adherence to Medication. *Journal Collegium Antopologicum*, 38(1): 55-62.

Daniel, A.C.Q.G. & Veiga, E.V. 2013. Factors that Interfere the Medication in Hypertensive Patients. *Einstein*, 3(11):331-337.

De Souza, A.C.C., Moreira, T.M.M., Oliveira, E.S., Menezes, A.V.B., Loureiro, A.M.O., Silva, C.B.A., Linard, J.G., Almeida, I.L.S., Mattos, S.M. & Borges, J.W.P.2016. Effectiveness of Educational Technology in Promoting Quality of Life and Treatment Adherence in Hypertensive People. *Journal of the American Academy of Physician Assistants,*11(11):1-10.

De Vos, A.S., Strydom, H., Fouché, C.B. & Delport, C.S.L. 2013. *Research at Grass Roots: For the Social Sciences and Human Services Professions.* 4th edition. Pretoria: Van Schaik.

Dong-Soo, S. & Chun-Ja, K. 2013. Psychometric Evaluation of a Korean Version of the 8-item Medication Adherence Scale in Rural Older Adults with Hypertension. *The Australian Journal of Rural Health,* 21(6):336-342

Duncan, P., Howe, L., Manakusa, Z. & Purdy, S. 2014. Determinants of Blood Pressure Control in Rural KwaZulu-Natal, South Africa. *South African Family Practice*, 556(6):297-304.

Farquhar, W.B., Edwards, D.G., Jurkovitz, C.T. & Weintraub, W S. 2015. Dietary Sodium and Health: More Than Just Blood Pressure. *Journal of the American College of Cardiology,* 65(10):1042-1050.

Garbuzenko, D.V., ed. 2012. *Portal Hypertension-Causes and Complications*. Croatia: InTech.

Gerring, J. 2012. *Social Science Methodology: A United Framework*. 2nd ed. Cambridge: Cambridge University Press.

Geyer, N., Mogotlane, S.M., Young, A., Boshof, H., Chauke, M.E., Matlakala, M.C., Mokoena, J.D., Naicker, L.P. & Randa M.B. 2016. *Juta's Manual of Nursing Volume 1: Fundamental and General Nursing.* 3rd Ed. Cape Town: Juta.

Goverwa, T.P., Masuka, N., Tshimanga, M., Gombe, N. T., Takundwa, L., Bangure, D. & Wellington, M. 2014. Uncontrolled Hypertension among Hypertensive Patients on Treatment in Lupane District, Zimbabwe, 2012. *Bio Medical Central Research Notes*, 7(7):3-8.

Gupta, P., Patel, P., Horne, R., Buchanan H., Williams, B. & Tomaszewski, M. 2016. How to Screen for Non-Adherence to Antihypertensive Therapy. *Currations Hypertension Response,*16(7):81-89.

Hacihasanoglu, R. & Gozum, S. 2011. The Effect of Patient Education and Home Monitoring on Medication Compliance, Hypertension Management, Healthy Lifestyle Behaviours and BMI in a Primary Health care Setting. *Journal of Clinical Nursing*, 20:692-705.

Halfoun, V.L.R., Mattos, D.D., Lauredo, A.L.B., Selorico, C.F., Ferreira, J.M. & Albuquerque, M.P.S. 2014. Adherence to Hypertension Treatment in a Primary Health Care Unit. *Journal of Advanced Nursing*, 15(1):15-20.

Hanus, J.S., Simoes, P.W., Amboni, G., Ceretta, L.B. & Tuon, L.G.B. 2015. Association Between Quality of Life and Medication Adherence in Hypertensive Individuals. *Acta Paul Enferm,* 28(4):381-387.

Himmelfarb, C.R.D. & Commodore-Mensah,Y. 2016. Expanding the Role of Nurses to Improve Hypertension Care and Control Globally. *Annals of Global Health*, 82(2):243-253.

Holmes, E.A.F., Hughes, D.A. & Morrison, V.L. 2014. Predicting Adherence to Medications Using Health Psychology Theories: A Systematic Review of 20 Years of Empirical Research. *Value in Health,* 17(1):863-876.

Holzemer, W.L., ed. 2010. *International Council of Nurses: Improving Health Through Nursing Research*. United Kingdom: Wiley-Blackwell.

Hong, Y., Zhang, B., Han, W.,Xue, F., Liang, Y., Zhang, Z.,Asaiti, M., Wang, Z., Pang, L., Wang, Y., Wang, S., Qlu, C. & Jiang, J.2017. Interaction of ACE Genotype and Salt Intake on Hypertension among Chinese Kazakhs: Results from a Population-Based Cross-Sectional Study. *Bio-Medical Journal Open*, 1(3):7-13.

Huein, N., Stanley, A.G. & Williams, B. 2010. *Hypertension: Pathogenis, Risk Factors and Prevention*, United Kingdom: Elsevier.

Ikeda, N., Sapienza, D., Guerrero, R., Aekplakorn, W., Naghavi, J.L., Mokdad, A.H., Lozano, R., Murray, C.J.L. & Lim, S.S. 2013. Control of Hypertension with Medication: A Comparative Analysis of National Surveys in 20 Countries. *Bulletin of the World Health Organisation*, 92(10). http://www.who.int/bulletin/volumes/92/1/13/en/. Date of access: 27 July 2014.

Iloh, G.U.P. & Amadi, A.N. 2017. Treatment Satisfaction, Medication Adherence, and Blood Pressure Control among Adult Nigerians. *International Journal of Health and Allied Sciences,* 6(1):75-81.

Ivarsson, B., Hesselstrand, R., Rådegran, G. & Kjellström, B. 2018. Adherence and Medication Belief in Patients with Pulmonary Arterial Hypertension or Chronic Thromboembolic Pulmonary Hypertension: A National Population-Based Cohort Survey. *The Clinical Respiratory Journal*, 2(2):692-703.

Jackson, S.L., Cogwell, M.E., Zhao, L., Terry, A.L., Wang, C., Wright, J., King, S.M.C., Bowman, B., Chen, T., Merritt, R. & Loria, C.M. 2018. Potassium Excretion and Blood Pressure among Adults in the United States: National Health and Nutrition Examination Survey, 2014. *Circulation*, 137(1):237-246.

Johns Hopkins University. 2019. http://nursing.jhu.edu./faculty_research/research/projects/hill-bone-scales.html. Date of access: 14 April 2019.

Khothatso, T., Moshoeshoe, T., Saroni, Z. & Ross, A. 2015. Knowledge of Hypertensive Patients about Treatment in the Seboche Hospital, 2013. *South African Family Medicine,*58 (1):27-38.

Kim, M.T., Hill, M.N., Bone, L.R. & Levine, D.M. 2000. Development and Testing of the Hill-Bone Compliance to High Blood Pressure Therapy Scale. *Progress in CardiovascularNursing*,15 (3). http://onlinelibrary.wiley.com/doi/10.1111/j.7117.2000.tb00211.x/abstract. Date of access: 24 April 2015.

Knafl, G.J., Schoenthaler, A. & Ogedegbe, G. 2012. Secondary Analysis of Electronically Monitored Medication Adherence Data for a Cohort of Hypertensive African-Americans. *Patient Preference and Adherence*, 6(1):207-219.

Lam, W.Y. & Fresco, P. 2015. Medication Adherence Measures: An Overview. *BioMed Research International*, 5(21):1-12.

Lee, K., Halimatun, H.M., Steven, E.K. & Ong, B.K. 2012. Understanding the Perception Concerning Medication and Types of Adherence Behaviour in Hypertensive Patients. *Pertanika Journal of Social Sciences and Humanities*, 20(3):781-796.

Leedy, P.D. & Ormrod, J.E. 2016. *Practical Research Planning and Design*. 11th ed. Boston: Pearson.

Le May, A. & Holmes, S. 2012. *Introduction to Nursing Research: Developing Research Awareness.* United Kingdom: Hodder Arnold.

Lesotho. 1970. *Public Health Order No. 12 of 1970*. Maseru.

Lesotho. 2010. Annual Joint Review Report (2009/2010). Maseru: *Government of Lesotho*: Maseru.

Lesotho. Ministry of Health and Social Welfare. 2008. *National Health and Social Welfare Research Policy.* Maseru: Government Printers.

Lesotho. Ministry of Health and Social Welfare. 2009. *National Guidelines on Management of Diabetes and Hypertension at Primary Care Guidelines.* Maseru: Government Printers.

Lesotho. Ministry of Health. 2017. Standard Treatment Guidelines for Lesotho. 2nd ed. Maseru: Government Printers.

Lesotho, Ministry of Health and Social Welfare. 2012. *Impact Evaluation of the Lesotho Health Sector Reforms*. Maseru: Government Printers.

Lesotho, Ministry of Health and Social Welfare. 2013a. *District Health Package: Designing an Essential Service Package for the Lesotho Health Sector. Maseru*: Government Printers.

Lesotho, Ministry of Health and Social Welfare. 2013b. Health Sector Strategic Plan 2012/13-2016/17. Maseru: Government Printers.

Lorraine, B., Lindsey, D., Rachelle, D. M., Katee, D. L., Lauren, N. P., Nancy, A. T., Loren, T. S., Hossein, Y.N. Dana, R. N., Melisa, P. A., LynnMarie, M. C. & Phillip, D. 2017. Text Messaging to Improve Hypertension Medication Adherence in African Americans from Primary Care and Emergency Department Settings: Results from Two Randomized Feasibility Studies. *Journal of Medical Internet Research*, 19(2): 45-51.

Lo, S.H.S., Chau, J.P.C., Woo, J., Thompson, D.R. & Choi, K. 2016. Adherence to Antihypertensive Medication in Older Adults with Hypertension. *Journal of Cardiovascular Nursing,* 31(4):296-303.

Mafutha, G.N. & Wright, S.C.D. 2013. Compliance or Non-Compliance of Hypertensive Adults to Hypertension Management at Three Primary Healthcare Day Clinics in Tshwane. *Curations*, 36(1):1-6.

Maguire, L.K., Hughes, C.M. & McElnay J.C. 2012. Exploring the Impact of Depressive Symptoms and Medication Beliefs on Medication Adherence in Hypertension: A Primary Care Study. *Journal of General Internal Medicine*, 73(2):371-376.

Martin, K.D., Roter, D.L., Beach, M.C., Carson, K.C. & Cooper, L.A. 2013.Physician Communication Behaviours and Trust among Black and White Patients with Hypertension. *Med Care*, 51(2):151-157.

Matthes, J. & Albus, C. 2014. Improving Adherence with Medication– a Selective Literature Review based on the Example of Hypertension Treatment. *DeutschesArzteblatt International,* 111(4):41-47.

Mohan, V., Sedaat, Y.K. & Pradeepa, R. 2013. The Rising Burden of Diabetes and Hypertension in Southeast Asian and African Region: Need for Effective Strategies for Prevention and Control in Primary Health Care Settings. *International Journal of Hypertension*, 1(12):1-14.

Moise, N., Schwart, J., Bring, R., Shimbo, D. & Kronish, I.M. 2015. Antihypertensive Drug Class and Adherence; An Electronic Monitoring Study. *American Journal of Hypertension,*28(6):717-721.

Mugomeri, E., Ramathebane, M.V., Maja, L., Chatanga, P. &Moletsane, L. 2016. Knowledge of Disease Condition and Medications among Hypertension Patients in Lesotho. *Journal of the American Society of Hypertension*, 10(1):41-46.

Mweene, M.D., Banda, J., Mweene, M.M. & Lakhi, S. 2010. Factors Associated with Poor Medication Adherence in Hypertensive Patients in Lusaka, Zambia. *Medical Journal of Zambia,* 37(3):252-261.

Nagarkar, A.M., Gadhave, S.A., Sharma, I. Choure, A. & Morisky, D. 2013. Factors Influencing Medication Adherence among Hypertensive Patients in a Tertiary Care Hospital. *National Journal of Community Medicine*, 4(4):559-563.

Nashilongo, M.M., Singu, B., Kalemeera, F., Mubita, M., Naikaku, E., Baker, A., Ferrario, A., Godman, B., Achieng, L. & Kibuule, D. 2017. Assessing Adherence to Antihypertensive Therapy in Primary Health Care in Namibia: Findings and Complications. *Cardiovascular Drugs and Therapy*, 31(1): 564-578.

Njuguna,B. & Vedanthan, R. 2017. Find and Plug the Leak: Improving Adherence to Anti-hypertensive Medicines. *Cardiovascular Drugs Therapy*, 31(5-6):485-487.

Nkosi, N.G. 2010. Knowledge Related to Nutrition and Hypertension Management Practices of Adult in Ga-Rankuwa Day Clinics. *Curations,* 33(2):33-40.

Ntsekhe, M. & Damasceno, A. 2013. Recent Advances in the Epidemiology, Outcome and Prevention of Myocardial Infarction and Stroke in Sub-Saharan Africa. *Heart*, 99(1):1230-1235.

Nulu, S., Aronow, W. S., & Frishman, W. H. 2016. Hypertension in Sub-Saharan Africa: A Contextual View of Patterns of Disease, Best Management and Systems Issues. *Cardiology in Review*, 24(1): 30-40.

Nwabuo, C.C., Morss Dy, S., Weeks, K. & Young, J.H. 2014. Factors Associated with Appointment Non-Adherence among African-Americans with Severe, Poorly Controlled Hypertension. *Journal Pone*, 9(8):1-7.

Ogah, O.S. & Rayner, B.L. 2013. Recent Advances in Hypertension in Sub-Saharan Africa. *Heart*, 99(1):1390-1397.

Onoruoiza, S.I., Musa, A. Umar, B.D. & Kunle, Y.S. 2016. Using Health Belief Model as an Intervention to Non Compliance with Hypertension Information among Hypertensive Patient. *Journal of Humanities and Social Sciences*, 20(9):11-16.

Oparil, S. &Schmieder, R.E. 2015. New Approaches in the Treatment of Hypertension. *Circular Research*,116(1):1074-1095

Osamor, P.E. 2015. Social Support and Management of Hypertension I South-West Nigeria. *Cardiovascular Journal of Africa*, 26(1): 29-33.

Osamor, P.E. & Owumi, B.E. 2011. Factors Associated with Treatment Compliance in Hypertension in Southeast Nigeria. *Journal of Population and Nutrition*, 29(6):619-628.

Panjabi, S., Lacey, M., Banroft, T. & Cao, F. 2013. Treatment Adherence, Clinical Outcomes and Economics of Triple Drug Therapy in Hypertensive Patients. *Journal of the American Society of Hypertension,7*(1):46-60.

Partridge, A. H., Avorn, J., Wang, P. S. & Winer, E.P. 2012. Nonadherence to Adjuvant Tamoxifen Therapy in Women with Primary Breast Cancer. *Journal of Clinical Oncology,* 21(4): 602-604.

Patel, R., Chang, T., Greysen, S.R. & Chopra, V. 2015. Social Media Use in Chronic Diseases: A Systematic Review and Novel Taxonomy. *The American Journal of Medicine*, 10(3):22-30.

Patel, S., Jacobus-Kantor, L., Marshal, L., Ritchie, C., Kaplinski, M., Parvinder, M. D., Khurana, M. D., & Katz, R. J. 2013. Mobilizing Your Medications: An Automated Medication Reminder Application for Mobile Phones and Hypertension Medication Adherence in a High-Risk Urban population. *Journal of Diabetes Science and Technology,* 7(3): 630-639.

Peck, R.N., Green, E., Mtabaji, J., Majinge, C., Smart, L.R., Downs, J.A. & Fitzgerald, D.M. 2013. Hypertension-related Diseases as a Common Cause of Hospital Mortality in Tanzania: a 3year Prospective Study. *Journal of Hypertension*, 9(31). http://www.ncbi.nlm.nih.gov/pubmed/23777761. Date of access: 7 May 2014.

Polit, D.F. & Beck, C.T. 2017. *Nursing Research: Generating and Assessing Evidence for Nursing Practice*. 10th edition. Philadelphia: Wolters Kluwer.

Quine, L., Steadman, L., Thompson, S. & Rutter, D. R. 2012. Adherence to Anti-hypertensive Medication: Proposing and Testing a Conceptual Model. *British Journal of Health Psychology,* 17(1):202-219.

Rao, C.R., Kamath,V.G. & Kamath, A. 2014. Treatment Compliance among Patients with Hypertension and Type 2 Diabetes Mellitus in a Coastal Population of Southern India. *International Journal of Preventive Medicine*, 5(8):992-998.

Ribeiro, A.G., Ribeiro, S. M., Dias,C.M. Ribeiro, A.Q., Castro, F.A., Suarez-Varela, M.M. & Cotta, R.M. 2013. Non-Pharmacological Treatment of Hypertension in Primary Health Care: Comparative Clinical Trial of Two Education Strategies in Health and Nutrition. *African Journal of Primary Health Care & Family Medicine*, 11(1):637-644.

Roumie,C.L., Greevy, R., Wallston, K.A., Elsay, T.A., Kaltenbach, L., Kotter, K, Dittus, R.S. &Speroff, T. 2013. Patient Centered Primary Care is Associated with Patient Hypertension Medication Adherence. *Journal of Behavioural Medicine*, 34(4):244-2553.

Sansbury, B., Dasgupta, A., Guthrie, L. & Ward, M. 2014. Adherence: Time Perspective and Medication Adherence among Individuals with Hypertension and Diabetes. *Patient Education and Counselling*, 95(1):104-110.

Schiffbauner, L. 2013. Collaborative Relationships, Individual Potential, Meaningful Impact. *Self-Determination Theory,*http:///athrivingworkplace.com/2013/08/29. Date of access: 1 December 2015.

Song, Y. Han, H. Song, H. Nam, S. Nguyen, T. & Kim, M. 2011. Psychometric Evaluation of Hill-Bone Medication Adherence Subscale. *Asian Nursing Research*, 5(7): 183-188.

Steward, S., Stocks, P.N., Burrell, L.M., Looze, F.J., Esterman, A., Harris, M., Hung, J., Swemmer, C.K., Kurstjens, N.P., Jennings, G.L. & Carrington, M.J. 2014. More Rigorous Protocol Adherence to Intensive Structured Management Improves Blood Pressure Control in Primary Care: Results from the Valsartan Intensifies Primary care Reduction of Blood Pressure Study. *Journal of Hypertension*, 32(6):1342-1350.

Sultana, S.N., Sirisha, S.N. Priyanka, M., Sireesha, V., Sultana, N., Krishna, R. & Rao, V.U. 2016. Effect of Health Education on Knowledge, Attitude, Practice and Therapeutic Compliance of Hypertension in the Population of Hyderabad. *Indo American Journal of Pharmaceutical Research,* 6(3):4715-4725.

Taher, M., Abredari, H., Karimy, M., Abedi, A. & Shamsizadeh, M. 2014. The Relation between Social Support and Adherence to the Treatment of Hypertension. *Journal of Education and Community Health,* 1(3):63-69.

Takase, H.,Sugiura, T., Kimura, G., Ohte, N. & Dohi, Y. 2015. Dietary Sodium Consumption Predicts Future Blood Pressure and Incident Hypertension in the Japanese Normotensive General Population. *Journal of the American Heart Association*, 10(6):1-12.

Thinyane, K. H., Mothebe, T., Sooro, M., Namole, L. D. & Cooper V. 2015. An Observational Study of Hypertension Treatment and Patient Outcomes in a Primary Health Care Setting. *Pan Africa Medical Journal*, 20(1):424-432.

Tientcheu, D., Ayers, C., Das, S.R., Mcquire, D.K. & De Lemos, J. 2015. Target Organ Complications and Cardiovascular Events Associated with Masked Hypertension and White-Coat Hypertension: Analysis from the Dallas Heart Study. *Journal of the American College of Cardiology*, 66(10):2159-2169.

Uys, L., ed. 2017. *Integrated Fundamental Nursing.* 2nd Ed. South Africa: Pearson.

Vancini-Campanharo, C.R., Oliveira, G.N., Andrade, T.F.L., Okuno, M.F.P., Lopes, M.C. B.T. & Batista, R.E.A. 2015. Systemic Arterial Hypertension in the Emergency Service: Medication Adherence and Understanding of the Disease. *Revista Latino-American De Enfermagem*, 23(6):1149-1156.

Van Horn, L. 2015. Dietary Sodium and Blood Pressure: How Low Should We Go?. *Progress in Cardiovascular Diseases*, 58(1):61-68.

Vrijens, B., Antoniou, S., Burnier, M., De la Sierra, A. & Volpe, M. 2017. Current Situation of Medication Adherence in Hypertension. *Frontiers in Pharmacology*, 100(8):1-8.

Walker, B.R., Colledge, N.R., Ralston, S.H. & Penman, I.D. 2014. *Davidson's Principles of Practice of Medicine.* 22nd Ed. Churchill Livingstone, Elsevier.

Weber, M.A., Schiffrin, E.L., White, W.B., Mann, S., Lindholm, L.H., Kenerson, J.G., Flack, J.M., Carter, B.L., Materson, B.J., Ram, V.S., Cohen, D.L., Cadet, J., Jean-Charles, R.R., Taler, S., Kountz, D., Townsend, R.R., Chalmers, J., Ramirez, A.J., Bakris,G.L.,Wang,J., Schutte, A.E., Bisognano,J.D., Touyz, R.M.,Sica, D. & Harrap, S.B.2014. Clinical Practice Guidelines for the Management of Hypertension in the Community: A Statement by the American Society of Hypertension and the International Society of Hypertension. *The Journal of Clinical Hypertension,* 16(1):14-26.

Welmer, A.K., Angleman, S., Rydwik, E., Fratiglioni, L. & Qui, C. 2013. Association of Cardiovascular Burden with Mobility Limitation among Elderly People: A Population-Based Study. *PLos ONE Journal*, 8(5):1-7.

World Bank Group. 2015. *Public Private Partnership in SADC-Country Analysis: Lesotho.*http://www.sadcpppnetwork.org/lesotho/ Date of access: 19 May 2018.

World Health Federation. 2012. *Cardiovascular Disease Risk Factors*. Geneva: World Health Federation.

World Health Federation. 2017. *Stroke and Hypertension Updates*. Fact Sheets: Hypertension.https://www.world-heart-federation.org/resources/stroke-and-hypertension/

WHO (World Health Organization). 1978. *Declaration of Alma Ata. Primary Health Care: Report of the International Conference on Primary Health Care*. Alma Ata: WHO.

WHO (World Health Organization). 2007. *Strengthening Health Systems to Improve Health Outcomes*. Geneva: WHO.

WHO (World Health Organization). 2010. Chronic Diseases – *Poor Compliance of Patients with Drug Treatment*. http://www.bio-medicine.org/medicine-news/In-Chronic-Diseases---Poor-compliance-of-Patients-with-drug treatment--2097-1/. Date of access: 12 March 2015.

WHO (World Health Organization). 2012a. *Epidemiology of Hypertension*, Geneva: WHO.

WHO (World Health Organization). 2012b. *New Data Highlight Increases in Hypertension, Diabetes Incidence*, Geneva: WHO.

WHO (World Health Organization). 2013a. *A Global Brief on Hypertension: Silent Killer*, *Global Health Crisis*. Geneva: WHO.

WHO (World Health Organization). 2013b. *Country Cooperation Strategy at a Glance*. http://www.who.int/countries/en/. Date of access: 4 May 2014.

WHO (World Health Organization). 2013c. *Global Action Plan for Prevention and Control of Non-Communicable Diseases 2013-2020*. Geneva: WHO.

WHO (World Health Organization). 2013d. *Hypertension*. www.who.int/topics/hypertension/en/. Date of access: 15 May 2018.

WHO (World Health Organization). 2014. WHO *Steps Country Reports*. Geneva: WHO.

Zabihi, R.E., Ashktorab, T., Banaderakhshan, H. & Zaeri, F. 2012. Adherence to Therapeutic Regimens in Patients with Hypertension. *ARYA Atherosclerosis Journal,* 1(8):190-194.

Addendum 1 –UFS Health Sciences Research Ethics Committee

UNIVERSITY OF THE FREE STATE
UNIVERSITEIT VAN DIE VRYSTAAT
YUNIVESITHI YA FREISTATA

UFS·UV
HEALTH SCIENCES
GESONDHEIDSWETENSKAPPE

IRB nr 00005240
REC Reference nr 230408-011
IORG0005187
FWA00012784

06 June 2016

MS M SHAABE
C/O DR VAN RHYN
SCHOOL OF NURSING
IDALIA LOOTS BUILDING
UFS

Dear Ms Shaabe

HSREC 26/2016
PROJECT TITLE: COMPLIANCE TO TREATMENT OF HYPERTENSION BY PATIENTS ATTENDING PRIMARY HEALTH CARE SERVICES IN MAFETENG DISTRICT, LESOTHO

1. You are hereby kindly informed that the Health Sciences Research Ethics Committee (HSREC) approved the above project after all conditions were met. This decision will be ratified at the next meeting to be held on 26 July 2016.
2. The Committee must be informed of any serious adverse event and/or termination of the study.
3. Any amendment, extension or other modifications to the protocol must be submitted to the HSREC for approval.
4. A progress report should be submitted within one year of approval and annually for long term studies.
5. A final report should be submitted at the completion of the study.
6. Kindly use the **HSREC NR** as reference in correspondence to the HSREC Secretariat.
7. The HSREC functions in compliance with, but not limited to, the following documents and guidelines: The SA National Health Act. No. 61 of 2003, Ethics in Health Research: Principles, Structures and Processes (2015); SA GCP(2006); Declaration of Helsinki; The Belmont Report; The US Office of Human Research Protections 45 CFR 461 (for non-exempt research with human participants conducted or supported by the US Department of Health and Human Services (HHS), 21 CFR 50, 21 CFR 56; CIOMS, ICH-GCP-E6 Sections 1-4, The International Conference on Harmonization and Technical Requirements for Registration of Pharmaceuticals for Human Use (ICH Tripartite), Guidelines of the SA Medicines Control Council as well as Laws and Regulations with regard to the Control of Medicines, Constitution of the HSREC of the Faculty of Health Sciences.

Yours faithfully

DR SM LE GRANGE
CHAIR: HEALTH SCIENCES RESEARCH ETHICS COMMITTEE

Health Sciences Research Ethics Committee
Office of the Dean: Health Sciences
T: +27 (0)51 401 7795/7794 | F: +27 (0)51 444 4359 | E: ethicsfhs@ufs.ac.za
Block D, Dean's Division, Room D104 | P.O. Box/Posbus 339 (Internal Post Box 540) | Bloemfontein 9300 | South Africa
www.ufs.ac.za

Addendum 2 – Lesotho Health Research and Ethics Committee

LESOTHO

Ministry of Health
PO Box 514
Maseru 100

REF: ID63-2016

Date: April 12, 2016

To
Mannini Shaabe
Masters of Social Science in Nursing
University of Free State.

Category of Review:
[x] Initial Review
[ ] Continuing Annual Review
[ ] Amendment/Modification
[ ] Reactivation
[ ] Serious Adverse Event
[ ] Other _____

Dear Ms. Mannini,

RE: Compliance to treatment of hypertension by patients attending primary health care services in Mafeteng District, Lesotho (ID63-2016))

This is to inform you that on April 07, 2016 the Ministry of Health Research and Ethics Committee reviewed and **APPROVED** the above mentioned protocol modifications and hereby authorizes you to conduct the study according to the activities and population specified in the protocol. Departure from the approved protocol will constitute a breach of this permission.

This approval includes review of the following attachments:
[x] Protocol version dated March 14, 2016
[ ] English consent forms
[ ] Sesotho consent forms
[x] Data collection forms dated March 14, 2016
[x] Participant materials dated March 14, 2016
[x] Other materials: CV of the PI dated March 14, 2016

This approval is **VALID** until April 11, 2017.

Please note that an annual report and request for renewal, if applicable, must be submitted at least 6 weeks before the expiry date.

All serious adverse events associated with this study must be reported promptly to the MOH Research and Ethics Committee. Any modifications to the approved protocol or consent forms must be submitted to the committee prior to implementation of any changes.

We look forward to receiving your progress reports and a final report at the end of the study. If you have any questions, please contact the Research and Ethics Committee at rcumoh@gmail.com (or) 22226317.

Sincerely,

Dr. Nyane Letsie
Director General Health Services

Dr. **Jill Sanders**
Co-chairperson NH-REC

Addendum 3A– Information leaflet (English)

Title of research: Compliance to hypertension treatment by patients attending primary health care services in Mafeteng district, Lesotho

Molula setulo: Komiti ea tsamaiso

Block D, Room 104, Good day

I, Mannini Shaabe, am doing research on compliance to hypertension treatment by patients attending primary healthcare services in Mafeteng district, Lesotho. A research is a process to learn the answer to a question. In this study I want to learn about the compliance behaviour of patients to hypertension treatment attending primary health care services in Mafeteng, in order to inform decision makers on what the current situation is and to develop better care for patients.

Invitation to participate: I am asking/inviting you to participate in this research study.

What is involved in the study – You will be asked to complete a questionnaire designed to help determine your compliance behaviour to hypertension treatment. It will take an average of 45 minutes to complete the questionnaire.

Risks- There are no risks involved in participating in the study.

Benefits- Benefits of participating in the study are that your compliance behaviour will be described and this will assist nurses to identify gaps in compliance to hypertension treatment. Study results may be published.

Voluntary participation- Participation is voluntary, and refusal to participate will involve no penalty or loss of benefits to which you are otherwise entitled; you may discontinue participation at any time without penalty or loss of benefits to which you are otherwise entitled. No costs will be payable by you as a participant and you will also not be paid for your participation in the research.

Confidentiality: Anonymity will be ensured since only numbers will be used in the questionnaires. The researcher will not put names in the results.

Contact details of researcher – for further information

Mannini Shaabe Tel: 00266 62056851

Contact details of Research Ethics Committee Secretariat and Chair – for reporting of complaints/problems.

(051) 4017795 OR write to

The Chairperson: Ethics Committee

Block D, Room 104,

Francois Retief Building

PO Box 339 (G40)

Nelson Mandela Drive

Faculty of Health Sciences

University of Free State

Bloemfontein 9300, South Africa.

Addendum3B – Information leaflet (Sesotho)

Sehlooho sa lipatlisiso: Kamohelo ea lipehelo tsa kalafo bakuling ba phallo e phahameng ea mali seterekeng sa Mafeteng Lesotho

Lumela, ke ‘na Mannini Shaabe

Ke ntse ke etsa lipatlisiso tseo sehlooho sa tsona eleng: **Kamohelo ea lipehelo tsa kalafo bakuling ba phallo e phahameng ea mali seterekeng sa Mafeteng Lesotho**. Lipatlisisong tsena ke batla ho ithuta ka tsela eo bakuli ba nang le phallo e phahameng ea mali seterekeng sa Mafeteng Lesotho ba amohelang lipehelo tsa kalafo ka teng e le ho beha leseling ba nkang liqeto (makala a amehang) ka boemo bo renang ha joale e le ho ntlafatsa kalafo ea bakuli ba phallo e phahameng ea mali

Memo ea ho nka karolo: Ke u kopa mona hore u nke karolo lipatlisisong tsena.

Se ka hare ho lipatlisiso tsena– u tlo koptjoa ho araba lipotso tse 14 tse etselitsoeng ho thusa ho ithuta tsela eo u amohelang lipehelo tsa kalafo ea phallo ea mali e phahameng ka teng. Ho tla u nka metsotso e 45 ho araba lipotso tseo.

Ha ho no ba le litahlehelo tse ka bang teng ka ho nkakarolo boithutong bona**.**

Molemo oa ho nka karolo lipatlisisong tsena ke hore tsela eo u amohelang lipehelo tsa kalafo ea phallo e phahameng ea mali ka teng li tla hlalosoa ‘me sena se ka thusa baoki ho ela hloko likheo tse teng kamohelong ea lipehelo tsa kalafo bakuling banang le phallo e phahameng ea mali. Se tlang ho fumanoa lipatlisisong tsena se kanna sa phatlalatsoa.

Ke boikhethelo ba motho ho nka karolo lipatlisisong tsena ‘me ho se lumele hoba karolo ea tsona ho ka se etse hore u sekisetsoe kapa u lahleheloe ke melemo eo u neng u ntse u e fumana. U ka emisa ho tsoelapele ho nka karolo lipatlisisong tsena nako eohle ho se kotlo kapa hona ho lahleheloa ke melemo eo u neng u ntse u e fumana. U keke oa lefa letho ‘me ha ho letho leo u tlang ho le lefuoa ha u nkile karolo lipatlisisong tsena.

Poloko ea lekunutu: Mabitso a batho ba nkileng karolo lipatlisisong tsena a keke a hlahisoa kaha ho tlo sebelisoa lipalo feela lipotsong tseo u tlang ho li araba.

Linomoro tsa mohala oa mofuputsi – bakeng sa tlhahiso leseling

Mannini Shaabe Tel: 00266 62056851

Aterese le linomoro tsa mohala tsa komiti ea tsamaiso – bakeng sa ho tlaleha litletlebo kapa mathata, letsetsa:

(051) 4017795 kapa u ngolle ho:

Francois Retief Building
PO Box 339 (G40)
Nelson Mandela Drive
Faculty of Health Sciences
University of Free State
Bloemfontein 9300, South Africa.

Addendum 4A – Questionnaire (English)

Dear participant. You have been asked to participate in this research study. Please note that by completing this questionnaire you are voluntarily agreeing to participate in the research study. You will remain anonymous and your data will be treated confidentially at all times. You may withdraw from this study at any given moment during the completion of the questionnaire. Please note that the results of the study may be published.

Tick in the appropriate box below or write the answer in the provided spaces

1. DEMOGRAPHIC DATA	
Gender	
Male	Female

How old are you? ……..years

What is your marital status?					
Single	Married	Living with partner	Divorced	Separated	Widowed

What is your highest level of education?			
No school	Primary school	High school	Tertiary level

What is your employment status?			
Employed	Unemployed	Self employed	Retired

What is the distance that you travel to the facility?					
0-1 (km)	1-2 (km)	2-3 (km)	3-4 (km)	4-5 (km)	>5km

How long have you been diagnosed with hypertension? …….years

2.HILL-BONE COMPLIANCE TO HIGH BLOOD PRESSURE THERAPY SCALE

Please tick in the appropriate box for each question

HILL-BONE COMPLIANCE TO HIGH BLOOD PRESSURE THERAPY SCALE						
	None of the time	**Some of the time**	**Most of the time**	**All of the time**	**Not Applicable (NA)**	**Don't know (DK)**
1. How often do you forget to take your HBP medicine?	1	2	3	4	8	9
2. How often do you decide not to take your HBP medicine?	1	2	3	4	8	9
3. How often do you eat salty food?	1	2	3	4	8	9
4. How often do you shake salt, fondor, or aromat on your food before you eat?	1	2	3	4	8	9
5. How often do you eat fast food? (KFC, McDonalds, fat cook, fish and chips)	1	2	3	4	8	9
6. How often do you get the next appointment before you leave the clinic?	1	2	3	4	8	9
7. How often do you miss scheduled appointments?	1	2	3	4	8	9
8. How often do you leave the dispensary without obtaining your prescribed pills?	1	2	3	4	8	9
9. How often do you run out of HBP pills? (due to long line, closure of the clinic, forgot)	1	2	3	4	8	9

10. How often do you skip your HBP medicine 1-3 days before you go to the clinic?	1	2	3	4	8	9
11. How often do you miss taking your HBP pills when you feel better?	1	2	3	4	8	9
12. How often do you miss taking HBP pills when you feel sick?	1	2	3	4	8	9
13. How often do you take someone else's HBP pills?	1	2	3	4	8	9
14. How often do you miss taking your HBP pills when you care less?	1	2	3	4	8	9

3. OTHER QUESTIONS

Instructions: Write the answer in the space provided

What is the importance of antihypertensive treatment to your health?

.....
.....
.....
.....

What motivates you to comply with your hypertension treatment?

.....
.....
.....
.....

Please describe how you manage to keep your appointments.

.....
.....
.....
.....

How do you ensure a diet with low salt?

.....
.....
.....
.....

How do you remember to take your medication regularly?

.....
.....
.....
.....

What support do you get from health care providers, family and friends?

.....
.....
.....
.....

Addendum 4B – Questionniare(Sesotho)

Lumela 'mé/ntate. U kopuoa ho nka karolo boithutong bona, 'me u kopuoa ho ela hloko hore ho tlatsa foromo ena, u lumetse ho nka karolo boithutong osa qobelloe. Boitsebiso ba hau bo ke se hlaisoe ka tsela ea mofutaofe kapa ofe. U amolehile hore uka itokolla boithutong bona nako eohle le hau so ntso tsoelapele.sepheto sa boithuto bona se ka nna sa phatlalatsoa.

Tsóaea karabo ka lebokoseng le ka tlasa karabo eahau

1. BOITSEBISO					
Boleng					
Botona	Botséhali				

Lilemo……					

Boemobalenyalo					
Hakea nyaloa	Ke nyetsoe	Kelula le mokhotsi	Kehlalile	Kearohane le molekane	Ke hlokahelletsoe ke molekane

Mangolo a thutoonang le ona			
Hakea kenasekolo	Sekolo sa mathomo	Sekolo se bohareng	Sekolo se phahameng

Maemo a tsébetso				
Ke hiruoe	Hake sebetse	Kea itsébetsa	Seke le phomolong	Seke le phomolong

Sebakaseo use tsamaeang ho easetsingsabophelo					
0-1 (km)	1-2 (km)	2-3 (km)	3-4 (km)	4-5 (km)	>5km

Una le nako e kae u tsebilehore una le phallo e phahamengeamali? (Lilemo)……					

KAROLO EA BOBELI: HILL-BONE HIGH BLOOD PRESSURE COMPLIANCE SCALE

Tsóaeatsoepo ka lebokoseng le arabangpotsoeahau

HILL-BONE HIGH BLOOD PRESSURE COMPLIANCE SCALE						
	Hohang	**Kanakoe ‘ngoe**	**Boholobanako**	**Nakoeohle**	**Ha e sebetse**	**Ha ketsebe**
1. Ke ha kae u lebalang ho noa litlhare tsa phallo e phahameng ea mali?	1	2	3	4	8	9
2. Ke ha kae u ikhethelang ho se noe litlhare tsa phallo e phahameng ea mali?	1	2	3	4	8	9
3. Ke ha kae u jang lijo tse letsoai?	1	2	3	4	8	9
4. Ke ha kae u nokang letsoai kapa aromat lijong tsa hau pele o ka ja?	1	2	3	4	8	9
5. Ke ha kae u jang lijo tse se ntse li phehue? (KFC, McDonalds, makoenya, tlhapi le litapole tse halikiloeng)	1	2	3	4	8	9

6. Ke ha kae u tlohang setsing sa bophelo o behetsoe letsatsi la ho khutla?	1	2	3	4	8	9
7. Ke ha kae u sa itlaleheng setsing sabophelo ka letsatsileo o le behetsoeng?	1	2	3	4	8	9
8. Ke ha kae u tlohang setsing sa bophelo o sa fumana litlhare tseo o li ngolletsoeng?	1	2	3	4	8	9
9. Ke ha kae u felloang ke litlhare tsa phallo e phahamengeama li (ka lebaka la mola o molelele, ho se ho koetsoe kappa o lebetse)?	1	2	3	4	8	9
10. Ke ha kae u sa noeng litlhare letsatsi ho isa ho a mararo pele o easetsing?	1	2	3	4	8	9
11. Ke ha kae u sa noeng litlhare ha u ikutlua o le betere?	1	2	3	4	8	9
12. Ke ha kae u sa noeng litlhare ha u ikutlua o kula?	1	2	3	4	8	9

13. Ke ha kae u noang litlhare tsa motho e mong?	1	2	3	4	8	9
14. Ke ha kae u sa noeng litlhare ele hobane o sa tsotelle?	1	2	3	4	8	9

3. KAROLO EA BORARO: LIPOTSO TSE LING

Arabela lipotso tse latelang ka tlase.

Molemo oa ho noa litlhare tsa kalofo ea phallo e phahameng ea mali ke ofe bophelong ba hau?

.....
.....
.....
.....

Ke eng se u khothatsang hore u lule u ikamahanya le lipehelo tsa kalafo ea phallo e phahameng ea mali?

.....
.....
.....
.....

Hlalosa hore u khona joang ho lula o ea setsing sa kalafo ka matsatsiao o a behetsoeng

.....
.....
.....
.....

Ke eng se u hopotsang ho noa litlhare tsa hau nako le nako?

.....
.....
.....
.....

U netefatsa joang hore o lule o ja lijo tse letsoai le tlase?

.....
.....
.....
.....

Ke ts’ehetso ea mofuta ofeng eo o e fumanang ho tsoa setsing sa bophelo, lelapeng la hau kapa metsoalleng ea hau?

.....
.....
.....
.....

Addendum 5- Language editor’s declaration letter

Declaration

7 January 2019

Hester Sophia Human
PO Box 86602
Eros
Windhoek
Namibia

Student: Mannini Shaabe

Dissertation: Compliance to treatmentof hypertension by patients attending primary health care services in Mafeteng district, Lesotho

I confirm that I edited this dissertation and audited the references.

Hettie Human
WRITER | EDITOR | TRANSLATOR | INTERPRETER
+264 813 359 120 | hettie.human@gmail.com