CONTRIBUTORY FACTORS OF NONCOMPLIANCE TO TREATMENT AMONG PATIENTS DIAGNOSED WITH HYPERTENSION IN THE VHEMBE DISTRICT OF THE LIMPOPO PROVINCE

BY

VULEDZANI SYLVIA MASHILA

UNIVERSITY OF VENDA

2018

CONTRIBUTORY FACTORS OF NONCOMPLIANCE TO TREATMENT AMONG PATIENTS DIAGNOSED WITH HYPERTENSION IN THE VHEMBE DISTRICT OF THE LIMPOPO PROVINCE

by

VULEDZANI SYLVIA MASHILA

Student no: 11636573

A dissertation submitted in fulfilment of the requirements for the degree: Masters in Nursing

Department of Advanced Nursing Science

School of Health Sciences

University of Venda

Supervisor : Prof NH Shilubane

Co-supervisor : Dr SA Mulondo

August 2018

DECLARATION

I, Vuledzani Sylvia Mashila hereby declare that the dissertation for the MCUR degree of the University of Venda, hereby submitted by me, has not previously been submitted for a degree at this or any other university, and that it is my own work in design and execution and that all reference material contained therein has been duly acknowledged.

…… …….

Student's signature Date

DEDICATION

This dissertation is dedicated to my family and many friends who have supported me throughout the process.

ACKNOWLEDGEMENT

I would like to express my profound gratitude to God Almighty, the architect of my life who has guided me in this direction.

I would also like to express my highest appreciation to my supervisor, Prof NH Shilubane and co-supervisor, Dr SA Mulondo who guided me with patience, encouragement and support throughout my study. Thank you for assisting me in remaining focussed throughout the process of completing my dissertation.

Thanks to the District Executive manager (Mr Serwali NR) for giving me the approval to conduct the study. I would like to thank all the staff of the medical wards (regional hospital) and nine PHC facilities.

I want to thank biostatistician Mrs Tshilidzi Mulaudzi from the School of Mathematics for her statistical advice. I am grateful to all my family and friends who have been with me during these years and express my appreciation to the many people who have contributed in one way or another from the start of this research proposal to the finalising of the research report.

Finally I would also like to thank Ms Marion Pfeiffer who have edited and proofread this document.

ABSTRACT

Noncompliance with antihypertensive treatment is a challenge for uncontrolled hypertension in both high income and middle income countries. Compliance to antihypertensive treatment and lifestyle modification plays a significant role in the control of hypertension and reduces the cardiovascular morbidity and mortality rate. The purpose of this study was to explore and describe contributory factors of noncompliance to treatment among patients diagnosed with hypertension in the Vhembe District of the Limpopo Province

The study was conducted at the regional Hospital and nine Primary Health Care facilities in the rural community in the Vhembe District of the Limpopo Province. The study population consisted of those patients diagnosed with hypertension receiving treatment from the ten sampled health facilities. In this study, the target population included 134 noncompliant patients diagnosed with hypertension taking treatment at the sampled health facilities.

This study used simple random sampling. The instrument used for data collection was self-administered questionnaire. Data was analysed using the Statistical Package for Social Sciences. The results of this current study reveal that participants aged 40 years and above (85.1%) were noncompliant to treatment compared to those of the same or less than 40 years old (14.9%). Also, it indicated that females were more frequently noncompliant to treatment (73.1%) compared to males (26.9%), which was statistically significant. The study revealed that the unmarried participants (64.9%) were more non-compliant with treatment when compared to the married participants (35.1%). The current findings demonstrate that 40.3% of noncompliant participants mentioned the reason being that they were feeling well. Various factors related to participants' noncompliance with their antihypertensive treatment and lifestyle modification regimen were described. Health education should cover the nature of hypertension specifically emphasising causes, severity and potential complications.

KEY WORDS: Noncompliant, Treatment, Patients diagnosed with hypertension, Hypertension

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF ABBREVIATIONS

BHS	British Hypertension Society
BP	Blood Pressure
DASH	Dietary Approaches to Stop Hypertension
DoH	Department of Health
HBM	Health Belief Model
HPT	Hypertension
NICE	National Institute for Health and Clinical Excellence
PHC	Primary Health Care
RSA	Republic of South Africa
SSA	Sub-Saharan Africa
UNIVEN	University of Venda
USA	United States of America
WHO	World Health Organisation

LIST OF ANNEXURES

CHAPTER 1

OVERVIEW OF THE STUDY

1.1 INTRODUCTION AND BACKGROUND

Hypertension (HPT) remains a significant challenge to public health in both economically middle income and high income countries due to the changes in both dietary and lifestyle patterns. Prevention, detection, treatment and control of HPT need to receive high priority (Alsolami, Xiang-Yu, & Correa-Velez, 2012:27). However, the lack of knowledge about the severity of the condition, the importance of complying with the prescribed treatment and absence of motivation to make lifestyle changes constitute barriers to compliant behaviour. In certain circumstances, the issue of "HPT requires both pharmacologic and non-pharmacologic approaches on the part of the patient. This must translate into pro-active living, lifestyle modification" and treatment compliance (Kaplan, 2005:4).

The risk factors for HPT that are most prevalent in the population include a sedentary lifestyle, obesity, consumption of fatty foods, salt intake and resultant dyslipidaemia and contribute to the epidemic (WHO, 2003a:15). As indicated by the World Health Organisation (WHO), compliance to treatment in patients with chronic conditions averages at only around 50% in high income countries. The situation is worse in middle income countries due to poor accessibility to treatment and health care services. In the Third National Health and Nutrition Examination Survey in the United States of America (USA), Wang, Bohn, Knight, Glynn, Mogun and Avorn (2002:509) indicated that nearly half of patients diagnosed with HPT in their community-based sample did not comply with the treatment prescribed. Furthermore, only a quarter of those treated had adequately controlled Blood Pressure (BP). However, ensuring patients` compliance with treatment of HPT and lifestyle modifications to prevent complications such as stroke, renal failure, atherosclerosis and blindness remains a major challenge in many middle income countries (Osamor & Owumi, 2011:619).

HPT refers to a raised systolic or diastolic BP equal to or more than 140/90mmHG on three prior clinical visits (Department of Health (DoH), 2014:73). HPT was the single most common

and important risk factor for cardiovascular disease. Noncompliance with antihypertensive treatment can cause chronic HPT damaging the walls of the blood vessels, hypertrophy and hyperplasia (Nkosi, 2008:69). Compliance with treatment is a cost saving measure since it decreases the incidence of complications and needs for additional treatments (WHO, 2003a:20). The WHO predicts that about 62% of cerebrovascular disease and 49% of ischemic heart disease problems worldwide are attributable to suboptimal BP levels while high BP is projected to cause 7.1 million deaths yearly, accounting for 13% of all deaths worldwide (WHO, 2006:146).

Treatment compliance is a complex multidimensional phenomenon that includes numerous personal and social factors which are not understood (Osamor & Owumi, 2011:619). Therefore, it is significant for health care professionals to recognise those factors contributing to noncompliance in their health care facilities to manage the disease effectively. Patient's knowledge of HPT and its complications, as well as beliefs and attitudes, are some of the key factors to attain compliance with treatment and control of BP. HPT is preventable and manageable but rarely achieved. Compliance with medical regimen was variable because symptoms of HPT do not disturb daily routines. Nevertheless, for an outpatient setup, a feasible, reliable and valid measure of treatment compliance was required (Nagarkar, Gadhave, Sharma, Choure & Morisky, 2013: 561).

Treatment with appropriate management was a key factor in the control of HPT and reduction in associated risks of complications (Mafutha & Wright, 2013:1). The definition of treatment noncompliance is an informed decision on the part of the patient not to comply with therapeutic suggestions (Mosby Dictionary, 1994:1078). Furthermore, treatment noncompliance represents the level to which the patient`s behaviour did not follow medical recommendations. Noncompliance with treatment was the most obvious cause of uncontrolled HPT (Hadi & Rostami, 2004:292).

Despite the availability of several guidelines for HPT management globally, noncompliance with treatment continues among those patients diagnosed with HPT (Patel & Davis, 2006:439). HPT is still a major challenge to public health affecting approximately 30% of the population by the age of 60 years. However, 10% of the patients diagnosed with HPT appear resistant to treatment. The estimates for the prevalence of HPT in middle income countries

are expected to escalate by approximately 60% by 2025. Most of this growth is recognised as due to the projected increase in the number of people with HPT in economically middle income regions. Between 2000 and 2025, HPT worldwide is predicted to increase by 9% in men and 13% in women because of the anticipated changes in the age distribution of the population (Patel & Davis, 2006:439).

HPT is the leading cause of morbidity and mortality among non-communicable diseases in both middle income and high income countries. According to the WHO, approximately 80% of deaths from HPT and associated cardiovascular diseases now occur in middle income countries and are particularly prevalent among groups with low socioeconomic status (WHO, 2003a:12). These deaths, appearing in economically productive age groups, undermine the socioeconomic development of families in these countries (WHO, 2003a:28).

The WHO estimates that approximately one billion people in high income and middle income countries are affected by HPT, contributing to more than 7.1 million deaths per year. According to the WHO, the definition of compliance is the degree to which a person is taking treatment, following a diet and executing lifestyle modifications corresponding to the agreed recommendations from health care providers. Noncompliance with prescribed treatment or adopting lifestyle changes is associated with uncontrolled HPT and risks of developed complications (Joho, 2012:34). Kumar and Halesh (2010:250) indicated that for patients diagnosed with HPT, understanding of their drug regimens assists in improving treatment compliance thereby preventing complications and debilitating outcomes.

In Sub-Saharan Africa (SSA), HPT has appeared as a major public health issue due to rural-urban migration attached to the modernisation of trends, characterised by a sedentary style of life and a diet rich in refined carbohydrates and animal fat (Gelaw, Yitayih, Gizaw & Esayas, 2014:51). The findings of the study conducted by Gelaw et al. (2014:52) on the assessment of antihypertensive adherence and factors for noncompliance in Ethiopia revealed that admission of patients diagnosed with HPT in the hospital was approximately 33–69% due to poor treatment compliance. They further estimated that 5–15% of hospitalisations among the elderly resulted from poor compliance to the prescribed treatment. Studies have found that poor compliance with treatment was the most crucial reason for uncontrolled HPT, thus increasing the risk of stroke, atherosclerosis, blindness

and renal failure (Hadi & Rostami, 2004:29; Lubaki, Mabuza, Malete, Maduna & Ndimande, 2009:1). HPT is a chronic disease and manageable by appropriate treatment or adopting lifestyle modifications. Risk factors for HPT like western lifestyle (cigarette smoking and alcohol consumption), sedentary lifestyle, obesity and modern lifestyle (consumption of fatty foods) were highly prevalent in the population and contributed to the epidemic (WHO, 2003b:38).

A study conducted among community members in Iraq by Samim, Al-dabbagh and Sirwan (2010:28) found that secondary prevention by treatment reduces the risk of coronary heart disease and stroke by about 25%. The study further indicates that in the Eastern Mediterranean Region more than 20% of patients were diagnosed with HPT whereas in Egypt HPT affects approximately 26.3% of the entire population. Numerous studies in Iran and Saudi Arabia by Hadi and Rostami (2004:292) and Alsolami et al. (2012:27) were conducted to identify the contributory factors to the failure to comply with treatment. The results indicated that these relate to socio-demographical factors, physiological factors and health care providers (Hadi & Rostami, 2004:292; Alsolami et al., 2012:27). The study conducted in Iran by Hadi and Rostami (2004:294) indicated additional factors contributing to noncompliance to treatment as side-effects, lack of knowledge about the disease, attitudes towards treatment, availability of health care and personal health beliefs.

A significant problem in the management of HPT is the phenomenon of noncompliance with antihypertensive treatment. A study conducted by Addo, Smeeth and Leon (2007:1013) showed that HPT was the leading cause of morbidity and mortality among non-communicable diseases in SSA. HPT has shown a rapid increase in prevalence affecting urban more than rural areas in all countries of the region because of changes in dietary and lifestyle modifications. Available data indicated an overall prevalence of 5–20%. Health in SSA is dominated by communicable diseases such as HIV/AIDS and non-communicable disease like HPT. A study conducted in Nigeria by Kabir, Iliyasu, Abubakar and Jibril (2004:16) on compliance to hypertensive treatment found that HPT was the most treatable cause of mortality and morbidity. The management of HPT was still a challenge especially in middle income countries, even though safe and effective drugs are available. The study further indicated that the high incidence of complications among patients diagnosed with HPT concerning treatment was due to poor compliance. Findings in clinical practice have

raised issues concerning inadequate treatment and noncompliance with antihypertensive treatment hindering the effectiveness of these medications.

A qualitative study conducted at Vanga Hospital in Bandundu Province in the Democratic Republic of Congo by Lubaki et al. (2009:1) found that side-effects, inadequate knowledge of the illness and treatment, lack of support from family members and difficulty in obtaining antihypertensive treatment discouraged patients from taking the prescribed treatment. Also, patients used treatment only when they experienced perceived symptoms of HPT. Tanzania was facing urbanisation and modernisation causing modifications in diet, which is consumption of fatty and processed food, and reduced physical activity particularly in the cities such as Dar es Salaam (Joho, 2012:34). Like many other middle income countries, because of improvements in the standard of living as well as the influence of the western lifestyle such as cigarette smoking and alcohol consumption, HPT creates a major public health dilemma (Bovet, Gervasoni, Mkamba & Balampama, 2008:35). Another study conducted by Edo (2009:112) monitored the compliance to antihypertensive treatments in Seychelles and reported that only 46% were compliant in the first month and this percentage decreased to 26% by 12 months. This poor compliance with antihypertensive treatment is frustrating because it contributes to increasing levels of morbidity and mortality due to hypertensive conditions.

Antihypertensive treatments are provided free of charge in all Primary Health Care (PHC) facilities to all patients diagnosed with HPT in the Republic of South Africa (RSA). In addition, health care professionals provide health education for lifestyle modifications essential for lowering BP. HPT is on the rise in the RSA despite these efforts and poses a challenge for the government as well as the population. Maepe and Outhoff (2012:32) conducted a one-year HPT prevalence study at one of the gold mines in Gauteng (RSA) and found that poor control of HPT confirms that it continues to be a cause of disability. A study conducted by Mafutha and Wright (2013:2) on the noncompliance of hypertensive adults to HPT management in Gauteng indicated that both beliefs and cognitive factors influence treatment compliance. Fears included using antihypertensive treatment long-term and possibly for the rest of their life.

A study conducted in the Limpopo Province of RSA by Peltzer (2004:17) reported that 35% of patients were not taking prescribed treatments appropriately whereas 65% were taking their medication as prescribed. The study examined similar findings among White and West Indian patients diagnosed with HPT. However, changes in dietary and lifestyle patterns related factors contribute significantly to the high prevalence of HPT in many countries.

1.2 PROBLEM STATEMENT

According to the WHO (2003a:12), poor compliance is the primary cause of uncontrolled HPT, and more than 80% of deaths from HPT occur commonly among people of low socioeconomic status. The researcher is a clinical nurse practitioner and observed that treatment noncompliance among patients diagnosed with HPT is one of the biggest problems in the Vhembe District of the Limpopo Province and requires a response. The average statistics of infrequent visits of patients diagnosed with HPT during July 2010–June 2014 in the Vhembe District ranged from 598–2849 (District Health Information System, 2014). The numbers related to noncompliance with treatment and lifestyle changes among patients diagnosed with HPT resulting in uncontrolled HPT and complications associated with morbidity and mortality. Thus, impact and effect of the disease represent a significant burden for many PHC facilities and hospitals.

1.3 PURPOSE OF THE STUDY

De Vos, Strydom, Fouche and Delport (2011:94) defined purpose as the comprehensive more abstract conception of something which you plan to do or achieve. The purpose of this study was to identify and describe contributory factors of noncompliance to treatment among patients diagnosed with HPT in Vhembe District of the Limpopo Province.

1.4 RESEARCH OBJECTIVES

According to Grove, Gray and Burn (2015:138), objectives are clear, concise and declarative statements expressed clearly in the present tense with only one or two variables.

The research objectives of the study were as follows:

- Identify and describe the contributory factors of noncompliance to treatment,
- Assess the beliefs and perceptions of patient diagnosed with HPT, and

- Describe the lifestyle modification regimen of patient diagnosed with HPT

1.5 RESEARCH QUESTION

What are the contributory factors of noncompliance to treatment among patients diagnosed with HPT in the Vhembe District of the Limpopo Province?

1.6 THE SIGNIFICANCE OF THE STUDY

Research findings may assist the Department of Health Planning Committee with health awareness campaigns to plan and coordinate all activities related to HPT. Medical practitioners and other health care workers such as nurses and dieticians could assist in educating the community about the benefits of treatment compliance during HPT awareness week to minimise the risk of complication such as atherosclerosis, stroke, blindness and renal failure. Research findings can support health care professionals in improving service delivery and managing HPT appropriately. The results of this research may reduce the need for hospitalisations and decrease the workload of these professionals thereby reducing the costs for admissions. The findings could aid policymakers in reviewing policies concerning HPT management and care. Furthermore, the outcome could indicate the need for future studies to improve the lives of those diagnosed with HPT.

1.7 DEFINITION OF THE KEY CONCEPTS

A contributory factor is defined as a circumstance or influence that assists to bring about a result (Oxford Dictionary of Current English, 2006:217).

In this study, **a contributory factor** refers to something that provokes internal or external stimuli and has an outcome or leads to noncompliance.

Noncompliance is an informed decision on the part of the patient not to comply with a therapeutic suggestion (Mosby Dictionary, 1994:1078).

In this study, **noncompliance** refers to all patients diagnosed with HPT who did not take their treatment frequently and fail to adopt lifestyle modifications.

Treatment is defined as “medical care for an illness or injury” (Oxford Dictionary of Current English, 2006:1550).

In this study, **treatment** refers to the use of an approved medicine for controlling HPT.

HPT signifies a raised systolic or diastolic BP equal to or more than 140/90mmHG on three prior clinical visits (DoH, 2014:73).

In this research, **HPT** referred to raised systolic BP equal to and greater than 140mmHg and raised diastolic BP equal to and greater than 90mmHg on three prior clinical visits.

1.8 RESEARCH METHODOLOGY

This study describes research settings, population, sample and sampling method, data collection methods and instrument, data analysis, as well as measures to ensure validity and reliability and ethical considerations. These concepts are explained in detail in Chapter 3 of this dissertation.

1.8.1 Research design

A quantitative descriptive design was used in this study because it provides direction for the research questions. In quantitative design, the researcher uses structured tools to generate numerical data, which are analysed statistically to draw inferences about the universe (Grove et al., 2015:211).

1.8.2 Research setting

The study was conducted on nine PHC facilities and one regional hospital in the Vhembe district, Limpopo Province.

1.8.3 Population and sampling

In this current study, the population included 669 noncompliant patients diagnosed with HPT taking antihypertensive treatment at the sampled health facilities in the Vhembe District of the Limpopo Province.

1.8.3.1 Sample

The study sample was drawn from the population receiving treatment from the ten selected health facilities during the data collection in the Vhembe District of the Limpopo Province.

1.8.3.2 Sampling technique

In this study, both probability and non-probability sampling were used.

1.8.3.3 Sampling of participants

In this study, a simple random sampling procedure was employed to select the study participants.

1.8.3.4 Sampling of health facilities

A probability simple random sampling method was used to choose the nine PHC facilities and a non-probability purposive sampling procedure to select the regional Hospital.

1.8.4 Sample size

Following the advice of a statistician, the final sample consisted of 134 participants.

1.8.5 Inclusion criteria

The study included male and female patients aged 20 years and above, who missed two or more follow-up appointments.

1.8.6 Exclusion criteria

Those who were not willing or refused to participate in the study and patients younger than 20 years were excluded.

1.8.7 Development of instrument

The research objectives and literature review guided questions developed by the researcher.

1.8.8 Data collection

The researcher used a self-administered questionnaire to collect data. The research objectives and literature review guided questions.

1.8.9 Data analysis

Descriptive statistics examined the distribution of the responses and calculated frequencies and percentages.

1.9 PRETEST

The questionnaire was pilot tested using 13 patients diagnosed with HPT in one of the health care facilities not selected for this study.

1.10 VALIDITY AND RELIABILITY

1.10.1 Validity

After constructing the questionnaire, it was examined by a statistician and supervisor for advice concerning the phrasing and format of the questions.

1.10.2 Reliability

The reliability of the questionnaire was verified by the supervisors in the field of health sciences for their contribution/input.

1.11 ETHICAL CONSIDERATIONS

Data collection commenced after the approval certificate (SHS/15/PDC/06/0206) was issued by the Research and Innovation Directorate of the University of Venda ethics committee.

1.12 SCOPE AND LIMITATION OF THE STUDY

The study was conducted among patients diagnosed with HPT within one hospital and nine PHC facilities in the Vhembe District of the Limpopo Province. Only patients diagnosed with HPT from the age of 20 years and above participated in the study, which excluded younger people. Therefore, the findings from this study cannot be generalised to patients attending private clinics and all PHC facilities in the Vhembe District.

1.13 STRUCTURE OF THE DISSERTATION

This study was presented in six chapters as follows:

CHAPTER 1

Chapter 1 provides an overview of the background to the study, problem statement, purpose of the study, research questions, objectives, significance of the study, definition of the key concept, research methodology, data analysis, validity and reliability, ethical considerations and limitations of the study.

CHAPTER 2

Chapter 2 provided an overview of the literature related to the key concepts and matters enclosed in this dissertation. The emphasis was to identify and describe the contributory factors of noncompliance to treatment among patients diagnosed with HPT, particularly from high income, middle income countries and RSA. The literature review presented an overview of the factors affecting compliance, stressed the importance of compliance, patients' knowledge and skills, patients' beliefs and perceptions, health-related factors and lifestyle modifications were discussed and applied to the current study.

CHAPTER 3

Chapter 3 describes the research design, research settings, sampling method, as well as measures to ensure scientific rigour and ethical research. The method and instrument employed depend on the research paradigm. Since this was a quantitative study, the researcher administered questionnaire to collect data.

CHAPTER 4

The chapter presents the findings of the study.

CHAPTER 5

Chapter 5 discuss about the findings

CHAPTER 6

Chapter 6 presents the summaries, conclusions, limitations and recommendations based on the results of research concerning contributory factors on noncompliance to treatment amongst patients diagnosed with HPT. Following the analysis and interpretation of the data, the objectives of the study correlated with the results. Comments were made regarding noncompliance to treatment among patients diagnosed with HPT.

CHAPTER 2

LITERATURE REVIEW

2.1 INTRODUCTION

The previous chapter addressed the research problem, research questions, significance of the study, definition of key concepts, research methodology, research design, measures of ensuring validity and reliability of the study, ethical considerations and scope and limitations of the study. In this study, literature was reviewed based on the research question; what are the contributory factors of noncompliance to treatments among patients diagnosed with HPT in the Vhembe District of the Limpopo Province?

2.1.1 Purpose of the literature review

This chapter examined previous studies, focussing on the following:

- The definition of compliance,
- Factors affecting treatment noncompliance among patients diagnosed with HPT,
- Patients' beliefs and perceptions, and
- Lifestyle modifications.

2.2 LITERATURE REVIEWED

The literature review is an essential component of research because it discloses information from similar studies carried out on a given topic and prevents replication. Literature was examined from several studies related to the contributory factors of noncompliance to treatment among patients diagnosed with HPT. The researcher observed this to be a major problem in the Vhembe District of the Limpopo Province requiring further investigation.

2.2.1 Compliance with treatment

Compliance behaviour is a complex and multidimensional phenomenon and the different factors motivating it have been studied and reported in the literature (WHO, 2003b:29). These factors include patient-related factors (socio-demographic elements) such as age,

gender, marital status, educational and employment status and structural factors (such as knowledge about the condition) (Hadi & Rostami, 2004:292; Alsolami et al., 2012:27).

A study conducted in Finland by Jokisalo, Kumpusalo, Enlund and Takala (2002:756) indicated that 66% of participants denied being hypertensive and did not comply with their treatment. Another report, conducted in Malaysia by Ramli, Ahmad and Paraidathathu (2012:614) on treatment adherence among patients diagnosed with HPT stated that the prevalence of HPT among adults aged 30 years and above has risen from 30.9% in 1996 to 40.5% in 2004. The number was increasing due to the ageing of the population. Alexa, Stoicia, Burca, Obreja, Rusu, Ungureanu and Covic (2006:15) report that up to 60% of all treatment prescribed is taken incorrectly, or not taken at all.

Therefore, it was essential to identify contributory factors and develop strategies to improve compliance. A study by Jin, Sklar, Oh and Li (2008:276) in the Republic of Singapore indicated that noncompliance was a complicated behavioural process and influenced by many factors such as the patient's character, patient-physician relationships and health care system. Research by Alsolami et al. (2012:27) in Saudi Arabia established that patients diagnosed with HPT and compliance behaviour to antihypertensive treatment include patient-related factors (e.g., sociodemographic and individual's knowledge), health system issues (such as cost and patient's resources), and provider-related factors (such as patient-provider relationships and communication).

It was, therefore, essential that health care providers understand the contributing factors to noncompliance in their context to manage the condition effectively. Among patients diagnosed with HPT in Pakistan, 48.3% were compliant with antihypertensive treatment whereas 51.7% were not (Nazir, Muhammad, Syed & Wagas, 2008:68). The study by Alsolami et al. (2012:28) reported that HPT was a common health problem in Saudi Arabia, where the frequency was rising at 26.1% among adults aged 30 years and above. Furthermore, they found that patients diagnosed with HPT in Saudi Arabia were reported to have poor compliance with their antihypertensive treatment (Alsolami et al., 2012:28).

2.2.2 Factors contributing to treatment noncompliance

In this study, the researcher explains contributory factors of noncompliance to treatment among patients diagnosed with HPT including demographic data, patient's knowledge and skills, patient's beliefs and perceptions, health care providers and lifestyle modifications.

2.2.2.1 Demographic data

Demographic factors refer to those aspects of society or culture that are measurable and can place people into categories. Demographic factors include the following in this study such as age, gender, education, marital and employment status that should help place participants of a population into smaller groups (Hadi & Rostami, 2004:292).

- **Age**

The researcher described participants' ages ranged from 20 to above 70 years. A patient's age influences the decision to comply with antihypertensive treatment. The survey conducted in industrialised countries shows a prevalence of HPT of 15–38% in those aged 30 years and above. Furthermore, a study by Samim et al. (2010:31) in Iraq reported that compliance was found to be highest among patients diagnosed with HPT aged 70 years and above followed by those aged less than 30 years. In contrast, other studies conducted in Ethiopia and Dar es Salaam by Joho (2012:33); Gelaw et al. (2014:55) indicated that most patients above 60 years were noncompliant to treatment due to economic and distance problems.

Also, the additional research noted that 90% of the elderly patients made mistakes when taking treatment. The reasons for not taking their medication correctly and on time was due to physical barriers (weakness/bedridden patients), functional difficulties (memory loss) and being more susceptible to side-effects than younger people (WHO, 2003a:29). The report demonstrated that the prevalence of HPT was higher in patients older than 60 years in different countries such as Saudi Arabia and Romania (Alexa et al., 2006:17; Alsolami et al., 2012:28).

Furthermore, elderly patients need family support especially if they live alone. This was not surprising because the prevalence of HPT increases with age as does the risk of a cardiovascular condition. Another researcher stated the opposite in a study conducted in

Iran by Hadi and Rostami (2004:293) reported that patients above the age of 50 years were more compliant than younger patients. They concluded that compliance should be poorer in younger patients due to ignorance or denial of their HPT condition.

In contrast, a study in Ethiopia by Anuwer, Seifu, Gelaw, Gunasekaran, Gebremariam and Mohammed (2015:787) on noncompliance and its contributing factors to antihypertensive treatment in ambulatory patients diagnosed with HPT indicated that the age of the patient has significant associations with participants who were not adhering to their treatment regime. This study shows that 36.5% of patients whose age was >50 years were noncompliant. There was no significant relationship between compliance behaviour and their age distributions (Osamor & Owumi, 2011:621).

- **Gender**

In this study, gender was discussed as the factor affecting noncompliance among patients diagnosed with HPT. A cross-sectional study conducted between 2002 and 2003 in the USA by Li, Wallhagen and Froelicher (2008:326) concerning Chinese immigrants reported that women (75%) were slightly more compliant than men (69%) to their treatment regimens. Being male and living for a prolonged period in the USA was statistically related to noncompliance among the Chinese immigrants surveyed. In contrast, the study in Egypt by Awad, Gwaied, Fouda and Essa (2015:33) revealed that men were more compliant than women.

Research by Joho (2012:33) in Dar es Salaam on the factors affecting treatment compliance among HPT patients reported that noncompliance was more statistically associated with females than males. Knight, Bohn, Wang, Glynn, Mogun and Avorn (2001:810) established similar findings from their study conducted in Boston, USA. Knight et al. (2001:810) stated that the female gender and widowhood are associated with noncompliance behaviour. However, some studies have reported no significant relationship between gender and compliance behaviour (Bovet et al., 2008:35; Edo 2009:112; Osamor & Owumi, 2011:621).

- **Educational level**

A study by Gelaw et al. (2014:55) reported that high educational levels associate with better treatment compliance as illiterate patients were not able to understand their medication. In another study by Kabir et al. (2004:16), only 27% of participants were literate and had formal education (primary, secondary and tertiary education), and most of them were illiterate. Also, in the studied population 72 (74.2%) of 97 participants with formal education were more compliant with their treatment compared to 123 of the 263 (47.0%) participants without formal learning. Knowledge should lead to better understanding of the risks factors involved in noncompliance behaviour. Literate persons and those who were motivated to know more about their disease were more receptive to health education than illiterate persons.

This research contrasts with another study, which established that low levels of education (illiterate and primary) had better compliance than those with high levels of education (Samim et al., 2010:31; Joho, 2012:33). The reason could be due to these patients having more faith in their physicians' advice compared to those with formal education. Other studies revealed that the participants' level of education was not associated with their treatment compliance (Stilley, Sereika & Muldoon, 2004:122; Anuwer et al., 2015:787).

- **Marital status**

Research conducted in Dar es Salaam by Joho (2012:33) on factors affecting treatment compliance among patients diagnosed with HPT revealed that unmarried participants were less likely to follow treatment regimens than those who were married. This result is similar to studies conducted by Cooper, Carpenter and Katona (2005:1072) and Rosland, Kieffer and Israel (2008:1995). Married women had more access to financial resources and social support, less psychological stress and were more likely to incorporate positive behaviours for a healthier lifestyle. Spousal income support reduces the stress resulting from possible financial ups and downs within a household. Also, commitment to marriage encouraged women to stay healthy and hence, women may feel motivated to engage in more positive health-related activities.

These contribute to the beneficial effects of marriage on HPT. However, stability or duration in a marital state should be another variable with a significant impact on women's health. Another study showed similar findings in that 87.6% of the married patients were associated with higher treatment compliance than the remainder who were divorced, single or widowed (Hadi & Rostami, 2004:294). The support from a spouse may be the reason why married patients are more compliant than those who are widowed, single or divorced.

Marital and familial commitment encourages married women to self-regulate their health risk behaviours. Social support from a husband may assist a woman to deal with stressful situations. In comparison to married and never married women, divorced, widowed or separated women, married women revealed higher treatment compliance. In contrast to other studies, Arshia, Mehwish, Noor-ulain, Mariam, Sadaf and Sobia (2015:161) in Pakistan found that noncompliance was equally distributed among those who were married and those who had no partners.

- **Employment status**

Kabir et al. (2004:16) conducted a study on compliance with treatment among patients diagnosed with HPT in Nigeria. This indicated that participants (89.7%) who had earned a monthly salary of above 10,000 Naira were more compliant with their treatment than those making less than 10,000 Naira (35.0%). Similarly, another study conducted in Seychelles factors affecting compliance with antihypertensive drug treatment and required lifestyle modifications among patients diagnosed with HPT showed that patients with highly skilled occupations were more compliant than those with lesser skills (Edo, 2009:112).

The relationship between compliance and skilled occupations was not clear, but some argue that patients with higher professional skills should have higher socioeconomic status suggested as associated with compliance (WHO, 2003a:35). Also, the prevalence of noncompliance with treatment is higher among unemployed persons and those with low socioeconomic status and may be due to cost and lack of access to treatment. Noncompliance was reported to be greatest among patients (86%) diagnosed with HPT who paid for their treatment compared to those whose treatment was funded by family or others. This agrees with the research carried out by Arshia et al. (2015:162).

- **Socioeconomic status**

The WHO suggests that the socioeconomic position of patients is an essential factor influencing treatment and noncompliance behaviour (WHO 2003b:28). Research conducted in Iraq by Samim et al. (2010:32) stated that compliance significantly associates with the socioeconomic status of patients. This study indicated that of the studied population 61.7% of patients diagnosed with HPT with intermediate socioeconomic status were more compliant than 41% of patients with low and high socioeconomic status.

They assumed that the contributing factors to poor compliance could be the lack of for treatment (32.7%) and payment for transport to primary health facilities. They concluded that patients diagnosed with HPT with higher socioeconomic status are more compliant than those with lower socioeconomic status. Similarly, patients with low socioeconomic status were often poor and did not have money to purchase treatment and transport costs to health care facilities (Gelaw et al., 2014:54; Anuwer et al., 2015:787).

Therefore, patients from low socioeconomic standing were found to be more likely to be noncompliant than those with higher socioeconomic status. A meta-analysis of HPT studies in the Sub-Saharan region showed that HPT was more predominant in urban than rural areas. Unfortunately, most of these countries lack the resources to detect, prevent and treat the disease (Addo et al., 2007: 1012).

2.2.2.2 Patient's knowledge and skills

Research has shown that a high level of understanding is significant in achieving adequate control of BP and lack of knowledge is an essential predictor of poor BP control. A study supporting this view was carried out to determine the compliance of patients with HPT with their treatment regimen and its effect on their quality of life. The highest proportion of the rural and urban sample of patients lacked information relating to the significance of high BP, the reason, manifestations, continuation of treatment and actions to keep BP at a reasonable level (Anuwer et al., 2015:787). The researchers also disclosed that among patients diagnosed with HPT, awareness and knowledge of the disease was strongly associated with satisfactory BP control. Patients without information about normal systolic BP values of ≤140mmHg and its meaning had significantly higher BP than those who were informed.

However, the association between the understanding of HPT and treatment compliance is inconsistent. Participants who understood their condition assisted in controlling their HPT because they visited their physicians frequently and compliance with the prescribed treatment was good. There was a positive association between patient's levels of knowledge and better compliance. Furthermore, understanding their illness and having a positive attitude toward antihypertensive treatment were both associated with improved compliance (Hadi & Rostami, 2004:293).

Awareness of HPT was important in emphasising the benefits of taking medication regularly and indicated how the absence of knowledge influences patient's poor compliance behaviour. A qualitative study conducted at Vanga Hospital Bandundu province in the Democratic Republic of Congo by Lubaki et al. (2009:108) noted that inadequate knowledge of the illness and treatment related to poor compliance. Studies have concluded that patient's insufficient knowledge about the treatment often associates with the effectiveness of the counselling. The authors suggested that there must be an awareness programme for the patients diagnosed with HPT to improve their level of knowledge. In contrast, Awad et al. (2015:33) asserted that there was no significant relationship between knowledge of HPT and compliance with treatment. The association between knowledge and adherence is confusing because knowledge is not enough to ensure adherence, but is necessary for it to occur. A study by Hashmi, Afridi, Abbas, Sajwani, Saleheen and Philippe (2007:5) on factors associated with adherence to antihypertensive treatment in Pakistan reported that awareness about HPT and its treatment was minimal, as 24% of participants took their treatment only when they thought they had symptoms of high BP. Similarly, few patients were aware of the risk factors for HPT, and even fewer knew about the complications.

2.2.2.3 Patient's beliefs and perceptions

The Health Belief Model (HBM) incorporates perception as a core concept in its framework. Participants should take preventative action with the confident expectation that taking a recommended action results in avoiding an adverse health condition (Glanz, Rimer & Lewis, 2002:47). For example, the belief that the use of antihypertensive treatment prevented complications. Furthermore, participants must trust that there were fewer barriers to taking a recommended health action to do it. Perceptions varied according to factors such as cultural, religious and social experiences.

These factors primarily influence the perception of condition and treatment. Therefore, the knowledge of persons suffering from HPT affects their acceptance or rejection of care. According to Alsolami et al. (2012:28), patients' compliance often improved when they were positive about the efficacy of the treatment that was working well to control their HPT. Perceived susceptibility and perceived severity together influence participants' perception of HPT as a threat.

Participants who thought that they were not susceptible to HPT did not comprehend the need to take prescribed treatment or change their lifestyle. A study conducted in the Limpopo Province (Mokopane Hospital) by Mathevula (2013:35) reflected that this lack of information about taking their treatment as prescribed raises a concern as this may affect compliance if patients diagnosed with HPT are not sure of the approach to their treatment. Furthermore, patients diagnosed with HPT who had experienced side-effects were more likely to be noncompliant.

A qualitative study conducted at Vanga Hospital Bandundu province in the Democratic Republic of Congo by Lubaki et al. (2009:110) noted that patients took treatment only when they experienced visible symptoms of HPT. A study by Peltzer (2004:8) conducted in rural hospitals of RSA, reported that approximately 80% of noncompliant participants had used other treatment for their high BP apart from prescription treatment. This study also revealed that faith and traditional healing play a significant role among noncompliant patients.

Patients diagnosed with HPT who were noncompliant were using home remedies, faith healing, then traditional healing and over the counter treatment. Also, people had different practices in managing HPT. Research findings by Mafutha and Wright (2013:2) indicated both beliefs and cognitive factors affect treatment compliance. Fears included using antihypertensive treatment long-term and possibly all their lives.

The study conducted in Saudi Arabia by Alsolami et al. (2012:28) reported that 43.7% of patients believed that antihypertensive treatment should discontinue once their BP has stabilised. In a study conducted in Iran by Hadi and Rostami (2004:294), results indicated that patients who had experienced complications such as cardiovascular disease, stroke or ischemic heart attack, heart failure or renal failure were more compliant. This study also

found that participants who had taken treatment for more than five years and patients who were taking other daily drugs had a higher compliance score.

On the other hand, other contributory factors associated with poor compliance were side-effects of treatment and forgetfulness. This study found that participants who regularly visited the clinic had 54.2% compliance while 45.8% had poor compliance. Reasons include ignorance about the need for regular treatment 32.7%, non-availability of drugs at facilities 8.0%, side-effects 12.1%, exhaustion of prescriptions and not attending scheduled clinic days 4.8%, normal BP during previous appointments 3.6%, forgetfulness 3.0% and busy schedules 1.8% (Kabir et al., 2004:16, Peltzer, 2004:7; Alexa et al., 2006:17).

In another study, only 34.9% of participants with similar results had ever forgotten to take their treatment on time. Of the studied population, 37.1% of participants had skipped treatment because of feeling well. Furthermore, 37.0% of participants neglected their planned treatment (Samim et al., 2010:30). Moreover, they showed that only 54.6% of the patients were taking their medication regularly and were more compliant.

The study also revealed that 54% of patients diagnosed with HPT were compliant with treatment according to the test. The compliance rate was higher in patients who had HPT for more than ten years than in newly diagnosed patients who had low levels of compliance. Also, the presence of other illnesses increased compliance rates. A qualitative study conducted at Vanga Hospital Bandundu province in the Democratic Republic of Congo by Lubaki et al. (2006:109) indicated that side-effects, lack of support from family members and difficulty in obtaining hypertensive treatment discouraged patients from taking prescribed treatment.

A study conducted by Joho (2012:33) in Dar es Salaam on factors affecting treatment compliance among patients diagnosed with HPT indicated that noncompliance was due to forgetfulness, deliberately missing doses, side-effects, increased quantity of tablets, not properly counselled and cost issues. Noncompliance may be unintentional (such as forgetting) or intentional, whereby patients decide not to take treatment is based on their personal beliefs about their illness and treatment (Hashmi et al., 2007:5).

2.2.2.4 Health care provider factors

Health care provider factors also contribute to noncompliance treatment among patients diagnosed with HPT. In a study, conducted by Jin et al. (2008:277) in the Republic of Singapore compliance with antihypertensive treatment was promoted if the relationship between patients experience and doctor was positive, received adequate advice and experienced improvement in BP control. Thus, physicians have a vital role in enhancing treatment compliance among patients with HPT.

They further indicated physicians' characteristics might contribute to compliance treatment among patients diagnosed with HPT. The study noted that these include empathy towards the patients, willingness to explain the condition and antihypertensive treatment. Research in Iran by Hadi and Rostami (2004:294) also confirmed that good patient-physician relationships promoted compliance with treatment compared to those without a good rapport. The analysis noted that visits to physicians on a 3-month interval or less were two independent variables of compliance. Patients diagnosed with HPT with higher treatment compliance attended their appointments. Another study revealed that recording information about those patients diagnosed with HPT and their regular follow-up appointments, the frequency of prescriptions and date of the last refill all were essential in tracking compliance.

The data showed that 63% of hypertensive cases were well controlled, 50% had good compliance with appointments and 9% suffered from HPT-related complications (Alsolami et al., 2012:28). A study by Jin et al. (2008:282) in the Republic of Singapore on factors affecting therapeutic compliance indicated that participants with high levels of perceived health care system-related problems were more likely to be noncompliant.

A study conducted by Kumanan, Guruparan and Mohideen (2016:51) on noncompliance of antihypertensive therapy in Sri Lanka indicated that the consultation with the treating physician might be viewed as unsatisfactory because inadequate time, insufficient explanation and poor doctor-patient interaction contributed to noncompliance.

2.2.2.5 Lifestyle modification regimen

The HPT clinical guideline from the National Institute for Health and Clinical Excellence (NICE) recommends regular physical exercise and reduction of salt intake, alcohol and

smoking and encourages healthy low-calorie diets for those who are overweight and have raised BP. The British Hypertension Society (BHS) guidelines state that advice should be given for prevention and treatment of HPT and provided to pre-hypertensive individuals and especially to those with a strong family history. Furthermore, active lifestyle modification can lower BP by at least as much as a single antihypertensive drug. Even a 2 mmHg decrease in diastolic BP has been found to reduce HPT prevalence by 17%, risk of coronary heart disease by 6% and stroke by 15%.

In addition to the NICE recommendations, the BHS also encouraged maintaining healthy body weight, a diet rich in fruit and vegetables, and reducing total and saturated fat. These interventions could reduce the need for treatment, enhance the effectiveness of treatment, reduce the necessity for multiple drug regimens and positively influence overall cardiovascular risk. The international guidelines advocate diet/behavioural modification at every stage, both before drug therapy in pre-HPT, for high-risk patients and those on treatment.

The BHS and international guidelines recommend diet and behavioural modification for all patients diagnosed with HPT, regardless of weight, the severity of HPT or treatment. They also specifically advise the adoption of the Dietary Approaches to Stop Hypertension (DASH) eating plan (Henein, 2010:880).

The WHO defines compliance as the extent to which a person`s behaviour in taking treatment, following a diet and executing lifestyle modification corresponds with the agreed recommendations from health care providers. Lifestyle changes are nonpharmacological management necessary to lower high BP. The WHO strongly recommends lifestyle modifications since these usually have no known side-effects, do not affect the quality of life and are less expensive than pharmacological treatment (WHO, 2003b:5).

HPT is a chronic disease and manageable by appropriate treatment or adopting lifestyle modifications. The study conducted by Cakir and Pinar (2006:190) in Turkey on the effects of extensive lifestyle alterations by patients diagnosed with HPT assigned 70 patients randomly into intervention and control groups and collected baseline data from both groups. The intervention group attended health education sessions and individual counselling on lifestyle modifications whereas the control group had none. After six months, Cakir and

Pinar (2006:190) indicated that BP, body weight, body mass index, waist circumference and fasting lipids had reduced significantly among the intervention group compared to the control group.

A study conducted in Ethiopia resulted in similar findings. The results of the healthy diet, physical exercise and weight loss intervention trial conducted by Anuwer et al. (2015:786) revealed that extensive lifestyle modifications could control BP.

The researchers presented an average of a 4.9kg decrease in weight, 9.5mmhg decrease in systolic BP and 5.3mmhg decrease in diastolic BP in the experimental group. There was no similar observation detected in the control group. Health-related actions to lower BP include weight reduction, adopting the DASH eating plan, reducing sodium intake and alcohol consumption and regular physical exercise (Chobanian, Bakris, Black, Cushman, Green, Izzo, Jones, Materson, Oparil, Wright & Rocella, 2003:1217; Edo, 2009:112). Lifestyle modifications alone could effectively decrease the systolic BP of patients diagnosed with HPT by a range of 8-14 mmHg (Anuwer et al., 2015:786). Reduced saturated fat (animal fat) and salt consumption were necessary dietary factors in the prevention and control of HPT.

A decrease in sodium intake was a significant component of non-pharmacological treatment of HPT. Numerous studies have confirmed strong associations between salt intake and HPT (He & MacGregor, 2003:1; Obarzanek, Proschan, Vollmer, Moore, Sacks, Appel, Svetkey, Most-Windhauser & Cutler, 2003:459). Therefore, hypertensive and non-hypertensive persons are advised to limit their dietary salt intake to 100mmol per day (Chobanian et al., 2003:1217).

Several studies on compliance among HPT and renal transplantation patients found that those who smoked or drank alcohol were more likely to be noncompliant to a medical regimen (Cooper et al., 2005:1072; Fodor, Kotrec, Bacskai, Dorner, Lietava & Sonkodi, 2005:1263; Tugli, Ramaano, Klu, Mokonoto, Korkpoe & Morwe, 2014:1618).

The WHO emphasises that alcohol abuse and tobacco smoking are important modifiers of compliance behaviour (WHO 2003a:30). Studies conducted by Edo (2009:112) in Seychelles and Gelaw et al. (2014:55) in Ethiopia revealed that heavy alcohol drinkers were less compliant with their antihypertensive treatments than moderate drinkers. This was not

surprising since the fear of drug interaction with alcohol could discourage a patient from taking medication. Noncompliance might also be primarily due to forgetfulness in heavy drinkers. Lifestyle modifications to lower BP include regular exercise (at least 30 minutes three times per week), salt and fat free diets, cessation of smoking and reducing daily alcohol intake to less than 20g of ethanol for men and less than 10g for women (Svetkey, Erlinger, Vollmer, Feldstein, Cooper, Appel, Ard, Elmer, Harsha & Stevens, 2005:21).

Regardless of the availability of adequate therapy, HPT remains poorly controlled due to noncompliance (Osamor & Owumi, 2011:621). Compliance involves the degree to which patients follow medical advice, comply with lifestyle modifications and healthy diet and keeping medical appointments and follow-ups and maintaining treatment prescriptions and regimens. Noncompliance with BP-lowering treatment is a significant reason for poor control of high BP worldwide. Although safe and effective treatments are available, the management of high BP is still a challenge especially in middle income countries (Osamor & Owumi, 2011:621).

2.3 KEY FINDINGS AND GAPS

The literature reviewed in this chapter considered research on noncompliance treatment among patients diagnosed with HPT globally and raised several questions. Nevertheless, some of the area covered by these studies and the gaps identified are highly appropriate to the current study in RSA. The majority of the studies conducted in middle income countries and SSA confirm noncompliance with treatment among patients diagnosed with HPT.

2.3.1 Observed gaps in the reviewed studies

Most of the treatment noncompliance among those diagnosed with HPT studies discussed in this chapter is from both high income, middle income countries, SSA and RSA. Studies on factors contributing to noncompliance with treatment among patients diagnosed with HPT in Vhembe do not exist. The current study, therefore, was intended to fill this gap.

2.4 CONCLUSION

This chapter provided an overview of the literature related to the key concepts and discussions in this dissertation. The emphasis was to identify and describe the contributory factors of noncompliance to treatment among patients diagnosed with HPT, particularly from high income, middle income countries and RSA. The literature review presented an overview of the factors affecting compliance, the importance of compliance is stressed, patients' knowledge and skills, patient's belief and perceptions, health-related factors and lifestyle modifications were discussed and applied to the current study. The next chapter will present research methodology.

CHAPTER 3

RESEARCH METHODOLOGY

3.1 INTRODUCTION

The previous chapter presented the literature review on treatment noncompliance among patients diagnosed with HPT. This quantitative descriptive study describes contributory factors to noncompliance to treatment among patients diagnosed with HPT in the Vhembe District of the Limpopo Province. This chapter explains the research design, research settings and sampling method, as well as measures taken to ensure scientific rigour and ethical research. The process and instrument employed depend on the research paradigm. Since this was a quantitative study, a self-administered questionnaire was used to collect data.

3.2 PURPOSE OF THE STUDY

The purpose of the study was to identify and describe contributory factors of noncompliance to treatment among patients diagnosed with HPT.

3.3 RESEARCH OBJECTIVES

Research objectives of the study were to:

- Identify and describe the contributory factors of noncompliance to treatment,
- Assess the beliefs and perceptions of patient diagnosed with HPT, and
- Describe the lifestyle modification regimen of patient diagnosed with HPT.

3.4 RESEARCH DESIGN

Research design is the set of logical step taken by researcher to reply the research question (De Vos et al., 2011:143). There are two types of research designs, namely, quantitative and qualitative. The model adopted in this study was quantitative and descriptive.

Grove et al. (2015:211) indicated that the primary purpose of a research design is to maximise control over factors that can affect the validity of the study findings. The researcher describes the contributory factors of noncompliance to treatment among patients diagnosed with HPT.

3.4.1 QUANTITATIVE STUDY

Quantitative research is defined as an investigation into a social or human problem, based on testing a theory composed of variables, measured with numbers and analysed with statistical procedures in order to determine whether to predictive generalisations of the theory hold true (Devos et al., 2011:64)

In a quantitative study, the numerical information is collected systematically in controlled circumstances using statistical procedures to analyse and draw inferences about the subject. The researcher converts the data into numbers for statistical analysis. A quantitative study is conducted to describe new situations, events or concepts, observe associations among variables and establish the effectiveness of treatment or interventions on specific health outcomes in the world (Grove et al., 2015:32). The researcher used a questionnaire to collect the participants' numerical data and converted it to numbers. Since this was a quantitative study, the researcher describes the findings of the study.

3.4.1.1 Advantages of a quantitative study

- The quantitative method provides direction for the research questions using structured procedures and questionnaires to collect data.
- This approach allows the researcher to ask all the participants the same questions collecting the unbiased data.
- The names and addresses of the participants were not recorded to ensure anonymity (Grove et al., 2015:212).
- The absence of a researcher ensures there is no bias in the replies from the participants in response to the researcher rather than to the questions.
- The researcher selected a quantitative method due to time limits and resource constraints (shortage of funds) (Brink, 2012:154).
- The process minimises threats to the internal and external validity of the study.

- Findings can be generalised to the entire population.

3.4.1.2 Disadvantages of quantitative study

- Participants' lack of openness to present in the best possible way sometimes resulted in a low response rate.
- Misunderstandings may occur because there is no clarification of the issues raised on the forms. Illiterate individuals cannot use the questionnaire without assistance from the researcher.

3.4.2 DESCRIPTIVE STUDY

Grove et al. (2015:33) define a descriptive study as the description of phenomena in real-life situations that aims to describe aspects rather than explain them and is common in the emerging field of nursing research. In this study, the researcher describe the contributory factors of noncompliance to treatment, assess the beliefs and perceptions of patient diagnosed with HPT, and describe the lifestyle modification regimen of patient diagnosed with HPT. Descriptive studies are often conducted with high numbers of participants when little knowledge is available about the topic. This research is important as a foundation for later investigation as it describes the specific details of a situation, social settings or relationships and focusses on how and why questions.

The researcher introduces a well-defined subject and aims to describe it accurately. A descriptive study provides new information on a phenomenon and determines the frequency with which something occurs and categorises information in natural settings. It is the second class of non-experimental studies because it focusses on the corrective feedback of the supervisor. The purpose of descriptive studies is to observe, describe and document aspects of real-life situations and sometimes provide a starting point for the generation of a hypothesis or theory development (Polit & Beck 2012:226).

3.4.2.1 Advantages of a descriptive study

- Descriptive studies may be used to develop concepts, identify problems and justify the current practice, make conclusions about practice or identify trends of illnesses or determine what other professionals in similar situations are doing to promote prevention of disease and health in selected groups.

- Describe the variables to answer the research question.
- The study may commence without a theoretical framework.
- Studies summarise the status phenomena (Grove et al., 2015:212).
- Protection against bias in a descriptive design realised through; 1) conceptual and operational definitions of variables, 2) sample selection and size, 3) valid and reliable instruments.

3.4.2.2 Disadvantages of a descriptive study

- Studies that do not examine cause-effect relationships among variables.
- If the criteria for external validity are incomplete, findings cannot be generalised.

3.5 RESEARCH SETTINGS

Brink (2012:59) indicated that the research setting is the location for conducting the research and can be a natural or highly-controlled environment. The study was undertaken in the Vhembe District (as shown in Figure 1) which is the largest of the five Districts of the Limpopo Province. The Vhembe District has one regional Hospital, five community Hospitals, eight health centres, 120 clinics and 18 mobile clinics. The study was conducted at regional Hospital and nine PHC facilities located in the northern region about 170 km from the capital Polokwane. Regional Hospital is a 538-bed hospital receiving referred patients from 24 clinics situated in the Tshisaulu village along the Phunda Maria Road. The study site was chosen because most patients diagnosed with HPT from PHC facilities are referred to this regional Hospital for further assessment and management, expertise and availability of treatment.

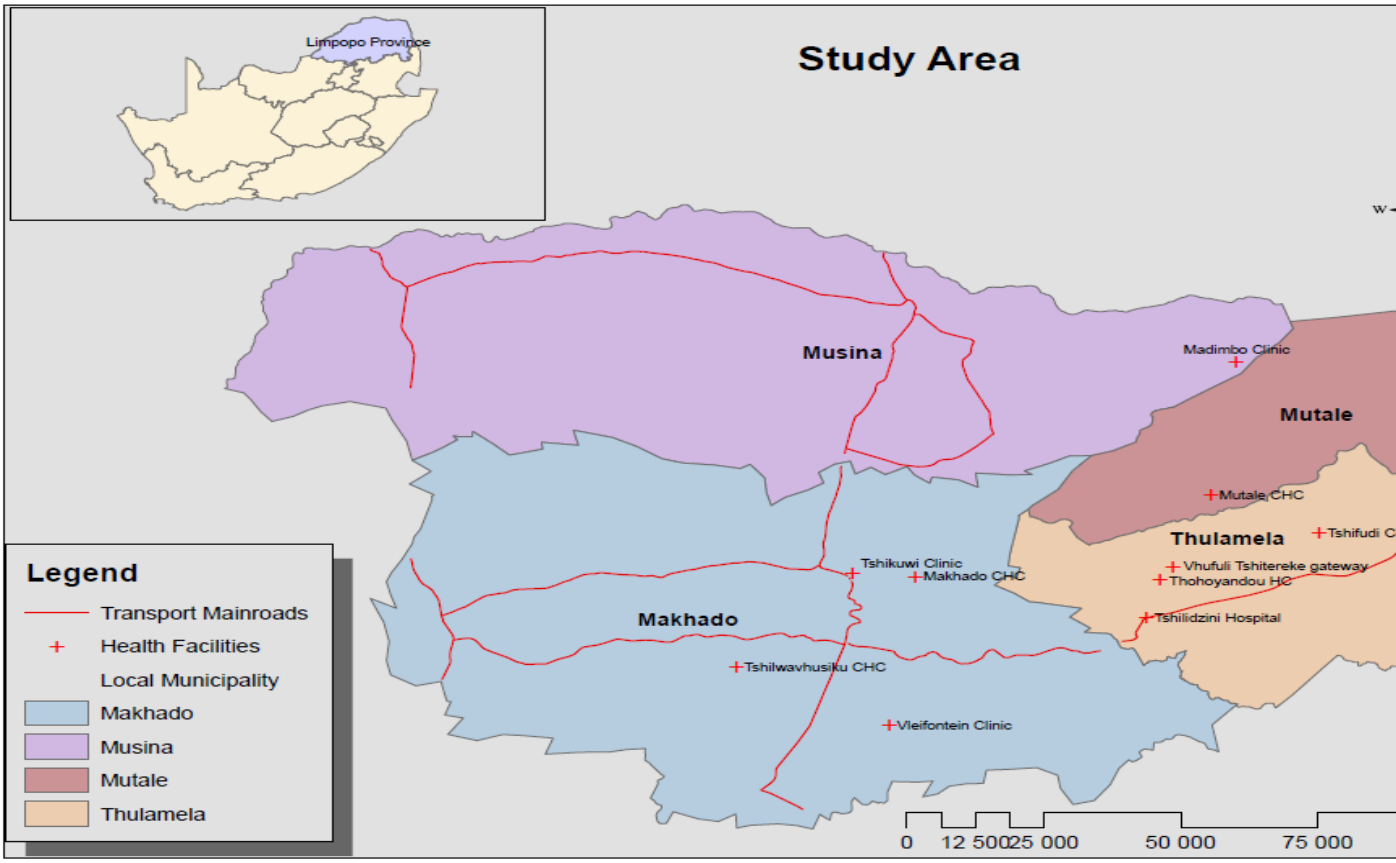

FIGURE 3.1 Limpopo map and research focal area

(http://www.dhsd.limpopo.gov.za/docs/reports/final%20DHSD) **(**Accessed 10 September 2014)

3.6 POPULATION

Brink (2012:131) defines population as the "entire aggregation of cases in which a researcher is interested". The population for this study was 669 patients diagnosed with HPT receiving treatment dispensed by the ten sampled health facilities in the Vhembe District of the Limpopo Province.

The target population refers to subjects with similar attributes to that of the research subjects from whom the researcher may generalise his findings (Polit & Beck, 2012:274). In this study, the total population was 669 noncompliant patients diagnosed with HPT taking antihypertensive treatment from the ten sampled health facilities in the Vhembe District of the Limpopo Province. The sample size of this study was 134 participants calculated by using 20% of the population (669) who visited their health centres irregularly (De Vos et al., 2011:225).

3.6.1 Sample

De Vos et al. (2011:225) define sample as contains elements or a subset of the population considered for actual inclusion in the study. The study sample was drawn from the population receiving treatment from the ten selected health facilities during data collection in the Vhembe District of the Limpopo Province.

3.6.2 Sampling technique

Polit and Beck (2012:275) define sampling as the process of selecting a number of individuals to represent the entire population enabling inferences to be made about that population. There are two sampling methods, probability and non-probability (Polit & Beck, 2012:275). In this study, both probability and non-probability were used for sampling health facilities and study population. Probability approach proposes a degree of confidence on the representative nature of the chosen sample by minimising bias and allowing the researcher to estimate the sampling error. This enhances the applicability of the study findings to the target population. Non-probability approach is usually more convenient and economical, and allows the study of populations when the researcher is unable to locate the entire

population (Brink, 2012:139). Simple random sampling was used to select PHC facilities and purposive sampling used to select Regional Hospital in this study.

3.6.2.1 Sampling of Health facilities

Probability sampling involves the random selection of study elements allowing any member of the study population to be selected. A simple random sampling procedure was employed to choose the PHC facilities. There were pieces of paper labelled 1 or 2; the number 1 represented the targeted PHC facilities and 2 those not taking part in the study that were removed from a box until the desired sample size was reached for the PHC facilities. These were randomly selected from 120 clinics and eight Health Centres in the Vhembe District.

Non-probability sampling was used to select the Regional Hospital because most patients diagnosed with HPT from District Hospitals, health centres and clinics are referred here. Brink (2012:141) indicated that the advantage of purposive sampling is that it permits the researcher to select the sample based on knowledge of the phenomena to be studied.

3.6.2.2 Sampling of participants

All patients diagnosed with HPT who were not taking treatment attended one of the nine PHC facilities or one Regional Hospital from 8:00 to 16H30 during the week (Monday to Friday) and met the criteria in the sampling list for the study were included. In this study, a simple random sampling procedure was employed to select participants, who had not taken treatment for at least two months and missed two or more consecutive follow-up appointments for HPT from the ten selected health facilities in the Vhembe District of the Limpopo Province.

The researcher selected the participants randomly because it is the most conservative sampling method and ensures equal opportunity for each participant to be involved (Grove et al., 2015:259).

The researcher utilised ten chronic registers maintained at regional Hospital and nine PHC facilities in the Vhembe District of the Limpopo Province as the sampling frame.

3.6.3 Inclusion criteria

Grove et al. (2015:251) defined inclusion criteria as the characteristics that the participants must have to be part of the study. The study included all participants:

- Who were willing to participate aged 20 years and older,
- Male or female patients on monthly treatment for six months or longer,
- Residents of the Vhembe District and foreigners who were permanent residents, and
- Those who had missed two or more consecutive follow-up appointments.

3.6.4 Exclusion criteria

Exclusion criteria refer to the characteristics lacked by those who are excluded from the study (Grove et al., 2015:251). Patients rejected from taking part in this study included:

- Patients diagnosed with HPT age 20 years and above who did not consent and were not willing to participate,
- Too sick for an interview,
- Mentally unstable, and
- Patients with HPT age 20 years and above who were not on treatment for six months or longer.

3.6.5 Sample size

Following the advice of a statistician, the final sample consisted of 134 participants with 98 females and 36 males. The sample size of this study was 134 participants calculated by using 20% of the population (669) who visited their health centres irregularly (De Vos et al., 2011:225). A list of sampled health facilities with their total population, as well as the sample size for each, is illustrated below in Table 3.1.

Table 3.1: The Sample Frame

HEALTH FACILITIES	IRREGULAR VISITS (POPULATION)	PERCENTAGE SUGGESTED	NUMBER OF PARTICIPANTS (SAMPLE)
1.TSHILIDZINI HOSPITAL	26	20%	5
2.THOHOYANDOU HEALTH CENTRE	87	20%	17
3.TSHILWAVHUIKU HEALTH CENTRE	111	20%	22
4.VHUFULI TSHITEREKE GATEWAY	80	20%	16
5.TSHIKUWI CLINIC	28	20%	6
6.MAKHADO HEALTH CENTRE	81	20%	16
7.VLEIFONTEIN CLINIC	52	20%	10
8.MADIMBO CLINIC	54	20%	11
9.MUTALE HEALTH CENTRE	86	20%	18
10.TSHIFUDI CLINIC	64	20%	13
TOTAL	669	20%	134

3.6.6 Development of instrument

The researcher developed the questions guided by the research objectives and the literature review. The questionnaire had five sections and each measured different aspects of the compliance phenomenon.

Section A: Demographical data: This section contained ten items gathering demographic data such as age, gender, marital status, location, employment, monthly income, religion, education and duration of illness.

Section B: Family history of illness by participants**:** This section contained eight items such as family history, type, frequency, number of treatments used per day and health complaints.

Section C: Compliance with the treatment: A 12-item scale was developed to measure compliance with the treatment regimen. The responses were noted on a 4-point Likert scale. The response options were: daily (4), frequently (3), rarely (2), never (1).

Section D: Patient's beliefs and perceptions: A 6-item scale was developed to measure compliance with the beliefs and perceptions

Section E: Compliance with the lifestyle modification regimen: An 11-item scale was drawn up to measure compliance with this regimen related to lifestyle factors which increase or decrease HPT. The questionnaire consisting of closed-ended questions. The self-administered questionnaire was translated from English to Tshivenda and Xitsonga languages and back to English by linguistic experts to ensure complete understanding.

3.7 DATA COLLECTION

Grove et al. (2015:310) described data collection as the process of systematic information gathering from research subjects to answer questions and achieve the purpose and aim of the study. A self-administered questionnaire was used to collect data (refer to Annexure G). The data were compiled during 10 weeks between December 2015 and February 2016.

The objectives and benefits of taking part in the study were discussed with the participants and they were assured that they could discontinue the interviews at any time if they wished to do so. The researcher assisted those who could not read and write. For this study, the questionnaires were distributed by the researcher to gather information from a large number of participants. The researcher used codes to create the list of contributors rather than real names for all patients diagnosed with HPT in these health facilities.

The structured data collection instrument permitted the researcher to ask the same questions of all participants and mark the responses for those who could not read and write using programmed response options. This approach of efficiently organising and analysing the findings assisted the researcher. The time taken to complete one questionnaire form was approximately 45 minutes.

3.8 PRETEST

The questionnaire was pilot tested using 13 patients diagnosed with HPT in one of the health care facilities not selected for the study. The researcher conducted this pilot testing to check for unclear or ambiguous questions and amended the questionnaire accordingly. The pilot testing of the questionnaire helped to estimate the time taken to respond to the survey. Participants partaking in the reliability testing were not part of the study sample.

3.9 VALIDITY AND RELIABILITY

The researcher describes measures to ensure the reliability and validity of the questionnaire.

3.9.1 Reliability

Reliability refers to the issue of whether a method of measurement works consistently in producing similar results in similar situations (Grove et al., 2015:287). The reliability of the questionnaire was verified by the supervisor in the field of health sciences for their contribution/input. The consistency of the research process was ensured by adhering to defined structures and explanations. In this study, questionnaires were distributed to those patients diagnosed with HPT not complying with treatment in the Vhembe District of the Limpopo Province to ensure reliability. Pretesting was performed with 13 patients diagnosed with HPT in order to assess participants understanding of questions and any difficulties in using questionnaire. The pilot testing of the questionnaire helped to estimate the time taken to respond to the survey.

3.9.2 Validity

The validity refers to the degree to which that instrument measures what it sets out to measure in the context of the phenomenon of interest (Polit & Beck, 2012:336). After creating the questionnaire, it was evaluated by a statistician and the supervisor for advice concerning the phrasing and formatting of the questions. Discussions with the researcher took place to consider issues of clarity, specificity of variables to be measured and relevance of the contents of the questionnaire.

The researcher further ensured validity by conducting a pilot study. Factors contributing to noncompliance treatment were considered from the literature reviewed to ensure validity and that the questions asked corresponded with the topic and answered the research question.

3.9.2.1 Content-related validity

For this study, the researcher conducted a comprehensive literature review on noncompliance treatment among patients diagnosed with HPT. The questionnaire was developed under the supervision of the statistician and supervisor to ensure content validity.

3.9.2.2 Internal validity

Internal validity refers to the extent to which alterations in the dependent variable (effect) can be attributed to the independent experimental variable (cause) (De Vos et al., 2011:153). In this study, the researcher randomly selected participants from a specific population. Questionnaires were provided after they completed the consent form.

3.10 ETHICAL CONSIDERATIONS

Polit and Beck (2012:151) define ethics as a system of moral values that is concerned with the degree/extent to which a researcher adheres to the professional, legal and social obligations to the study participants.

3.10.1 Permission to conduct study

Data collection commenced after the approval certificate (SHS/15/PDC/06/0206) was issued by the Research and Innovation Directorate of the University of Venda ethics committee. Permission to conduct the research and to gain access to the regional hospital and nine PHC facilities were obtained from the Department of Health (in December 2015) – Limpopo Province. The letter of permission from the district office was presented to the assistant managers of medical wards (regional Hospital) and operational managers of the related nine PHC facilities.

3.10.2 The right to self-determination

The right to self-determination means that the participants have the choice to participate or withdraw from the study without coercion or risk of punishment. They should be treated as autonomous and allowed make this decision (Polit & Beck, 2012:100). For this study, the researcher included participants who agreed to participate after the explanation (the purpose of research, nature of their involvement, right to withdraw from the study) without any prejudicial punishment from the researcher or the health care workers. The researcher fully explained the nature and purpose of the study to the participants in the local language so they could understand. All participants were required to indicate their willingness to participate by signing the consent form (refer to Annexure F) while making provision for those who could not write to thumbprint their approval.

3.10.3 The right to full disclosure/informed consent

The principle of full disclosure means that people have the right to make an informed, voluntary decision about participating in the study (Brink, 2012:38). Participation was voluntary and all participants requested to give their informed consent before the study commenced. The researcher informed the participants about the purpose of the study and the confidentiality of any information given. Participants were informed that there was no risk or discomfort during the process of data collection. They would not be paid or rewarded in any way for participating in the study. Written consent was obtained from each patient diagnosed with HPT participating in the study before the administration of the questionnaire.

3.10.4 Beneficence

Polit and Beck (2012:108) define beneficence as the most fundamental ethical principle in research, which imposes a duty on the researcher to minimise harm and maximise benefits.

3.10.4.1 The right to freedom from harm and discomfort

The researcher endeavoured to avoid any harm to the participants by monitoring the participants for any signs of distress. According to Burns and Grove (2011:190), interviews usually have minimal physical risks.

Polit and Beck (2012:108) explain that a researcher should offer assurances to all participants that information divulged would not be used against them. In this study, the researcher made this assurance and honoured the promise. The participants may otherwise fear victimisation if they reveal information about their noncompliance or their health care provider.

The researcher assured the participants that the information revealed would not compromise their treatment at the health care facilities. This study intended to identify and describe contributory factors of noncompliance to treatment among patients diagnosed with HPT in the Vhembe District of the Limpopo Province. The research results could be used to improve compliance, which serves the interests of patients with HPT.

3.10.4.2 The principle of justice

- **The right to fair selection and treatment**

This principle stipulates fair selection of study participants free from social, cultural, racial, political or religious restraints (Brink, 2012:36). In this study, the participants' selection was based on research requirements not their position and there was no discrimination based on culture, race, politics or religion. The participants were all registered patients diagnosed with HPT attending ten health care facilities in the Vhembe district of the Limpopo Province.

They were selected using a simple random method, hence minimising researcher bias. No financial advantages were promised and none were delivered. They were informed that even though they would not experience immediate benefits, the outcomes of the research would eventually benefit the larger society. The researcher also clarified that this study was for educational purposes and funding was entirely the responsibility of the researcher.

- **The right to privacy**

Participants who accepted voluntarily shared their information privately. The interview questions were limited to those on the schedule. Anonymity refers to keeping the identity of the participant secret (Brink, 2012:35). Participants completed the questionnaire without the researcher and their names and addresses were not recorded to ensure anonymity.

Confidentiality of information refers to keeping all the participants' divulged information safe (Brink, 2012:35) and assured by storing data in a safe and locked place with only the researcher having access to the raw data. Finally, all participants were guaranteed of the confidentiality of their responses and anonymity of their identities.

3.11 CONCLUSION

This chapter describes the research design, research settings, sampling method, as well as measures to ensure scientific rigour and ethical research. Since this was a quantitative study, the researcher administered questionnaire to collect data.

CHAPTER 4

DATA PRESENTATION

4.1 INTRODUCTION

The chapter presents the findings of the study. The study had three objectives. The first was to identify and describe the contributory factors of noncompliance to treatment, the second is to assess the beliefs and perceptions of patient diagnosed with HPT, and the third one is to describe the lifestyle modification regimen of patient diagnosed with HPT.

4.2 RESULTS OF THE STUDY

4.2.1 DEMOGRAPHICAL CHARACTERISTICS

The table 4.1 below presents the demographical characteristics of the participants. The participants' ages ranged from 20 to above 70 years old. Eighty-five per cent of participants were aged 40 years and older while 14.9% were less than 40 years. This is not surprising as HPT is usually diagnosed in adults. Majority of the participants, 72(53.7%) lived at Thulamela, 49(36.6%) lived at Makhado, 8(6.0%) lived at Mutale and only 5(3.7%) lived at Musina Municipality. The majority of the participants were females 98 (73.1%) and 36 (26.9%) were males. In this study population, the number of married participants was 47 (35.1%) followed by 36(26.9%) were widow, 30(22.4%) were divorced, 19(14.2%) were single and only 2(1.5%) were widower. Concerning employment status, 72 (53.7%) participants were pensioners and 14 (10.4%) unemployed. About half of the participants 71 (53.0%) earned a monthly salary of between R1000-R1999 and four (3.0%) earned R2000-R2999. Therefore, 121 (90.3%) of the participants had a source of income. The findings revealed that majority of participants 109 (81.3%) were Christians while 25 (18.7%) were non-Christians.

In terms of educational level, 95 (70.9%) of participants received a formal education while 39 (29.1%) did not. Concerning the educational standard of the participants, 19 (14.2%) were undergraduates and postgraduates, and 37 (27.6%) never went to school at all. As shown in the table below, 59 (44.0%) had been suffering from the condition for a period

ranging from 1–5 years. The results of the study revealed that the majority of the participants had HPT for more than five years.

Table 4.1 Distributions of patients by treatment compliance

Demographic data	**Frequency**	**Percentage**
Age		
20-29	5	3.7
30-39	15	11.2
40-49	25	18.7
50-59	18	13.4
60-69	35	26.1
70+	36	26.9
Gender		
Female	98	73.1
Male	36	26.9
Municipality		
Thulamela	72	53.7
Makhado	49	36.6
Musina	5	3.7
Mutale	8	6.0
Marital status		
Single	19	14.2
Widower	2	1.5
Widowed	36	26.9
Married	47	35.1
Employment status		
Pensioners	72	53.7
Employed	34	25.4
Self-employed	14	10.4
Unemployed	14	10.4
Average earnings		
Demographic data	**Frequency**	**Percentage**
0-999	13	9.7

1000-1999	71	53.0
2000-2999	4	3
3000-3999	6	4.5
4000 and more	40	29.9
Religion		
Christianity	109	81.3
Indigenous	25	18.7
Formal education		
Formal education	95	70.9
Unformal education	39	29.1
Educational level		
Primary	29	21.6
Secondary	31	23.1
Undergraduate	16	12.0
Postgraduate	19	14.2
Did not go to school	39	29.1
Duration of illness		
< 1	5	3.7
1-5	59	44
6-10	31	23.1
11-15	22	16.4
16+	17	12.7
Total	**134**	**100**

4.2.2 FAMILY HISTORY OF ILLNESS OF PARTICIPANTS

About 75 (56.0%) participants mentioned that some of their family members had been diagnosed with HPT while 57 (42.5%) did not have close relatives with HPT. The table below indicates that 39 (29.1%) participants' parents have HPT and only one (0.7%) participant reported that her grandparent had a diagnosis of HPT.

The findings reveal that 112 (83.6%) took their antihypertensive treatment in the morning whereas 22 (16.4%) took it in the evening. Fifty-six (42.1%) of participants took only one

type of antihypertensive medication and (2.3%) took four and more. Table 4.2 below presented the participant's present health. Only a few, that is, 49 (36.6%) had no health complaints.

Table 4.2 Family history of illness of participants

	Frequency	**Percent**
Anyone with HPT in the family		
Yes	75	57.3
No	59	42.7
Relationship*		
Parent	39	52.0
Siblings	23	30.7
Child	12	16.0
Grandparent	1	1.3
Time for treatment		
Morning	112	83.6
Evening	22	16.4
Drug combination		
1	56	42.1
2	50	37.6
3	24	18.0
4+	3	2.3
Health complaints		
Heart problems	7	5.2
Paralysis of limb	27	20.1
Swollen legs	28	20.9
Visual impairment	23	17.2
Kidney problems	1	0.7
Shortness of breath	9	6.7
Palpitations	26	19.4
No health complaints	49	36.6
TOTAL	**134**	**100**

*Participants who reported cases of HPT in their family

4.2.3 COMPLIANCE WITH TREATMENT REGIMEN

This section presents compliance with a treatment regimen that includes visits to health care facilities, monitoring of BP and reasons for not taking treatment. There were several questions asked related to compliance. The following presents the findings on noncompliance.

Regarding check-ups, 98 (73.1%) visited PHC facilities monthly for management of HPT and two (1.5%) bi-monthly. These findings indicate that 76 (56.7%) of the female participants were visiting the PHC facilities for BP monitoring monthly compared to males 22 (16.4%). The majority of the participants 98 (73.1%) had their BP regularly monitored while 36 (26.9%) did not. Of the 98 (73.1%), most participants 76 (56.7%) whose BP was regularly monitored were female but, 22 (16.4%) of the female participants' BP was not.

For male participants, 22 (16.4%) had their BP regularly monitored while 14 (10.4%) did not. Most participants 96 (71.6%) had their BP monitored monthly and only two (1.5%) had their BP checked daily. Among the 134 patients diagnosed with HPT, 72 (55.0%) rarely used treatment as advised, 57 (43.5%) never took it as prescribed and two (1.5%) took treatment frequently.

Table 4.3: Gender vs. frequency of visits to PHC facilities for HPT management

		How often did you visit PHC facilities for HPT management?			
Gender		**Monthly** N (%)	**Bi-monthly** N (%)	**Quarterly** N (%)	**Total** N (%)
	Male	22(16.4)	1 (0.7)	13 (9.6)	36 (26.9)
	Female	76(56.7)	1 (0.7)	21 (15.7)	98 (73.1)
Total		98(73.1)	2(1.5)	34 (25.3)	134 (100)

Table 4.4: Gender vs. BP monitoring

	Gender		Total
Frequency of BP monitoring	**Male N (%)**	**Female N (%)**	**N (%)**
Is your BP monitored regularly?			
Yes	22 (16.4)	76 (56.7)	98 (73.1)
No	14 (10.5)	22 (16.4)	36 (26.9)
How often is your BP monitored?			
Daily	0 (0)	2 (1.5)	2 (1.5)
Monthly	22 (16.4)	74 (55.2)	96 (71.6)
Quarterly	14 (10.5)	22 (16.4)	36 (26.9)
Total	**36 (26.9)**	**98 (73.1)**	**134 (100)**

About 48 (35.8%) participants stated they rarely forgot and eight (6%) frequently forgot to take their treatment. Most participants 78 (58.2%) revealed they never stopped taking their medication and 16 (11.9%) often stopped their treatment when they felt well.

Among the 134 patients diagnosed with HPT, 113 (84.3%) reported they never discontinue treatment as prescribed and four (3.0%) frequently stopped taking their prescribed medication. Poor compliance was also found to be due to the perception that the treatment was ineffective. The majority of the participants 119 (88.8%) never stop and five (3.7%) stop taking treatment frequently because they believe it to be ineffective.

Among the 134 patients diagnosed with HPT, 116 (87.2%) stated that they never discontinue treatment and four (3.0%) frequently stopped because the doctor kept changing the treatment. Do you receive your treatment refill before you run out of medicine? Most participants, 96 (71.6%) never complied and received treatment refill on time. Twelve (9.0%) were visiting the PHC services frequently for treatment replenishment before running out of medication.

Another question asked of participants was whether they go for their check-up appointments as scheduled. About 93 (69.4%) of the participants never attended clinic appointments and six (4.5%) went as booked. Among the 134 patients diagnosed with HPT, 62 (46.6%) never stopped taking treatment and 19 (14.3%) often stopped treatment because of side-effects.

Table 4.5: Percentage distribution of patients by reason of noncompliance with treatment

Compliance to treatment	Daily N (%)	Frequently N (%)	Rarely N (%)	Never N (%)
Forget to take treatment	0	8 (6.1)	48 (36.6)	75 (57.3)
Stop taking treatment when you feel well	0	16 (12.1)	38 (28.8)	78 (59.1)
Stop taking treatment because condition deteriorated	1 (0.8)	4 (3.0)	15 (11.3)	113 (85.0)
Stop treatment because you believe that it was ineffective	0	5 (3.8)	9 (6.8)	119 (89.5)
Stop taking treatment because the doctor changes the type of treatment frequently	0	4 (3.0)	13 (9.8)	116 (87.2)
Receive prescription refill on time	1 (0.8)	12 (9.1)	23 (17.4)	96 (72.7)
Clinic appointment	6 (4.5)	9 (6.8)	25 (18.8)	93 (69.9)
Fear of side-effects	0	19 (14.3)	52 (39.1)	62 (46.6)
Taking treatment as prescribed	0	2 (1.5)	72 (55.0)	57 (43.5)

4.2.4 PATIENTS' BELIEFS AND PERCEPTIONS

This section presents the following: measures taken to manage HPT, belief that HPT is curable, whether diet can control HPT and how patients diagnosed with HPT benefit from physical exercise. The other question posed to participants was what measures they use to manage their condition. Most participants 117 (87.3%) were taking treatment while three (2.2%) used spiritual healing. About 132 (98.5%) of the 134 participants were non-compliant as they were not taking their treatment regularly while only 2 (1.5%) were complying with treatment. Subjects were asked whether they believed HPT was curable or not. Sixty-three (47.0%) participants did not know whereas 27 (20.1%) thought the condition could be cured. Among 134 participants, 90 (67.2%) believed that diet control could manage HPT while nine (6.7%) did not agree that a controlled diet could manage the condition. The table below indicates that most participants, 80 (59.7%) believed that patient diagnosed with HPT could benefit from physical exercise while 13 (9.7%) did not agree.

Table 4.6: Percentage distribution by attitude of patients regarding treatment

Measures to manage HPT	**Frequency**	**Percent**
Use of treatment	117	87.3
Use of diet control	7	5.2
Use of traditional medication	7	5.2
Use spiritual healing	3	2.2
Compliance with treatment		
Yes	2	1.5
No	132	98.5
Is HPT curable		
Yes	27	20.1
No	44	32.8
Do not know	63	47.0
Diet can manage HPT		
Yes	90	67.2
No	9	6.7
Do not know	35	26.1
Benefit from physical activity		
Yes	80	59.7
No	13	9.7
Do not know	41	30.6
TOTAL	**134**	**100**

4.2.5 COMPLIANCE WITH THE LIFESTYLE MODIFICATION REGIMEN

The lifestyle modification behaviours are categorised into six recommended and five non-recommended behaviours. The recommended actions were eating vegetables and fruits, engaging in physical exercise, trying to lose weight, relaxing and having enough sleep. The non-recommended behaviours were smoking, drinking alcohol, eating meals high in animal fat, eating fast food and sprinkling salt on food.

The table 4.7 below indicates that 49 (36.6%) participants eat vegetables frequently and six (4.5%) never eat vegetables. About 77 (57.5%) participants stated that they rarely eat fruits and one (0.7%) never eats fruits. Among the 134 patients diagnosed with HPT, 79 (59.0%) never use salt on food while seven (5.2%) always use salt. About 55 (41.0%) participants never eat meat high in animal fat while only one (0.7%) eats meat high in animal fat daily.

Usually, 65 (48.5%) of the participants never eat fast food while eight (6.0%) frequently eat fast food. Most of the participants 59 (44.0%) never engage in physical exercise while 12 (9.0%) exercise daily. More than half of the patients diagnosed with HPT, 77 (57.5%) mentioned they never tried to lose weight and only five (3.7%) tried to reduce weight daily.

Half of the participants 67 (50.0%) mentioned they frequently relax whereas one (0.7%) never relaxes. Among the 134 participants, 67 (50.0%) get enough sleep regularly and two (1.5%) never get enough sleep. The majority of the participants 115 (85.8%) never smoke cigarettes and only four (3.0%) rarely smoke. Regarding consumption of alcohol, many participants 102 (76.1%) reported they never drink alcohol and seven (5.2%) drink alcohol daily.

Table 4.7: Lifestyle management practices

	Daily N (%)	Frequently N (%)	Rarely N (%)	Never N (%)
Eat vegetables	41 (30.6)	49 (36.6)	38 (28.4)	6 (4.5)
Eat fruits	24 (17.9)	32 (23.9)	77 (57.5)	1 (0.7)
Use salt on food	9 (6.7)	7 (5.2)	39 (29.1)	79 (59.0)
Meat high in animal fat	1 (0.8)	24 (18.0)	53 (39.8)	55 (41.4)
Eat fast food	0	8 (6.1)	59 (44.7)	65 (49.2)
Engage in physical exercise	12 (9.2)	21 (16.0)	39 (29.8)	59 (45.0)
Reduce weight	5 (3.8)	16 (12.0)	35 (26.3)	77 (57.9)
Relax	34 (25.8)	67 (50.8)	30 (22.7)	1 (0.8)
Enough sleep	29 (21.8)	67 (50.8)	35 (26.3)	2 (1.5)
Smoking	13 (9.8)	0	4 (3.0)	115 (87.1)
Drink alcohol	7 (5.3)	10 (7.6)	13 (9.8)	102 (77.3)

4.3 CONCLUSION

In this chapter, the researcher presented the results of the descriptive statistics where percentages, frequency tables, etc. were used. Data were analysed using the Statistical Package for Social Sciences (SPSS) version 17.

CHAPTER 5

DISCUSSION

5.1 INTRODUCTION

The chapter presents the discussion of the findings of the study as follows: demographical characteristics, family history of illness by participants, compliance with treatment, contributory factors of noncompliance to treatment, the beliefs and perceptions of patients and the lifestyle modification regimen of patients diagnosed with HPT.

5.2 DEMOGRAPHICAL CHARACTERISTICS

- **Age**

The current study reveals that majority of the participants diagnosed with HPT were aged 40 years and above. As indicated, HPT is an illness that affects the adult population. The study findings agree with other studies conducted in Dar es Salaam and Ethiopia by Joho (2012:33) and Gelaw et al. (2014:55) respectively that reported that most patients above 60 years were noncompliant to treatment. Consequently, a patient's age could be an influence on the decision to comply or not with antihypertensive treatment regimens.

These results are comparable to the research in North America by Krousel-Wood, Muntner, Islam, Morisky and Webber (2009:63) in that those participants aged less than 64 years had a higher proportion following treatment compared to those over 65 years old. One explanation may be that younger people have higher incomes since they are working and have the money to buy medication when is not available. Another possible reason is that older people may have more than one disease due to ageing and use several chronic drugs making them tired, hence, stop taking treatment regularly.

Furthermore, elderly patients have a tendency to not comply due to cognitive impairment (memory loss) and reduced functional capabilities such as failing eyesight and trembling hands affecting the opening of bottles of medication (WHO, 2003a:29). Furthermore, elderly participants' compliance to treatment is poor due to physical difficulties, such as problems in swallowing tablets, handling small tablets, distinguishing colours or identifying markings on drugs (Cooper et al., 2005:1071). The result is in contrast with that previously reported stating that compliance was highest among patients diagnosed with HPT aged 70 years and above (Samim et al. 2010:31; Alsolami et al. 2012:28).

- **Gender**

In this current study, 73.1% of female patients were noncompliant to treatment compared to 26.9% of male patients. This finding is consistent with the studies in Dar es Salam by Joho (2012:33) and Egypt by Awad et al. (2015:33) which revealed that men were more compliant than women. The researchers stated that the female gender and widowhood are associated with noncompliant behaviour.

In contrast, some researchers have found female patients to be more compliant with treatment (Fodor et al., 2005:1263; Jin et al., 2008:274). A cross-sectional study conducted between 2002 and 2003 in the USA by Li, Wallhagen and Froelicher (2008:326) concerning Chinese immigrants reported that women were slightly more compliant than men with their medication regimens. Being male and staying for a prolonged period in the USA were statistically related with non-adherence among the Chinese immigrants surveyed. However, some studies stated no significant relationship between gender and compliance behaviour (Hadi & Rostami, 2004:293; Edo, 2009:112; Osamor & Owumi, 2011:621).

- **Educational level**

The findings of the study showed that 70.9% of participants with formal education levels had poor treatment compliance compared to those without education. This agreed with the research by Samim et al. (2010:31) and Joho (2012:33) who established that low levels of education (illiterate and primary) are associated with compliance relative to those with higher levels of education. This may be because patients without education have more trust

in their physicians' advice compared to those with formal education. From these results, educational levels are not a good predictor of treatment compliance. In contrast, several studies established that patients with higher educational levels were more compliant than those with low levels of education. Research conducted by Edo (2009:112) showed higher education to be associated with receiving more advice and information from health professionals making them more compliant to a treatment regimen. Other studies found no association between educational levels and compliance (Stilley et al., 2004:122; Anuwer et al., 2015:787).

- **Employment status**

In the current study, more than half of the participants (53.7%) did not comply with their treatment regimen. This is not surprising as most of these patients diagnosed with HPT are pensioners using public health facilities to receive free treatment. This noncompliance was associated with reluctance to take antihypertensive treatment rather than non-availability. Studies worldwide reported that despite the availability of effective medical therapy, over half of all patients diagnosed with HPT do not take any treatment (Chobanian et al., 2003:217). Research conducted by Osamor and Owumi (2011:621) reported that more than half of the participants were unemployed.

- **Average earnings**

The findings of the current study demonstrate more than half of the participants (53.0%) were earning a monthly salary of between R1000-R1999 and did not comply with a treatment regimen. This could indicate financial difficulties in that they cannot afford to buy medication when it is out of stock at the clinics. Other studies also revealed that patients with low incomes were more likely to be noncompliant to treatment (Gelaw et al., 2014:54; Anuwer et al., 2015:787). However, in other cases, income was not related to compliance levels (Stilley et al., 2004:1120). The association between compliance and earnings is not clear. However, this discrepancy might be due to the different health care systems in the various countries. Research by Atallah, Inamo, Larabi, Chatellier, Rozet, Machuron, De Gaudemaris and Lang (2007:319) in the Caribbean reported that high prevalence and poor control of HPT is detected in populations with low socioeconomic status, including poor

therapeutic control in the lower social classes, as in this study. Therefore, the majority of the participants had a source of income in this study.

- **Marital status**

The findings of this study imply that non-married participants (64.9%) are less compliant with treatment than married individuals. Marital status might influence participants' compliance with treatment positively as the support from a spouse could be the reason why married patients were more compliant than those who are widowed, single or divorced. Other studies support this and demonstrate higher treatment compliance among married patients than divorced, single or widowed (Hadi & Rostami, 2004:294; Rosland et al., 2008:1995). Research conducted by Rosland et al. (2008:1995) reported that practical and emotional support received by the family had a positive influence on measures of disease management in patients internationally. Research does suggest that social support can benefit patients diagnosed with HPT by reducing the impact of stress, changing disturbing states, encouraging adherence to treatment and influencing change in negative health behaviours.

Additionally, research indicates strong associations between positive family dynamics (e.g., cohesion and familial guidance) and better BP control among patients diagnosed with HPT (Pereira, Berg-Cross, Almeida & Machado, 2008:190). Regarding family cohesion, describing families as warm, accepting and close, the probability of adherence was three times higher compared to non-cohesive families. Furthermore, family structural support (patient's marital status and living arrangements) is also positively associated with treatment adherence.

A study conducted in Dar es Salaam, Joho (2012:33) on factors affecting treatment compliance among patients diagnosed with HPT reported the probability of adherence for married patients was higher than for single patients. However, in the same study, functional social support (e.g., practical and emotional support) had stronger effects on adherence to treatment than structural social support, suggesting that the quality of family-patient relationships matters more than just the presence of individuals within a patient's network of support. Family members are the most significant source of that support. Jin et al.

(2008:277) further demonstrated that married patients who had emotional support and help from family members or health care providers were more likely to be compliant with the treatment regimen. Social support helps patients to decrease negative attitudes to treatment, be motivated and remember to implement treatment. Also, social and financial assistance from family may help patients to work through various life stressors.

Commitment to marriage also encourages patients to stay healthy and motivated to engage in more positive health-related activities. Patients who leave a marriage may lose their only financial resource and social support previously provided and may suffer from depression leading to reduced treatment compliance. However, the stability or duration of marriage may be another variable with a significant impact on patient's health and marriage increases the probability of compliance with treatment. This contrasts with the study conducted by Arshia et al. (2015:161) in Tanzania that found that noncompliance was equally distributed among married and single individuals although the difference was found to be insignificant in both studies.

- **Duration of illness**

The findings of this current study reveal that 31 (23.1%) of participants who lived with the diagnosis of HPT for more than five years are noncompliant. Compliance with long-term therapy was difficult for patients with HPT. However, another Ethiopian study did reveal a similar association with duration of illness (Anuwer et al., 2015:787).

5.3 FAMILY HISTORY OF ILLNESS BY PARTICIPANTS

- **Kinds of treatment**

More than half of the participants (57.5%) took more than one type of treatment, which could mean that they suffer from other medical conditions. Since antihypertensive medications are taken daily for the rest of their lives, multiple dosages will increase frustration and can lead to noncompliance (Awad et al., 2015:33). Research has revealed that treatment compliance decreases when patients with chronic conditions take more than one type of treatment (Coleman, Limone, Sobieraj, Lee, Roberts, Kaur, & Alam, 2012:535). This could be the case in this study since most participants are taking more than one type

and have had the condition for longer than five years. However, acute illnesses are associated with higher compliance than chronic diseases (Gascón, Sanchez-Ortuño, Llor, Skidmore & Saturno, 2004:128).

5.4 COMPLIANCE WITH TREATMENT

- **Stop taking treatment when feeling well**

The current findings demonstrate that the participants (40.3%) who were noncompliant mentioned the reason as being feeling well (when there are no symptoms). This indicates their lack of knowledge about the disease as they think that absence of symptoms denotes a cure. The adverse effect of discontinuing treatment is the development of complications. The lack of HPT symptoms is a high contributing factor to low adherence to treatment as observed in the current study. Nevertheless, Awad et al. (2015:33) state that it is the degree of disease brought about by symptoms that promote good compliance. Some symptoms may not encourage the commitment to follow treatment instructions.

A study by Hashmi et al. (2007:280) on factors associated with adherence to antihypertensive treatment in Pakistan revealed that awareness about HPT and its treatment was minimal. Most took their medication only when they thought they had symptoms of high BP and this group had little commitment to taking their medication. Such decisions to discontinue treatment are based on the mistaken assumption that having no symptoms indicates recovery. However, research shows that HPT is a disease without symptoms. Patients diagnosed with HPT are reluctant to seek care because they feel that this is not a priority and this may cause them not to adhere to their medications.

Samim et al. (2010:33) in their research on the compliance of patients diagnosed with HPT to management in Duhok, reported similar reasons for not taking treatment regularly that may be related to the disease type (HPT) being asymptomatic and chronic. Chronic illness usually connects to a high incidence of defaulters. Furthermore, they explained that complications attributed to HPT are irrelevant and often the patient does not realise the importance of maintaining the treatment regimen. Studies conducted by Mathevula (2013:32) support this. Patients have reported feeling well without treatment and the

absence of symptoms of HPT as reasons for their noncompliance with treatment. It is surprising to discover that patients with a chronic condition, such as HPT, lack basic knowledge, awareness of potential risks and the importance of following the prescribed treatment even without symptoms.

So, it does not seem unusual that they also have lay knowledge and beliefs about medication that can reduce compliance. Health care workers must address this and, if this is the case, adequate information should be provided to minimise fear and anxiety about medicines as this might improve compliance.

- **Contributory factors of noncompliance with treatment**

The present study also found other contributory factors for noncompliance with treatment as being forgetfulness (41%), feeling bad about their medication (15.1%), belief that treatments were ineffective (11.4%) and constant change of treatment by the doctor (12.8%). When participants perceived forgetting to take treatment and side-effects of medication as problematical, they were less likely to comply with antihypertensive treatment. Also, it is not surprising that participants forget to take their treatment and attend follow-up visits because the majority are aged over 60 years.

However, in this study, there was little evidence of reported side-effects of treatment (13.4%) feared by participants to cause them to stop taking medication as prescribed. This finding might indicate a relative tolerance to the prescribed antihypertensive treatment among the participants. The present study contrasts with other studies that found treatment side-effects as the significant reason for patients' noncompliance to treatment regimens (Alexa et al., 2006:17; Hashmi et al., 2007:280).

5.5 PATIENTS' BELIEFS AND PERCEPTIONS

The study findings revealed that 87.3% of participants were taking treatment to manage their condition rather than using diet, traditional medication and spiritual healing. It is believed that antihypertensive treatment is effective in reducing high BP and significantly reduces the risk of cardiovascular illness (Chobanian et al., 2003:1217). Furthermore, the benefits for the patients from antihypertensive treatment is diminished because of poor

compliance while noncompliance can be unintentional (such as forgetting) or intentional, whereby patients diagnosed with HPT decide not to take treatment based on their personal beliefs about their illness and treatment (Hashmi et al., 2007:281).

In contrast, a study conducted by Gascón et al. (2004:128) indicated patients diagnosed with HPT identified several factors influencing noncompliance. These included fear of using treatment and being dependent on them for the rest of their lives, confidence in natural remedies being effective in controlling HPT, believing that the disease has been cured providing BP was controlled, as well as little awareness of HPT treatment, risk factors, characteristics and complications. Among 134 participants, many (67.2%) believe that diet control can manage HPT while 26.1% did not know. Findings of this research suggest that most of the participants had poor compliance on eating healthy food like fruits.

- **Participants believed on benefit from physical exercise**

The results of this study demonstrate that 59.7% of participants believe that patients diagnosed with HPT could benefit from physical exercise. However, 40.3% never exercise due to ignorance or lack of motivation from health care providers and this can contribute to complications. The most significant barrier was a lack of discipline in complying with the required dietary restrictions. In this study, patients with HPT with a greater perception of difficulties such as little time to exercise and lack of motivation because they could not be cured were expected to demonstrate less compliance behaviour than those who believe that the benefits outweigh the barriers (Glanz, Rimer & Lewis, 2002:48).

Research has revealed that regular moderate exercise such as walking briskly or performing aerobics (lasting at least 30 minutes three times per week) can lower systolic and diastolic HPT considerably. Also, the WHO strongly recommends lifestyle modifications since these usually have no adverse effects, do not affect the quality of life and are less expensive than pharmacological treatment (WHO, 2003b:5).

5.6 COMPLIANCE TO THE LIFESTYLE MODIFICATION REGIMEN

- **Diet**

The current study demonstrates that most patients did not adhere to the correct diet. Forty-one per cent of participants used salt on food, did not eat fruits or vegetables and almost half of participants ate fast food, which is the opposite of what is advised. Studies conducted by Anuwer et al. (2015:786) reported that dietary changes alone could efficiently reduce the systolic BP of a patient diagnosed with HPT by a range of 8-14 mmHg. Also, decreased saturated fat and dietary salt consumption are vital nutritional factors in the prevention and control of HPT. The reduction of salt intake in a diet is a significant component of the non-pharmacological treatment of HPT.

Several studies have confirmed strong associations between salt intake and HPT (Appel, 2003:101; Obarzanek et al., 2003:459; Anuwer et al., 2015:786). Most family diets are high in sodium chloride. Therefore, hypertensive and non-hypertensive persons are advised to limit their dietary salt intake to 100mmol per day (2.4g sodium) or 6g of sodium chloride per day (Chobanian et al., 2003:1217).

- **Never try to reduce weight**

The findings of this study revealed that most participants (57.9%) never try to reduce weight. Similarly, the research in the Seychelles by Edo (2009:112) demonstrated significant noncompliance concerning engaging in physical exercise and trying to lose weight and another Egyptian study revealed a similar association in that 64% did not try to reduce weight (Awad et al., 2015:34). Health-related actions to lower BP include weight reduction, adopting a dietary approach to stop hypertension (DASH) eating plan, reduced dietary salt intake, decreased saturated fat consumption and reduced alcohol consumption (Chobanian et al., 2003:1217; Edo, 2009:112).

A study conducted in Turkey by Cakir and Pinar in a randomised controlled clinical trial (2006:190) tested the effects of extensive lifestyle modifications by patients diagnosed with

HPT. The researchers randomly allocated 70 patients into intervention and control groups and collected baseline data from both. The intervention group had health education sessions and individual counselling on lifestyle modifications while the control group had none. After six months, the authors found that BP, body weight, body mass index, waist circumference and fasting lipids reduced significantly among the intervention group compared to the control group.

- **Smoking and alcohol**

The result in the current study reveals general compliance with smoking cessation and alcohol intake restrictions. Hence few participants consume alcohol and smoke cigarettes. Cigarette smoking is considered as a significant risk factor for high BP and overall cardiovascular diseases and a major risk for respiratory illnesses and cardiovascular mortality (Dochi, Sakata, Oishi, Tanaka, Kobayashi & Suwazono, 2009:42). Several studies on compliance among HPT and renal transplantation patients found that those who smoked or drank alcohol were more likely to be noncompliant to a medical regimen (Cooper et al., 2005:1072; Fodor et al., 2005:1263; Tugli et al., 2014:1618).

Appel (2003:101) argues that lifestyle modification has essential roles in hypertensive and non-hypertensive individuals. Smoking, drinking alcohol, consumption of unhealthy food and noncompliance to treatment are serious risk elevation factors for HPT. Appel (2003:101) indicated lifestyle modification as an initial treatment before the start of drug therapy and in addition to medication in persons already on drugs.

Compliance involves the degree to which patients diagnosed with HPT adapt to medical advice, comply with lifestyle and dietary changes and keep medical appointments and follow-ups, and take and maintain treatment prescription and regimen. Despite the availability of safe and effective therapy, management of HPT remains poorly controlled due to noncompliance (Appel, 2003:101; Osamor & Owumi, 2011:621).

However, there are indications that interventions are essential to motivate more participants to abstain from consuming salt, fast food, animal fat, alcohol and stop smoking cigarettes. Noncompliance is one of the primary reasons for poor control of HPT worldwide.

Therefore, estimation and identification of the population most likely to be noncompliant to treatment would support middle income and implementing simple, cost-effective measures and perhaps result in deterioration in complications.

5.6 CONCLUSION

Chapter 5 presented the discussion findings of the data analysis and interpretation of the data using descriptive statistics. Various factors related to participants' noncompliance with their antihypertensive treatment and lifestyle modification regimen were described.

CHAPTER 6

SUMMARY, CONCLUSIONS, LIMITATIONS AND RECOMMENDATIONS

6.1 INTRODUCTION

Chapter 4 and 5 presented the results of the data analysis and interpretation of findings. This section presents the summaries, conclusions, limitations and recommendations based on the research findings regarding the contributory factors on noncompliance to treatment amongst patients diagnosed with HPT. Following the analysis and interpretation of the data, the objectives of the study correlated with the results.

6.2 OVERVIEW OF THE STUDY

6.2.1 Purpose of the study

The purpose of this study was to identify and describe the contributory factors of noncompliance to treatment among patients diagnosed with HPT. The study sought to answer the following question: What are the contributory factors of noncompliance to treatment among patients diagnosed with HPT in the Vhembe District of the Limpopo Province?

6.2.2 Objectives of the study

The objectives of this study were as follows: Identify and describe the contributory factors of noncompliance to treatment, assess the beliefs and perceptions of patient diagnosed with HPT, and describe the lifestyle modification regimen of patient diagnosed with HPT.

6.3 SUMMARY OF THE STUDY

6.3.1 Demographical data

The majority of female participants in this study were noncompliant to treatment as compared to those male patients diagnosed with HPT. These conclusions were similar to the results of the research conducted in the Netherlands by Van Wijk, Klungel, Heerdink and Boer (2004:1832) which revealed that men are more compliant than women. Awad et al. (2015:33) found similar findings in a study conducted in Egypt.

Regarding age distribution, most participants were 40 years of age and older, and this is expected as HPT is usually diagnosed in adults. Similarly, other studies conducted in Romania and Ethiopia by Alexa et al. (2006:15) and Gelaw et al. (2014:55) indicated most patients above 60 years were noncompliant to treatment due to economic and distance problems. In contrast, studies conducted by Samim et al. (2010:31) and Alsolami et al. (2012:28) reported that compliance was highest in patients diagnosed with HPT aged 70 years and above.

This study indicated that participants with formal education had poor treatment compliance compared to those with informal education. Findings revealed that unmarried participants were more likely to be noncompliant with treatment than those who are married as established in the study by Cooper et al. (2005:1072). Marital status might influence participants' compliance positively with support from a spouse being the reason why married patients are more compliant with treatment.

6.3.2 Compliance with the treatment

The current findings demonstrate that 40.3% of participants who were noncompliant mentioned the contributing factor to noncompliance to treatment as feeling well (i.e., there are no symptoms). This indicates their lack of knowledge about the disease as they think that absence of symptoms denotes a cure and has an adverse effect because they discontinue treatment leading to the development of complications. The lack of HPT symptoms is a substantial contributing factor to low adherence to treatment as observed in this study. Nevertheless, Haynes, McDonald and Garg (2002:2882) and Mathevula (2013:32)

state that it is the degree of disease brought about by symptoms that promote good compliance.

Some symptoms may fail to encourage the commitment to follow treatment instructions. A study by Kumanan et al. (2016:50) on non-adherence to antihypertensive treatment in Sri Lanka revealed that awareness about HPT and its treatment was minimal, as participants took their treatment only when they had symptoms of high BP and had very poor adherence. The decisions to discontinue treatment are based on the mistaken assumption that the absence of symptoms indicates recovery. Research shows that HPT is a disease without symptoms. Therefore, patients diagnosed with HPT are reluctant to seek care because they feel that this is not a priority for them; this may cause them not to follow their treatment.

6.3.3 Patient's beliefs and perceptions

Among the 134 individuals, some participants (32.8%) did not know nor believe that diet control could manage HPT. Findings of this research revealed that more than half of the participants (59%) did not eat fruit, which means they did not know the importance of eating fruit mostly due to lack of knowledge about healthy food. Only a few participants ate fruit daily and had sufficient sleep.

A study conducted by Miller, Erlinger, Young, Jehn, Charleston, Rhodes, Wasan and Appel (2002:612) reported that dietary changes alone could efficiently reduce the systolic BP of a patient diagnosed with HPT by a range of 8-14 mmHg. In this study, 50.8% of participants eat fast food and 41% of participants use salt, which is not recommended for patients diagnosed with HPT. Decreased saturated fat and dietary salt consumption are major components of the non-pharmacological treatment in the prevention and control of HPT. Several studies have confirmed strong associations between salt intake and HPT (Appel, 2003:101; Obarzanek et al., 2003:459; Anuwer et al., 2015:786).

Forty-five per cent of participants did not know that physical exercise could manage HPT or benefit those diagnosed with HPT and only 26% of participants exercise. Most of the participants in the present study never exercised. Therefore, they were noncompliant with

lifestyle modifications due to lack of knowledge. Research reveals that regular moderate exercise such as walking briskly or performing aerobics (lasting at least 30 minutes three times per week) can lower systolic and diastolic HPT considerably. Also, the WHO strongly recommends lifestyle modifications since there are no known adverse effects, it does not affect the quality of life and is usually less expensive than pharmacological treatment (WHO, 2003b:5).

6.3.4 Compliance to the lifestyle modification regimen

The findings of this study revealed that more than half of the participants (57.9%) never try to lose weight. Health-related actions to lower BP are weight reduction, adopting a dietary approach to stop HPT (DASH) eating plan, reducing salt intake, decreasing saturated fat consumption and reducing alcohol consumption (Chobanian et al., 2003:1217; Edo, 2009:112). Similar findings were obtained in a related study in the USA. The results of the diet, exercise and weight loss intervention trial conducted by a group of researchers reported that BP could be controlled by extensive lifestyle modifications (Miller et al., 2002:616).

The data from this study reveals general compliance with smoking cessation and alcohol intake restriction requirements. Hence, the results reflect that 32.7% participants consume alcohol and 12.7% smoke cigarettes. Cigarette smoking is considered a major risk factor for high BP and overall cardiovascular disorders and remains a significant risk for respiratory diseases and cardiovascular mortality (Dochi et al., 2009:42). Several studies on compliance among HPT and renal transplantation patients found that those who smoked or drank alcohol were more likely to be noncompliant to medical regimens (Cooper et al., 2005:1072; Tugli et al., 2014:1618; Gelaw et al., 2014:55).

6.4 LIMITATIONS OF THE STUDY

The study was conducted among patients diagnosed with HPT within one hospital and nine PHC facilities in the Vhembe District of the Limpopo Province. Participants were male and female patients diagnosed with HPT from the age of 20 years and above that were on antihypertensive treatment for six or months or longer. Therefore, findings from this study cannot be generalised to patients attending private clinics and all PHC facilities in the Vhembe District.

6.5 RECOMMENDATIONS FROM THE FINDINGS

Based on the outcome of this study, the following recommendations are suggested for improving the use of HPT health services and compliance to treatment by patients diagnosed with HPT. The researcher also highlights areas recommended for further research on contributory factors of noncompliance to treatment among patients diagnosed with HPT.

The aim is to provide a basis for suitable interventions and opportunities to the DOH to develop HPT education policies and programmes taught by professionals. Moreover, the information and strategies generated here could be used to reduce the number of unintended HPT complications among patients diagnosed with HPT in the Vhembe district.

6.5.1 Nursing Practice

- The Directorate for chronic diseases and geriatrics should supply pamphlets with HPT information written in patients' language to the PHC facilities and Hospitals to distribute information.
- Health promotion and education campaigns delivered through the mediums of radio and television, posters and pamphlets targeting all patients diagnosed with HPT to improve compliance. Medical practitioners and other health care workers such as nurses and dieticians should supplement with health education and advice. Doctors and all health care professionals need to stress that the treatment is for life, dosages should not be missed or discontinued.
- Communities and families of patients diagnosed with HPT should be targeted to provide advice and social network support system.

- Reinforce HPT awareness through health education to communities in areas, for example, basic knowledge and management of HPT
- Health education should cover the nature of HPT specifically emphasising causes, severity and potential complications. Furthermore, stressing the necessity to comply with the prescribed treatments, lifestyle modifications and the consequences of noncompliance.
- For all patients diagnosed with HPT, health care workers need to stress the importance of treatment compliance despite the absence of symptoms which could affect their compliance levels. This includes complying with follow-up visits and honouring clinic appointments.
- Lifestyle modification education directed specifically to all patients diagnosed with HPT. Health care workers should assist patients diagnosed with HPT to remove identified barriers that prevent them from making the required lifestyle changes, such as dietary restrictions, cessation of smoking, physical exercise, relaxation, sufficient sleep, avoiding alcohol, reducing salt intake and remaining motivated.
- Introduce contact mechanisms at the health care facilities to trace and monitor patients diagnosed with HPT who do not comply with follow-up visits and clinic appointments.

6.5.2 Recommendations for further research study

- Conduct similar studies in other regions of the Limpopo Province on contributory factors of noncompliance to treatment among patients diagnosed with HPT.
- Further research on the prevalence of HPT and uncontrolled HPT should be conducted to determine the effectiveness of lifestyle modifications and medication regimens regarding improved prognosis.

  The results from such studies would encourage patients diagnosed with HPT to comply and health care professionals to increase strategies to improve compliance.

  Such surveys would provide relevant information for policymakers to evaluate trends over time.

- Qualitative research should be conducted to acquire more detailed information about factors to improve compliance.

6.6 CONCLUSIONS

In conclusion, this study identified and described the contributory factors of noncompliance to treatment among patients diagnosed with HPT in the Vhembe district of the Limpopo Province. This quantitative descriptive research on noncompliance to treatment among patients diagnosed with HPT (medication and lifestyle modification regimens) revealed poor compliance. Findings of this study showed that most participants above 40 years were noncompliant, more females were noncompliant than males, participants with formal education were also noncompliant with treatment. Other findings suggest there are many negative implications such as patients not taking treatment because they have no symptoms and this is common among those diagnosed with HPT. The risk behaviours identified are insufficient relaxation and sleep, never engaging in physical exercise and failure to reduce their weight. Most participants did not comply with the dietary requirements.

The findings could be used in an integrated programme to enhance self-management monitoring of patients diagnosed with HPT. It further proposes that the management of high BP is not only about medical therapy but also about lifestyle modification. Noncompliance can be prevented with simple measures like proper counselling, comprehensive prescription explanations, efficient health care delivery systems and establishing a support group for HPT patients. Health education and training are recommended as vital to improving the compliance with treatment in the Vhembe district of the Limpopo Province.

REFERENCES

Addo, J., Smeeth, L. & Leon, D.A. 2007. Hypertension in Sub-Saharan Africa: A systematic review. *Hypertension*, *50*: 1012–1018.

Alexa, I.D., Stoicia, S., Burca, P., Obreja, L., Rusu, I.R., Ungureanu. G. & Covic, A. 2006. Noncompliance in a large population of elderly patients with cardiovascular disease. *Journal of Clinical Medicine*, *1*(3): 14–18.

Alsolami, F., Xiang-Yu, H. & Correa-Velez, I. 2012. Factors Affecting Antihypertensive Treatment Adherence: A Saudi Arabian Perspective. *Clinical Medicine and Diagnostics*, *2*(4): 27–32.

Anuwer, R., Seifu, M.F., Gelaw, B.K., Gunasekaran, T., Gebremariam, E.T. & Mohammed, M.A. 2015. Non-adherence and Its contributing factors to anti-hypertensive medication in ambulatory patients diagnosed with HPT in Adama Referral Hospital, Oromia Region, Ethiopia. *Indo American J of Pharm Sci*, *2*(4):780–789.

Appel, L.J. 2003. Lifestyle modification as a means to prevent and treat high blood pressure. *Journal of American Society of Nephrology*, *14*(2): 99–102.

Arshia, B., Mehwish, R., Noor-ulain, S., Mariam, A., Sadaf, S. & Sobia, R. 2015. Noncompliance to anti-hypertensive medication and its associated factors among hypertensives. *J Ayub Med Coll Abbottabad, 27*(1):158–63.

Atallah, A., Inamo, J., Larabi, L., Chatellier, G., Rozet, J.E., Machuron, C., De Gaudemaris, R. & Lang, T. 2007. Reducing the burden of arterial hypertension: what can be expected from an improved access to health care? *Journal of Human Hypertension*, *21*:316–322.

Awad, E.Y., Gwaied, B.E., Fouda, L.M. & Essa, H.A.E. 2015. Compliance of patients diagnosed with HPT with treatment regimen and its effect on their quality of life. *Journal of Nursing and Health Science*, *4*(2): 26–36.

Bovet, P., Gervasoni, J., Mkamba, M. & Balampama, M. 2008. Low utilization of health care services following screening for hypertension in Dar es Salaam (Tanzania): A prospective population-based study. *BMC Public health*, *407*(8): 1471–2458.

Burns, N. & Groove, S.K. 2011. *The practice of nursing research-conduct, critique and utilisation*. (5th ed.). Pennsylvania: Saunders.

Brink, H. 2012. *Research methodology for healthcare professional*. (3rd ed.). Cape Town.

Cakir, H. & Pinar, R. 2006. Randomized control trial on lifestyle modification in patients diagnosed with HPT. *Western Journal of Nursing Research*, *28*(2): 190–209.

Chobanian, A.V., Bakris, G.L., Black, H.R., Cushman, W.C., Green, L.A., Izzo, J.L., Jones, D.W., Materson, B.J., Oparil, S., Wright, J.T. & Rocella, E.J. 2003. The seventh of report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure. *JAMA*. 289:2560–2572.

Cooper, C., Carpenter, I. & Katona, C. 2005. The AdHOC study of older adults' adherence to medication in 11 countries. *Am J Geriatric Psychiatry*, *13*(12):1067–76.

Coleman, C.I., Limone, B., Sobieraj, D. M., Lee, S., Roberts, M.S., Kaur, R. & Alam, T. 2012. Dosing frequency and medication adherence in chronic disease. *Journal of Managed Care Pharmacy*, *18*(7): 527–39.

Department of Health (DOH), 1998. *South African demographic and health survey*. Pretoria.

Department of Health (DOH), 2014. *South African standard treatment guidelines and essential drug list for primary health care*, (5th ed.). Pretoria.

De Vos, A.S., Strydom, H., Fouche, C.B. & Delport C.S.L. 2011. Research at grassroots for the social sciences and human service professions. (4th ed.). Pretoria: Van Schaik.

Dochi, M., Sakata, K., Oishi, M., Tanaka, K., Kobayashi, E. & Suwazono, Y. 2009. Smoking as an independent risk factor for hypertension: a 14-year longitudinal study in male Japanese workers. *Tohoku Journal of Experimental Medicine*, *217*(1): 37–43.

Edo T.A. 2009. Factors affecting compliance with antihypertensive drug treatment and required lifestyle modification among patients diagnosed with HPT on Praslin Island [a thesis for master in public health. Praslin Island - University of South Africa; [accessed Oct 16, 2012].

Fodor, G.J., Kotrec, M., Bacskai, K., Dorner, T., Lietava, J. & Sonkodi, S. 2005. Is interview a reliable method to verify the compliance with antihypertensive therapy? An international central-European study. *Journal of Hypertension*, *23*(6): 1261–1266.

Gascón, J.J., Sánchez-Ortuño, M., Llor, B., Skidmore, D. & Saturno, P.J. 2004. Why patients diagnosed with HPT do not comply with the treatment: Results from a qualitative study. *Family Practice*, *21*(2): 125-130.

Gelaw, B.K., Yitayih, K.G., Gizaw, D.S. & Esayas, T.G.M. 2014. Assessment of adherence of patients with anti-hypertensive medication and factors for non-adherence in Amhara Region Dessie Referral Hospital, Ethiopia. *International Journal of Chemical and Natural Science*, *2*(1): 51–57.

Glanz, K., Rimer, B.K. & Lewis, F.M. 2002. *Health behavior and health education: theory, research and practice.* (3rd ed.). Jossey-Bass: San Francisco.

Grove, S.K., Gray, J.R. & Burns, N. 2015. Understanding nursing research: building an evidence-based practice. (6th ed.). Philadelphia: Saunders.

Hadi, N. & Rostami, G.N. 2004. Determinant factors of medication compliance in patients diagnosed with hypertension of Shiraz, Iran. *Archives of Iranian Medicine*, *7*(4): 292–296.

Hashmi, S.K., Afridi, M., Abbas, K., Sajwani, R.A., Saleheen, D. & Philippe, M. 2007. Factors Associated with Adherence to Anti-Hypertensive Treatment in Pakistan. *PLoS ONE*, *2*(3): e280.

Haynes, R.B., McDonald, H.P. & Garg, A.X. 2002. Helping patients follow prescribed treatment: Clinical applications. *JAMA*. *288*(22): 2880–2883.

He, F.J. & MacGregor, G.A. 2003. Cost of poor blood pressure control in the UK: 62,000 unnecessary deaths per year. *J Hum Hypertens*, *17*(7): 455–457.

Henein, M.Y. 2010. Department of Public Health and Clinical Medicine, and Heart Centre, Umeå University, SE-90187, Sweden. *British Journal of General Practice*, 12:880.

http://www.dhsd.limpopo.gov.za/docs/reports/final%20DHSD **(**Accessed 10 September 2014)

Jin, J., Sklar, G.E., Oh V, M.S. & Li, S.C. 2008. Factors affecting therapeutic compliance: A review from the patient's perspective. *Therapeutics and Clinical Risk Management, 4*(1): 269–286.

Joho, A.A. 2012. Factors affecting treatment compliance among hypertension patients in three district hospitals - Dar Es Salaam. Master's Thesis, Muhimbili University of Health and Allied Sciences.

Jokisalo, E., Kumpusalo, E., Enlund, H., Halonen, P. & Takala, J. 2002. Factor related to noncompliance with antihypertensive drug therapy. *Journal of Human Hypertension*, *16*(8): 577–583.

Kabir, M., Iliyasu, I.S., Abubakar & Jibril, M. 2004. Compliance to medication among patients diagnosed with hypertension in Murtala Mohammed Specialist Hospital, Kano, Nigeria. *Journal of Community Medicine & Primary Health Care*, *16*(1): 16–20.

Kaplan, M.N. 2005. *Kaplan's clinical hypertension*. (9th ed.). Philadelphia: Lippincott Williams & Wilkins.

Knight, E.L., Bohn, R.L., Wang, P.S., Glynn, R.J., Mogun, H. & Avorn, J. 2001. Predictors of uncontrolled hypertension in ambulatory patients. *Hypertension*, *38*(4): 809–814.

Krousel-Wood, M., Islam, T., Webber, L.S., Re, R.N., Morisky, D.E. & Muntner, P. 2009. New medication adherence scale versus pharmacy fill rates in seniors with hypertension. *Am J Manag Care*. *15*(1): 59–66.

Kumanan, T., Guruparan, M. & Mohideen, M.R. 2016. Non-adherence of antihypertensive therapy: A serious public health issue in Sri Lanka. *Journal of the Ceylon College of Physicians*, *47*(1): 50–51.

Kumar, P. & Halesh, L.H. 2010. Antihypertensive treatment: a study on correlates of non-adherence in a tertiary care facility. *Int J Biol Med Res*. *1*(4): 248-252.

Li, W.W., Wallhagen, M.I. & Froelicher, E.S. 2008. Hypertension control, predictors for medication adherence and gender differences in older Chinese immigrants. *Journal of Advanced Nursing*, *61*(3): 326–335.

Limpopo Department of Health (DOH) 2014. District Health Information System (DHIS).

Lubaki, J., Mabuza, L., Malete, N., Maduna, P. & Ndimande, J.V. 2009. Reasons for noncompliance among patients with hypertension at Vanga Hospital, Bandundu Province, Democratic Republic of Congo (DRC): A qualitative study. *African Journal of Primary Health Care & Family Medicine*, *1*(1): 2–5.

Maepe, L.M. & Outhoff, K. 2012. Hypertension in gold miners. *South African Medical Journal*, *102*(1): 30–33.

Mafutha, G.N. & Wright, S.C.D. 2013. Compliance or noncompliance of hypertensive adults to hypertension management at three primary health care day clinics in Tshwane. *Journal of the Democratic Nursing Organisation of South Africa*, *36*(1): 52–58.

Mathevula, H.M. 2013. Factors Affecting Adherence to Treatment in Patients on Chronic Medication at Mokopane Hospital. BPharm (UL). (Masters Dissertation)

Miller, E.R., Erlinger, T.P., Young, D.R., Jehn, M., Charleston, J., Rhodes, D., Wasan, S.K. & Appel, L.J. 2002. Results of diet, exercise, and weight loss intervention trial (DEW-IT). *Hypertension* 46: 612-618.

Mosby's Medical, Nursing, & Allied Health Dictionary. 1994. (4th ed.). United States of America: Philadelphia.

Nagarkar, A.M., Gadhave, S.A., Sharma, I., Choure, A. & Morisky, D. 2013. Factors Influencing Medication Adherence among Patients diagnosed with HPT in a Tertiary Care Hospital, Pune, Maharashtra. *Natl J Community Med*, *4*(4): 559–563.

National Institute for Health and Clinical Excellence. 2006. NICE clinical guideline 34 Hypertension: management of hypertension in adults in primary care (partial update of NICE clinical guideline 18). London: NICE, http://www.nice.org.uk/nicemedia/pdf/CG034NICEguideline.pdf (accessed 11 Nov 2010).

Nazir, A., Muhammad, A.K., Syed, H.S. & Wagas, A. 2008. Compliance to treatment, salt restriction, exercise and control of systemic hypertension in patients diagnosed with hypertension at Abbottabad. *Journal Ayub Med Coll*, *20*(2): 66–68.

Nkosi, N.G. 2008. Management practices and nutrition related knowledge of hypertensive adults in Ga-Rankuwa. Master's thesis. Department of Nursing Science. Tshwane University of Technology, Pretoria.

Obarzanek, E., Proschan, M.A., Vollmer, W.M., Moore, T.J., Sacks, F.M., Appel, L.J., Svetkey, L.P., Most-Windhauser, M.M. & Cutler, J.A. 2003. Individual blood pressure responses to changes in salt intake: results from the DASH-Sodium Trial. *Hypertension*, *42*(4): 459-467.

Osamor, P.E. & Owumi, B.E. 2011. Factors Associated with Treatment Compliance in Hypertension in Southwest Nigeria. *J Health Popul Nutr*, *29*(6): 619–628.

Oxford Dictionary of Current English. 2006. (4th ed.). London: Oxford University Press.

Patel, U.D. & Davis, M.M. 2006. Physicians' attitudes and practices regarding adherence to medical regimens by patients with chronic illnesses. *Clinical Paediatrics*, *45*(5): 439–495.

Peltzer, K. 2004. Health beliefs and prescription medication compliance among diagnosed hypertension clinic attenders in a rural South African hospital. Human Sciences Research Council, University of the North.

Polit, D.F. & Beck, C.T. 2012. *Nursing research: generating and Assessing Evidence for Nursing Practice*. (9th ed.). Lippincott William & Wilkins. New York-London.

Pereira, M., Berg-Cross, L., Almeida, P. & Machado, J. 2008. Impact of family environment and support on adherence, metabolic control, and quality of life in adolescents with diabetes. *Int J Behav Med*. *15*:187–193.

Ramli, A., Ahmad, N.S. & Paraidathathu, T. 2012. Medication adherence among patients diagnosed with hypertension of primary health clinics in Malaysia. *Patient Preference and Adherence*, 6: 613–622.

Rosland, A.M., Kieffer, E. & Israel, B. 2008. When is social support important? The association of family support and professional support with specific diabetes self-management behaviors. *J Gen Intern Med*, *23*: 1992–1999.

Samim, A., Al-dabbagh, M.D. & Sirwan, M. 2010. Compliance of patients diagnosed with hypertension to management in Duhok Governorate. *Duhok Med Journal*, *4*(1): 28–37.

Stilley, C.S., Sereika, S. & Muldoon, M.F., et al. 2004. Psychological and cognitive function: predictors of adherence with cholesterol lowering treatment. *Ann Behav Med*, *27*(2): 117–24.

Svetkey, L.P., Erlinger, T.P., Vollmer, V.M., Feldstein, A., Cooper, L.S. & Appel, L.J. 2005. Effects of comprehensive lifestyle modifications on blood pressure by race, sex, hypertension status and age: the report of the Premier Collaborative Research Group. *Journal of Human Hypertension*, *19*: 21–31.

Tugli, A.K., Ramaano N.S., Klu, E.K., Mokonoto, M., Korkpoe, C.H. & Morwe, K. 2014. Assessing Medication Default, Alcohol Intake and Smoking Habits among Patients diagnosed with HPT in a Rural Village of Limpopo Province, South Africa. *Mediterranean Journal of Social Sciences*, *23*(5): 1614–1620.

Van Wijk, B.L.G., Klungel, O.H., Heerdink, E.R. & De Boer, A. 2004. The association between compliance with treatment and modification of antihypertensive drug regimen. *Journal of Hypertension*, *22*: 1831–1837.

Wang, P.S., Bohn, R.L., Knight, E., Glynn, R.J., Mogun, H. & Avorn, J. 2002. Non- compliance with antihypertensive medications: the impact of depressive symptoms and psychosocial factors. *Journal of General Internal Medicine*, *17*(7): 504–511.

World Health Organization (WHO). 2003a. *Adherence to long-term therapies: evidence for action*. Geneva: World Health Organisation.

World Health Organization (WHO). 2003b. *Diet, nutrition and the prevention of chronic diseases: report of a joint WHO/FAO expert consultation*. WHO Technical Report Series, No. 916. Geneva: World Health Organisation.

World Health Organization (WHO). 2006. International Society of Hypertension. Guidelines for the management of hypertension-part II. *Cardiology today*, 6: 1646–1647.

ANNEXURE A: ETHICAL APPROVAL CERTICATE

RESEARCH AND INNOVATION
OFFICE OF THE DIRECTOR

NAME OF RESEARCHER/INVESTIGATOR:
Ms VS Mashila

Student No:
11636573

PROJECT TITLE: Contributory factors of non-compliance to treatment among patients diagnosed with hypertension in Vhembe District of Limpopo Province.

PROJECT NO: SHS/15/PDC/06/0206

SUPERVISORS/ CO-RESEARCHERS/ CO-INVESTIGATORS

NAME	INSTITUTION & DEPARTMENT	ROLE
Dr NH Shilubane	University of Venda	Supervisor
Ms S Mulondo	University of Venda	Co-Supervisor
Ms VS Mashila	University of Venda	Investigator - Student

ISSUED BY:
UNIVERSITY OF VENDA, RESEARCH ETHICS COMMITTEE

Date Considered: June 2015
Decision by Ethical Clearance Committee Granted
Signature of Chairperson of the Committee: .....
Name of the Chairperson of the Committee: Prof. G.E. Ekosse

University of Venda
PRIVATE BAG X5050, THOHOYANDOU, 0950λ LIMPOPO PROVINCEλ SOUTH AFRICA
TELEPHONE (015) 962 8816/8313 **FAX** (015) 962 9060
"A quality driven financially sustainable, rural-based Comprehensive University"

ANNEXURE B: PERMISSION LETTER FROM THE PROVINCE

LIMPOPO
PROVINCIAL GOVERNMENT
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF HEALTH

Enquiries: Latif Shamila Ref:4/2/2

Mashila VS
University of Venda
Private Bag X5050
Thohoyandou
0950

Greetings,

RE: Contributory factors of non-compliance to treatment among patients diagnosed with hypertension in Vhembe District of Limpopo Province

The above matter refers.

1. Permission to conduct the above mentioned study is hereby granted.
2. Kindly be informed that:-
   - Research must be loaded on the NHRD site (http://nhrd.hst.org.za) by the researcher.
   - Further arrangement should be made with the targeted institutions.
   - In the course of your study there should be no action that disrupts the services.
   - After completion of the study, a copy should be submitted to the Department to serve as a resource.
   - The researcher should be prepared to assist in the interpretation and implementation of the study recommendation where possible.
   - The above approval is valid for a 3 year period.
   - If the proposal has been amended, a new approval should be sought from the Department of Health.

Your cooperation will be highly appreciated.

Head of Department

18/12/15
Date

18 College Street, Polokwane, 0700, Private Bag x9302, POLOLKWANE, 0700
Tel: (015) 293 6000, Fax: (015) 293 6211/20 Website: http/www.limpopo.gov.za

The heartland of Southern Africa – *development is about people*

ANNEXURE C: APPLICATION LETTER

University of Venda

P/bag x5050

Thohoyandou

0950

The District Manager

Vhembe District

P/bag x5009

Thohoyandou

0950

Dear Sir / Madam

APPLICATION FOR PERMISSION TO CONDUCT RESEARCH IN THE VHEMBE DISTRICT

Mashila Vuledzani Sylvia currently registered in Masters in Nursing programme at the University of Venda (UNIVEN), under the Department of Advanced Nursing Science, hereby request for permission to conduct a research study at regional hospital and 9 primary health care facilities. Based on the curriculum of the above-mentioned programme, I am expected to conduct a study which could be of value to the community and help the health care providers to render a quality comprehensive care to our clients and enhance my knowledge and skills in research.

Topic of the study: Contributory factors of noncompliance to treatment among patients diagnosed with HPT in the Vhembe District of the Limpopo Province.

My supervisors are Prof Shilubane NH and Dr Mulondo SA in the Department of Advanced Nursing Science, School of Health Sciences.

The purpose of the study is to: identify and describe the contributory factors of noncompliance to treatment among patients diagnosed with HPT in the Vhembe District of the Limpopo Province.

The following ethical standards will be observed throughout the research process to preserve the name and dignity of the participants:

- Informed consent will be signed voluntarily or under no pressure.
- Voluntary participation and freedom to withdraw without penalty.
- Data collected will only be accessed by my supervisor and statistician.
- Raw data will be kept under lock and key to ensure confidentiality.
- Names of the participants will not be mentioned during the discussions.
- Checklist will be destroyed.
- The research summary will be made available for the Head of Department of Health.

Hoping that permission will be granted

Yours faithfully

Mashila Vuledzani Sylvia

Signature of the researcher…… Date…….

Contact number: 0768291365

ANNEXURE D: PERMISSION LETTER TO CONDUCT STUDY FROM DISTRICT

LIMPOPO
PROVINCIAL GOVERNMENT
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF HEALTH: VHEMBE DISTRICT

Enquiries: Makhwanya T E

Contact details: 084 690 0606 or Makhwanyate@gmail.com or fax no 015 962 2373

Date: 15th January 2016.

To: CEO: Tshilidzini hospital

Sub-district Managers: PHC

All sub-districts

RE: PERMISSION TO CONDUCT THE STUDY: MS MASHILA V S.

This is to confirm that the above-mentioned student has been accepted by the District to conduct the research study as approved by the Province (See attached approval).

Your hospital and or PHC facilities (Tshilwavhusiku CHC, Makhado CHC, Mutale CHC, Thohoyandou CHC, Tshikuwi clinic, Tshifudi clinic, Madimbo clinic and Vhufuli Tshitereke are hereby requested to give her the necessary assistance and or support since the study is likely to benefit profoundly the District in terms of service delivery.

Thanking you in advance for your assistance and or support.

pp. 15.01.2016

ACTING-DISTRICT EXECUTIVE MANAGER DATE

ANNEXURE E: INFORMATION SHEET FOR PARTICIPANTS

INTRODUCTION AND BACKGROUND

My name is Sylvia Vuledzani Mashila. The purpose of this study is to explore and describe the contributory factors of noncompliance to treatment among patients diagnosed with HPT in the Vhembe District of the Limpopo Province.

I am requesting for your participation in this study. You will be given a questionnaire about factors contributing to noncompliance treatment among patients diagnosed with HPT that will take approximately 45 minutes to complete. The information that you will provide, is essential for the study.

CONFIDENTIALITY

All participants will be given codes, and those codes will be used as your identity during completing questionnaire, instead of using your proper names. All codes will only be known by the researcher. The results of the study will be published anonymously without names. All information provided by you will only be used for the purpose of this study, and will be treated as private and confidential.

CONSENT

Ethical clearance will be obtained from the UNIVEN Research Ethics Committee. Permission to carry out the study will be obtained from the DoH as well as the District Executive Manager of Vhembe District.

I will ask you to voluntarily sign an informed consent form, both to participate in the study and be interviewed. The researcher will appreciate your voluntarily participation.

BENEFITS AND RISKS OF PARTICIPATION

Note that participation in this study is voluntary and there will be no direct benefits to the participants. Participants are free to withdraw from the study if they are no longer interested or if their rights are violated, or if they don't want to give answers.

CONTACT DETAILS

I will be available to answer any question and to give clarity where necessary. This study has been approved by University Higher Degree Committee. For any questions regarding the study and interview contact Mashila Sylvia Vuledzani at 0768291365.

ANNEXURE F: CONSENT FORM

Letter of informed consent

Statement by the researcher

The purpose of the study is to describe the contributory factors of noncompliance to treatment among patients diagnosed with HPT in the Vhembe District of the Limpopo Province. Participation in this study is therefore voluntary and participants can withdraw from it without providing any reasons. Anonymity and confidentiality will be maintained throughout the study and will not be linked to the participants' responses. The result of the study will be communicated back to the participants.

Consent: as the purpose of the study was explained to you I will then require your approval by writing your name and signing in the space provided or uses a thumb print.

I…….. hereby agree that I have heard, read and understand the proposed study and any questions that I had, have been answered. I understand that participation in this study is completely voluntary and I am aware that the results of this study will be used for planning purpose to improve health care services.

Signature of the participant: ……

Date : ……..

Signature of Researcher: …….

Name of the Researcher: …….

ANNEXURE G: QUESTIONNAIRE

Contributory factors of noncompliance to treatment among patients diagnosed with HPT in the Vhembe District of the Limpopo Province

Researcher: Mashila V S

Supervisor: Prof Shilubane NH

Co-Supervisor: Dr Mulondo S A

The purpose of the questionnaire in this study is to identify and describe factors contributing to noncompliance treatment and recommend strategies to improve compliance among patients diagnosed with HPT in the Vhembe District of the Limpopo Province.

SECTION A: DEMOGRAPHICAL CHARACTERISTISTIC OF THE PARTICIPANTS

1. How old are you?

A =20-29	
B = 30-39	
C =40-49	
D =50-59	
E = 60-69	
F =>70	

2. Where do you live?

3. What is your gender?

A = Male	
B = Female	

4. Indicate your marital status

A = Single	
B = Married	
C = Divorced D = Widower	

5. Are you

A = Employed	
B = Self- employed	
C = Unemployed	
D = Others	

6. What are the average earnings of your household per month?

A= O-999	
B= 1000-1999	
C= 2000-2999	
D= 3000-3999	
E= 4000 and more	

7. Indicate your religion/faith

A = Christianity	
B = Indigenous	
C = Muslim	
D = Judaism	

8. Have you received formal education?

A = Yes	
B = No	

9. If yes what is your level of education?

A = Primary school	
B = Secondary school	
C = Undergraduate	
D = Post graduate	

10. Duration of illness

A = Less than 1 year	
B = 1-5 years	
C= 6-10 years	
D = 11-15 years	
E = Above 16 years	

11. Are you a hypertensive patient?

Yes	
No	

SECTION B: HISTORY OF PARTICIPANTS' ILLNESS INCLUSIVE FAMILY MEMBERS

12. Is there anyone with HPT in the family?

Yes	
No	

13. If yes, how are you related to that person

Parent	
Sibling	
Child	
Grandparent	

14. Are you on hypertensive treatment?

Yes	
No	

15. When did you take your treatment?

A = Morning	
B = Evening	

16. Mention type of treatment you are using

A = Diet only	
B=Treatment	
C= Traditional medicine	

17. How many kinds of treatment are you taking for HPT?

One	
Two	
Three	
Four and Above	

18. What health complaints other than high BP do you have?

Heart problems	
Paralysis of a limb	
Swelling of the legs	
Visual impairment	
Kidney problems	
Shortness of breath	
Palpitations	
None	

SECTION C: COMPLIANCE WITH TREATMENT

19. How often do you visit PHC facilities for HPT management?

Monthly	
Bi-monthly	
Quarterly	

20. Is your BP monitored regularly?

Yes	
No	

21. How often is your BP monitored?

Daily	
Weekly	
Monthly	
Quarterly	

COMPLIANCE WITH TREATMENT

How often	Daily	Frequently	Rarely	Never
22. Do you take your treatment as prescribed?				
23. Do you forget to take treatment				
24. Do you stop taking treatment because you feel well				
25. Do you stop taking treatment because you feel worse				
26. Do you stop taking treatment because you believe that they are ineffective				
27. Do you stop taking you treatment because the doctor changes the type of treatment frequently?				
28. Do you receive treatment refill in before you run out of treatment?				
29. Do you turn up for your clinic appointments as scheduled?				
30. Do you stop taking treatment because you fear side-effects?				

SECTION D: PATIENT'S BELIEFS AND PERCEPTIONS

31. What measures can one take to manage HPT?

Use of diet control	
Use of medication	
Use of traditional medication	
Use spiritual healing	

32. Do you take your treatment regularly?

Yes	
No	

33. If no indicate why?

34. Do you believe that HPT can be cured?

Yes	
No	
Do not know	

35. Do you believe that diet control can manage HPT?

Yes	
No	
Do not know	

36. Do you believe that hypertensive patient can benefit from physical exercise?

Yes	
No	
Do not know	

SECTION E: COMPLIANCE TO THE LIFESTYLE MODIFICATION REGIMEN

How often do you	Daily 4	Frequently 3	Rarely 2	Never 1
37. Eat vegetables?				
38. Eat fruits?				
39. Sprinkle salt on your food?				
40. Eat a meat high in animal fat?				
41. Eat fast food?				
42. Engage in physical exercise?				
43. Try to reduce weight?				
44. Relax?				
45. Get enough sleep?				
46. Smoke?				
47. Drink alcohol?				

TSHIPIDA TSHA UTHOMA: DEMOGRAPHIC CHARACTERISTISTIC OF THE PARTICIPANTS

1. Vha na minwaha mingana?

A =20-34	
B = 35-44	
C =45-54	
D =55-64	
E = 65-74	
F =>75	

2. Vha dzula ngafhi?

3. Vha munna kana mufumakadzi?

A = Munna	
B = Mufumakadzi	

4. Tshiimo tsha mbingano

A = A Vhongo malwa	
B = Vho malwa	
C = Vho taliwa D = Vho lovheliwa	

5. Vha a

A = Shuma?	
B = Di shuma?	
C = Shumi?	
D = Zwinwe vho	

6. Kha vha anganye muholo wa hayani nga nwedzi

A= O-999	
B= 1000-1999	
C= 2000-2999	
D= 3000-3999	
E= 4000 na u fhira	

7. Vha tenda kha vhurereli vhufhio?

A = Tshikhirisite	
B = Bvelelo	
C = Muslim	
D = Judaism	

8. Vho dzhena tshikolo?

A = Ee	
B = Hai	

9. Arali vho dzhena Tshikolo vho dzhena u swika kha murole u fhio?

A = Fhasi ha murole wa vhutanu	
B = Murole wa vhutanu u swika wa fumi	
C = Undergraduate	
D = Post graduate	

10. Vha na vhulwadze ha mutsiko wa malofha?

A = Ee	
B = Hai	

TSHIPIDA TSHA VHUVHILI: ZWITHU ZWINO KWAMA VHULWADZE HAVHO NA MASHAKA

11. Huna munwe arena vhulwadze ha mutsiko wa malofha mutani wahavho?

A = Ee	
B = Hai	

12. Arali a hone, avha ambe vhushaka havho na uyo muthu

13. Ndi tshifhinga tshi nga fhani vho thoma u lwala

A = fhasi ha nwaha	
B = U bva kha nwaha muthihi u swika kha mitanu	
C= U bva kha minwaha mitanu na muthihi u swika kha fumi	
D = U bva kha fumi nthihi swika fumi	
E = Ntha ha minwaha ya fumi thanu	

14. Vha a nwa mushonga wa mutsiko wa malofha?

A = Ee	
B = Hai	

15. Vha dzhia mishonga tshifhinga-de?

A = Matsheloni	
B = Madekwana	

16. Khavha ambe zwithu zwine vha shumisa u langa mutsiko

A = Zwiliwa fhedzi	
B = Mushonga wa mutsiko	
C= Zwinwe vho	

17. Vha dzhia tshaka nngana dza mushonga wa mutsiko wa malofha?

A = Luthihi	
B = Luvhili	
C = Luraru	
D = Luna na u fhira	

18. Ndi a fhio manwe malwadze ane vhavha nao nga nndani ha mutsiko wa malofha?

Thaidzo dza mbilu	
U oma ha milenzhe	
U zwimba ha milenzhe	
U sa vhona zwavhudi	
Thaidzo ya dzi tswio	
U ita vha tshifhelelwa nga muya	
U rwela ntha mbilu	
Ahuna na tshithihi	

TSHIPIDA TSHA VHURARU: U TEVHEDZA NDAELA DZA UNWA MUSHONGA

19. Vhadalela lungana kiliniki u tshekwa vhulwadze ha mutsiko wa malofha?

Nwedzi munwe na munwe	
Murahu ha vhege mbili	
Luthihi nga murahu ha minwedzi miraru	

20. Mutsiko wavho wa malofha udzulela utshekiwa na?

Ee	
Hai	

21. Mutsiko wavho wa malofha utshekiwa lungana?

Duvha na Duvha	
Vhege inwe na inwe	
Nwedzi munwe na munwe	
Luthihi nga murahu ha minwedzi miraru	

Lunganaa?	Duvha na duvha	Tshifhinga tshothe	Tshinwe tshifhinga	Na luthihi
22. Vha anwa mishonga sa zwe vha vhudzwa				
23.Vha a hangwa unwa				
24. Vho litsha unwa mishonga ngauri vha khwine				
25. Vho litsha unwa ngauri zwi khou hulela				
26. Vho litsha unwa ngauri vha tenda uri au shumi				
27. Vho litsha unw ngauri vho dokotela vha dzulela u shandukisa mishonga?				
28. Vho litsha unwa ngau ofha masia ndo itwa?				
29. Vho litsha unwa ngauri vha khou shumisa zwavho maine kana zwa vhureleli vhunwe				
30. Vhaya dzulela uya vhuongeloni utshekiwa?				

TSHIPIDA TSHA VHUNA: ZWINE VHALWADZE VHA TENDA KHAZWO

31. Ndi zwifhio zwine vha nga ita u langa mutsiko?

U la zwiliwa zwo teaho	
U shumisa mishonga	
U shumisa mishonga ya bvelelo	
U rabeleliwa	

32. Vha a dzhia mishonga tshifhinga tshothe?

Ee	
Hai	

33. Arali vha tshiri hai ndi ngani?

34. Vha a tenda uri vhulwadze ha mutsiko vhu a fhola?

Ee	
Hai	
Thina vhutanzi	

35. Vha a tenda uri zwiliwa zwo teaho zwi a langa mutsiko wa malofha?

Ee	
Hai	
Thina vhutanzi	

36. Vha a tenda uri vhalwadze vha mutsiko wa malofha huna zwine vha wana kha nyonyoloso?

Ee	
Hai	
Thina vhutanzi	

TSHIPIDA TSHAVHUTANU: U TEVHEDZA KU TSHILELE KWAO

Ndi lungana vha tshi	**Duvha na duvha** **4**	**Tshifhinga tshothe** **3**	**Tshinwe tshifhinga** **2**	**Na luthihi** **1**
37. La miroho?				
38. La mitshelo?				
39. Shela muno nga ntha ha zwiliwa?				
40. La nama yo dalesaho mapfura?				
41. La zwiliwa zwa u renga zwo bikwa?				
42. Di dzhenisa kha zwa nyonyoloso?				
43. Lingedza u fhungudza tshileme				
44. Awela?				
45. Edela tshifhinga tshinzhi?				
46. Daha fola?				
47. Nwa zwikambi?				

XIYENGE XA A. DEMOGRAPHIC CHARACTERISTISTIC OF THE PARTICIPANTS

1. Mi na malembe mangani?

A =20-34	
B = 35-44	
C =45-54	
D =55-64	
E = 65-74	
F =>75	

2. Mi tshama kwihi?

3. Mi wanuna kumbe wansati?

A =Wanuna	
B = Wasanti	

4. Mi tekiwile xana ina/ ee

A = A mi tekiwangi	
B = Mi tekiwile	
C =Mi hambani le na nuna kumbe nsati D =Mi loverlwile hi nuna kumbe nsati	

5. Ma tirha xana?

A = Ma tirha xana	
B = Ma tirha kumbe mi tirha e hansi ka munhu unwana xana	
C = A mi tirhi xana	
D = Ku na swinwana leswi mi swi endlaka	

6. Xana muholo wa vanhu hikwavo endyangirini wu hlanganile hi nhweti I mali muni?

A= O-999	
B= 1000-1999	
C= 2000-2999	
D= 3000-3999	
E= 4000 and more	

7. Mi tshemba ka ri pfumelo rihi

A = Mi pfumela ka Yesu	
B = Mi pfumela ka swa ndhavhuko	
C = Muslim	
D = Swinwana hi swihi leswi ni pfumelaka ka swona	

8. Mi nghenile xikolo xana?

A = Ina	
B = E-e	

9. Mi fike ka ntangha yihi?

A = Hansi ka ntangha ntlhanu?	
B = Ntangha ntlhanu ku fika ka khume	
C = Undergraduate	
D = Post graduate	

10. Mi muvabyi wa ngati ya le henhla naa?

A = Ina	
B = E-e	

XIYENGE XA B: MI NA XAKA LERI NGA NGHENELELAKU EKA VUVABYI BYA NWINA

11. Xana ku na munhu loyi anga na tshikelelo wa ngati endyangwini kee?

A = Ina	
B = E-e	

12. Loko hlamulo kuri ina, wena una vuxaka muni na munhlu loyi i

Mutswari	
Makwavo	
Nwana	

13. I nkarhi wo leha ku fika kwihi mi kha mi vabya?

A = E hansi ka lembe?	
B = Ku suka ka lembe rinwe ku ya ka ntlhanu?	
C= Ku suka ka malembe ya ntlhanu ku ya ka khume?	
D = Ku suka ka khume ku fika ka khume ntlhanu?	
E = E henhla ka malembe ya khume ntlhanu?	

14. Mile ku nweni ka mirhi ya ngati ya le henhla?

A =Ina	
B = E-e	

15. Miteka mirhi hi nkari muni?

Mpundzu	
Madyambu	

16. Mi tirhisa yini ku lawula ngati ya le henhla?

A = Swakudya ntsena	
B = Murhi wa xilungu	
C= Swinwana	

17. Mi teka mihlovo mingani ya mirhi ya ngati ya le henhla?

18. Mi na mavabyi manwana e handle ka mavabyi ya ngati ya le henhla naa?

Mavabyi ya mbilu	
Ku oma milenge kumbe mavoko	
Ku pfimba milenge	
Mi na riphuma	
Mavabyi ya tinsu	
Mi heleriwa hi moya	
A kuna nchumu	

XIYENGE XA C: KU LANZELELA LESWI MI NGA BWERIWA KU MINWISA SWONA

19. Xana u ya kangani a klinikini ku ya kamberiwa mavabyi ya ngati ye le henhla?

Nhwetini kanwe	
Ndzhuku ka tirihwati timbivhi	
Ndzhaku ka tinweti tinharhu	

20. Xana ntsikelo wa ngati wu kamberiwa?

A = Ina	
B = E-e	

21. Xana ntsikelo wa ngati wu kamberiwa ka ngani?

Siku na siku	
Nhwetini kanwe	
Kambiri a nhwetini	
Kumbe e ndzaku ka tinweti tinharu	

Mi nwa ka ngani?	Siku rinwana na rinwana	Nkarhi hinkwawo	Nkarhi wunwani	Na kanwe
22. Mi teka mirhi hi ndlela leyi dokodela a mi byeleke hi yona naa?				
23. Mi pfa mi rivala ku nwa mirhi naa?				
24. Mi pfa mi tshika ku nwa loko mi twa mi antswa naa?				
25. Mi pfa mi tshika hi ku twa swi kha swi nyanya naa?				
26. Mi pfa mi tshika hi ku vona swi nga tirhi naa?				
27. Mi pfa mi tshika mirhi hikuva dokodela vatshamela ku yi ncica naa?				
28. Mi teka mirhi leyinwani yi nga se hela naa?				
29. Mi vuyelela e tliliniki hi nkarhi lowu mi nga byeriwa wona naa?				
30. Mi pfa mi tshika hi ku chava swi ta ndhaku naa?				

XIYENGE XA D: RIPFUMELO RA MUVABYI NA MAVONELO

31. Mi na tirhisa yini ku hunguta ngati ya le henhla?

Mi tirhisa swakudya ku hunguta ngati ya le henhla	
Mi tirhisa mirhi ya xilungu naa?	
Mi tirhisa mirhi ya xintima naa?	
Mi tirhisa xikhongelo xana?	

32. Mi teka kahle tiphilisi naa?

Ina	
E-e	

33. Loko kuri E-e! Hlamuselani ku ri hikwalaho ka yini?

34. Mi tshemba ku ngati ya le henhla yi nga hola naa?

Ina	
E-e	
A ni tivi	

35. Mi tshemba ku swakudya swi nga horisa ngati ya le henhla naa?

Ina	
E-e	
A ni tivi	

36. Mi tshemba ku vutiolori byi nga hunguta ngati ya le henhla xana?

Ina	
E-e	
A ni tivi	

XIYENGE XA E: MA LANDZELELA TINDLELA TA RIHANYU RA SIKU RINWANA NA RINWANA?

Mi dya kangani	**Siku rinwana na rinwana** **4**	**Minkarhi hinkwayo** **3**	**Nkarhi wunwana** **2**	**Na kanwe** **1**
37. Miroho xana?				
38. Mihandzu				
39. Ma chela munyu ka swakudya loko swi swekiwile?				
40. Madya nyama leyi nga nga na mafurha ya swiharhi?				
41. Madya swakudya leswo swekiwa tikhefini naa?				
42. Ma endla vutiolori naa?				
43. Mi le ku ringeteni ka ku hunguta mirhi xana?				
44.Ma wisa xana				
45. Mi elela tiawara to ringanela xana?				
46. Ma dzaha fole xana?				
47. Ma nwa byala xana?				

ANNEXURE H: CERTIFICATE OF EDITOR

Marion Pfeiffer

P73 Thesen Island

Knysna 6571

Tel: 083 590 6762

044 382 7510

imarion100@gmail.com

23 August 2018

DECLARATION OF PROFESSIONAL EDIT

CONTRIBUTORY FACTORS OF NONCOMPLIANCE TO TREATMENT AMONG PATIENTS DIAGNOSED WITH HYPERTENSION IN THE VHEMBE DISTRICT OF THE LIMPOPO PROVINCE

By Vuledzani Sylvia Mashila

I declare that I have edited and proofread this document. My involvement was restricted to language usage and spelling, completeness and consistency, referencing checking and style and formatting of headings, captions and Tables of Contents. I did no structural re-writing of the content.

Sincerely,

Marion Pfeiffer

Freelance Copy-editor and Proofreader

Intermediate Member, SfEP UK

Professional EDITORS Group

Full member, Professional Editors Group and SAFREA